Nos. 17A911, 17-8151

IN THE
Supreme Court of the United States

RUSSELL BUCKLEW,

Petitioner,

v.

ANNE PRECYTHE, ET AL.,

Respondents.

On Petition for Writ of Certiorari to the
U.S. Court of Appeals for the Eighth Circuit

Application for a Stay of Execution

RESPONDENTS' APPENDIX

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IN THE SUPREME COURT OF THE UNITED STATES

RUSSELL BUCKLEW, Petitioner,	)	
v.	)	Nos. 17A911, 17-8151
ANNE PRECYTHE, *et al.*, Respondent.	)	

EXHIBIT LIST INDEX

March 16, 2018.

IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MISSOURI

RUSSELL BUCKLEW,

Plaintiff,

CASE NUMBER:
4:14-CV-8000-BP

vs.

GEORGE A. LOMBARDI,
DAVID A. DORMIRE,
And
TERRY RUSSELL,

Defendants.

- -

DEPOSITION OF
DR. JOEL B. ZIVOT, MD, FRCP

MARCH 8, 2017

SCHEDULED AT 12:30 P.M. (E.S.T)

AT THE LAW OFFICES OF
KILPATRICK TOWNSEND & STOCKTON, LLP
1100 PEACHTREE STREET, NE
SUITE 2800
ATLANTA, GEORGIA 30309

DTI JOB NUMBER: AT-117942

REPORTED BY: PAULA S. PARRIS, CCR-B-1664

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I N D E X

Witness

Dr. Joel B. Zivot, MD, FRCP

- - -

Exhibits

Defendants'

(Exhibit index continued on next page.)

Exhibits (continued)

Defendants'

Exhibit Number 8, Dr. Zivot Article, "The Slippery Slope from Medicine to Lethal Injections." Time, May 2, 2014, identified on page 9

Exhibit Number 9, Dr. Zivot Article, "Lethal Injection: States Medicalize Execution." 49 U. Rich L. Rev., 711, March 2015, identified on page 9

Exhibit Number 10, Dr. Zivot Article, "The Absence of Cruelty is Not the Presence of Humanness." Philosophy, Ethics and Humanities in Medicine, 2012, identified on page 10

Exhibit Number 11, Dr. Zivot Article, "Too Sick to be Executed: Shocking Punishment and the Brain." 85 Fordham L. Rev., 697, Nov. 2016, identified on page 10

Exhibit Number 12, Dr. Zivot Article, "The White Coat: A Veil for State Killing?" Medpage Today, Aug. 17, 2014, identified on page 10

Exhibit Number 13, Dr. Zivot Interview, "Timeline Described Frantic Scene at Oklahoma Execution." New York Times, May 1, 2014, identified on page 11

Exhibit Number 14, Dr. Zivot Interview, "Florida's Gruesome Execution Theater." Washington Post, March 19, 2014, identified on page 11

Exhibit Number 15, Dr. Zivot Interview, "Oklahoma Wants to Reinstate Gas Chamber, and Experts Say it's a Bad Idea." Huffington Post, Feb. 12, 2015, identified on page 11

Exhibit Number 16, Dr. Zivot Interview, "The Harsh Reality of Execution by Firing Squad." Time, March 12, 2015, identified on page 13

Exhibit Number 17, Eleventh Circuit Decision, Gissendaner v. Commissioner, Georgia Dept. of Corrections, 15-10797, March 2, 2015, identified on page 13

(Exhibit index continued on next page.)

Exhibits (continued)

Defendants'

Exhibit Number 18, Affidavit of Dr. Zivot in the Gissendaner case, identified on page 14

Exhibit Number 19, Florida Supreme Court Decision, Davis. v. Florida, SC14-1178, identified on page 14

Exhibit Number 20, Polk County, Florida, Circuit Court Decision, State v. Davis, CF94-001248-XX, identified on page 15

Exhibit Number 21, Evidentiary Hearing Testimony of Dr. Zivot in Davis v. Florida, identified on page 15

Exhibit Number 22, Florida Supreme Court Decision, Henry v. Florida, SC14-398, identified on page 15

Exhibit Number 23, Motions Including (Dr. Zivot Affidavit Circuit Court of Broward County Florida. State v. Henry, 87-18628CF10A, identified on page 16

P R O C E E D I N G S

(Wednesday, March 8, 2017, Atlanta, Georgia, 12:38 p.m.)

(Exhibit Numbers 1-23 were marked for identification prior to the deposition.)

(Witness sworn by court reporter.)

- - -

Whereupon,

DR. JOEL B. ZIVOT, MD, FRCP

being duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. SPILLANE:

Q. Dr. Zivot, I'm Mike Spillane, from the Missouri Attorney General's office. I wanted to start out by talking about this list of exhibits we have in front of you. And I wanted to go through real quickly and have you identify them. I think everything here is something you'll be familiar with. The first thing I have is Exhibit 1, which is the Missouri Execution Protocol. I assume you're familiar with that.

(Exhibit Number 1 was identified for the record.)

THE WITNESS: Oh, right. This -- this is --

BY MR. SPILLANE:

Q. That's the exhibit list, and then the first one --

A. I see.

Q. -- is the Missouri--

A. (Reviewing). Yes.

Q. Right. And then the second one is your Supplemental Report, which I assume you're familiar with.

(Exhibit Number 2 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. And the third one is a group that I've stapled together of three Affidavits that you gave in this case. And I assume you're familiar with those.

(Exhibit Number 3 was identified for the record.)

THE WITNESS: (Reviewing). Yes.

BY MR. SPILLANE:

Q. Okay. Fourth thing is Dr. Antognini's Supplemental Report.

(Exhibit Number 4 was identified for the record.)

THE WITNESS: I -- I'm skimming these, obviously. So if you want me to --

BY MR. SPILLANE:

Q. Right. Yeah, yeah. I mean, you -- I'm just asking if you've -- if you've read Dr. -- and I'll represent to you that it's Dr. Antognini's report and you're familiar with his report.

A. Yes.

Q. And then that was the supplemental. The second one is his original report, which is Exhibit 5, and I assume you have read that and are familiar with it, if that is his report.

(Exhibit Number 5 was identified for the record.)

THE WITNESS: (Reviewing). Yes.

BY MR. SPILLANE:

Q. Okay. Next thing is an article you authored. I have it labeled as Exhibit 6. It's in USA Today, and it's titled "Why I'm for a Moratorium on Lethal Injections." I assume you remember writing that and are familiar with it.

(Exhibit Number 6 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is a piece you did for CNN, Exhibit 7, titled "Lethal Injection Explained." I assume you're familiar with that.

(Exhibit Number 7 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. All right. The next one is another article you authored for Time, and it's Exhibit 8, and it's "The Slippery Slope From Medicine to Lethal Injection." I assume you're familiar with that.

(Exhibit Number 8 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is an article that you wrote in the University of Richmond Law Review, called "Lethal Injection: States Medicalize Execution", Exhibit 9. I assume you wrote that and are familiar with it.

(Exhibit Number 9 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. The next one is an article you wrote in Philosophy, Ethics and Humanities in Medicine, I've labeled Exhibit 10, and it's titled "The Absence of Cruelty is Not the Presence of Humanness, Physicians and the Death Penalty in the United States." I assume you're

familiar with that.

(Exhibit Number 10 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is an article which you authored in the Fordham Law Review. It is -- I've labeled it Exhibit 11, and it specifically discusses Mr. Bucklew's case to a certain extent, and it's called "Too Sick to be Executed: Shocking Punishment and the Brain."

(Exhibit Number 11 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Are you familiar with that?

A. Yes.

Q. The next article I have is Exhibit 12. It's written in a document -- i a publication called Medpage Today, Public Health and Policy, and it's called "The White Coat: A Veil for State Killing?"

And I assume that you're familiar with that as you are the author of that article.

(Exhibit Number 12 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is an interview, I believe you gave, in the New York Times. And it is Exhibit 13, and it is called "Timeline Describes Frantic Scene at Oklahoma Execution." And I assume you recall giving that interview and are familiar with its contents.

(Exhibit Number 13 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is another interview that you gave for the Washington Post, and it's called "Florida's Gruesome Execution Theater." And I assume you're familiar with that and recall giving the interview.

(Exhibit Number 14 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. The next one is an interview you gave for a publication. I believe it's called Crime. It's listed as Exhibit 15, and it says -- it's titled "Oklahoma Wants to Reinstate the Gas Chamber, and Experts Say it's a Bad Idea."

(Exhibit Number 15 was identified

for the record.)

THE WITNESS: I don't -- I don't recall this.

BY MR. SPILLANE:

Q. Well, let me see if I can refresh your recollection.

A. I see -- I see my name here, but I don't recall this publication. So I don't know.

Q. Right. You're -- the -- the quotation that you supposedly gave was on page 2 of 6, and you talk about nitrogen hypoxia. Does that refresh your recollection?

A. I see that, yes.

Q. Okay. Do you remember giving that interview now, about nitrogen hypoxia, or speaking about it?

A. I do.

Q. Okay.

A. I just don't recognize the name of this publication.

Q. Right. Kind of an odd name. Crime.

A. Yeah.

Q. Oh, you know what, I'm absolutely wrong. The publication is the Huffington Post, and Crime is part of the title, I guess. The Crime section of Huffington

Post.

A. I see.

Q. So I apologize. So now does that refresh your recollection?

A. Yes.

Q. Okay. The next thing I have is -- again, it's a Time interview, and it's called "The Harsh Reality Of Execution by Firing Squad," and you gave a little interview for that. And I don't know if you recall that.

(Exhibit Number 16 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. Seventeen is an opinion of the Florida Supreme Court, in a case called Gissendaner -- I'm sorry, of the United States Court of Appeals for the Eleventh Circuit, in a case called Gissendaner versus Commissioner. And I believe you gave evidence in that case.

Do you recall giving evidence in that case and the Supreme Court opinion? Excuse me, the Eleventh Circuit opinion.

(Exhibit Number 17 was identified for the record.)

THE WITNESS: I don't -- I -- I recall the

case. I would have to, you know, look to familiarize myself again but, yes, I recall the case.

BY MR. SPILLANE:

Q. The next document I have is Exhibit 18, and it is an Affidavit which you gave in the Gissendaner case. Do you recall giving that now, the Affidavit --

A. Yes.

Q. -- and the contents of it?

(Exhibit Number 18 was identified for the record.)

BY MR. SPILLANE:

Q. The next is Exhibit 19, which is a Florida Supreme Court opinion in a case called Davis v. Florida.

A. Uh-huh (affirmative).

(Exhibit Number 19 was identified for the record.)

BY MR. SPILLANE:

Q. Do you recall participating in that case?

A. Yes.

Q. Okay. And then the next thing after that is Exhibit 20, which is an order of the Circuit Court denying the stay of execution -- well, I guess it's what they call the Circuit Court. The trial level court in Florida, denying the stay of execution in the Davis case.

(Exhibit Number 20 was identified for the record.)

BY MR. SPILLANE:

Q. Do you recall that?

A. Yes.

Q. Okay. Exhibit 21 is your testimony that you gave in the Davis case, and I believe your testimony actually starts at page 19 of the transcript I've handed you.

(Exhibit Number 21 was identified for the record.)

THE WITNESS: (Reviewing). Yes, I see that.

BY MR. SPILLANE:

Q. Yeah. And you recall giving that testimony?

A. Yes.

Q. Okay. The next thing I have is a Florida Supreme Court Decision in a case called Henry v. State of Florida, in which you gave evidence. Do you recall that case?

(Exhibit Number 22 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. All right. And do you recall this decision at all?

A. Not specifically.

Q. Okay. The next thing I have is Exhibit 23. And if you -- it is a pleading that was filed by Mr. Henry in the State of Florida. And if we flip to the back of it, attached to it is an Affidavit that you gave in the case. Do you recall that Affidavit I'm looking at? I think it's farther back.

(Exhibit Number 23 was identified for the record.)

THE WITNESS: Yes.

BY MR. SPILLANE:

Q. Okay. Now I'm going to ask you something specifically about your report. When you listed the interviews and such that you did in your report, which is Exhibit 2, you referred to an interview that you gave with Dahlia Lithwick, which was a podcast for something called Slate. Do you recall doing that?

A. Yes.

Q. Okay. I have in my notes that at page two -- at two minutes and thirty seconds into that podcast, you said that the Constitution does not ask for a punishment to be humane, but it does ask that punishment not be needlessly cruel. Is that accurate?

A. I don't have a copy of the transcript, so I --

Q. Is that consistent with your views?

A. Say it again.

Q. What you said was the Constitution does not ask for the punishment to be humane. It does ask that the punishment not be needlessly cruel. Is that consistent with your views?

A. Yes.

Q. Okay. I have at page -- excuse me, twelve minutes and twelve seconds into that, you said, lethal injection can never meet the requirement for not needlessly cruel. You didn't say being -- actually -- I didn't misread it. It actually says lethal injection can never meet the punishment for -- meet the requirement for not needlessly cruel. Do you remember saying that?

A. Perhaps.

Q. Is it consistent with your views?

A. Yes.

Q. Explain, please. Explain why lethal injection can never meet the requirement for not being needlessly cruel.

A. Lethal injection, as I've seen it practiced, or have -- having reviewed protocols, imagines that the chemicals that are employed can produce death in

a way that the chemicals are not able to do.

Q. Okay. Let me refer you to Exhibit 8, which was an article you wrote, on page 2, and it's The Slippery Slope From Medicine to Lethal Injection article. And it's page 2 of that. And I'm looking at the paragraph that says:

(Reading:) Lethal injection is merely an impersonation of medicine, nothing more. It wastes scarce drugs that could serve dozens of patients in medical need. When I study the details of lethal injection -- of the lethal injection protocol, my medical knowledge feels more like a curse as I see mistakes that lead to unnecessary cruelty (end of reading).

Is that consistent with your view?

A. Yes.

Q. And I'm going to skip down to the next paragraph where you wrote: (Reading:) Lethal injection was never anything other than a facade for punishment, never not needlessly cruel (end of reading).

Is that consistent with your views?

A. Yes.

Q. All right. Also, and I -- I don't know if you recall this, but I'll simply step out of order here a little bit. In your testimony in the Davis case, you refer to yourself as a vocal advocate against lethal

injection. Is that accurate? I mean, are you a vocal advocate against lethal injection?

A. I'm not sure what you mean when you define a vocal advocate.

Q. I don't know. I'll come back to -- I -- I've got the quote here and when I get to it, I'll probably ask you what you meant then.

A. Okay.

Q. I would refer you now to Article -- excuse me, to Exhibit 6. It's an article you wrote titled Why I'm for a Moratorium on Lethal Injections. One of the first things I saw there is you were talking about when you first witnessed an anesthetic, sodium thiopental, being used. And you described that it raced into a vein and in a moment rendered the patient unconscious. Is that accurate?

A. This article was written, you know, for a newspaper audience. And so if you're asking me to define what a moment means as a specific amount of time in seconds, then I think maybe that's what we have to discuss.

Q. Well, tell me what you meant.

A. That in a -- in a short period of time. So, I don't know, I think a moment was just meant to mean relatively quickly.

Q. All right. Let me ask you something else you wrote. You wrote that your right to use thiopental was earned through thousands of hours of study, training and evaluation, and proof of your sound, safe and sage practice is being endangered by the use of lethal chemicals in injections. Is that accurate?

MS. CARLSON: Do you have that -- are you reading from somewhere?

MR. SPILLANE: Yeah. I have it written down here, but it's also in the article if you wish to -- let's see. Give me a moment and I'll find the exact quote.

BY MR. SPILLANE:

Q. (Reading:) My right to use sodium thiopental was earned through thousands of hours of the study of pharmacology, anatomy, physiology, training and evaluation. It was earned by the granting of a medical degree. It was granted by State medical boards whose job is to protect the public. It was validated by granting the hospital privileges based on proof of my sound, safe and sage practice and a license from the Drug Enforcement Agency (end of reading).

And above that, you talk about how that -- the right to use thiopental has been taken away because it's been used in lethal injections and is no longer

available. Is that accurate?

A. Yes.

Q. Talking a little bit -- this may go a little bit into your qualifications. Explain to me a little bit about the thousands of hours of training and so forth that go into your ability to use anesthetics.

A. An anesthesiologist is a physician who has trained in that particular specialty after having completed four years of college and four years of medical school. That training is an additional four years. During that time, I studied anatomy and physiology and -- and chemistry as it applies to anesthesiology.

At the end of that training, I write an exam, and I have a -- I'm further examined through an oral exam format. And the American Board of Anesthesiology, which is an organization recognized by the -- a group -- by an organization that grants specialty certification to various medical specialties.

I submit myself to that, and having passed those things, I'm -- I'm granted as a -- or designated as a member of the American Board of Anesthesiology in this case. And so the sum total of that time, of all that training, is -- is thousands of hours.

Q. That would include conducting many, many surgeries, doctor?

A. Anesthetics.

Q. Well, what -- I probably misspoke. Doing the anesthesia during many, many surgeries?

A. Correct.

Q. How many?

A. Well, are you asking me during my training or --

Q. Yes. During your training in order to become board certified, how many anesthesias would you have to do during surgeries?

A. Well, on average, it would be -- say we could estimate four, maybe four anesthetics a day. So that would be twenty a week. Maybe eighty a month. Maybe eight hundred a year, times by four would be thirty-two hundred anesthetics in the training experience.

Q. When you did these anesthesias, were you required to be competent to set IV lines?

A. Yes.

Q. Were you required to be competent to do that in peripheral veins?

A. Yes.

Q. Were you required to be able to do that in central veins?

A. Yes.

Q. Would that include the femoral vein?
A. Yes.
Q. Would it include the subclavian vein?
A. Yes.
Q. Would it include the jugular vein?
A. Yes.
Q. And how many times did you have to do that in the period you were training to be board certified, sir?
A. I would say that I did that -- in each of those locations or in total?
Q. Well, just tell me generally how often you had to use a central line. I won't differentiate between the location, between the large veins.
A. Well, during my training, I would say that I did that a hundred times, maybe two hundred times. I don't recall specifically, but it was an often enough experience that I would do it on a regular basis.
Q. And is that typical for persons that are trained to be a board-certified anesthesiologist, sir?
A. Yes, it is.
Q. And would it be fair to say that if you weren't competent at that, you wouldn't have gotten certified?
A. That would be one of the requirements that

an anesthesiologist would require for certification.

Q. All right. Let's flip to Exhibit 13, Frantic Scene at State Killing. Page 4 of 4 is what I'm interested in.

MS. CARLSON: Did you say 13?

MR. SPILLANE: Yes, ma'am.

BY MR. SPILLANE:

Q. Timeline Describes Frantic Scene at Oklahoma Execution. Sorry, my notes didn't quote it exactly. Are we at page 4 of 4? Four -- 4 of 4?

A. Yes, sir.

Q. Okay. Yes?

A. Yes.

Q. And it earlier describes that Oklahoma had said that a femoral vein had blown to explain the allegedly -- the botched execution. And you have a comment there. Let's see. (Reading:) The femoral vein is a big vessel, Dr. Zivot said. Finding the vein, however, can be tricky. The vein is not visible from the surface and is near no major artery. You can feel it and you can't see it. Without special expertise --

A. You can't feel it.

Q. Oh, I'm sorry. You're right. (Continues reading:) You can't -- without special expertise, you can't feel it. Without special expertise, the failure is

not surprising (end of reading).

And so what I'm gathering here is -- from the paragraph above that, that you're disputing Oklahoma's assertion that the femoral vein was blown.

A. This was -- this -- that was --

Q. I'm sorry. Let me ask a better question. I'll read the paragraph I'm thinking about. (Reading:) Dr. Joel Zivot, an anesthesiologist at Emory University School of Medicine, said that the prison's initial account that the vein had collapsed or blown was almost certainly incorrect (end of reading).

And I want to know why you -- why you said that.

A. The -- what was described was that the catheter that was used was actually a short catheter. And so I think that the word blown might be a bit of a term of art. So they claimed that the vessel did not -- ruptured in some way. And my view here is that the catheter was pulled out of the vein, was not in the vein. And so the distinction here, I think, is perhaps what you're asking me.

Q. Yes. That's -- I was trying to get at why you made that conclusion. I wasn't sure from the article. And in the next paragraph when you're describing your conclusion, you say, the femoral vein is

a big vessel.

Would that go to your reasoning in why you concluded it wasn't blown as they used the term?

A. The femoral vein is a vessel of a -- of a large caliber, and should be able to, if -- when properly placed, take a fair amount of fluid when -- as it is infused into the vein. And so for that vein to rupture, from what was described, seemed unlikely.

Q. And let me contrast it to a peripheral vein. If a peripheral vein was used, that might be more likely to rupture because it's not a big vessel, as you describe the femoral vein?

A. Yes.

Q. Okay. Now your article at Exhibit 7, for CNN, the thrust that I got from that article is that it's opposition to lethal injection, and at one point you said, if capital punishment continues, it needs to be a better method. Is -- is that a fair summary of the article?

A. Not really.

Q. Well, tell me -- tell me what you meant there.

A. Well, are you saying that that's -- I think that's one point.

Q. That's one point that you made, is --

A. Yeah.

Q. -- that if lethal -- if execution continues, it shouldn't be lethal injection. Is that a fair point?

MS. CARLSON: Take your time to read the entire article if you need to because he's asking you a lot of questions about various articles.

THE WITNESS: Ask -- please ask me that question again.

BY MR. SPILLANE:

Q. Well, let me -- let me see if I can come to a specific point that I can ask you about then, instead of -- please keep reading and I'll ask you about a specific point.

A. (Reviewing).

Q. I'm looking at your -- in the concluding thing at the end of page 3 of 3. And you begin the paragraph: (Reading:) Lethal injection as presently practiced is an impersonation of medicine populated by real doctors who don't acknowledge the deception. The rightness or wrongness of capital punishment remains an open question, but it's time to reject lethal injection. If capital punishment continues, it needs another method (end of reading).

Is that consistent with -- what you wrote

there, consistent with your views?

A. Yes.

Q. I'm going to go next to Exhibit 10, which is titled The Absence of Cruelty is Not the Presence of Humanness.

A. Humanness (pronouncing), actually.

Q. Oh. Okay. I thought there would be another E there. My mistake. Not the presence of humanness, physicians and the death penalty in the United States.

Are you familiar with the content of this article?

A. Yes.

Q. I'll read the last sentence in the article. (Reading:) If the death penalty is cruel, then attempts to reduce cruelty by pharmacological adjustments are not necessarily humane, or worse, create an illusion of humanness as they are physician directed (end of reading).

Do you agree with that analysis?

A. Yes.

Q. Okay. Now the next article I'm going to go to is Number 11, which is the Fordham Law Review article, Too Sick to be Executed: Shocking Punishment and the Brain. And I'm going to turn to page 2 of 7. I

apologize for taking a moment here, but I have a specific quote I wanted to ask you about.

Here we go. I'm looking at -- under Roman Numeral II, Too Sick to be Executed. I believe it to be the second full sentence in the paragraph, and it's describing Mr. Bucklew's tumors. And it says --

A. Which number is that? I think these are all numbered --

Q. Roman Numeral II.

A. No, but these are all numbered sentences. So which number?

Q. Well, it's -- it's right after Footnote 34. It begins these vascular tumors.

A. I see.

Q. Okay. (Reading:) These vascular tumors have been present since birth and will continue to grow. They are resistant to definitive treatment and will eventually obstruct Bucklew's airway and kill him by self-strangulation if he is not executed first (end of reading).

Is that your -- do you agree with the statement that you wrote there?

A. Yes.

Q. Okay. And I think let's shift then to your actual Supplemental Report, which is Exhibit 2. And if

we go to page 8.

A. Just give me a moment to find 2.

Q. Oh, I'm sorry. Well, how about let's go to -- let's go to page 8, paragraph 10, when you get there.

A. Yeah. This is 5. This is 2. All right, I found it.

Q. All right.

A. All right. So here's 2. So, I'm sorry, where?

Q. Paragraph labelled 10 at the bottom of page 2. This is in your report.

A. Bottom of page 2.

Q. Bottom of page 8. I'm sorry. If I said 2, I apologize. It's paragraph 10 at the bottom of page 8.

A. Okay.

Q. All right. What you wrote there: (Reading:) As already described, Mr. Bucklew's condition is progressive. As of April 2012, Mr. Bucklew's medical records indicate that his condition did not appear to place him at risk of life-threatening hemorrhaging.

My examination of Mr. Bucklew on January 8, 2017, as well as my review of recent MRI and CTI imaging reports, form the basis of my conclusion at the -- at the present time. Mr. Bucklew is at risk of life-threatening hemorrhaging, particularly under the conditions imposed

by Missouri's execution procedure (end of reading).

So is -- is that paragraph consistent with your earlier conclusion that if he's not executed, the hemangioma is eventually going to strangle him?

A. Yes.

Q. Okay. Let's go to -- oh, let's see, page 9, conclusion A. (Reading:) It is my professional opinion that Mr. Bucklew suffers from a severe and life-threatening form of cavernous hemangioma. Given the nature of Mr. Bucklew's condition, it is my medical opinion that the vascular tumors that obstruct Mr. Bucklew's airway will present a permanent threat to his breathing, and that life-threatening choking episodes will occur on an ongoing basis. When these choking episodes occur, they will be associated with hemorrhaging to a varying degree that will be easily visible by any observer (end of reading).

Is that also consistent with your conclusion that the hemangioma will strangle him if he's not executed?

A. I think that what I said here is consistent with my view, so, yes.

Q. Okay. And when that happens, then there will also be hemorrhaging is what I take from A. When he chokes, there will also be hemorrhaging.

A. That's my belief.
Q. Okay. Now I'm going to shift to Exhibit 12, which is The White Coat: A Veil for State Killing? Now as I take this article, it is your account of an execution that you witnessed in the State of Georgia.
A. Yes.
Q. Why would you write an account of an execution which you witnessed in the State of Georgia?
A. I'm not sure I understand your question.
Q. Well, this is -- let me ask it this way. Did you write an article -- did you witness an execution in the State of Georgia and write an article about it as part of your vocal advocacy against lethal injection?
MS. CARLSON: Objection. Form.
BY MR. SPILLANE:
Q. You can answer it if you can understand it. If it's too confusing, I'll try again.
A. I -- I don't really understand what you're asking me.
Q. Why did you write the article, The White Coat: A Veil for State Killing?
A. Why did I write it?
Q. Yes, sir.
A. I'm -- I'm interested in the subject.
Q. Why did you witness the execution?

A. I was requested to witness it by the person executed, Mr. Wellons.

Q. Okay. When we go to page 3 of 6, you described a little bit of what you saw there. And I'm looking at the paragraph that begins, the inmate. I believe it is the one, two, three, fourth paragraph from the top, the fourth full paragraph.

A. Yes.

Q. Okay. And you said: (Reading:) The inmate has an apparent change in his respiratory pattern and I assume the execution has therefore begun. He twitches strongly once, mostly on the left side of his body. I am looking hard now for something in his breathing or in his movements that I could construe as consciousness or the lack of it (end of reading).

And then you kind of move on to something else. I was wondering if you saw something in his breathing that you could construe as consciousness or the lack of it?

A. No.

Q. Okay. Next you said that a corrections officer fainted, in the next paragraph.

A. He collapsed. The corrections officer collapsed.

Q. All right, yeah. And you used the word, I

lose count when suddenly one of the corrections officers faints and falls forward. I was using your word.

A. Okay.

Q. Okay. How long were you distracted by the corrections officer's fainting?

A. I don't understand your question.

Q. Well, later in the article, you came back and talked more about the inmate and didn't see anything abnormal occur. But that talk -- that happens after you talk about the corrections officer fainting and you describe that. So I was wondering how long your attention was off of the inmate.

A. I don't --

MS. CARLSON: Objection. Foundation.

THE WITNESS: I don't know how long it went on for. I had no watch. I had no way -- if you're asking me in matter of minutes, is that what you're asking me, or is this a --

BY MR. SPILLANE:

Q. Well, let me ask the question a different way. Earlier you described you didn't see anything prior to the guard fainting, any change in breathing that would indicate he was or was not conscious. Did you see anything like that during the remainder of the execution?

A. It was very hard to see much. So all I

could see, I was looking through a window from a distance. It was hard to see things with great precision.

Q. All right. I'm looking at page 5 of 6, and I'm looking at the paragraph that begins with, if the Georgia Composite Medical Board.

A. Uh-huh (affirmative).

Q. And you write there that: (Reading:) If the Georgia Composite Medical Board or any other State medical board refuses to be a plaintiff against the warden for an order of mandamus to force disclosure of the identities of physicians hired to supervise lethal injections, then probably any resident in that state has sufficient interest in knowing whether the men in question are his or her doctors (end of reading).

And then in the next paragraph, you say: (Reading:) Residents may bring a relator action against the warden and may name the medical board as a defendant in whose name Mr. Jordan -- I assume -- Mr. Jones (end of reading). I assume that's the guard -- moves for mandamus.

A. No, Mr. Jones is --

Q. Mr. Jones is the defendant? Okay.

MS. CARLSON: No. I think he's -- no. I think that misstates what the article says.

THE WITNESS: It's just -- he's a --
BY MR. SPILLANE:
Q. Who is Mr. Jones?
A. A theoretical plaintiff.
Q. Okay. The citation of the case would read Georgia Composite Medical Board, ex rel. Jones v. Warden. So if I take this correctly, you're suggesting here that residents of the State of Georgia should bring an action against the warden based on what happened at this execution. Is that fair?
MS. CARLSON: Objection. Form.
THE WITNESS: No. That's not what I'm saying.
BY MR. SPILLANE:
Q. Tell me -- tell me what you mean.
A. The -- what's at issue is the fact that in Georgia, physicians who participate in lethal injection, their identity is kept secret. And medical boards need to know the identity and activity of all physicians within the State. But these particular physicians, if they choose to participate, their identity is protected, and the medical board should demand to know what all physicians in the State do under normal considerations when they are practicing or holding themselves out to be practicing medicine in any form. And that's my point.

Q. So as I understood it, you first of all talked about the State Medical Board refusing to be a plaintiff, and then you talked about the residents may bring an action against the warden. Is that accurate?

A. I don't -- I don't understand your question.

Q. All right. You said here, residents may bring a relator action against the warden and may name the board as a defendant. So are you saying that residents should sue the medical board because they're not actively pursuing the physicians who participated in the execution?

MS. CARLSON: Objection. Form.

THE WITNESS: This is an article that I wrote which are my views on -- on something of this -- in this subject. And I'm not holding myself out as a legal expert or as a national advocate in some way, nor am I representing myself as the beginning of some lawsuit that should be brought against the State. That's not my intention here.

BY MR. SPILLANE:

Q. Okay. I'm going to go next to Exhibit 14, which is titled Florida's Gruesome Execution Theater, in the Washington Post. Did you give an interview for this

article?

A. Yes.

Q. What was the point of your interview here, sir? What did you say?

A. I -- I don't recall.

Q. Okay. That's fine. Let's -- let's move forward. I'm going to go to Exhibit 15, Huffington Post. It's titled Oklahoma Wants to Reinstate the Gas Chamber, and Experts Say it's a Bad Idea.

And then I'm looking at page 2, where we start with Dr. Zivot -- Dr. Joel Zivot, assistant professor of anesthesiology. Are we there?

A. Uh-huh (affirmative).

Q. And then it's --

A. Yes.

Q. -- (Reading:) Dr. Joel Zivot, assistant professor of anesthesiology and surgery at Emory University School of Medicine, told the Huff Post it is ethically impossible for a doctor to conduct tests and therefore reach conclusions on execution procedures. No physician is an expert in killing, and medicine doesn't itself -- doesn't position itself intentionally in taking a life, Zivot said. He added, there's no therapeutic use of nitrogen gas and there's no way to ethically or practically test if nitrogen gas is a humane alternative

(end of reading).

So what were you referring to in that second paragraph there, sir, about no physician is an expert in killing?

A. I'd -- I'd have to -- I -- I don't know if I can recall the question that was asked of me at the time. So without knowing the question, I'm -- I'm not sure I can accurately --

Q. Well, let me ask you is this is accurate, where you wrote, there's no way to ethically or practically test if nitrogen gas is a humane alternative. And I assume by that, you mean a humane alternative to lethal injection. Is that accurate?

A. I'm not sure that I used the word humane, frankly. That may have been what they inserted here, because that would not be my word here.

Q. Tell me what your word would be.

A. I would say not cruel.

Q. So there's no way to tell if nitrogen gas would not be cruel, is -- is that what you were saying?

A. Yes.

Q. I know you just spoke about nitrogen, and the article talks about gas chambers, so I'm guessing it might be broader. Do you have an opinion if there's any way to know that another gas used in an execution would

not be a -- would not be cruel?

A. I have no opinion about that.

Q. Well, would the same reasoning that you can't test it, therefore you can't know about nitrogen, apply to other gases?

A. I -- I'd have to know the entirety of what you're describing to know how to answer your question.

Q. Well, you said there's no practical way to test if nitrogen gas -- and you used the word cruel here, so I'll use the word cruel -- is a cruel alternative. Does that statement apply to using other gases besides nitrogen as a replacement for lethal injection?

A. I -- I'm not an expert in any technique of killing. If you're asking me to design or describe --

Q. No, I'm not. I'm asking if your statement that your made about nitrogen applies to other gases.

A. I would have to know which gases, and the details, to be able to answer your question.

Q. Okay. Let's move on to document 18, which is your Affidavit in the Gissendaner case. Let me know when you've -- you've gotten there.

A. I've got it.

Q. Now, I'm looking at paragraph 11 on it looks like page 4 of 6. And what you wrote there is: (Reading:) I have been informed that Kelly Gissendaner

is a 46-year-old woman with a height of five foot ten inches and a weight of two hundred and ten pounds. This corresponds to a body mass index BMI of 30.1 kilograms per M squared.

A. Meter squared.

Q. Meter squared. Thank you. I didn't -- I do not know the term. (Continues reading:) And puts her in the obese category. Intravenous access is very difficult to obtain in obese individuals. Female gender is also a misfactor for difficult intravenous access, as their venous systems tend to be smaller than those of men. As a result of Kelly Gissendaner's diagnosis of obesity and her gender, I anticipate that establishing intravenous access will be extremely difficult. Obesity is also a known risk factor for obstructive sleep apnea (end of reading).

Now, did you know anything about Ms. Gissendaner besides the information that you said in paragraph 10 that you were told -- paragraph 11 that you were told?

A. What sort of information do you --

Q. Anything. I mean, you said I was informed, and then before you gave your opinion, you told in paragraph 11 what you were informed about Ms. Gissendaner. Did you know anything else?

A. I don't know if I understand what you're asking, specifically. Anything else, meaning --

Q. Did you examine her medical records?

A. I can't recall.

Q. Did you examine her?

A. No, I did not examine her.

Q. I'm looking at paragraph 18. You said: (Reading:) As a result of these facts, I hold the position that if the State of Georgia proceeds with the execution of Kelly Gissendaner as outlined in the referenced lethal injection procedures, she will suffer an excruciating death (end of reading).

Do you recall making that conclusion?

A. I see it here, yes.

Q. But do you recall making it?

A. Yes.

Q. And your signature's on the Affidavit, is it not?

A. Yes.

Q. Now is there anything in your Affidavit about Ms. Gissendaner's physical condition except that she's female, she's 46 years old, and she's overweight, and overweight people tend to get sleep apnea?

A. I would have to review --

Q. Okay.

A. -- the entirety of this.
Q. Okay.
A. And also records that I don't have here, to remind myself.
Q. Well, why don't you read this and tell me if there's anything in there besides she's overweight and she's female, and overweight female people have sleep apnea?
A. So then ask me the question that you want me to answer then.
Q. I wanted to know if there's anything in this Affidavit besides the information in paragraph 11 that you based your conclusion on about Ms. Gissendaner's condition?
MS. CARLSON: Objection. Form.
THE WITNESS: (Reviewing). All right. So I've looked at this now so, please, again, I'm sorry, ask me your question one more time.
BY MR. SPILLANE:
Q. Is there anything in that Affidavit, besides the information in paragraph 11, that you knew about Ms. Gissendaner's physical condition?
A. No.
Q. So you based your conclusion, at least as far as it went to her physical condition, that she would

suffer an excruciating death during an execution, on the fact that she was a female and she was overweight?

MS. CARLSON: Objection. Form.

THE WITNESS: There were two points that I made here.

BY MR. SPILLANE:

Q. Yes.

A. One was difficulty in obtaining IV access and the problem of that.

Q. Yes.

A. And the second was her risk for obstructive sleep apnea based upon her BMI. And then drawing from the experience of the execution of Dennis McGuire. And that was the reason why I came to my conclusions.

Q. But the information you had about her was that she was five foot ten, weighed two hundred and ten pounds, she was female, and females are prone to sleep apnea?

A. No. No, I didn't say females are prone to sleep apnea.

Q. Well, let me look at what you said.

A. I said females are -- have smaller vein aperture, and that her weight is what puts her at risk for sleep apnea.

Q. You're right. Obesity is also a known risk

for obstructive sleep apnea.

Now did the United States District Court or the Court of Appeals stay Ms. Gissendaner's execution?

A. Are you asking me if Kelly Gissendaner was executed?

Q. Yes. I'm asking you first, those opinions that I handed you --

A. Yeah. I don't know.

Q. -- did either --

A. I can't recall.

Q. Was she executed?

A. Yes, she was.

Q. Did you read any articles about her having suffered an excruciating execution?

A. I didn't read any articles about that.

Q. Did you write any articles about it?

A. No.

Q. You wrote about the Georgia execution where that man, Mr. Clayton Lockett, was executed.

A. That was based upon the narrative of others.

Q. Do you have any reason to believe -- well, let me ask you this. If I represent you -- to you that there was an NBC article that you can find on the internet that indicates that she sang Amazing Grace

during the execution, would that be consistent with her suffering an excruciating execution?

MS. CARLSON: Objection. Form.

THE WITNESS: I think that the -- I can't know, nor can anyone know, what Ms. Gissendaner felt or didn't feel. I can't know that. I can only speculate it. She did not, by reports, which are very flawed, generally, of -- based upon witnesses.

The reason why I say it is, for example, in the case of the execution that I saw, there was no report of that in the official report that anybody -- that any corrections officer fell on the legs of Marcus Wellons. I know that I saw that. That didn't make it into the execution report.

So the fact that she -- I think we probably both know that the way that these things are reported, they're reported with perhaps either a certain style or intention. If you're asking me are these reports impartial, I would say --

BY MR. SPILLANE:

Q. No, I'm not asking you if they're impartial. I asked if you read a report that she sang Amazing Grace during the execution?

A. I -- I've heard that. I heard that she

sang Amazing Grace at some point.

Q. So you were aware of that?

A. Yes.

Q. How were you aware of it?

A. By a report in the media.

Q. You just told me five minutes -- a moment ago that you didn't read any reports.

A. No, you asked me if I read any report if she suffered.

Q. Oh.

A. If I read anything of whether she had suffered. And the answer was I did not read any report that she had -- that anyone had written that she had suffered. But that's --

Q. Okay. That's probably a bad question on my part. I should have asked you if you read any reports in the media. My mistake.

Let's see if we can move on to document 21, which will be your testimony in State of Florida v. Davis. I'm going to go to -- when you're ready -- to page 22.

A. I have it. Okay.

Q. All right. If you'd go ahead and read that page real quick.

A. Just where? The beginning of Q, or just

from the top of the page?

Q. Just from the top, please.

A. (Reviewing).

Q Well, I'll stop you. What I'm mainly interested on page 22 is the one that begins with A, well, anesthetics. And when you've read that, let me know. Just that, that answer.

A. (Reviewing). Okay.

Q. When you started there on A, when you were asked, well, it doesn't deaden pain correct, sir, you answered, well, anesthetics, when done correctly, do take away pain. Could you explain to me how that works?

A. Which part? Anesthetics take away pain?

Q. Yes. How do anesthetics take away pain, sir?

A. Well, pain is a -- is something that is a response to a stimulus that would be considered to be generally noxious. And certain kinds of medications used in an anesthetic can block the perception of that noxious stimulus.

Q. Does that work for barbiturates such as thiopental and pentobarbital?

A. No.

Q. Okay, you said, well, anesthetics, when done correctly, do take away pain. When you use

thiopental, would the people feel pain?

A. Barbiturates, as a class, are not considered to be analgesic.

Q. I understand. When people are unconscious, they're in a coma-like state. Do they -- let me -- let me -- that's a compound question. Do anesthetics, before a surgery is conducted, put a person in a coma-like state?

A. I don't know what you mean when you say coma.

Q. Are they in a -- in a place where they cannot feel noxious stimuli -- stimuli during surgery?

A. The interior experience under an anesthetic is somewhat variable, but the -- the hope is that the experience that is taking place is not noxious to a degree that it would either cause great distress in the moment or cause distress afterwards.

Q. And is that what you meant when you said anesthetics, when done correctly, do take away pain?

A. Anesthetics, when done correctly, can take away pain, yes. But -- I'm sorry.

Q. Go ahead.

A. No.

Q. No, please go ahead. I don't want to cut you off.

A. No, I'm -- I'm done.

Q. Okay. And so do anesthetics, and I mean barbiturates such as pentobarbital or sodium thiopental, when done correctly, create a stim-- a situation in the patient that takes away pain?

A. Barbiturates are not analgesic.

Q. I understand. That wasn't what I asked you. I asked you if you use thiopental as your surgical anesthetic, do you -- do you get a level of depth there where it takes away pain?

A. It's not used in that way.

Q. Using sodium thiopental as a surgical anesthetic?

A. It's not --

Q. Before propofol?

A. It's not -- no, sorry.

Q. Before propofol became in, was not sodium thiopental the generally used surgical anesthetic in the United States?

A. I need you to define for me when you say surgical anesthetic, what you mean, or what part of the anesthetic you intend there.

Q. Was it commonly used as an anesthetic for surgeries in the United States?

A. It was used as something called an

induction agent, if you're familiar with that term.

Q. Yes.

A. It was used as an induction agent in combination with other agents.

Q. What other agents?

A. Narcotics, benzodiazapenes, maybe analgesics of other classes.

Q. Well, benzodiazapenes are not analgesics, are they?

A. You're correct, they're not.

Q. Okay. What was the thrust of the evidence you gave in the Davis case? What was the opinion that you gave to the Court?

A. I -- I don't recall.

Q. Would it refresh your recollection to indicate -- if we go to page 24 and 25 of your testimony, which you indicated that he would have an attack of acute porphyria, severe abdominal pain, rashes, neuropathy, burning sensation, heat and cold tolerance, alodemia, which is sensitivity to general touching, confusion and seizures.

Why don't you read through 24 to 26 if you have a second there?

A. (Reviewing). Okay, I've read it.

Q. Is that a fair conclusion that you

indicated, that if he would be executed using midazolam, that he would have an attack of acute porphyria, which would result in these symptoms?

A. I don't think this was midazolam. Does it say midazolam?

Q. Yeah, it was midazolam. And you relied on a study of chick embryos.

A. Okay.

Q. So is that consistent with your testimony which you indicated he would have an attack of acute porphyria if he was executed?

A. That was my opinion, yes.

Q. Did you have any knowledge that he had ever had an attack of acute porphyria in his life?

A. I think -- no.

Q. Okay.

A. But -- no. Ask -- whether I knew it or not is not the question, I don't believe. So that was my concern based upon his history.

Q. What history?

A. That he was at risk for an attack of porphyria. But I'd have to look back again. It's been a while, on the medical information. If I made the statement, then I'm certain that I had a reason to make it.

Q. Do you recall relying on a -- on a chick embryo study in this case?

A. Well, relying. That may have been one of the things that I reviewed.

Q. Let's go to -- now, let me ask you about the study. Did the study that you reviewed on chick embryos also say at its end that triazolam and midazolam are generally listed as safe for use with people that have porphyria?

A. I can't recall it. I'd have to look at it again.

Q. Now, do you recall that the Florida Supreme Court denied the motion for stay of execution that was based at least in part on the claim that he would have an acute attack of porphyria?

A. I believe so.

Q. All right. Do you recall that Mr. Davis was executed?

A. I believe so, yes.

Q. Now I'm going to ask a better question this time. Did you read any news reports about his execution?

A. I don't recall.

Q. So you didn't -- and you didn't write any articles about his execution?

A. Not that I recall.

Q. And the answer to this question may be no, but if he had shown symptoms of porphyria during his execution, such as vomiting, nausea, convulsions, that's something that somebody would have written about, isn't it, Doctor?

A. Potentially not.

MS. CARLSON: Objection. Form.

THE WITNESS: I have no idea.

BY MR. SPILLANE:

Q. If I represented to you that there was an article in the Lakeland Florida Ledger, which is, I believe, where the victim was from, that he showed no signs of discomfort during his execution, would you have any reason to disagree with that?

A. What, where the article was written?

Q. The article was written by the Lakeland Florida Ledger. I assume that the author witnessed the execution, as media people do, and he wrote that there were no signs of discomfort. Do you have any reason to disagree with that?

A. Well, I think my answer is, as I've stated before, that there is a difficulty here in what witnesses can see, and witnesses are poor at recalling or describing events. So whether or not that person who wrote that article, what the basis of their opinion was,

I cannot know.

Q. Okay. So there might have been nausea and vomiting or seizures and the witnesses might not have reported it?

A. Yes, I would agree.

Q. Let's go on to document 23.

A. In the same way that there was no report of a corrections officer collapsing on the legs of Marcus Wellons.

Q. I'm going to find your Affidavit here, which I think is at the tail end of Exhibit 22. And what I'm looking for here is -- let's see. Starting at paragraph 5 on the first page of your Affidavit.

MS. CARLSON: So you said 23 first.

MR. SPILLANE: Oh, I'm sorry. I meant -- I have -- I have this. Is this what you're looking at, 23?

MS. CARLSON: Yeah. You said 22.

MR. SPILLANE: I apologize. I must have misspoken a second time.

BY MR. SPILLANE:

Q. Have you got the right document in front of you, sir?

A. This is 23, yes?

Q. Yes.

A. Yes.

Q. And then I'm looking at -- your Affidavit is at the back of it. It starts with I, Joel Zivot, being first sworn as follows.

A. What page?

Q. It's at the -- it's at the -- if you go back to the last three pages of the document, because it's attached to a pleading.

A. Yes, I see it.

Q. Okay. I'm looking at paragraph -- starting at paragraph 5. (Reading:) I have reviewed the medical records of Mr. Henry, that record of his blood pressure at various times between 1987 and 2014. These records show both systolic and diastolic hypertension on many occasions. It is of note that Mr. Henry's hypertension was present prior to age 35 (end of reading).

And then in paragraph 6, you say: (Reading:) I have reviewed blood work between 2012 and 2014 that demonstrates a marginal HDL in relation to cholesterol relationship (end of reading).

I'm going to stop you there and ask you what you meant by a marginal HDL in relation to cholesterol ratio.

A. In order to make a diagnosis of -- of an abnormal lipid profile, the way that it can be calculated

is by a ratio of the quantity of cholesterol that's referred to as HDL and cholesterol referred to as LDL.

Q. Uh-huh (affirmative).

A. So it would be the quantity of HDL in comparison to quantity of LDL that would make the diagnosis of an abnormally elevated cholesterol where it would be problematic for the person.

Q. Right. And what I wanted to focus on was what you meant by the word marginal.

A. Marginal, being insufficient.

Q. So all that -- it doesn't mean that it's anything more than a yes or no conclusion that the good cholesterol was too low compared to the bad cholesterol?

A. Correct.

Q. Okay. And it says, in the next paragraph: (Reading:) Hypertension is quantitatively the most important risk factor in premature cardiovascular disease and is strongly associated with dislipidemia. Dislipidemia is an independent risk factor for coronary artery disease (end of reading).

What do you mean by risk factor for coronary artery disease?

A. Coronary artery disease is a condition that occurs in -- in the population, and there are certain factors that when present make the likelihood of coronary

artery disease be more the case. So cholesterol is one of those risk factors. When a person has elevated cholesterol, it means that the likelihood of coronary artery disease is increased.

Q. Okay. And also, he has high blood pressure, so that's also an independent risk factor that meets the likelihood that he has coronary -- the risk that he has coronary artery disease is also increased?

A. Yes.

Q. Okay. Okay. I'm going to go down to paragraph 13, where you say: (Reading:) The design of the Florida lethal injection procedure will very likely cause serious illness and needless suffering to Mr. Henry as a consequence of the acute coronary event (end of reading).

Does that mean a heart attack?

A. I don't know how -- how you define a heart attack, so I don't know how to answer your question.

Q. Why don't you define an acute coronary event?

A. An acute coronary event can be where one of the arteries that supply blood to the heart may become obstructed or narrow to the point where there can be some downstream negative effect of the heart muscle.

Q. So as I understand what you wrote earlier,

you didn't say that this man necessarily had coronary artery disease, you said he had two risk factors. High blood pressure and low HDL compared to the LDL.

A. That would be -- yes, that's correct.

Q. And based on that, you concluded: (Reading:) Mr. Henry -- let's see -- let's see, will likely -- that the injection procedure will very likely cause serious illness and needless suffering to Mr. Henry as a consequence of the acute coronary event (end of reading).

And that acute coronary event is going to happen because he has these two risk factors for coronary disease?

MS. CARLSON: Objection. Form and foundation.

THE WITNESS: His blood pressure will fall, and it's the falling of the blood pressure that will lead -- in the setting of narrowed aperture arteries, that would be the mechanism for the acute coronary event.

BY MR. SPILLANE:

Q. But that assumes that he has coronary artery disease?

A. Yes.

Q. And you didn't know that?

A. There would be no way of knowing without a heart catheterization. That was my opinion.

Q. But you still concluded that there would be a substantial risk?

A. Mr. Henry -- in my examination of Mr. Henry, Mr. Henry complained to me of angina. And so on the basis of Mr. Henry's complaints of angina, I concluded that he very likely had coronary artery disease.

Q. Oh. What paragraph of your report is the angina in, sir?

A. I don't know. I don't recall it.

Q. Why don't you read it and show me?

A. Where -- where does my part begin?

Q. Well, the whole thing is you. It's -- you wrote the whole thing.

A. Okay.

Q. Oh, you mean when does your Affidavit begin?

A. Yes.

Q. It begins on the third to the last page.

A. All of that is mine here?

Q. Yes. Where it starts with I, Joel Zivot, being duly sworn.

A. I really don't know if that's in here or

not. I can't say.

Q. Well, I'll wait -- I'll wait for you to determine.

A. But I -- (reviewing). I -- I don't see it listed here exactly, but I recall in my examination and in my conversation with him that that's what he complained of to me.

Q. I know this is probably a dumb question, but do you know why you didn't put it in the -- in the Affidavit, explaining your opinion?

A. I -- I don't recall.

Q. All right, then. If you'd move on to -- let's go back to document 2, which is your Supplemental Report, because I have a question about that. I'm sorry for moving you all over the place. Why don't you go to Exhibit D when you get there.

A. What page?

Q. Oh, I don't --

MS. BIMMERLE: The last?

BY MR. SPILLANE:

Q. Yes, I think it's your last exhibit that you attached. See, I'm having trouble finding it too, but I think I've got it memorized well enough to know where it's at.

A. This is the one that is -- begins with the

MRI?

Q. About the MRI. Look at the bottom of page 2 there.

MR. SPILLANE: Could you hand me document 2, ma'am, because I seem to have lost it.

THE COURT REPORTER: Which one do you need?

MR. SPILLANE: Exhibit 2. I've lost it in my pile.

THE COURT REPORTER: Here we go (presenting).

MR. SPILLANE: Thanks. I'll give it right back to you.

MS. BIMMERLE: By Exhibit D, did you mean Exhibit C?

MR. SPILLANE: I'm talking about the MRI report.

THE COURT REPORTER: Can you say that again? I was looking over here. Just what did you say? I didn't get it.

MS. BIMMERLE: I just wondered if by Exhibit D, he meant Exhibit C?

BY MR. SPILLANE:

Q. I think I probably did. Let me see, because I was working from memory, and I apologize if I got it wrong. It's the MRI report. It starts with 1 of

3, and I'm looking at 2 of 3. And I'm looking at the second -- well, it's the last big paragraph on the page. And you said, the left vertebral artery is dominant. No aneurysm is seen --

A. Wait, I'm not seeing what you're seeing. I'm sorry. Oh, I see. So this is the last -- the sentence. Okay. This is not my report, by the way. You said I said.

Q. No. Oh, I'm sorry. I thought -- is this not --

A. No, I didn't write this. No.

Q. Oh, right, you just attached it. I apologize.

A. Yes.

Q. But I'm going to ask you about the meaning of something --

A. Okay.

Q. -- in it, because you attached it. At the last thing that's said there is no vascular stains supplying the hemangioma. Tell me what that is and what it means.

A. This -- in this view --

Q. Uh-huh (affirmative).

A. -- they don't see any arterial -- I believe it's arterial blood that they're referring to here --

that is connected to the hemangioma as they see it in this particular view.

Q. What is the significance of that, if anything?

A. I don't think there's any significance of it.

Q. Now, did you have a chance to read Dr. Antognini's supplemental report?

A. What would you refer to specifically?

Q. Paragraph 1. Well, let's see. Document 5. Let's see, I think it is page 2 of 3.

MS. CARLSON: The document -- you said the supplemental, but document 5 is the initial report.

MR. SPILLANE: Then it should be document 4.

MS. CARLSON: Okay.

BY MR. SPILLANE:

Q. In paragraph 5 there, Dr. Antognini talks about rapid onset of unconsciousness. Is it relevant to his -- to -- to how fast unconsciousness would occur whether or not the hemangioma itself interferes with the normal distribution of the pentobarbital?

A. Ask me the question again.

Q. Is the hemangioma itself -- is it relevant

to how fast unconsciousness would occur, whether the hemangioma itself, by diverting blood flow, interferes with the normal distribution of pentobarbital that one would expect?

MS. CARLSON: Objection. Form.

BY MR. SPILLANE:

Q. You can answer it if you understand it.

A. I don't think it's relevant.

Q. Did you find any evidence that the hemangioma is the type of formation that interferes with blood flow in the sense that it would interfere with the normal distribution of pentobarbital?

A. Did I find any evidence?

Q. Any evidence that the hemangioma itself is -- do you know what the -- I mean, are you familiar with the terms of a slow flow system and a fast flow system?

A. Yes.

Q. All right. And a slow flow system would be one where the blood flow does not flow into the hemangioma from the veins at a high rate, and therefore would be less of an obstacle to normal circulation, and a fast flow would be that it flows faster into the hemangioma, and might interfere with normal circulation. Is that a fair characterization?

A. That's as you characterize it. I'm hearing

what you're saying.

Q. Well, you said you were familiar with the terms. Tell me what they mean to you.

A. I'm familiar from the -- from the perspective of what is -- what Dr. Antognini -- how do you pronounce his last name?

Q. Antognini (pronouncing).

A. Antognini is saying. So ask me the question that you want to ask me specifically about this.

Q. Okay. Do you have specific evidence that leads you to believe that the hemangioma is either a fast flow or a slow flow system?

A. I don't know. I have no evidence for it specifically to answer the question.

Q. So that's not part of your opinion as to why the execution would have a substantial risk of unnecessary pain, because you don't know? Your opinion is based on other things. It's not based on the hemangioma being a fast flow system that would interfere with normal distribution?

A. Correct.

Q. That-- that's what I was -- that's what I was getting at.

A. Yes.

Q. I didn't say it very articulately, so thank

you for helping me.

(Off the record 2:00 p.m. - 2:24 p.m.)

BY MR. SPILLANE:

Q. Doctor, I'm going to ask you a question about Exhibit 1, which is the Missouri execution protocol.

A. Uh-huh (affirmative).

Q. I'm looking at the heading which is C, intravenous line, and then paragraph 1. And the sentence that I'm looking at says: (Reading:) Medical personnel may insert the primary IV line as a peripheral line or as a central venous line, e.g., femoral, jugular or subcranial, provided they have appropriate training, education and experience for that procedure (end of reading).

Now, as I understood your testimony earlier, when you were training to be a board-certified anesthesiologist, you did, I think you said, a hundred or more central lines. Is that accurate?

A. Yes.

Q. And I also believe you said that that was normal experience for a person who -- before they were certified as an anesthesiologist. Is that true?

A. Let me change my answer there. I think that that was a high number. My own experience, because

of my career path, which was to critical care medicine, and I also was working in the field of cardiac anesthesia, I focused more than the average person.

Q. Well, let me ask a follow-up question then. A person, in order to become a board-certified anesthesiologist, would have to have the appropriate training and experience to be able to insert an IV in a -- in a -- in a central line or central vein such as the subclavian, jugular or femoral?

A. In a patient.

Q. Yes.

A. In the setting of an operating room.

Q. Yes.

A. Not in an execution chamber.

Q. Well, let's talk about the operating room first. Is the answer yes?

A. If -- if a person -- I'm sorry, ask me again then.

Q. About the operating room, is the answer to my question yes?

A. And your question was?

Q. Does a person, in order to become a board-certified anesthesiologist, have to have the appropriate training and education and experience to be able to set an IV in a central line in a clinical

situation?

A. Yes.

Q. Now explain to me why an execution is different. Well, first of all, you said it was different. Tell me what you meant, because I'm not sure I understood.

A. No doctor is trained to care -- to -- to lend assistance in an execution chamber for the purpose of execution. So whether the training that a doctor obtains is suitable and can be transferrable to an execution setting, I cannot say. It's not made for that design.

Q. Is there something different, physically, about setting an IV in a central vein in an execution setting as opposed to a clinical setting?

A. This protocol is silent on exactly what would be available, what kind of conditions, what else would be happening, for me to -- to comment. It's not written as a medical document, so I cannot say whether or not it would be suitable and transferrable.

Q. Okay. I'll move on. I -- I think you've answered my question. Let's go to document 2, page 8, paragraph 6, at the top.

A. Okay.

Q. You said: (Reading:) I also observed

during my examination that Mr. Bucklew has very poor veins in both of his arms. Poor venous visualization suggests that establishing intravenous access in the setting of a lethal injection will be potentially difficult, prolonged and painful for Mr. Bucklew (end of reading).

Did you examine any veins except the peripheral veins in the arms?

A. No.

Q. Why not?

A. What veins do you mean?

Q. The subclavian, the femoral, the jugular. Did you look at any of those?

A. There is no way to look at those veins.

Q. Is there any way to conclude, then, that it would be difficult to set an IV in those, more so than in the ordinary person, in Mr. Bucklew's case? Let me rephrase that. That question is backwards.

Is there any way, in Mr. Bucklew's case, to conclude that setting an IV in his subclavian, jugular or femoral veins would be particularly difficult as it would be particularly difficult in the peripheral veins?

A. I -- I can't know, because those veins are not visible. A certain percentage of those veins will not be where one imags them to be anatomically. This I

know. There's variations of anatomy. I don't believe -- the way that those veins would normally be found would be through the assistance of ultrasound. That's how -- that would be the standard of care now.

The execution protocol here does not specify or contemplate the use of ultrasound as an assistance. So now, what you're now talking about, is establishing venous access through what's called a blind technique. And blind techniques are going to have a higher failure rate than techniques with ultrasound, most certainly.

Q. Let me ask you this question. You said all -- as I understood your answer, you believe the standard of care now is using an ultrasound for all central lines, including the subclavian and the femoral?

A. Yes.

Q. And why do you believe that?

A. I --

Q. Well, I mean, I know the jugular -- has it always -- it's your view it has always been the standard of care, or was there a time when the jugular required an ultrasound, and the subclavian and the femoral, that wasn't the standard of care?

A. Well, there was a time where ultrasound wasn't available. So at the beginning of my career,

ultrasound was not available, and so I learned to do these lines without ultrasound and I had a failure rate.

Q. What was your failure rate?

A. It depends on the circumstance. Sometimes, you know -- I mean, each of those different locations that I probably had a different failure rate, honestly. And a complication rate too. So I don't know if you're asking me a percentage or what are you asking me?

Q. Well, why don't we talk about a percentage on the femoral, if you know?

A. I don't know. It's probably now -- my hands are mine, and so I can't speak to other people's failure rate, how facile they may or may not be. I think that in -- and I don't know, in this case, how experienced a particular person would be, because when I -- when you asked me before about competency or ableness to pass a fellowship, that would be a minimum standard. And so many of those people who go on to their careers don't actually perform these lines except during their training, and may also increasingly lose the ability to do them later on in their career.

Q. Okay. And the question I asked you was what your failure rate was during training without using ultrasound on the femoral vein.

A. Well, I probably would miss them sometimes

a third of the time. I would not be able to get them.

Q. And did you get better?

A. I got better, yes.

Q. What was it before ultrasound -- before you started using ultrasound all the time, towards the end of the period when you were still doing it without ultrasound, what was your failure rate then?

A. I mean, I have to -- it's hard to recall, honestly, but I would say that maybe, I don't know, ten percent of the time I would fail.

Q. And what would you do when you missed that ten percent of the time?

A. Well, I might try to go to the other side. If I failed once, I might go to the other side.

Q. Uh-huh (affirmative).

A. Or I would ask a more experienced person to try.

Q. I'm going to test your memory here. Did you ever miss on both sides?

A. Sure.

Q. What percentage?

A. I don't know. A small percentage, probably.

Q. And -- go ahead, I'm sorry.

A. Well, because I would -- are you asking me

as a trainee?

Q. Well, as you are board cert -- well, just how about both. Both before you were board certified, right before you were board certified, and then right before you started using ultrasound.

A. Well, I think that when you're training, really there's an obligation to defer to senior people sooner. So if you fail one time, you know, you may get it on the second or third attempt or fourth attempt, but because you failed, it's really incumbent upon to you to pass it off to a senior person.

So it may be that because you -- and it's kind of a -- let me be clear about failure. So there's ultimate failure, where no matter how many times you try, you will not succeed. And then there are gradations of failure, so it may take you two, three, five, ten times to ultimately succeed. So those are different kinds of experiences.

I can tell you that once ultrasound became available, I switched to using it, because I recognized that -- that success without ultrasound may involve many attempts at cannulation that would be failed, but ultimately I might be able to succeed. So not wanting to subject a patient to multiple pokes, I would use ultrasound instead.

Q. Again, I'm going to test your memory. During your training, when you -- if you deferred to an experienced surgeon --

A. Not a surgeon.

Q. Not a surgeon. An anesthesiologist, after one of the one-third of the times that you initially missed the femoral stick, did the surgeon -- did the experienced surgeon, in your experience -- in your recollection -- ever miss?

A. The experienced --

MS. CARLSON: Objection. Form.

BY MR. SPILLANE:

Q. In your recollection.

A. Anesthesiologist.

Q. Anesthesiologist. I keep saying that and I apologize. Did they ever miss? After -- after you said, hey, Doctor, you have experience, on this one, can you get this one for me, do you ever remember them missing?

A. Yes.

Q. How many times?

A. I can't -- not often.

Q. Not often. Let's talk about total failures. A total failure, I assume, is when you fail to establish a central line, because you talked about gradations and then total. I assume by total failure,

you mean you completely were not able to get a central line.

In your recollection, in your entire practice, both before and after you were certified, about what percentage do you recall being a total failure?

A. In which position?

Q. Let's talk femoral.

A. The problem with lumping people -- lumping this as a percentage is that there are certain kinds of patients that I would know would be very likely to have more failure than other kinds. So people who have had catheters in the femoral position before, people who have had surgery, people who have had other kinds of cohesive conditions, people who have abnormalities in the clotting of blood. So there would be one category of people where they would be highly likely to fail.

Then there would be other categories of people that have a likelihood of being less so because they've never had a catheter, because they have no other medical problems. Maybe they're a victim of trauma or something like that and, you know, and they're not obese and they're not -- they have on vascular disease. So it's a bit -- I worry that by answering your question as you ask it, I'll create a false impression of an overall success or failure rate that really is more patient

specific.

Q. Okay. That's fair. And I'm -- then I'm going to go back and follow up with something I asked you about Mr. Bucklew. As I understood your answer earlier, is we're unavailable to evaluate whether or not he would have a specific problem with his central veins, because that's just not the kind of thing you can know with the information you have now. Is that a fair characterization of your earlier answer?

A. Yeah. Yes, I wouldn't be able to know.

Q. So there's no -- we don't know if there's a specific risk factor out there like you described, like somebody who had been in -- had gotten a central line many times in their femoral or something like that?

A. Well, except again, that now we're talking about a category of a person who is to be executed. So that's a different kind of person. And I -- I'm not trained to start intravenouses in people who are going to be executed, and no physician is.

Q. All right. I'm going to go down to -- let's see, paragraph 10, where it says: (Reading:) As earlier described, Mr. Bucklew's condition is progressive. Medical records indicate that his -- his condition -- is it present him with -- well, I'm sorry. I'll stop reading until I get to the point. (Reading to

self).

Let me back up a little bit and go back to the veins in -- in paragraph 6, and then I'll come back to paragraph 10. Is there a likelihood -- and I think you discussed this later in your conclusions with Mr. Bucklew. I think it's paragraph E in your conclusions.

A. Paragraph E?

Q. Right.

A. Is it on page 9?

Q. Yeah, page 9 and page 10.

A. Okay.

Q. I think I'll stick with the veins for a minute before I go the next thing. In there, you conclude that there's a likelihood that Mr. Bucklew could have a blown vein. I think at the end you said, and in patients with veins as poor as Mr. Bucklew's, it is not uncommon for a vein to blow once the fluid begins flowing through the needle.

A. Uh-huh (affirmative).

Q. When you say that, I assume you're talking about the peripheral veins that we discussed earlier in paragraph 6, because you don't really have any knowledge about the other veins he had?

A. Yes, correct.

Q. Okay. Let's go to paragraph C, if we

could.

A. On page 9 here?

Q. Yes, sir.

A. Okay.

Q. I'm going to your conclusions here.

A. Uh-huh (affirmative).

Q. It says: (Reading:) Mr. Bucklew's airway is compromised such that his breathing is labored and choking and bleeding occur regularly, even under the least stressful circumstances, and when Mr. Bucklew is fully alerted and capable of taking corrective measures to prevent suffocation (end of reading).

Let's go back to his MRI. I believe you indicated that during his MRI, he took corrective measures by adjusting his breathing pattern when he was required to remain supine for an hour. Is that accurate?

A. He said something to that effect.

Q. And I assume that here, he wouldn't be able to do that if he was supine, because he'd be unconscious. Is that fair?

A. Right.

Q. After he receives -- as I assumed it, you said that he would be unable to take remedial measures. (Reading:) As often happens, Mr. Bucklew is able to wake up and take remedial measures to alleviate the feeling of

choking and return to normal. When unconscious or reduced consciousness is brought on by sedation, an individual is incapable of becoming fully alert and, therefore, unable to alleviate feelings of air hunger and choking (end of reading).

So, as I understand what you're saying, the difference is that once he is sedated, he would be -- not be conscious in the sense that he was during the MRI, so he won't be able to adjust his breathing, and therefore he will have difficulty in breathing that he can't correct like he did during the MRI. Is that fair?

A. Yes.

Q. But that's going to happen after he's sedated and becomes unconscious or, I think you used the word semiconscious, at some point. Is that accurate? Reduced consciousness is the word you used.

A. I'm not sure what you're asking me.

Q. I'm asking, until he becomes unconscious because of sedation, he could make the same adjustments that he made when he was taking the MRI, by adjusting his breathing to compensate for airway difficulties?

A. I'm -- I think that the word -- I'm going to have to push back on the word consciousness and unconsciousness.

Q. Okay. Tell me what you mean.

A. So I -- I think that I'm not sure -- I think that those terms have common meanings. And I can tell you that in the anesthetic world, those terms are more vague and more uncertain discriptors. So if you're -- at some point when there will be a, you know, decreased brain activity, maybe, that will make it hard for Rusty to make corrective maneuvers for breathing. And I would also say that breathing is a very, and a basic, deep, brain activity, and that shortness of breath is also something that we don't have to cognitively consider.

So at some point, it will be that he will stop breathing before he dies. That -- how long that will be, I cannot say, but at some point that will happen. And there will be points before then where he's not dead and he's not -- where he's beginning to experience the effects of the pentobarbital, where his ability to control and regulate and adjust his airway will be impaired, although there will still be the experience capable of knowing that he cannot make the adjustment, and will experience it as choking and being -- being, you know, very uncomfortable.

Q. All right. And I think this is obvious, but I'm going to ask you a follow-up. When one takes an MRI, one has to keep one's head still or it doesn't work

very well, is that fair? Or CAT scan.

A. One has to keep still for periods of time.

Q. Okay.

A. But -- but let me say that an MRI goes on repeatedly.

Q. Uh-huh (affirmative).

A. So there can be repeated moments when the image is obtained, and sometimes there's movement and then they say, okay, we're doing it again. And so it goes on like that. So I wasn't there to witness it and it's not recorded as to how difficult it actually was to get the images that they got.

Q. All right. Your paragraphs E, F and G, I would characterize as dealing with the risks of a blown vein. And, again, we're talking about a peripheral vein. Is that fair?

A. Yes.

Q. Okay. And when we were talking about the execution in Oklahoma where you indicated that the Department of Corrections there was wrong as characterizing it as a blown vein, part of your analysis was that the femoral vein is a big vein. Isn't that -- that accurate? So that was one of the reasons why you felt they were wrong in saying it was a blown vein?

MS. CARLSON: Objection.

THE WITNESS: Let me say that I did not have the -- I was not there.

BY MR. SPILLANE:

Q. Uh-huh (affirmative).

A. At the time, I did not have the autopsy report. I did not know what kind of a needle that they placed. I assumed, as it turned out, wrongly, that they used the right kind of needle in the femoral vein, which would have had a much longer length than they actually used.

And so I thought if you got the -- actually got the catheter properly in the vein, that for that vein to blow, is unusual. So either you never got it in there, which is what I was suggesting, or again, you've just -- it got pulled out somehow. But that's not the same thing as a vein blowing.

Q. Right. That's what I wanted to make clear, is they used the wrong catheter and they said that they had a blown vein, but you concluded that was wrong because it was wrong?

A. Well, that was my impression at the time.

Q. Yes. You talked about -- a little bit about there being a stage when Mr. Bucklew would not be able to adjust his airway, but wouldn't be fully unconscious in the sense that he would be unaware there

was a problem. Were you able to come up with any calculation as to what period of time that would be?

A. Calculation in terms of length of time?

Q. Yes, sir.

A. You know, there's a wide range of time that that could be. You know, that period of when -- when the pentobarbital is injected to when there's death. Is that what you're asking?

Q. No. I'm asking, at some point he's going to become unconscious from pentobarbital. With five grams, he's going to become comatose in the sense that he's not aware of breathing, you know, or inability to breathe. And I understood your testimony that before that occurs, there would be a period when he would be unconscious or have reduced consciousness but be still aware of difficulty in breathing. And I was wondering if you had a calculation as to how long that would be?

A. I feel like there are too many parts of it, what you're -- what you're saying to me. I mean, are you saying how long it would -- maybe just -- if you could just break that up, maybe.

Q. All right. Let's start it this way. Dr. Antognini concluded, as you -- as you know, that within twenty to thirty seconds, he would be sufficiently reduced in consciousness that he wouldn't be aware of

noxious stimuli. Do you remember reading that?

A. I do.

Q. All right. Now let's ask you about that. Do you agree with that analysis? And if so, why, and if not, why?

A. I don't agree with that analysis. That's based upon a dog study from fifty years ago. So I don't think that's a good comparison to what might happen in this case. So I would think that that is a very small number that he's taking there, and my number would be longer than that.

Q. Tell me what your number would be.

A. Well, so it's hard to find literature here. It is, because no one does these as experiments. And so most of the literature is animal based. And so I located a paper recently that was a study on euthanizing horses, from 2015. And in that study, they -- what they did is they placed an electroencephalogram, an EEG, on the horse, and they also gave the horse different medications prior to the pentobarbital. They used pentobarbital. So there were other medications. And in their paper, what they looked for is the absence of an electroencephalograph tracing, something called an isoelectric EEG.

Q. And would that be brain death?

A. No.
Q. I mean, would it be indicative -- I mean --
A. It's not.
Q. Okay.
A. I think it's a misnomer. They actually call it brain death in this paper, but we understand an isoelectric EEG is not indicative of brain death. But it is indicative of at least electrical silence on the parts of the brain that an electroencephalogram has access to, which is generally kind of surface cortical stuff. So -- but in that paper, they record a range of as short as fifty-two seconds and as long as about two hundred and forty seconds before they see isoelectric EEG.
Q. Well, let me stop you there. Isoelectric EEG, that is the complete cessation of the brain making a record that the EEG can -- can -- can record, is that right?
A. Of what the EEG can see, which is not a lot. So, yes. And -- and -- so that number is almost twice as long -- or more than twice as long as -- as the number that you record, which is the short number of twenty seconds.
Q. Twenty to thirty --
A. Yeah.
Q. -- as opposed to fifty-two to two forty?

A. Yes.

Q. Okay. Now that was the complete cessation of things that the EEG could measure in the horse. Is there a point where the horse wouldn't be able to feel or recognize pain before that complete cessation?

A. I have no way of knowing. I'm not a horse expert.

Q. Well, how much pentobarbital did the horse get?

A. The dose that they gave the horse was, I think, a hundred milligrams per kilo. And horses are about four hundred kilogram animals. So it would be about forty thousand milligrams of pentobarbital.

Q. So it would be about four milligrams of pentobarbital given to a horse?

A. Yes, close.

Q. Right. And we're going to give five to a human who is probably smaller than a horse.

A. Well, it's the same -- it's a similar weight, actually, weight per kilo that would be used in lethal injection.

Q. I'm -- I'm sorry, and I probably am just too dense to understand your answer, but how many total grams did the horse get?

A. I don't think you're dense.

Q. Okay.

A. Yeah. So forty thousand milligrams. So that would be forty grams as opposed to five grams.

Q. Oh, you said ten thousand milligrams?

A. Yeah.

Q. I thought I heard four thousand.

A. Yeah, forty thousand.

Q. So around forty thousand? Okay.

A. Forty thousand. It's like on a weight base, it's quite similar to what your -- what the Missouri protocol --

Q. I understand now.

A. Yeah.

Q. And you've got a range of fifty-two to forty for complete stoppage of brain activity that could be measured by an EEG? Fifty-two to two forty. I'm sorry, I misspoke.

A. Yeah. Yeah.

Q. And that makes no sense. That would be going backwards.

A. Yeah. And I would add, too, where they had also received two other medications prior to that.

Q. Tell me what those were.

A. Ketamine.

Q. Okay. And that's going to keep him from

moving, I think, right? It should.

A. To a certain degree. Not exactly. It does some other things too.

Q. Uh-huh (affirmative).

A. And the other one was something that I don't -- I think it was Xylitol or something, which is not something that's used in -- in people. It's like it was a veterinary drug that I'm not -- might be a benzodiazapene, but I can't swear to it. It's not one that I was familiar with.

Q. All right. I'll just take a second to look at another one of your opinions. I'm going to go to page 9, paragraph B. And there you wrote: (Reading:) Mr. Bucklew's particular medical condition places him at almost certain risk for excruciatingly painful choking complications, including visible hemorrhaging, if he is subjected to execution by means of lethal injection (end of reading).

What did you mean by almost certain risk?

A. A high likelihood. A very, very high likelihood.

Q. Okay. So I took -- when you said almost certain risk, I didn't know if certain was my -- that it's almost certainly that there's going to be a risk, or it's almost certain that it's going to happen.

A. Almost certain that it's going to happen.
Q. Okay.
A. The risk is certain.
Q. So it's certain that he will have a risk, if he's executed, that he'll have choking and hemorrhaging?
A. Certain that there will be a risk of that, yes.
Q. Okay. That's what I wanted to be sure of. Now earlier, both in paragraph A and when we talked about your article, but specifically in the article, you indicated --
A. Which article? I'm sorry.
Q. The article in the Fordham Law Review.
A. Uh-huh (affirmative).
Q. Where you opined that if he is not executed, he will be strangled by the hemangioma.
A. Okay.
Q. That's certain to happen, right?
A. There's a certain risk of that, yes.
Q. Well, you didn't say in the article it's a certain risk. You said if he wasn't executed, that was going to happen, the hemangioma would eventually strangle him.
A. Well, he may die of some other reason. I

don't know.

Q. Assuming he doesn't die of some other reason --

A. Yeah.

Q. -- the hemangioma is going to strangle him if we don't execute him?

A. Eventually.

Q. And if we do execute him, there's a risk that he's going to choke because of the hemangioma?

A. Yes.

Q. Okay. At number -- excuse me, paragraph H, you talk about lying flat during the execution process increasing the risk to Mr. Bucklew. (Reading:) A second factor that is likely to increase the turbulence of Mr. Bucklew's air flow is the fact that the procedure for execution calls for Mr. Bucklew to lie flat during the execution process (end of reading).

A. Yes.

Q. Why do you conclude that the procedure for execution requires him to lie flat? Protocol to execute is Number 1.

A. If -- does it say that they would be -- could be in some other position?

Q. I don't think it addresses it, but take a look and see if you see anything there that says he has

to lie flat.

A. I -- I don't know if it does. I'm not sure that I've -- I don't know. Because it's not mentioned here, I don't know if that means it is or it isn't.

Q. Okay. Because --

MS. CARLSON: I would just object in that I don't think this is the complete protocol.

MR. SPILLANE: No, this is the complete OPA --

MS. CARLSON: Correct.

MR. SPILLANE: -- protocol that deals with the administration of chemicals.

BY MR. SPILLANE:

Q. And the reason I ask that is you said the procedure calls for Mr. Bucklew to lie flat, in paragraph H, and I was wondering where you got that from.

A. Well, what I have observed in the execution that I observed --

Q. In Georgia?

A. In Georgia. And -- and the way that I've seen it depicted in other states, is the gurney is in a position where the inmate is lying flat.

Q. When you conduct a clinical procedure and you administer anesthesiology -- anesthesia -- have you had cases where it was advantageous to airway management

not to have the patient supine?

A. Yes.

Q. What did you do?

A. Well, these were people who couldn't lie flat.

Q. And what did you do?

A. Well, then I used a different technique.

Q. What technique did you use?

A. I would intubate them when they were awake. I wouldn't --

Q. And were they supine when you intubated them?

A. No. I can -- sometimes, I've intubated people in a semi-recumbent position. But because they can't receive anesthesia, not because they can.

Q. That's what I'm asking, though. I mean, there's no physical reason why one can't administer an anesthesia to someone that's not supine?

A. It's more difficult when they're sitting up, generally, for induction of an anesthetic. But maybe I should clarify between securing an airway --

Q. Uh-huh (affirmative).

A. -- and the induction of an anesthetic.

Q. Yes.

A. So to secure an airway, it's much easier to

do it when a person is supine and when you're at the head of the bed. But sometimes, because of co-existing medical conditions, or the constraints of space, it can't be done in that way. But that's certainly the preferred way.

Sometimes patients are so sick and unstable that they can't lie flat because it's too uncomfortable for them,they are short of breath. And so in those situations, too, the general induction agents would cause their blood pressure to dangerously fall and could even, you know, cause other medical problems.

So the safer thing there is to approach it in a different fashion, which would be sometimes from the side, sometimes sitting up, and not anesthetized in a way that one would otherwise do when a person was well and able to be anesthetized in a more conventional body position.

Q. Is there any physical reason why a person has to be supine to receive thiopental or pentobarbital and have it be effective?

A. In an execution?

Q. In any.

A. Is there any particular reason why --

Q. Wouldn't it work just as well if they were sitting up if they were injected with pentobarbital?

A. Will work in what -- what are you talking about, work what? What are you trying --

Q. Suppose you had a clinical patient that it was necessary for reasons of -- for some reason that could not lay supine, and you were going to use, back in the old days, sodium thiopental, or now, for some particular reason, pentobarbital or another barbiturate on him, would the chemical still have the same effect if the man was sitting up?

A. It wouldn't -- I'm trying to answer your question.

Q. Okay.

A. I -- I recognize the problem here is that you're now talking about -- the reason why a person can't lie flat would be what would be important here. It's not that they just choose not to. It's that they can't because of a medical reason. So in that case, I might not use pentobarbital at all, or something akin to that, because pentobarbital is no longer available, or sodium thiopental, anyway, is no longer available. So I might not use, you know, the equivalent of that in that position because it's a different -- it's a different kind of case.

Q. I think that's about the best answer I'm going to get, sir, so I'm going to move on.

A. Okay.

Q. All right. We're going to go to O, which is on page 12. And your final conclusion is: (Reading:) In conclusion, it is my professional, medical opinion that Mr. Bucklew, as a result of his particular medical condition and atypical anatomy of his airway, will suffer excruciating pain and prolonged suffocation if he is executed by lethal injection (end of reading).

Okay. First question, in making that conclusion, does that conclusion assume that peripheral veins are going to be used to infuse the pentobarbital -- for setting the line that will be used for the pentobarbital?

A. As opposed to?

Q. As opposed to a femoral?

A. I don't think it's material. That part of it, anyway.

Q. All right. Does the fact that he is -- that -- your opinion, in paragraph H, assume that the protocol requires him to be supine? If he's not supine, does that change your opinion?

A. No.

Q. So as I understand it, what's left is your opinion -- is based on he has a difficult airway, and even if a femoral vein is used, and even if he's not

supine, and he's injected with pentobarbital, he will still have choking, excruciating pain and prolonged suffocation?

A. Yes.

Q. Why?

A. Because his airway narrowing is of a fixed nature. And what he tells me is that he experiences shortness of breath at all times, worse at some times than others. And I think that if they are going to use a femoral vein -- we can take this in maybe two parts. If they're going to use a femoral vein, I'm going to surmise that that would not be their first choice.

So they are going to start, first, by trying to start veins in his arms, and they're going to fail. And then they're going to fail on one arm, after poking several times. Then they'll switch to the other arm. Then they'll fail again. And this will go on for a period of time.

Q. Is that what you would do if this was your patient and you were a board-certified anesthesiologist, fail in both arms?

A. This is not a patient.

Q. I'm asking, if this was a -- if you had a patient with peripheral veins like this, would you fail in both arms before you went to the femoral?

A. This is not a patient. So I'm just trying to --

Q. If you had a patient, hypothetical, that had peripheral veins the same as Mr. Bucklew had, would you fail in both arms and then go to a femoral?

MS. CARLSON: Objection. Calls for speculation.

THE WITNESS: I don't know how they're going to do it, so I can't compare what they're going to do. But I don't know what decisions they make, unless it says -- it seems to say here that they're trying in the arms before they're trying in the femoral.

BY MR. SPILLANE:

Q. Well, let's go back and take a look. I'm looking at B-1 -- oh, I'm sorry. I picked up the wrong paper. I'm looking at C-1. (Reading:) Medical personnel may insert the primary IV line as a peripheral line or as a central venous line (end of reading).

So that doesn't seem to indicate they necessarily have to do a peripheral first.

A. Well, it's not -- it's not specified here. So I would be -- I would think that they would start with the peripheral.

Q. Why?

A. It's easier.
Q. Is that what you would do in a patient?
A. Yes. It's easier.
Q. And you would miss in both arms?
A. It depends. Sometimes I have done that. I mean, I can't always know until I try.
Q. Okay.
A. So that's what -- that's what I believe that they would do.
Q. I'm going to flip back to the Gissendaner case -- Gissendaner case, the Henry case and the Davis case. I'm just asking a question now. You don't need to look at anything.
A. Okay.
Q. Where in each case you gave an opinion that there would be an excruciating death. One of them because of -- in the Henry case, because of two risk factors for coronary disease. In the Gissendaner case, because she was female, overweight, and had a high BMI. And in the Davis case, because he would have an acute attack of porphyria. Do you believe that you were right in any of those cases?
MS. CARLSON: Objection to form.
THE WITNESS: Right in what way?
BY MR. SPILLANE:

Q. Right in predicting that those things would happen.

A. That was my opinion, yes.

Q. Those things didn't happen, though, did they?

A. We don't know that.

Q. Well, we know that Mr. Davis didn't convulse and vomit on he gurney, as far as anybody reported.

A. We don't know what he -- well, first of all, as we discussed earlier, the reports are very imperfect. So we don't actually know what happened. So I -- I can't comment on whether those things happened or they didn't happen.

Q. And same thing with -- with Ms. Gissendaner. As far as we know, she wasn't suffering excruciating pain when she was singing Amazing Grace.

A. Well, I don't know when the singing occurred with respect to when the injections began, or any other part of it, so I don't know.

Q. Okay. And let's go back to Mr. Henry. As far as we know, he didn't have a coronary event, based on his two risk factors, during the execution.

A. How would we know that he didn't?

Q. Well, there's no evidence of it. Do you

have any reason to believe that he did?

A. I -- he did not have an autopsy. He did not have electrocardiographic monitoring. He was not questioned during -- or there was no other way to feed back to know whether or not he was experiencing those things at all. So I would say that I -- that none of these executions refute my -- my claims or my concerns.

Q. Let me ask you this. Is there something different about Mr. Bucklew than those three? Or --

A. Different in what way?

Q. In -- I mean, here, as far as I can tell, you're -- you're saying that because he has a difficult airway, he's going to choke and bleed, and he's going to suffer an excruciating execution. Is -- is there some way this is different than those other three cases where you predicted an excruciating execution?

MS. CARLSON: Object. Objection. Form.

THE WITNESS: They're all different. They're all different cases with different kinds of medical problems. So they're all different.

MR. SPILLANE: Okay. That's all I have. Thank you.

MS. CARLSON: Are you finished?

MR. SPILLANE: Yes, ma'am.

MS. CARLSON: I just have a few questions.

I'll be -- I'll be relatively brief.

EXAMINATION

BY MS. CARLSON:

Q. So -- so, Dr. Zivot, I think you testified that -- I'm actually not sure you testified about this, so I'll just ask you. You were trained as an anesthesiologist, correct?

A. Yes.

Q. Did you have a secondary specialty when -- during your training?

A. Yes.

Q. And what was that?

A. Critical care medicine.

Q. And during your critical care medicine training, did that give you sort of a reason to do more central lines than you think an average board-certified anesthesiologist might do?

A. Yes.

Q. And do you have colleagues who are board-certified anesthesiologists?

A. Yes.

Q. And have any of those colleagues ever asked you to help them with a -- to do a central line?

A. Yes.

Q. And do you have any knowledge of why

they've asked you to help them?

A. Because they lacked the experience, or they had done it so long ago that they didn't feel comfortable anymore to be able to do it at the time.

Q. And I understand from the testimony that you've provided affidavits in other cases involving prisoners who are sentenced to death, is that correct?

A. Yes.

Q. And are these -- the three cases, I believe, that Mr. Spillane asked you about, are these the only three people who have reached out to you to work on their case --

A. No.

Q. -- involving lethal injection?

A. No.

Q. About how many other people could you say have reached out to you to provide an affidavit?

A. Oh, about maybe ten times, fifteen times.

Q. And you've decided not -- not to provide an affidavit in those cases?

A. Correct.

Q. And any sort of basic reasoning as to why, in those cases, you decided not to?

A. There was no obvious, you know, medical concern that I could glean from, you know, review and

discussion that I thought was germane, you know, to the case, to the -- to the type of lethal injection contemplated.

Q. And have you ever -- do you have any knowledge of anybody who has been executed who had Mr. Bucklew's condition of cavernous hemangioma?

A. No.

MS. CARLSON: If you can just give us one second, and then I might be done.

(Off the record)

MS. CARLSON: I have no further questions.

MR. SPILLANE: I had a follow-up in light of the cross.

RE-EXAMINATION

BY MR. SPILLANE:

Q. In your earlier testimony, you indicated that all lethal injections are necessarily -- are necessarily unnecessarily cruel. And I hate to use a word with a negative in front of it and a positive in front of it. But in light of that, would it be possible for you ever to give testimony that a -- in a particular case that a lethal injection wouldn't be -- would not be unnecessarily cruel?

A. I understand that -- that the Court has a different view on my view. So, you know, the cases that

you cite, I think all those situations were germane and the Court saw otherwise. I've said before that I think that lethal injection by design will be cruel because of the inability to know the things that the State claims that it can know. And that's my opinion.

MR. SPILLANE: Okay. Thank you, Doctor.

MS. CARLSON: Nothing further.

THE COURT REPORTER: And what about signature? Is the doctor going to read and sign?

MS. CARLSON: Yes.

THE COURT REPORTER: Okay. (To Ms. Carlson:) And do I send it to you?

MS. CARLSON: Sure.

THE COURT REPORTER: To send to the doctor.

MS. CARLSON: Yes.

THE COURT REPORTER: And if you don't mind, just where I can record your transcript orders. That would be quicker than filling out a form.

MS. CARLSON: Sure.

THE COURT REPORTER: Yeah, just --

MR. SPILLANE: Yes, I would like a transcript.

THE COURT REPORTER: Okay.

MR. SPILLANE: I would like it in pdf.

THE COURT REPORTER: Okay. Okay. And then

it's e-mailed to you?

MR. SPILLANE: E-mailed to me, please.

MS. CARLSON: Yeah, same.

THE COURT REPORTER: The same thing?

MS. CARLSON: Yeah.

(Deposition concluded at 3:30 p.m.)

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D I S C L O S U R E

STATE OF GEORGIA
COUNTY OF COBB

DEPOSITION OF: DR. JOEL B. ZIVOT, MD, FRCP

Pursuant to Article 8.B of the Rules and Regulations of the Board of Court Reporting of the Judicial Council of Georgia, I make the following disclosure:

I am a Georgia Certified Court Reporter. I am here as an independent contractor for DTI Global.

I was contacted by the offices of DTI Global provide court reporting services for this deposition. I will not be taking this deposition under any contract that is prohibited by O.C.G.A. 15-14-37 (a) and (b).

I have no contract/agreement to provide reporting services with any party to the case, any counsel in the case, or any reporter or reporting agency from whom a referral might have been made to cover this deposition. I will charge its usual and customary rates to all parties in the case, and a financial discount will not be given to any party to this litigation.

Paula S. Parris, CCR Number 1664
Certified Court Reporter

Date: 3/20/17

C E R T I F I C A T E

STATE OF GEORGIA

COUNTY OF COBB

I, Paula S. Parris, hereby certify that the foregoing deposition was taken down as stated in the caption, and the questions and the answers thereto were reduced to typewriting by me; that the foregoing pages 6 through 106 are a true, correct, and complete transcript of the evidence given by the witness, DR. JOEL B. ZIVOT, MD, FRCP, who was first duly sworn by me; that I am not a relative, employee, attorney, or counsel of any of the parties; that I am not a relative or employee of attorney or counsel for any of said parties; nor am I financially interested in the action.

I further certify that no contract exists with any law firm, or anyone involved in this matter, and myself.

Before completion of the deposition, review of the transcript was requested. If requested, any changes made by the witness (and provided to the reporter) during the period allowed are appended hereto.

This, the 20th day of March, 2017.

Paula S. Parris
Certified Court Reporter
Certificate Number B-1664

B

H

MISSOURI DEPARTMENT OF CORRECTIONS
PREPARATION AND ADMINISTRATION OF CHEMICALS
FOR LETHAL INJECTION

A. Execution Team Members

The execution team consists of department employees and contracted medical personnel including a physician, nurse, and pharmacist. The execution team also consists of anyone selected by the department director who provides direct support for the administration of lethal chemicals, including individuals who prescribe, compound, prepare, or otherwise supply the chemicals for use in the lethal injection procedure.

B. Preparation of Chemicals

Medical personnel shall prepare the lethal chemicals. The quantities of these chemicals may not be changed without prior approval of the department director. The chemicals shall be prepared and labeled as follows:

1. Syringes 1 and 2: Five (5) grams of pentobarbital (under whatever name it may be available from a manufacturer, distributor or compounding pharmacy), 100 ml of a 50 mg/mL solution, shall be withdrawn and divided into syringes labeled "1" and "2."

2. Syringe 3: 30 cc of saline solution.

3. Syringes 4 and 5: Five (5) additional grams of pentobarbital (under whatever name it may be available from a manufacturer, distributor or compounding pharmacy), 100 ml of a 50 mg/mL solution, shall be withdrawn into syringes labeled "4" and "5."

4. Syringe 6: 30 cc of saline solution. This syringe is prepared in the event that additional flush is required.

C. Intravenous lines

1. Medical personnel shall determine the most appropriate locations for intravenous (IV) lines. Both a primary IV line and a secondary IV line shall be inserted unless the prisoner's physical condition makes it unduly difficult to insert more than one IV. Medical personnel may insert the primary IV line as a peripheral line or as a central venous line (e.g., femoral, jugular, or subclavian) provided they have appropriate training, education, and experience for that procedure. The secondary IV line is a peripheral line.

2. A sufficient quantity of saline solution shall be injected to confirm that the IV lines have been properly inserted and that the lines are not obstructed.

D. Monitoring of Prisoner

1. The gurney shall be positioned so that medical personnel can observe the prisoner's face directly or with the aid of a mirror.

2. Medical personnel shall monitor the prisoner during the execution.

E. Administration of Chemicals

1. Upon order of the department director, the chemicals shall be injected into the prisoner by the execution team members under the observation of medical personnel. The lights in the execution support room shall be maintained at a sufficient level to permit proper administration of the chemicals.

2. The pentobarbital from syringes 1 and 2 shall be injected.

3. The saline solution from syringe 3 shall be injected.

4. Following a sufficient amount of time for death to occur after the injection of syringe 3, medical personnel shall examine the prisoner to determine if death has occurred. If the prisoner is still breathing, the additional five grams of pentobarbital will injected from syringes 4 and 5 followed by the saline from syringe 6.

5. At the completion of the process and after a sufficient time for death to have occurred, medical personnel shall evaluate the prisoner to confirm death. In the event that the appropriate medical personnel cannot confirm that death has occurred, the curtain shall be reopened until an appropriate amount of time has passed to reevaluate the prisoner.

F. Documentation of Chemicals

1. Medical personnel shall properly dispose of unused chemicals.

2. Before leaving ERDCC, all members of the execution team present at the execution shall complete and sign the "Sequence of Chemicals" form thereby verifying that the chemicals were given in the order specified in this protocol.

3. Before leaving ERDCC, one of the medical personnel present at the execution shall complete and sign the "Chemical Log" indicating the quantities of the chemicals used and the quantities of the chemicals discarded during the execution.

4. Within three days of the execution, the ERDCC warden shall submit the Sequence of Chemicals and the Chemical Log to the director of the Division of Adult Institutions (DAI). The DAI division director and the department director shall review the records. If they do not detect any irregularities, they shall approve the two documents. If any irregularities are noted, the DAI division director shall promptly determine whether there were any deviations from this protocol and shall report his findings to the department director.

Missouri Department of Corrections
Revised October 18, 2013

IN THE UNITED STATES DISTRICT COURT

WESTERN DISTRICT OF MISSOURI

RUSSELL BUCKLEW,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	**Case No. 4:14-CV-8000-BP**
	)	
GEORGE A. LOMBARDI,	)	
	)	
DAVID A. DORMIRE	)	
	)	
and	)	
	)	
TERRY RUSSELL,	)	
	)	
Defendants.	)	

RULE 26(a)(2) EXPERT REPORT

SUPPLEMENTAL EXPERT REPORT OF JOEL B. ZIVOT, M.D.

I, JOEL B. ZIVOT, being of sound mind and lawful age, hereby state under penalty of perjury as follows:

I. QUALIFICATIONS

A. Education

1. I received my Doctor of Medicine from the University of Manitoba, Canada, in 1988. From 1989–1993, I was a resident in Anesthesiology at the University of Toronto, Department of Post Graduate Medical Education, and from 1993–1995, I completed an additional residency in Anesthesiology and a Fellowship in Critical Care Medicine at the Cleveland Clinic Foundation, Department of Anesthesiology in Cleveland, Ohio.

B. Professional Licenses, Certifications and Memberships

1. I hold an active medical license from the State of Georgia and have held unrestricted medical licenses in Ohio, the District of Columbia, Michigan, and the Canadian provinces of Ontario and Manitoba. I also hold an active license to prescribe narcotics and other controlled substances from the federal Drug Enforcement Administration (DEA).

2. I hold board certification in Anesthesiology from the Royal College of Physicians and Surgeons of Canada and the American Board of Anesthesiology. I am also board certified in Critical Care Medicine from the American Board of Anesthesiology.

C. Professional Experience

1. I have served as the Medical Director of the Cardio-Thoracic Intensive Care Unit and the Fellowship Director for Critical Care Medicine at Emory University Hospital. I am an Associate Professor of Anesthesiology and Surgery at the Emory University School of Medicine and an adjunct Professor of Law at Emory University Law School. A complete list of my qualifications and publications authored in the last ten years is provided in my curriculum vitae attached as Exhibit A to this report.

2. I have practiced anesthesiology and critical care medicine for 22 years, and, in that capacity, I have personally performed or supervised the care of more than 42,000 patients.

3. In the course of my career, I have regularly performed or supervised the anesthesia care of numerous patients whose airways would be termed "difficult" or "very difficult" according to the Mallampati Classification. Airway evaluation includes this prediction score on securing the airway, where Mallampati I is predicted to be straightforward and Mallampati IV is predicted to be very difficult.

4. I am, by reason of my experience, training, and education, an expert in the fields of anesthesiology and critical care medicine. The opinions that follow are within my field of expertise, and are stated to a reasonable degree of medical and scientific certainty unless otherwise noted.

5. A complete list of the cases in which I have given expert testimony is attached as Exhibit B to this report.

D. Compensation

1. My compensation in this matter is as follows: (1) expert fee of $400/hour; (2) 15 hours of record and document review, report writing, and consultation with counsel since October 2016; and (3) approximately 12 hours of travel and examination of Mr. Bucklew with an estimated cost of $3000.00.

II. SUBJECT OF OPINIONS

A. I have been asked by Mr. Bucklew's attorneys in the above-referenced case to render an expert opinion regarding the risks and complications stemming from Mr. Bucklew's deteriorating medical condition—specifically the growing obstruction in Mr. Bucklew's airway—on the execution of Mr. Bucklew by means of lethal injection.

B. As a medical doctor, I am ethically prevented from prescribing or proscribing a method of executing a person. I am bound by these ethics, and am prohibited from assessing whether a different form of execution would be feasible. Therefore, while I can assess Mr. Bucklew's current medical status and render an expert opinion as to the documented and significant risks associated with executing Mr. Bucklew under Missouri's current Execution Procedure, I cannot advise counsel or the Court on how to execute Mr. Bucklew in a way that would satisfy Constitutional requirements.

C. In developing my opinion, and in addition to the materials I reviewed in connection with my declaration dated May 8, 2014, I have considered the following: (1) The report of medical imaging performed at Barnes-Jewish Hospital dated December 23, 2016 [Exhibit C]; (2) Mr. Bucklew's December 19, 2016 MRI and CT imaging from Barnes-Jewish Hospital at Washington University in St. Louis Missouri [Exhibit D]; (3) my own in-person examinations of Mr. Bucklew conducted on May 12, 2014 and on January 8, 2017; (4) Mr. Bucklew's medical records; (5) the Missouri Department of Corrections Procedure for Execution (the "Execution Procedure"); and (6) the Declaration of Joseph F. Antognini dated November 8, 2016.

III. SUMMARY OF OPINIONS

A. Mr. Bucklew suffers from a debilitating, incurable, and progressive condition known as cavernous hemangioma. This condition occurs sporadically and congenitally in the population and not as a consequence of any action on the part of Mr. Bucklew. This condition has caused large diffuse, vascular (blood-filled) tumors to form and grow in Mr. Bucklew's nasal cavity, face, and throat. Cavernous hemangiomas in the nasal cavity, face, and throat are a medically recognized cause of death by suffocation.

B. As a result of the hemangiomas located in Mr. Bucklew's nasal cavity, face and throat, and to a lesser-degree residual scar tissue from a past tracheostomy procedure, Mr. Bucklew's airway is medically termed a "very difficult" airway. Specifically, on the Mallampati four-point scale, Mr. Bucklew's airway is a Mallampati class IV. It is highly likely that Mr. Bucklew, as a result of having a Mallampati class IV airway, would require a surgical airway (i.e., tracheostomy)

in order to safely undergo a surgical procedure requiring a general anesthetic.[1] Mr. Bucklew's airway is so compromised that it is highly unlikely that he could be safely intubated without experiencing a serious hemorrhagic event within his throat.

C. Because of the degree to which Mr. Bucklew's airway is compromised by the hemangiomas, the anatomical mechanics of airflow and breathing, and the particular psychological and physical effects of lethal injection, it is highly likely that Mr. Bucklew would be unable to maintain the integrity of his airway during the time after receiving the lethal injection and before death.

D. Contrary to Dr. Antognini's assertion, the effect of pentobarbital injection as outlined in the Execution Procedure is highly unlikely to be experienced as "rapid unconsciousness followed by death." In my professional medical opinion, the effects of such an injection are highly unlikely to be instantaneous and the period of time between receiving the injection and death could range over a few minutes to many minutes. My view here is supported both by my own professional knowledge of how chemicals of this type are likely to exert their effects in the body as well as by the terms of Missouri's Execution Procedure, which calls for a waiting period of five minutes after the first two pentobarbital injections, before examining the inmate to determine whether death has occurred. The Execution Procedure expressly acknowledges that the first two Pentobarbital injections may not have caused death within five minutes, in which case a second round of injections is required.

E. As a result of his inability to maintain the integrity of his airway for the period of time beginning with the injection of the Pentobarbital solution and ending with Mr. Bucklew's death several minutes to as long as many minutes later, Mr. Bucklew would be highly likely to experience feelings of "air hunger" and the excruciating pain of prolonged suffocation resulting from the complete obstruction of his airway by the large vascular tumor.

F. As a result of this prolonged experience of suffocation, it is highly likely that Mr. Bucklew will struggle to breathe — a struggle apparent as convulsive movements—and as a result, given the highly friable and fragile state of the tissue of Mr. Bucklew's mouth and airway, he will likely experience hemorrhaging and/or the possible rupture of the tumor. The resultant hemorrhaging will further impede Mr. Bucklew's airway by filling his mouth and airway with blood, causing him to choke and cough on his own blood during the lethal injection process. It is not necessary that Mr. Bucklew be fully conscious in order to experience the excruciating pain and feeling of prolonged suffocation. Also,

[1] Note that while I generally object to Dr. Antognini's comparison between the medical act of general anesthesia and the non-medical act of lethal injection, for the limited purpose of this opinion I refer to the necessity of a tracheotomy in order to undergo general anesthesia only as a frame of reference for the degree to which Mr. Bucklew's airway is compromised. In short, even in a room full of doctors, Mr. Bucklew could not safely lose consciousness by way of sedation without the immediate capability of performing a surgical airway.

regardless of whether Mr. Bucklew is fully conscious, bleeding in his mouth and throat will cause choking and coughing and the coughed blood will be visible to viewers of the execution procedure.

G. In summary, I conclude with a reasonable degree of medical and scientific certainty that it is highly likely that Mr. Bucklew, given his specific congenital medical condition, cannot undergo lethal injection without experiencing the excruciating pain and suffering of prolonged suffocation, convulsions, and visible hemorrhaging.

IV. OBJECTIVE FACTUAL BASES FOR OPINIONS

A. A patient's airflow during breathing will typically be described as either being laminar or turbulent. Laminar flow is a smooth, orderly, linear flow of air with low resistance and is experienced as "easy" breathing by the patient. Turbulent flow, by contrast, is disorganized, has high resistance, and is experienced by the patient as "difficult" breathing. Four factors impact whether airflow is laminar or turbulent: (1) aperture or diameter of the airway, (2) length of the airway, (3) velocity of the flow, and (4) density of the gas. Of these four factors, the most pertinent in this case is the aperture of the airway. The smaller or more obstructed a patient's airway becomes, the more turbulent the flow of air becomes. This aperture narrowing is experienced by the patient as an inability to easily breathe. When a patient feels as though he cannot take a breath, the usual reaction is to breathe harder and faster to take in more air. This triggers the third factor listed above: "velocity of the flow." The faster a patient breathes, the more turbulent the flow becomes, particularly through a narrow or obstructed airway.

B. Diameter of the airway, or aperture, can be further understood with reference to the Mallampati classification used to describe how "difficult" it is to secure an airway in the setting of a medical procedure. An airway can be difficult because of anatomical abnormalities, both congenital and acquired. In this case difficulty in maintaining airway patency is a direct consequence of cavernous hemangiomas in Mr. Bucklew's airway.

C. In clinical cases where a patient has a Mallampati IV airway, an anesthesiologist must proceed with extreme caution and implement specialized precautions, such as creating a surgical airway via tracheotomy, to maintain the integrity of the patient's airway in order to safely prepare a patient for any procedure where the patient is sedated and unable to assist in supporting his or her own ventilation. This is supported by Mr. Bucklew's own medical records, referenced by Dr. Antognini, in which it was noted that Mr. Bucklew underwent a tracheotomy in connection with surgical procedures under general anesthesia [Decl. of Antognini; PC486].

D. Cavernous hemangioma is a condition that results in vascular lesions consisting of abnormally dilated blood vessels. These blood vessels form cavern-like pockets, i.e. vascular tumors or hemangiomas, in which blood pools. The pockets then

leak, or hemorrhage, as a result of defects in the walls of the blood vessels. The lesions can vary in size, and are linked to varying side effects including seizures, stroke symptoms, hemorrhages, and headaches, depending upon the size and location of the particular lesion, and the relative strength of the walls of the affected blood vessels. In addition, symptoms may resolve or reappear over time as the vascular tumor changes in size as it leaks and reabsorbs blood.

E. While the vascular tumors are often benign, in certain cases, such as Mr. Bucklew's, the progressive condition is life-threatening as it eventually leads to obstruction of the patient's airway leading to asphyxiation and death.

V. RECORD EVIDENCE SUPPORTING OPINIONS

A. Historic Medical Records

1. Mr. Bucklew's medical records indicate that, since birth, he has suffered from cavernous hemangioma resulting in vascular tumor formations in his face, brain, and throat. [Bates PC202]. The specific hemangioma at issue affects Mr. Bucklew's nasal cavity, face, right eye, and airway—approaching both the base of Mr. Bucklew's skull and his carotid artery. [PC202]. The location of Mr. Bucklew's hemangioma has resulted in a grossly enlarged uvula and narrowing of his airway resulting in generally turbulent air flow, which Mr. Bucklew experiences as shortness of breath or difficulty breathing.

2. Mr. Bucklew's condition is inoperable due to the severe risk of blood loss during surgery. Furthermore, due to the large size of the hemangioma, Mr. Bucklew's condition has been found to no longer be amenable to sclerotherapy [PC2257].

3. As a result of his condition, Mr. Bucklew has experienced "excruciating" pain and numerous hemorrhagic events, including bleeding from the face and mouth, necessitating emergency trips to the medical unit in which pressure with gauze was applied in order to slow the bleeding. [see e.g. PC2238, PC2227, PC2506].

4. As previously described in my Supplemental Declaration dated December 4, 2015, Mr. Bucklew's tumors are painful, easily bleed, and spontaneously hemorrhage. Mr. Bucklew has described past hemorrhages as sometimes "squirting" blood, while other times presenting as a "slow leak." [PC103].

5. Specifically with respect to Dr. Antognini's discussion of Mr. Bucklew's procedures between 2000 and 2003, Mr. Bucklew's records confirm that he underwent procedures in that time period that required general anesthesia. Records of a procedure that occurred in 2000, however, explicitly state that Mr. Bucklew received a tracheotomy, a procedure undertaken in cases of difficult airways for purposes of maintaining the

integrity of the airway while a patient is under anesthesia. [PC486]. Contrary to Dr. Antognini's apparent conclusion that Mr. Bucklew's airway does not warrant any special considerations, Mr. Bucklew's records show that special procedures were undertaken to account for Mr. Bucklew's difficult airway.

B. Findings of In-Person Examinations

1. The tumors obstructing Mr. Bucklew's airway are so large that Mr. Bucklew is no longer able to lie down flat on his back while sleeping without suffocating. On January 8, 2017, Mr. Bucklew explained that in order to breathe while sleeping, he must sleep on his right side with his head elevated at roughly a 45 degree angle. This position allows Mr. Bucklew to sleep without his airway becoming obstructed by the turn in his airway and his grossly enlarged uvula.

2. Even with the above precautions, Mr. Bucklew explained that his uvula occasionally gets "stuck" in his throat while he sleeps, causing him to wake up feeling as though he is choking and unable to breathe. In addition, the above precautions do not prevent Mr. Bucklew's tumors from leaking or hemorrhaging during the night. When asked to describe his typical morning, Mr. Bucklew explained that the first thing he does each morning is to clean off the blood on his face that leaked from his nose and mouth while he slept.

3. During my examination of Mr. Bucklew on January 8, 2017, I noted several large hemangiomas visible in Mr. Bucklew's hard and soft palate, lip, nose, and uvula. Of particular relevance to the aperture of Mr. Bucklew's airway were the grossly enlarged uvula and the easily visible hemangiomas on his hard and soft palates. Mr. Bucklew also has an easily visible hemangioma growing out of his upper lip and over his mouth. This tumor has enlarged in size since my prior examination of Mr. Bucklew.

4. In addition to the hemangiomas compromising Mr. Bucklew's airway, I also observed that Mr. Bucklew has residual scarring over the front of his throat caused by the past tracheostomy procedure. Mr. Bucklew explained that the scar tissue is tethered to his trachea in a way that makes it difficult to breathe and swallow. This scar tissue contributes to the obstruction of Mr. Bucklew's airway and increases the turbulence of the air flow through Mr. Bucklew's airway.

5. I also observed that Mr. Bucklew had residual loss of feeling in the right side of his face, causing him to be unable to completely close his right eye.[2]

[2] Dr. Antognini asserts, without having examined Mr. Bucklew, that Mr. Bucklew definitively has not suffered a stroke as a result of his condition. He bases his assertion on the fact that Mr. Bucklew "has recently been observed to

6. I also observed during my examination that Mr. Bucklew has very poor veins in both of his arms. Poor venous visualization suggests that establishing intravenous access in the setting of lethal injection will be potentially difficult, prolonged, and painful to Mr. Bucklew.

7. Also during my January 8, 2017 examination of Mr. Bucklew, I asked him to describe his experience during the MRI Procedure on December 19, 2016. He reported experiencing extreme discomfort during the procedure. In order to maintain the integrity of his airway while lying flat, Mr. Bucklew was forced to consciously alter his breathing pattern, and swallow repeatedly to keep his uvula from settling and completely obstructing his airway, in order to avoid choking.

8. Furthermore, as noted in my October 13, 2015 report, the tissue of Mr. Bucklew's airway has become increasingly fragile over time. In fact, Mr. Bucklew's airway is now so fragile that simply touching it causes the tissue to bleed. As most recently reported by Mr. Bucklew on January 8, 2017, the tissue bleeds so easily that it even bleeds while he is sleeping.

9. My finding that the tissue of Mr. Bucklew's airway is extremely fragile is not inconsistent with my suggestion that Mr. Bucklew undergo a clinical examination that would call for a bronchoscopy or use of a Glidescope. [Decl. Antognini, para. 17]. These procedures are intended to be minimally invasive, and a skillful physician would endeavor to insert the tube with an attached camera carefully into the airway without touching the fragile tissue. However, given Mr. Bucklew's present condition and its progressive nature, as of this date it is my professional medical opinion that Mr. Bucklew's airway is so compromised, and the tissue so fragile, that even the undertaking of a minimally invasive evaluation of his airway would pose very high likelihood of airway bleeding and subsequent loss of the airway that could be fatal.

10. As already described, Mr. Bucklew's condition is progressive. As of April 2012, Mr. Bucklew's medical records indicate that his condition did not appear to place him at risk of life-threatening hemorrhage [PC2257]. My examination of Mr. Bucklew on January 8, 2017, as well as my review of the recent MRI and CT imaging report forms the basis for my conclusion that at the present time, Mr. Bucklew is at risk of life-threatening hemorrhage, particularly under the conditions imposed by Missouri's Execution Procedure.

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speak normally and walk without difficulty." In my professional medical opinion, Dr. Antognini's assertion is based upon insufficient medical evidence. The residual effects of a stroke are not limited to speech impairment or decreased ability to walk, and the absence of these residual effects is not definitive proof that an individual has not suffered a stroke. Other symptoms, such as Mr. Bucklew's inability to fully control the muscles of the right side of his face, can be indicative of stroke.

C. December 19, 2016 Imaging and Report

1. The report generated in connection with the MRI imaging conducted on December 19, 2016, confirms my findings that Mr. Bucklew has a large hemangioma impacting his hard and soft palate, lip, nose, uvula, and throat. Specifically, the report describes the relevant portions of the hemangioma as continuing to impact his airway to a significant degree. The hemangioma is reported as smaller by 1/15th of an inch in a region that was not directly within the airway. This difference is without significance and will have no impact in lessening the serious risk to Mr. Bucklew in the setting of his planned execution as outlined above.

2. As already described, Mr. Bucklew's condition is progressive and his airway continues to be compromised. This finding is confirmed both by recent imaging studies and my own personal examination and evaluation of Mr. Bucklew on two separate occasions.

VI. CONCLUSION AND OPINIONS

A. It is my professional opinion that Mr. Bucklew suffers from a severe and life-threatening form of cavernous hemangioma. Given the nature of Mr. Bucklew's condition, it is my medical opinion that the vascular tumors that obstruct Mr. Bucklew's airway will present a permanent threat to his breathing and that life threatening choking episodes will occur on an ongoing basis. When these choking episodes occur, they will be associated with hemorrhaging to a varying degree that will be easily visible by any observer.

B. Mr. Bucklew's particular medical condition places him at almost certain risk for excruciatingly painful choking complications, including visible hemorrhaging, if he is subjected to execution by means of lethal injection.

C. Mr. Bucklew's airway is compromised such that his breathing is labored, and choking and bleeding occur regularly, even under the least stressful circumstances and when Mr. Bucklew is fully alert and capable of taking corrective measures to prevent suffocation.

D. While it is true that Mr. Bucklew is able to go to sleep after taking certain precautionary measures—including positioning himself to maintain a certain head elevation—without asphyxiating, it is not accurate to compare the experience of sleep with the unconsciousness brought on by sedation. When a person begins to choke while sleeping, as often happens to Mr. Bucklew, he is able to wake up and take remedial measures to alleviate the feeling of choking and return to a normal pattern of breathing. When unconsciousness, or reduced consciousness, is brought on by sedation, an individual is incapable of becoming fully alert and ambulatory and is therefore unable to alleviate the feelings of "air hunger" and choking.

E. The Execution Procedure calls for a minimum of three separate injections, to be administered by "non-medical" personnel. As noted above, Mr. Bucklew is

observed to have very poor veins in both of his arms. Mr. Bucklew's veins are so poor that even a qualified and experienced medical professional would have difficulty finding a vein of the proper and necessary quality for large volume intravenous injection as required in the Missouri lethal injection protocol. In these instances, it is frequently necessary to make more than one attempt to place the needle in a viable vein. However, a medical professional will typically start by trying to place the needle in the best available vein. Each subsequent attempt is even less likely to result in the needle being inserted into a suitable vein, because each successive vein will necessarily appear less viable than the one before. The consequences of placing a needle in an inadequate vein can be catastrophic, and in patients with veins as poor as Mr. Bucklew's, it is not uncommon for a vein to "blow" once the fluid begins flowing through the needle.

F. The risk of a vein blowing is even greater where, as here, the chemical being injected is a very strong "base." Certain chemicals can be characterized as either basic or acidic. Strong bases, just like strong acids, are extremely corrosive. The extremely corrosive properties of the Pentobarbital solution called for in the Execution Procedure make it highly likely that Mr. Bucklew's vein would blow during the injection process.

G. The adequacy of Mr. Bucklew's veins is related to the concerns with respect to his airway. Mr. Bucklew is extremely likely to experience an incremental increase in stress with each unsuccessful attempt to find a vein. A blown vein would also greatly increase Mr. Bucklew's stress. As previously explained, the lethal injection procedure itself is naturally a stressful experience. In an individual with Mr. Bucklew's extremely atypical airway, this increase in stress will manifest as increased difficulty breathing because stress typically causes an individual to breathe harder and faster. The increased velocity of air moving through Mr. Bucklew's airway will result in more turbulent airflow, which Mr. Bucklew will experience as an inability to breathe. Therefore, even prior to receiving the lethal injection, Mr. Bucklew is highly likely to experience greatly increased pain and discomfort and a feeling of "air hunger" greater than that which he experiences in the ordinary course of his day. And contrary to his ordinary experience, Mr. Bucklew will not be able to take remedial measures to normalize his breathing.

H. A second factor that is likely to increase the turbulence of Mr. Bucklew's airflow is the fact that the procedure for execution calls for Mr. Bucklew to lie flat during the execution process. However, when forced to lie completely flat, the aperture of Mr. Bucklew's airway is further reduced because of the location of the hemangiomas that necessarily shift so that they further obstruct Mr. Bucklew's airway when he lies flat. Thus, in addition to a greatly increased velocity of flow of air through his airway, the aperture of Mr. Bucklew's airway will significantly decrease. Mr. Bucklew will experience this combination as a painful inability to breathe normally, even as compared to his usual labored breathing.

I. In addition to the above, the Execution Procedure calls for the injection of 5g of pentobarbital, contained in two separate syringes, thereby requiring two separate

injections which will either be inserted into two separate veins, or through a single vein. The pentobarbital is likely to have the effect of impairing Mr. Bucklew's ability to maintain the integrity of his own airway, particularly given the aforementioned factors that will operate to make Mr. Bucklew's breathing extremely labored. Mr. Bucklew will likely not be fully alert or capable of altering his breathing to accommodate his compromised airway as he does while he is fully alert. Unlike when he is asleep naturally, he will not be able to shift position or wake up fully in order to correct his breathing.

J. I strongly disagree with Dr. Antognini's repeated claim that the pentobarbital injection would result in "rapid unconsciousness" and therefore Mr. Bucklew would not experience any suffocating or choking. [Decl. Antognini, ¶ 15]. In my medical opinion, the injection of pentobarbital called for in the Execution Procedure would not result in instantaneous unconsciousness. Rather, Mr. Bucklew would likely experience unconsciousness that sets in progressively as the chemical circulates through his system. It is during this in-between twilight stage that Mr. Bucklew is likely to experience prolonged feelings of suffocation and excruciating pain. This opinion finds support in the Execution Procedure that explicitly allows for the possibility that five minutes after receiving the injection, death may not have occurred and a second series of injections may be necessary. In addition, unconsciousness or semi-consciousness does not necessarily negate the feeling of pain; it only prevents the unconscious or semi-conscious individual from verbally manifesting that pain.

K. Any length of time in which an individual is experiencing choking and suffocation, without the ability to take a breath, is painful. Even if death is achieved after the passage of five minutes, five minutes is an excruciatingly long period of time for the individual to experience feelings of choking or suffocation. The passage of seconds and minutes is medically significant, particularly in Mr. Bucklew's case.

L. When Mr. Bucklew begins to experience the increased velocity of air through his airway coupled with the decreased aperture of his compromised airway, further exacerbated by pentobarbital's progressive effect on his mental and physical state, Mr. Bucklew will naturally struggle to take a breathe. This struggle will likely manifest as convulsive movements regardless of whether Mr. Bucklew is fully conscious. The harder Mr. Bucklew tries to take a breath, the more turbulent the flow of air through his airway will become and Mr. Bucklew will experience this as suffocation.

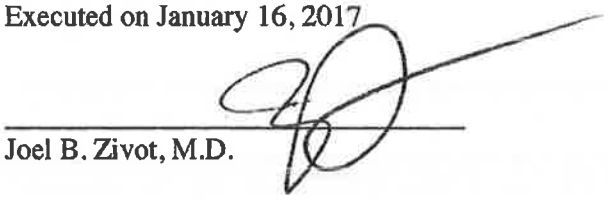
M. In addition, the increased violence with which Mr. Bucklew attempts to breathe and resultant convulsive movements, combined with the extremely fragile nature of the tissue of his airway, and the increase in blood pressure resulting from increased stress, are highly likely to result in hemorrhaging from the hemangioma in his throat, mouth, and nasal cavity.

N. Mr. Bucklew's airway would be further obstructed by the blood from the hemorrhaging, causing Mr. Bucklew to choke and cough on his own blood during the execution proceeding.

O. In conclusion, it is my professional medical opinion that Mr. Bucklew, as a result of his particular medical condition and the atypical anatomy of his airway, will suffer excruciating pain and prolonged suffocation if he is executed by lethal injection.

"I declare under penalty of perjury that the foregoing is true and correct."

Executed on January 16, 2017



Joel B. Zivot, M.D.

EXHIBIT A

EMORY UNIVERSITY SCHOOL OF MEDICINE
CURRICULUM VITAE

JOEL B. ZIVOT, MD, FRCP(C)

Revised: January, 2017

I. Contact Information

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II. Citizenship: American, Canadian

III. Current Titles and Affiliations:

A. Academic Appointments:

1. Primary Appointments:

   a. Associate Professor, Department of Anesthesiology

   b. Joint and Secondary Appointments:
   Associate Professor, Department of Surgery

2. Other academic appointments:

   a. Adjunct Professor, Emory School of Law

B. Other Administrative Appointments:

1. Medical Advisor, Southern Center for Human Rights, Atlanta, Georgia

IV. Previous Academic and Professional Appointments:

A. Fellowship Director, Critical Care Medicine, Department of Anesthesiology, Emory University School of Medicine, Jan 2013-January 2016

B. Medical Director, 4A/5A, EUH (February 2013 –June 2015)

C. Medical Director, 11S, EUHM (June 2010-February 2013)

D. Associate Professor, Department of Anesthesiology, University of Manitoba, Winnipeg, Manitoba, Canada, 2007-2010

E. Member, Academic Promotions Committee, University of Manitoba, Faculty of Medicine, Winnipeg, Manitoba, Canada, 2009

F. Member of selection committee, Physician Assistant Program, The University of Manitoba, Winnipeg, Manitoba, Canada, 2008

G. Member, Accreditation Review Committee-Anesthesiologist Assistants, Commission on Accreditation of Allied Health Education Programs (ARC-AA), 2008

H. Assistant Professor, Department of Anesthesiology and Critical Care Medicine, George Washington University Hospital, District of Columbia, USA, 2005-2007

I. Program Medical Director, Master of Science in Anesthesiology, Case Western Reserve University School of Graduate Studies, Cleveland, Ohio, USA, 2000-2005

J. Assistant Professor of Anesthesia, Surgery, and Intensive Care, University Hospitals of Cleveland, Case Western Reserve University School of Medicine, Cleveland, Ohio, USA, 1998-2005

K. Director Critical Care Medicine Fellowship, Department of Anesthesiology, University of Michigan Medical Center, Ann Arbor, Michigan, USA, 1996-1998

L. Assistant Professor, Department of Anesthesiology and Critical Care Medicine, University of Michigan Medical Center, 1995-1998

V. Previous Administrative and/or Clinical Appointments:

A. Medical Director, Cardio-thoracic ICU, Intensive Care Cardiac Sciences Program, Winnipeg Regional Health Authority, Winnipeg, Manitoba, Canada, 2007-2010

B. Medical Director, CTICU, George Washington University Hospital, Washington, DC, 2005-2007

C. Co-Medical Director, Surgical Intensive Care Unit, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, USA, 2002-2005

D. Director, Post Anesthesia Care Unit, Department of Anesthesiology, University of Michigan Medical Center, Ann Arbor, MI, 1995-1998

VI. Licensures / Boards:

A. Licentiate, Medical Council of Canada, 1989-present

B. *License, Controlled Substance, Drug Enforcement Agency, 1995-present*

C. *License, Michigan State Medical Board, 1995-2000*

D. *License, Ohio State Medical Board, 1998-2012*

E. *Fellow, American College of Chest Physicians, 2000-2010*

F. *License, District of Columbia Medical Board, 2005-present*

G. *License, College of Physicians and Surgeons of Manitoba, 2007-2011*

H. *License, Georgia Composite Medical Board, 2010-present*

VII. Specialty Boards:

A. Fellow, Royal College of Physicians of Canada, 1993-present

B. *Diplomat, Anesthesiology, American Board of Anesthesiology, 1995-present*

C. *Diplomat, Critical Care Medicine, American Board of Anesthesiology, 1995-present*

D. *Fellow, American College of Chest Physicians, 2000-2010*

E. *Testamur in basic peri-operative trans-esophageal echocardiography, National Board of Echocardiography, 2010-present*

VIII. Education:

A. University of Manitoba, Winnipeg, Manitoba, Canada, 1980-1983

B. University of Toronto, Toronto, Ontario, Canada, 1984

C. Doctor of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada, 1988

IX. Postgraduate Training:

A. Rotating Internship, Mount Sinai Hospital, University of Toronto, Department of Post Graduate Medical Education, Toronto, Canada, 1988-1989

B. Residency, Anesthesiology, University of Toronto, Department of Anesthesiology, Dr. David McKnight, Toronto, Canada, 1989-1993

C. Residency, Anesthesiology, Cleveland Clinic Foundation, Department of Anesthesiology, Dr. Armin Schubert, Cleveland, Ohio, United States, 1993-1994

D. Fellowship, Critical Care Medicine, Cleveland Clinic Foundation, Department of Anesthesiology, Dr. Marc Popovich, Cleveland, Ohio, United States, 1994-1995

E. Masters of Bioethics, Emory Center for Ethics, Dr. Toby Schonfeld, program director, 2012-present, expected graduation spring 2017

X. Committee Memberships:

A. National and International:

1. American Society of Anesthesiology, Committee on Ethics, 2011-present
2. American Society of Anesthesiology, Care Team Committee, 2007-2009
3. Society of Critical Care Medicine, Committee on Ethics, 2011-present
4. Society of Critical Care Medicine, Patient and Family Satisfaction Committee, 2013-present
5. Society of Cardiovascular Anesthesiology, Committee on Ethics, 2012-2013
6. Society of Critical Care Anesthesiologists, Graduate Education Committee 2013-present

B. Regional and State:

1. President, Cleveland Society of Anesthesiology, 2001-2002
2. President Elect, DC Society of Anesthesiology, 2006-2007

C. Institutional:

1. EUHM Committee on Ethics, 2011-present
2. EUHM Pharmacy and Therapeutics Committee 2011-present
3. EUHM Executive Critical Care Committee 2010-present
4. EUHM CAUTI and CLABSI prevention committee 2010-present
5. EUH Executive Pharmacy Committee 2012-present
6. EUH Antibiotic Utilization Subcommittee 2012-present
7. EUH Resuscitation Committee 2013-present
8. EUH Difficult Airway ad-hoc group 2013-2014

9. EUH Executive Critical Care Committee 2013-present

10. Department of Anesthesiology Residency Review Committee2013-present

11. EUH/EUHM CTS Quality Committee, 2012-present

XI. Peer Review Activities:

A. Manuscripts:

1. Canadian Journal of Anesthesiology, (manuscript reviewer), 2013

2. Critical Care Medicine, (manuscript reviewer), 2014-2015

3. Mayo Clinic Proceedings, (manuscript reviewer), 2015-

B. Grant reviewer

1. Reviewed grant applications for The Emory Georgia Tech Healthcare Innovation Program (HIP), (HIP-ACTSI-GSU) Seed grant

C. Conference Abstracts:

1. National and International:

- *American Society of Anesthesiology, 2012*
- *Abstract Review Committee and poster session moderator*

2. Regional:

- *Midwestern Anesthesia Resident Conference, 2001-2003 Abstract reviewer*

XII. Consultantships:

A. Merck Pharmaceuticals, physician advisory board, 2005-2007

B. Consultant for Wireless EKG Monitor, 2004-2005

C. Masimo Corporation, product design and physician advisory board, 2013-present

D. Doximity, physician advisory committee, 2014-present

XIII. Honors and Awards:

A. Robert B. Sweet Clinical Instructor of the Year, University of Michigan, Department of Anesthesiology, 1997

B. Outstanding Clinical Instructor of the Year, Case Western Reserve University, Master of Science in Anesthesiology Program, 1999

C. Clinical Instructor of the Year, University Hospitals of Cleveland, Department of Anesthesiology, 2000

D. Outstanding Clinical Instructor of the Year, Case Western Reserve University, Master of Science in Anesthesiology Program, 2001

E. *Meritorious Service Award, American Academy of Anesthesiologist Assistants, 2003*

This award was given to me for academic work as the medical director of the Masters in Science of Anesthesiology at Case Western Reserve University and also advocacy for scope of practice, and committee work to improve the relationship between the American Society of Anesthesiology and American Academy of Anesthesiologist Assistants.

F. Quality and Patient Safety Award, University Health Systems Consortium, 2002

This award was given by University Health System Consortium for various quality benchmark projects when I was the co-medical director of the Cardio-thoracic Intensive Care Unit at University Hospitals of Cleveland.

G. Distinguished service by a Physician Award, American Academy of Anesthesiologist Assistants, 2005

This award was given to me for work with the American Academy of Anesthesiology Assistants annual meetings where I served as a speaker on multiple locations and also developed and hosted an annual Jeopardy game competition between all of the Masters of Science in Anesthesiology schools around the country.

H. District of Columbia Annual Patient Safety Award, District of Columbia Department of Health, 2006

This award was given by the District of Columbia Department of Health for quality improvement work done when I was the medical director of the cardio-thoracic intensive care unit at George Washington University Hospital. I developed several collaborative quality projects between cardio-thoracic surgery and critical care medicine.

I. Presidential Citation, Society of Critical Care Medicine, 2013

This award was given to me for work done within the Society of Critical Care Medicine that included writing a book chapter, service on 2 society committees, and moderating an online debate about the topic of end of life decisions in patients with implanted mechanical cardiac support devices.

XIV. Society Memberships:

A. American Academy of Anesthesiologist Assistant, 2005-present

B. American College of Chest Physicians, 2000-2007

C. American Medical Association, 1995-2000

D. American Medical Association (reactivated), 2010-present

E. Society of Critical Care Anesthesiologists, 1995-present

F. American Society of Anesthesiologists, 1993-present

G. Canadian Anesthesiologist Society, 2007-present

H. District of Columbia Society of Anesthesiologists, 2006-2007

I. International Anesthesia Research Society, 1996-2000

J. International Extra-Corporeal Life Support Organization, 1997-2005

K. Ohio Society of Anesthesiologists, 1993-2005

L. Society of Critical Care Medicine, 1995-present

M. Manitoba Medical Society, 2007-2010

N. Canadian Medical Association, 2008-2012

O. Georgia Society of Anesthesiologists, 2010-present

P. Society of Cardiovascular Anesthesiologists, 2010-present

Q. Society of Academic Anesthesiology Associations, 2013-present

R. Medical Association of Georgia, 2016-

XV. Organization of National or International Conferences:

"On the Ethics of Drug Shortages" June 2012, Jointly with the American Society of Anesthesiology and the Emory Center for Ethics

Administrative Positions: Director, Meeting Planning Committee

Sessions as chair: Overall conference chair

XVI. Research Focus:

Medicine, moral theory, rhetoric, semantics, end of life, physicians and vulnerable populations. Physician participation in lethal injection. Ethogram to study conflict in the operating room. Human factors in critical care decision-making and biological variability. Developed economic model explaining the national generic drug shortages. Studied Propofol wastage in the operating room.

XVII. Grant Support:

A. Active Support:

1. Other: Team Based Science (TBS) grant from the Department of Anesthesiology for Evaluation of conflict in the operating room, $20,000.00

2. The Emory Georgia Tech Healthcare Innovation Program (HIP), (HIP-ACTSI-GSU) Seed grant, $25,000.00, for "Managing Conflict and Error in the Operating Room". Awarded July 2014.

B. Previous Support:

1. $20,000.00 from the American Society of Anesthesiology to plan the meeting "On the Ethics of Drug Shortages". June 2012

XVIII. Clinical Service Contributions

A. Medical director of 11S ICU (EUHM) and 4A/5A ICU (EUH)

I created and chaired a joint protocol development group with Critical Care Medicine, Surgery, Nursing, and Respiratory Therapy with the purpose of improving quality metrics in critical care medicine. This group accomplished several things including a blood conservation strategy for post-operative cardiac surgery patients, intra-aortic balloon pump removal, DVT and GI prophylaxis and the beginning of an atrial fibrillation management protocol. I also wrote and helped implement a rapid extubation protocol for EUH and EUHM cardiac surgery patients.

B. Hospital Committee involvement

I was involved in several Emory committees that addressed a broad range of issues, (see 12 c)

GME involvement, Fellowship Director, Critical Care Medicine, Department of Anesthesiology

I am the fellowship director for critical care medicine. I developed the first joint Anesthesiology-Emergency Medicine critical care medicine fellowship at Emory and I am expanding the number of fellows who will also be trained to assist in providing overnight coverage for airway management at EUH. Overnight airway

coverage has been a project of the EUH emergency airway committee on which I am a member. My ongoing conflict project has been embraced by Emory Healthcare Office of Quality and they are also contributing to the funding and management of the project on an ongoing basis.

XIX. Community Outreach:

A. Community Service

1. International:

St. Petersburg, Russia, 2002, 2004: Home visits to community members who were unable to travel to see a physician

2. Regional:

Hurricane Katrina Medical Response Team, 2005
Emory 500 Atlanta Motor Speedway Health Tent Volunteer, 2010

XX. Media

A. Op-Ed:

1. "Baby's status as human is on trial" Op-Ed, Feb. 19, 2010, Winnipeg Free Press, 2010

2. "Why I am for a moratorium on lethal injections" Op-Ed, Dec 15, 2013, USA Today, 2013

3. "The Slippery Slope from Medicine to Lethal Injection" Op-Ed, May 2, 2014 TIME, 2014

B. Interviews:

1. Anesthesiology News, 2002

-Anesthesiologist Assistants

2. The Medical Post, 2009

-Waiting for Cardiac Surgery

3. The Health Report, CJOB 68 AM, Winnipeg, Canada, 2010

-Cardiac Critical Care
-End of Life in the ICU
-VIP syndrome

4. Inside the Black Box, WREK 91.1 FM, Atlanta, Georgia, 2011

-Biting the Bullet: The Technology of Anesthesia

5. National Public Radio WABE 90.1 FM Atlanta, Georgia, 2011

-Physicians and the death penalty
-Drug shortages

6. Georgia Public Broadcasting, Atlanta GA, 2012

-Drug shortages reaching critical levels

7. Medpage Today, 2013

-No Advantage for Fresh Blood in ICU Transfusions

-Meningitis Outbreak: Suspicion needed for nausea complaints
-Drug Shortages spark use of compounders

8. Medscape Medical News, 2013

-GPOs to Blame for Drug Shortages, Says Physicians Group

9. Medpage Today, 2014

-Cruel and Unusual Punishment
-Lethal Injection: a cruel, painful, terrifying execution

10. Miami Herald, 2014

-Doctor speaks out on use of untested drugs in capital punishment

11. The New York Times, 2014

-Timeline describes frantic scene at Oklahoma execution

12. The Washington Post, 2014

-Florida's Gruesome Execution Theater
-Another execution gone awry. Now what?

13. CNN with Sanjay Gupta, 2014

-Dr. Zivot: Lethal injection not humane

14. Amicus on Slate with Dahlia Lithwick, 2015

-Botched protocols

15. Huffington Post, 2015

-Oklahoma wants to reinstate the gas chamber and experts say it's a bad idea

16. Time, 2015

-The harsh reality of execution by firing squad

XXI. Formal Teaching:

A. Medical Student Teaching:

1. Discovery Project: "Propofol wastage in the ICU" Medical student Mina Tran, 2012-2013, contact hours 4 hrs/week

2. Serve as teacher and mentor for medical students in anesthesiology and critical care medicine. 2010-present, contact hours: 3 hrs/week

3. Instructor for Fundamental Critical Care Support (FCCS) training course for medical students, 2012-present, contact hours: 1 hr/week

4. Forge Medical Student Innovation Group, Mentor, contact hours: 0.5 hrs/week

B. Graduate Programs:

1. Training Programs:

Instructor in the Masters of Science in Anesthesiology program. I developed the first critical care medicine rotation for all of the students and also a series of didactic lectures on the topic of critical care medicine the included "Critical Care Medicine", "Heart Failure", and "Acid-Base Disorders"

2. School of Law:

*Co-chief instructor of **LAW 819-002, "Law, Medicine and Human Rights",** a 2 credit hour seminar taught in the fall 2016 semester in the Emory School of Law*

3. Residency Programs:

Served as instructor for residents in anesthesiology, emergency medicine, and surgery in the area of critical care medicine. I also sit on the residency review committee for the Department of Anesthesiology. Lecture topics "Septic shock", "Thyroid disease in critical care", "Mechanical heart support", "Pulmonary artery catheters" "Heuristics and biases in clinical reasoning", "delirium and agitation in critical illness", "biological variability".

C. Other Categories

I give regular lectures on a variety of critical care topics for respiratory therapy including "capnography" and "paralytics". I lecture students in the Emory critical care NP/PA program and also regular critical care lectures to the NP/PA practitioners in critical care. I teach those students how to read chest X-rays. I am invited to lecture in the Emory School of Law on the topic "Physician Assisted Suicide".

Emory Tibet Science Initiative:

I taught biology to Buddhist monks at Drepung Loseling Monastery in Southern India in June 2015. This initiative is a result of an invitation from His Holiness, The Dalai Lama, to bring science education to the education of the monks and represents the first time in 700 years that the curriculum has changed. I spent 2 weeks at the monastery teaching for 6 hours per day including microscopy lab teaching. I worked with a series of translators.

XXII. Supervisory Teaching:

A. Residency Program:

Fellowship director, Critical Care Medicine, Department of Anesthesiology 2013-present. I am chiefly responsible for the education and training of the critical care fellows in the Department of Anesthesiology. In addition to a multitude of critical care topics, I assist the fellows in abstract writing for a national critical care meeting, grand rounds for the Department of Anesthesiology and a quality improvement project for Graduate Medical Education Day that occurs annually in June.

B. Other:

I completed a summer internship at the Southern Center for Human Rights and also teach law students on the topic of lethal injection.

XXIII. Lectureships, Seminar Invitations, and Visiting Professorships:

A. "The Case of Samuel Golubchuk: Lessons about end-of-life decision-making?" A debate between Doctors Joel Zivot and Adrian Fine
Wednesday, 18 March, 2009, 12h30-13h30. The Centre for Professional and Applied Ethics, The University of Manitoba, Winnipeg, Manitoba

B. "Cardiac output after the Pulmonary Artery Catheter" American Academy of Anesthesiologist Assistants Annual Meeting. Clearwater, Florida, April 2009

C. "End of Life in the ICU", Canadian Hospice Palliative Care Conference Annual Meeting, Winnipeg, Manitoba, Canada. October 2009

D. "Reductions in wait times for cardiac surgery may be harmful", poster presentation, Canadian Cardiovascular Society Annual Meeting, Edmonton, Alberta, Canada, October 2009

E. "Biological Variability" American Society of Anesthesiology, 2009-(I formed a panel to discuss biological variability. My panel consisted of an anesthesiologist, a mathematician, and a physicist.)

F. "End of life in the ICU: When the patient and doctor disagree…" Province wide health care ethics grand rounds, St. Boniface Research Centre, Winnipeg, Manitoba, Canada. January 2010

G. "Mostly dead is slightly alive, the problem with the dying process" Center for Ethics, Emory University, 2011.

H. "Anesthesiology Jeopardy!" American Academy of Anesthesiologist Assistants Annual Meeting, 2006, 2007, 2008, 2009, 2010, 2011

I. "Queuing Theory: Applications for Anesthesiology" American Academy of Anesthesiologist Assistants Annual Meeting, Destin, Florida, 2011

J. "Cardiac Anesthesia: Mostly we have it wrong" American Academy of Anesthesiologist Assistants Annual Meeting, Destin, Florida, 2011

K. "End of life in the ICU: When the patient and doctor disagree" American Academy of Anesthesiologist Assistants Annual Meeting, Destin, Florida, 2011

L. "Sedating the difficult patient" 5th Annual Southeastern Critical Care Summit. Emory University, Atlanta, GA, March 2012

M. "End of Life Care" IMPACT 2012 American Academy of Physician Assistants Annual Meeting, Toronto, Canada, June 2012

N. "Biosimilars, where do we stand?" Georgia Bio and the Georgia Association of Healthcare Executives. September 2012, Atlanta, Georgia

O. "Drug Shortages" Visiting Professor, Rutgers Business School, Newark, New Jersey, November 2012.

P. "Deactivating a permanent cardiac device is not physician assisted death", Pro-con debate Webinar, Society of Critical Care Medicine, November 2012.

Q. "Drug shortages: The invisible hand of the Market" New Horizons in Anesthesiology, Vail, Colorado, February 2013

R. "Hey Anesthesia is a compliment, not an insult: the case for protocols" New Horizons in Anesthesiology, Vail, Colorado, February 2013

S. "Pro/Con: Death Panels in End of Life Care" New Horizons in Anesthesiology, Vail, Colorado, February 2013

T. "Hockey Violence and Killer Apes: Conflict Management in the Operating Room" New Horizons in Anesthesiology, Vail, Colorado, February 2013

U. "Drug Shortages, a failed market" American Society of Anesthesiology Legislative Conference Annual Meeting, April 2013, Washington, DC

V. "Lethal injection in the death penalty", Georgia Law Society and the Southern Center for Human Rights, Atlanta, Georgia, July 2014

W. "Identifying and managing futile care in the ICU", 10th Annual South Easter Critical care Summit, May 2016, Atlanta, Georgia

X. "Capital Punishment and Lethal Injection", Georgia State School of Law, Atlanta, Georgia, September 2016

XXIV. Invitations to National or International Conferences:

A. University of Richmond Law Review, Allen Chair Symposium, 2014, *"The Death Penalty in the United States."*

B. Yale Law School, March 2015, *"Lethal injection."*

C. The Fordham Law Review, Fordham Law School, February 201,6 *"Criminal Behavior and the Brain: When Law and Neuroscience Collide."*

D. American College of Correctional Physicians

Fall Educational Conference
October 2016
Las Vegas, Nevada
"Physician participation in executions: A discussion of the Ethical Challenges and the Pros and Cons, a pro-con debate between Dr. Carlo Muso and Dr. Joel Zivot

E. "Prescribing Price: The Ethics, Science, and Business of Drug Development and Pricing"

Panelist
Emory Conference Center, November 2016
Atlanta, Georgia
Emory Center for Ethics

F. "The First International Emory Tibet Symposium: Bridging Buddhism & Science

Drepung Loseling Monastery
Karnataka State, India"
Panelist: What is life and what are its origins?

XXV. Bibliography:

A. Published and Accepted Research Articles (clinical, basic science, other) in Refereed Journals

1. Perera ER, Vidic DM, **Zivot J**. "Carinal resection with two high frequency jet ventilation delivery systems". Canadian Journal of Anesthesia. Jan 1993: 40(1):59-63. PMID: 8425245

2. **Zivot JB,** Hoffman WD. "Pathological effects of endotoxin". New Horizons. May 1995; 3(2):267-75. PMID:7583168

3. Popovich MJ, Lockrem JD, **Zivot JB**. "Nasal bridle revisited: an improvement in the technique to prevent unintentional removal of small-bore naso-enteric feeding tubes". Critical Care Medicine. March 1996; 24(3):429-31. PMID: 8625630

4. Kumar K, Zarychanski R, Bell DD, Manji R, **Zivot J**, Menkis AH, Arora RC; Cardiovascular Health Research in Manitoba Investigator Group. "Impact of 24-hour in-house intensivist on a dedicated cardiac surgery intensive care unit". *Ann Thorac Surg*. 2009 Oct;88(4):1153-61.doi: 10.1016/j.athoracsur. 2009.04.070

5. ***Zivot JB***. *"The Case of Samuel Golubchuk", AJOB Volume 10, Issue 3 March 2010, pages 56 – 57 doi: 10.1080/15265160903681890.*

6. AbdulRazaq A. H. Sokoro, PhD., **Joel B. Zivot**, , MD, FRCPC, Robert E. Ariano, PharmD, FCCM "Neuroleptic malignant syndrome versus Serotonin syndrome: the search for a diagnostic tool?" Ann Pharmacother. 2011 Sep;45(9):e50.doi: 10.1345/aph. 1P787. Epub 2011 Aug 30.

7. When patient and doctor disagree. **Zivot JB**, CMAJ 2012,Jan 10;184(1):76-6. doi: 10.1503/cmaj. 112-2008

8. **Zivot JB**, "Anesthesia does not reduce suffering at the end of life", Crit Care Med. 2012 Jul; 40(7):2268-9. doi: 10.1097/CCM.0b013e31824fc12b.

9. **Zivot JB,** "The absence of cruelty is not the presence of humanness: physicians and the death penalty in the United States". Philos Ethics Humanit Med. 2012 Dec 3;7(1):13. doi: 10.1186/1747-5341-7-13.

10. Mazzeffi, M, **Zivot J**, Buchman T, Halkos M, "In hospital mortality after cardiac surgery: patient characteristics, timing, and association with postoperative length of intensive care unit and hospital stay". Ann Thorac Surg. 2014 Apr;97(4):1220-5. doi: 10.1010/j.athoracsur.2013. 10.040. Epub 2013 Dec 21.

11. **Zivot JB**, "The withdrawal of treatment is still treatment". Can J Anesth 2014; Oct;61(10):895-8

12. **Zivot J**, "Lethal injection: the states medicalize execution" 49 U. Rich. L. Rev. 711 (2015)

13. **Zivot J,** "Elder care in the ICU: Spin bravely?" Crit Care Med 2015 July;43(7):1526-7\

14. Jones LK, Jennings BM, Goetz RM, Haythorn KW, **Zivot JB**, de Waal FB "An Ethogram to Quantify Operating Room Behavior" Ann Behav Med. 2016 Jan 26. [Epub ahead of print]

15. ***Zivot J**, Arenson K, "Lessons learned from physician participation in lethal injection: Is Carter v. Canada a death knell for medical self-regulation?" Can J Anaesth 2016 March;63(3):246-251*

16. **Zivot JB**, "Elderly patients in the ICU: Worth it, or not?" Crit Care Med 2016 April;44(4):842-3

17. Moll V, Ward CT, **Zivot JB**, "Antipsychotic-Induced Neuroleptic Malignant Syndrome after Cardiac Surgery" AA Case Rep. 2016 July 1; 7 (1); 5-8

18. **Zivot J**, "Too Sick to be Executed: Shocking Punishment and the Brain" November 2016 Vol 85, pp 697-703, Fordham Law Review

B. Examination Activities:

1. Committee Member, 2005, National Anesthesiologist Assistant Certification

2. Examination Development Committee

3. Question writer, 2005, Critical Care Medicine, National Board of Medical Examiners

4. Question reviewer, 2015, American Board of Anesthesiology-Maintenance of Certification in Anesthesiology (MOCA), Critical Care Medicine

C. Book Chapters:

1. Bojan Paunovic MD, FRCPC[1], Rizwan Manji MD, PhD, FRCSC[2], Rakesh Arora MD, PhD, FRCSC[2], Johan Strumpher MD, FRCPC[3], Rohit Singhal MD, FRCSC[2], **Joel Zivot MD, FRCPC**[4], and Eric Jacobsohn MBChB, MHPE, FRCPC[5] "Diagnosis and Management of Sepsis and Septic Shock in the Cardiac Surgical Patient". Society of Cardiovascular Anesthesiology Monograph, March 2010

2. **Zivot, JB**, "What Are Advance Directives?" Critical Care Ethics: A Practice Guide, Third Ed. Copyright 2014 Society of Critical Care Medicine.

D. Other Publications:

1. **Zivot J**, Hoffman W, Lockrem J, Esfandiari S, Bedocs N, Vignali C, Popovich M. "Changes in gastric intramucosal pH are not predicted by therapeutic changes in conventional hemodynamic variables for septic surgical patients". Critical Care Medicine. 23(1) Supplement A:107, Jan 1995

2. Webster J, Thomson V, **Zivot J.** "Excessive endotracheal tube cuff pressures are common but are not clinically significant". Anesthesiology 87(3 Suppl) A984, 1997

3. Bloch, MG, **Zivot JB**. "Successful transplantation of liver and kidney allografts from a donor maintained on veno-arterial extracorporeal membrane oxygenation". Anesthesia and Analgesia, 94(25 Supplement) S104, Feb 2002

4. **Zivot J**, Polemenakas A, Aggarwall S, Rowbottom J. "Differential lung capnography after single lung transplant". Critical Care Medicine 30(12) Supplement: A90 December 2002

5. Voltz D, **Zivot J**, "Changes in the Bispectral Index during Deep Hypothermic Circulatory Arrest." Society of Critical Care Medicine Annual Meeting, San Francisco, California, January 2003

6. Ravas R, **Zivot J**, "Blood conservation; Designing a better blood bag", Department of Anesthesiology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, Midwestern Anesthesia Resident Conference (MARC), Chicago, Illinois, March 2003

7. Hacker L, **Zivot J** "Local anesthetic spread for skin infiltration", Department of Anesthesiology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, Midwestern Anesthesia Residents Conference, Chicago, Illinois, March 2003

8. Falk S, **Zivot J**, "Post-operative Sidenafil for pulmonary hypertension following mitral valve repair" 17th Asia Pacific Conference on Diseases of the Chest, Istanbul, Turkey, August 2003

9. Aggarwal S, **Zivot J**, "New onset anterior spinal artery syndrome after lumbar drain removal" Department of Anesthesiology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, Midwestern Anesthesia Residents Conference, Rochester, Minnesota, March 2004

10. Stetz J, **Zivot J**, "Dextromethorphan masquerading as phencyclidine," Department of Anesthesiology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, Midwestern Anesthesia Residents Conference, Rochester, Minnesota, March 2004

11. Petelenz K, **Zivot J**, "Bilateral BIS monitoring in unilateral brain injury", Department of Anesthesiology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio, Midwestern Anesthesia Residents Conference, Chicago, Illinois, March 2005

12. Arora RC, Zarychynski R, Bell D, **Zivot J**, Lee J, Kumar K, Zhang L, Menkis A "The Manitoba Model of Post-Operative Cardiac Surgery Intensive Care" The Cardiac Sciences Program, St. Boniface Hospital and the University of Manitoba, Winnipeg, Canada. Toronto Critical Care Meeting, October 2007

13. K Kumar, R Zarychanski, DD Bell, **J Zivot**, J Lee, R Manji, A Menkis, RC Aurora, "The Impact of the Manitoba Model of 24 hour in-house intensivist on a dedicated cardiac surgery ICU" Canadian Cardiovascular Society Annual Meeting, Toronto, Ontario, Canada, October 2008

14. Fergusson DA, Hébert PC, Mazer CD, Fremes S, MacAdams C, Murkin JM, Teoh K, Duke PC, Arellano R, Blajchman MA, Bussières JS, Côté D, Karski J, Martineau R, Robblee JA, Rodger M, Wells G, Clinch J, Pretorius R; BART Investigators. "A comparison of aprotinin and lysine analogues in high-risk cardiac surgery". N Engl J Med. 2008 May 29;358(22):2319-31. Epub 2008 May 14. Erratum in: N Engl J Med. 2010 Sep 23;363(13):1290

15. M Rivet, S Chartrand, G Henry, ICCS Nurses, RC Aurora, DD Bell, A Menkis, **J Zivot**, RA Manji, on the GRACE, GRACE2 Investigators, "Bunk Beds in the ICU - Can Two Cardiac Surgery Patients Occupy One ICU Bed?" Canadian Cardiovascular Society Annual Meeting, Toronto, Ontario, Canada, October 2008

16. RA Manji, E Jacobsohn, D Bell, RK Singal, **J Zivot**, A Menkis " Delirium and bed management in the cardiac surgery ICU" Canadian Cardiovascular Society Annual Meeting, Edmonton, Alberta, Canada, October 2009

17. RA Manji, D Bell, C Shaw, C Moltzan, P Nickerson, AH Menkis, **J Zivot**, E Jacobsohn, Management Suggestions for Cardiac Surgery Patients with a Positive Heparin Induced Thrombocytopenia (HIT) ELISA, Canadian Cardiovascular Society Annual Meeting, Edmonton, Alberta, Canada, October 2009

18. RA Manji, E Jacobsohn, **J Zivot**, H Grocott, Alan Menkis, Prolonged in-hospital wait times does not affect outcomes for urgent coronary artery bypass surgery, Canadian Cardiovascular Society Annual Meeting, Edmonton, Alberta, Canada, October 2009

19. **J Zivot**, RA Manji, E Jacobsohn, H Grocott, A Menkis, Reductions in wait times for cardiac surgery may be harmful, Canadian Cardiovascular Society Annual Meeting, Edmonton, Alberta, Canada, October 2009

20. RA Manji MD PhD FRCSC MBA, E Jacobsohn MBChB FRCPC, H Grocott MD FRCPC, **J Zivot** MD FRCPC, AH Menkis DDS MD FRCSC, Longer in-hospital wait times does not affect outcomes for urgent coronary artery bypass grafting surgery, American Heart Association Annual Meeting, Orlando, Florida, November 2009

21. **Zivot, JB**, "When the patient and the doctor disagree: end of life in the ICU" (poster presentation) American Society of Anesthesiology Annual Meeting, San Diego, California, October 2010

22. Joel Zivot, MD, "A cure in search of a disease, comments on: From an Ethics of Rationing to an Ethics of Waste Avoidance", N Engl J Med. 2012; 366:1949-1951, May 24 2012

23. Mazzeffi, Halkos, **Zivot** "Timing and characterization of post-cardiac surgery in-hospital mortality" Society of Critical Care Annual Meeting Society of Critical Care Annual Meeting, Jan 2013.

24. Neamu, Halkos, **Zivot** "Right Ventricular Laceration During Closed Chest Compression in a Cardiac Surgical Patient" Society of Critical Care Annual Meeting: Jan 2013

25. Caridi-Scheible, **Zivot**, Paciullo, Connor "Successful treatment of pulmonary-renal syndrome secondary to p-ANCA vasculitis using ECMO with Argatroban", Society of Critical Care Medicine Annual Meeting, San Francisco, CA, Jan 2014

EXHIBIT B

PRIOR EXPERT TESTIMONY

In the past four years, I have testified as an expert by deposition in the following cases: (1) State of Georgia v. Christopher Calmer; (2) State of Georgia v. Catherine Goins; (3) Anthony Boyd v. Commissioner, Alabama Department of Corrections; (4) Ernest Johnson v. Troy Steele; (5) Joshua Bishop v. GDCP Warden; (6) Brian Keith Terrell v. Homer Bryson, Bruce Chatman, and Other Unknown Employees and Agents, Georgia Department of Corrections; (7) Robert L. Henry v. State of Florida; (8) Marcus Wellons v. Commissioner, Georgia Department of Corrections; (9) Tanya Johnson v. Springhill Hospitals; and (10) In re New England Compounding Pharmacy Inc. Products Liability Litigation. This list is true and correct to the best of my knowledge and recollection.

EXHIBIT C

Report of MRI Imaging dated December 23, 2016

510 Boulevard
Saint Louis, Missouri 63110

MIR

MALLINCKRODT
INSTITUTE OF RADIOLOGY
WASHINGTON UNIVERSITY
MEDICAL CENTER

BUCKLEW, RUSSELL
DOB: 05/16/1968
PAT CLASS: Outpatient
MRN: 4280226

This exam was performed at Barnes-Jewish Hospital

Attending Physician: ERNIE-PAUL BARRETTE, M.D.
Requesting Physician: ,
Radiologist(s): FRANZ WIPPOLD, M.D. WEI WANG, M.D.

******FINAL REPORT******
The radiology attending physician has personally reviewed this study, and has reviewed and/or edited this written report and agrees with it.

ACC#	Date	Time	Exam
39993297	Dec 19, 2016	14:39:00	70496 CT Angio Head w/o & w cont
39993329	Dec 19, 2016	14:39:00	70498 CT Angio Neck
39993701	Dec 19, 2016	17:00:00	70543 MRI Orb,Face,Nk, wo&w cont
39993703	Dec 19, 2016	17:00:00	70546 MR Angio Head wo&wi cont
39993730	Dec 19, 2016	17:00:00	70549 MR Angio Neck wo&wi cont

ACC#	Date	Time	Exam
39993297	Dec 19, 2016	14:39:00	70496 CT Angio Head w/o & w cont
39993329	Dec 19, 2016	14:39:00	70498 CT Angio Neck
39993701	Dec 19, 2016	17:00:00	70543 MRI Orb,Face,Nk, wo&w cont
39993703	Dec 19, 2016	17:00:00	70546 MR Angio Head wo&wi cont
39993730	Dec 19, 2016	17:00:00	70549 MR Angio Neck wo&wi cont

EXAMINATION:
1. Computed tomography angiography (CTA) of the neck.

2. Computed tomography angiography (CTA) of the head without and with contrast.

3. Magnetic resonance imaging (MRI) of the face and neck without and with contrast.

4. Magnetic resonance angiography (MRA) of the head without and with contrast.

5. Magnetic resonance angiography (MRA) of the neck without and with contrast.

HISTORY: 48-year-old male with hemangioma in the right tonsillar region.

TECHNIQUE:
1. Computed tomography of the head was performed without contrast according to standard protocol. Computed

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This exam was performed at Barnes-Jewish Hospital

tomographic angiography was obtained from the level of the aortic arch to the vertex following the uneventful administration of intravenous contrast. 3D images were generated on a dedicated workstation.
Contrast information: 98 mL Optiray-350

2. Multiplanar multi-weighted MRI of the face and neck was performed without and with intravenous contrast using the standard face and neck protocol. Magnetic resonance angiography of the head was performed using separate data set acquisitions including a non-contrast time-of-flight technique and a post-contrast technique to produce axial thin-slice source images. Magnetic resonance angiography of the neck was performed using a separate data set acquisition non-contrast time-of-flight technique and a post-contrast technique to produce thin-slice source images. These images were then used to generate maximum intensity projection (MIP) images.
Contrast information: 18 mL Dotarem

COMPARISON: MRI of neck dated 06/24/2010.

FINDINGS:

An approximately 4.4 cm (transverse) x 3.9 cm (anteroposterior) soft tissue mass arises in right tonsillar region, corresponding to the patients known hemangioma. It has slightly decreased in size, measuring 4.35 cm in lateromedial dimension on this exam, and it measured 4.72 cm in lateromedial dimension on the MRI in 2010.

The mass extends into the right masticator space (involving the right medial pterygoid muscle, and the buccal fat and the pterygopalatine fossa), the right parapharyngeal space, the right posterior floor of mouth, and the right soft palate and uvula. In the oral cavity, the tumor extends along the roof of the oral cavity to involve the hard palate and the soft palate, and it extends anteriorly to the soft tissue of the face, as well as upper lip and nose on the right side of the face. This causes narrowing of the oropharynx and the nasopharynx.

On the CTA, this mass is confirmed, also slightly decreased in size. This decrease in size involves predominantly the right posterior nasal component and masticator space component. Punctate densities likely represent calcifications versus prior interventions. The mass splays the right medial and lateral pterygoid plates and encroaches upon the right portion of the retropharyngeal space. The right internal carotid artery is not involved. A lobulated component of this mass involves the posterior nasal septum and right ethmoid paranasal sinus. An approximately 1 cm component involves the medial right extraconal orbit, as well as the right optic nerve at the orbital apex.

There is a gap and dehiscence of the right cribriform plate with an apparent meningocele descending into the region of the right ethmoid sinus. This is unchanged from the MR of 06/24/2010. This cribriform defect and meningocele may be due to involution of the hemangioma following the presumed intervention of several years ago. The remainder of the brain is unremarkable.

Regard the CTA portion of the examination, the origins of the common carotid arteries and vertebral arteries are normal. The common carotid bifurcations are normal. The courses of the internal carotid arteries are normal. There is a slight enlargement of the right facial artery and the right temporal artery. The circle of Willis is unremarkable. The left vertebral artery is dominant. No aneurysm is seen. No vascular stains supplying the hemangioma.

The nasopharyngeal airway is narrowed and displaced to the left. Also noted is a bullet fragment within the posterior left neck.

No other head and neck blood vessel abnormalities are seen.

IMPRESSION:

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Saint Louis, Missouri 63110

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INSTITUTE OF RADIOLOGY
WASHINGTON UNIVERSITY
MEDICAL CENTER

BUCKLEW, RUSSELL
DOB: 05/16/1968
PAT CLASS: Outpatient
MRN: 4280226

This exam was performed at Barnes-Jewish Hospital

1. Extensive deformation of the deep spaces of the midface due to known hemangioma.

2. Slight decrease in size of this hemangioma.

Dictated By: WEI WANG, M.D. on Dec 23 2016 1:25P

This document has been electronically signed by: FRANZ WIPPOLD, M.D. on Dec 23 2016 1:49P

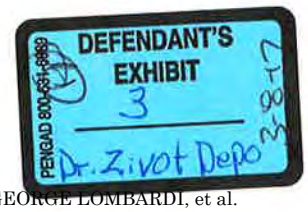
EXHIBIT D

[CDs containing the MRI and CT image files will be sent separately via FedEx First Overnight]

DECLARATION OF JOEL B. ZIVOT, M.D.

I, Joel B. Zivot, being of sound mind and lawful age, hereby state under penalty of perjury as follows:

1. My name is Joel B. Zivot and I reside in Atlanta, Georgia.
2. I am an assistant professor of Anesthesiology and Surgery at the Emory University School of Medicine in Atlanta, Georgia. I am also the medical director of the Cardiothoracic and Vascular Intensive Care Unit at Emory University Hospital and the academic director of the critical care medicine fellowship for the Department of Anesthesiology.
3. In addition to my present position, I have served in similar leadership positions in academic medical centers in Washington, D.C. (George Washington University Hospital); Winnipeg, Canada (University of Manitoba); Cleveland, Ohio (Case Western Reserve University School of Medicine); and Ann Arbor, Michigan (University of Michigan School of Medicine and University of Michigan Medical Center).
4. I am board certified in Anesthesiology and Critical Care Medicine by the American Board of Anesthesiology. I am also board certified in Anesthesiology from the Royal College of Physicians of Canada. I have an unrestricted medical license from the states of Georgia and Ohio and the District of Columbia. I hold a license from the Drug Enforcement Agency (DEA) granting me prescriptive authority for controlled drugs.
5. I received my Doctor of Medicine degree from the University of Manitoba, and am currently completing a Master's degree in Bioethics at Emory University. I am engaged in ongoing original research and have lectured and published on many topics related to Anesthesiology, Critical Care Medicine



and Bioethics, including a publication in a peer-reviewed journal on physicians and the death penalty in the United States. I serve on the ethics committees of the American Society of Anesthesiology and the Society of Critical Care Medicine, both of which are the largest professional associations in their respective specialties. A copy of my current curriculum vitae is attached as Exhibit A.

6. Since mid-April 2014, I have been consulting with attorneys for Missouri death row prisoner Russell Bucklew regarding Mr. Bucklew's medical condition and the risks attendant to executing him by lethal injection.

7. I became involved in Mr. Bucklew's case at the request of his attorneys and agreed to do a preliminary review of his medical records so that I could provide an affidavit that would allow the attorneys to seek sufficient time and funding to allow a proper evaluation of the risks posed to Mr. Bucklew if executed according to Missouri's lethal injection protocol.

8. As requested, I have reviewed Mr. Bucklew's medical records from January 22, 1986, through February 17, 2014, from Boone County Hospital, Boone County Jail, Lincoln County Hospital, the University of Missouri Medical Center, Southeast Missouri Hospital, and the Missouri Department of Corrections. I have reviewed operative reports, medications, reports of CT and MRI scans, blood test results, and EKG reports. I have also reviewed documents entitled "Missouri Department of Corrections Preparation and Administration of Chemicals for Lethal Injection," "Chronological Sequence of Execution" and "State of Missouri Department of Corrections Pre-Execution Summary of Medical History." I also reviewed execution team training materials and a document represented to be a prescription for pentobarbital for Herbert Smulls, dated January 6, 2014. More recently, I

also reviewed a disc containing imaging studies of Russell Bucklew, including radiology scans performed in 2005.

9. From the medical records and documents I reviewed, I observed that Mr. Russell Bucklew is a 45-year-old man who suffers from congenital cavernous hemangioma that primarily involves the face, including the pharynx.

10. I have reviewed radiology scans of Mr. Bucklew from August 2005 and compared them to the written report from imaging performed in 2010. The findings are consistent and show an extensive soft tissue mass involving the posterior pharyngeal and masticator space including a significant mass effect. The tumor is also visualized in the right ethmoid air cells, right orbit, and very likely extends into the brain. In lay terms, this means that Mr. Bucklew has a tumor growing in his face, occupying the nose, throat and airway passages and causing him to experience constant facial pain and pressure as well as constant difficulty breathing.

11. The total tumor burden results in a significant and dangerous compromise of Mr. Bucklew's airway.

12. As a result of this vascular malformation, Mr. Bucklew has received an ongoing course of medical treatment to manage his pain and recurrent facial and pharyngeal hemorrhages.

13. It is the nature of cavernous hemangiomas to continuously expand. Although they are classified as benign tumors, their growth can be locally invasive and destructive. The tumors are comprised of a tangle of blood vessels that preferentially steal blood flow from normal adjacent tissues, thereby depriving those tissues of necessary oxygen.

14. Records indicate that Mr. Bucklew has undergone at least one surgical procedure, in December 2000, in an attempt to control chronic pain and the

expansion of the vascular tumor. Throughout the years, Mr. Bucklew has been repeatedly diagnosed with generalized anxiety disorder and chronic pain, and he has required various medication treatments for management of his cavernous hemangioma.

15. Based on my review of Mr. Bucklew's medical records, it is my opinion that a substantial risk exists that, during the execution, Mr. Bucklew will suffer from extreme or excruciating pain as a result of hemorrhaging or abnormal circulation of the lethal drug, leading to a prolonged execution. Mr. Bucklew also has a partially obstructed airway, which raises a very substantial risk that during an execution he could suffocate. Further, because Mr. Bucklew is prescribed several medications, including medications for pain, there is a substantial risk he will suffer an adverse event from drug interactions.

16. A review of Missouri's lethal injection protocol shows that it includes the use of the drug methylene blue. The dosage is not listed. Methylene blue is a nitric oxide scavenger, which will cause a spike in blood pressure when injected.

17. Blood pressure is not monitored during lethal injection. A spike in Mr. Bucklew's blood pressure raises a very substantial risk of hemorrhage. Mr. Bucklew's cavernous hemangiomas are a plexus of blood vessels that are abnormally weak and can easily rupture, even when the blood pressure is normal.

18. If Mr. Bucklew's blood pressure spikes after the methylene blue injections, the hemangiomas, now further engorged with blood, are likely to rupture, resulting in significant bleeding in the face, mouth and throat. If blood enters Mr. Bucklew's airway, it would likely cause choking and coughing, which Mr. Bucklew will experience as severe pain and suffocation.

19. There is also a very substantial risk that, because of Mr. Bucklew's vascular malformation, the lethal drug will not circulate as intended. The presence of cavernous hemangiomas creates alternative low-resistance pathways to injected drugs. It is very likely that this abnormal circulation will inhibit the effectiveness of the pentobarbital, thereby delaying the depression of Mr. Bucklew's central nervous system. The reduced effectiveness of the pentobarbital and the delayed depression of the central nervous system will create a substantial risk of a prolonged and extremely painful execution for Mr. Bucklew.

20. In order to characterize the present extent of the tumor's involvement with Mr. Bucklew's airway and brain, a repeat high resolution CT of Mr. Bucklew's chest, neck, head and brain should be performed. The CT study should be performed with and without contrast to characterize the extent of the anticipated abnormal intracranial structures. The CT scan is necessary to characterize the location and extent of the tumor, and to assess the severe degree of compromise of Mr. Bucklew's airway.

21. If the CT scan does not fully characterize the extent of the known soft tissue tumors, then an MRI should be performed. In addition, a venogram and ultrasound evaluation should be performed of Mr. Bucklew's upper extremities, including the veins of the subclavian, internal and external jugular veins to determine venous patency (or openness) and suitable vascular access locations.

22. There is also a substantial risk of adverse events resulting from drug interaction. Mr. Bucklew regularly takes several drugs, including Clonazepam and Tramadol, to treat chronic pain and anxiety. These drugs and pentobarbital are central nervous system (CNS) depressants. CNS depressants may enhance the adverse/toxic effect of other CNS depressants.

23. Pentobarbital is a drug in the barbiturate class that has several effects on the central nervous system and works via GABA receptors. It is important to understand, in the present context, that pentobarbital is not an analgesic and has no effect on reducing pain. Like other barbiturates, pentobarbital is antalgesic, that is, it tends to exaggerate or worsen pain.

24. As noted above, Mr. Bucklew is prescribed medications that are CNS depressants. Pentobarbital is also a CNS depressant, and CNS depressants can enhance the adverse or toxic effect of other CNS depressants. Consequently, Mr. Bucklew's medications may interact with the pentobarbital—an antalgesic—in a manner that increases pain, causing a substantial risk that Mr. Bucklew will experience an extremely painful death.

25. The risks arising from drug interactions and the antalgesic effects of pentobarbital are increased further by the use of the compounded drug, which, unlike a manufactured drug, carries no guarantees of its safety, potency or purity.

26. Although there are aspects of the lethal injection protocol that, superficially, appear to draw on medical expertise, lethal injection is not a medical act and does not possess any of the safeguards of the practice of medicine and anesthesiology.

27. Personnel employed by the State of Missouri to carry out the lethal injection protocol either lack the necessary training to safely carry out lethal injection – particularly in the case of someone like Mr. Bucklew who has a complex medical condition – or they are acting explicitly contrary to the dictates of safe medical practice.

28. Because of the risks to Mr. Bucklew during an execution, I believe that during the procedure, Mr. Bucklew should be monitored by a qualified

doctor who is in the execution chamber with the purpose of being able to revive Mr. Bucklew in the event the execution is unsuccessful. The physician would have no role or assignment in assisting in any way with the lethal injection.

29. The use of medical personnel in lethal injection is prohibited by many medical associations, including the American Society of Anesthesiology. If any board-certified anesthesiologist were identified as participating in lethal injection, he or she would lose board certification.

30. Although Mr. Bucklew has apparently safely undergone anesthesia many years ago, that past experience has no bearing on lethal injection. During anesthesia and surgery, a highly skilled physician, working with a team of medical professionals, makes patient safety the paramount consideration. The safety of the procedure depends on competent professionals with comprehensive education in physiology and pharmacology, the availability of the proper medications, the application of monitors, the skilled vigilance of the provider, and attentive care throughout and after the procedure.

31. Lethal injection has nothing in common with medical anesthesia other than using chemicals that are typically used for the purpose of healing. In addition, in lethal injection, these drugs are used in much larger amounts. The use of pentobarbital in these amounts has never been studied or tested in human beings or subjected to any regulatory review or approval. Moreover, the passage of time suggests that Mr. Bucklew's hemangiomas may pose significantly greater risk at this time, as it is the nature of hemangiomas to continuously expand. For this reason, a comprehensive examination of Mr. Bucklew is vital to developing a thorough understanding of the substantial risks posed to Mr. Bucklew by lethal injection

32. I hold the opinions stated in this Declaration to a reasonable degree of medical certainty.

33. Should additional information become available at a later date, I reserve the opportunity to update or add to the opinions stated in this Declaration. I am currently scheduled to personally examine Mr. Bucklew at Potosi Correctional Center on May 12, 2014, and anticipate that opportunity will allow me to make additional observations about Mr. Bucklew's physical condition, the degree of compromise of his airway and the risks faced by him during lethal injection.

Further affiant sayeth not.

I swear or affirm that the foregoing statements are true and accurate.

Joel B. Zivot, M.D.

KAREN S WOODS NOTARY PUBLIC GWINNETT COUNTY, GEORGIA MY COMMISSION EXPIRES MAY 19, 2014

State of Georgia
County of Dekalb

Subscribed and sworn to before me on this 8th day of May 2014.

Notary Public

My commission expires on: 5-19-2014

SUPPLEMENTAL AFFIDAVIT OF JOEL B. ZIVOT, M.D.

I, Joel B. Zivot, being of sound mind and lawful age, hereby state under penalty of perjury as follows:

1. I am an assistant professor of Anesthesiology and Surgery at the Emory University School of Medicine in Atlanta, Georgia. I am also the medical director of the Cardiothoracic and Vascular Intensive Care Unit at Emory University Hospital and the academic director of the critical care medicine fellowship for the Department of Anesthesiology.

2. I am board certified in Anesthesiology and Critical Care Medicine from the American Board of Anesthesiology. I have an unrestricted medical license from the states of Georgia and Ohio and the District of Columbia. I hold a license from the Drug Enforcement Agency (DEA) granting me prescriptive authority for controlled drugs. I submitted an initial affidavit at the request of counsel on May 8, 2014, wherein my education, training and professional experience are recounted in detail.

3. At the request of counsel, I traveled to Potosi Correctional Center on May 12, 2014, to conduct a physical examination of Mr. Bucklew.

4. During the examination, I examined Mr. Bucklew's face, head, mouth and throat. I took his blood pressure in his right and left arm, and found him to be hypertensive. He was 140/100 on both arms. This represents severe hypertension. In examining the inside of his mouth and throat, I noted a very large vascular mass. The mass arises through the hard palate, extends into the upper maxilla on the right, and fully encompasses the uvula and distorts the anatomy of Mr. Bucklew's airway.

6. Mr. Bucklew's airway is severely compromised or obstructed due to the hemangiomas. It is also friable, meaning it is weak and could tear or rupture. If you touch it, it bleeds.

7. If Mr. Bucklew were a patient,, managing his airway would be a top priority during any procedure. Attending to Bucklew's dangerously compromised airway would require the highest level of vigilance from a medical team.

8. The only way for a doctor to properly perform a medical procedure on Mr. Bucklew would be to perform it in a hospital with a fully equipped surgical suite and the ability to do an emergency tracheostomy if necessary.

9. During an execution, Mr. Bucklew will be at great risk of choking and suffocating because of his partially obstructed airway and complications caused by his hemangiomas.

10. The use of any tube or other standard airway equipment typically used to maintain an open airway will only create problems for Mr. Bucklew as the placement of any device in

the pharynx will cause instant bleeding. Bleeding would further complicate the situation because it would compromise and impair visibility of the airway.

11. The risks arising from Mr. Bucklew's airway are greater if he is lying flat, because his airway is more obstructed in that position. As I observed, and as is documented Mr. Bucklew's medical records, Mr. Bucklew experiences constant shortness of breath as a consequence of his partial airway obstruction. Mr. Bucklew is unable to sleep in a normal recumbent position because of airway obstruction. Mr. Bucklew's airway tumors are of a dynamic nature. That is, they worsen when he is recumbent, even when recumbent for only a few moments.

12. Any increase in Mr. Bucklew's blood pressure -- such as from stress -- will only aggravate his vascular tumors and thus cause greater threat to his airway. If any secretions enter his airway or he starts breathing hard -- because of stress or any other cause -- his airway will become even more constricted. This will likely start a dangerous cycle in which more strenuous attempts to breathe by Mr. Bucklew will only increase the degree of his airway obstruction. The typical things that other individuals do to get more air in -- like taking a big breath -- will only make his obstruction worse, and the harder he tries to breathe, the less air he will get.

13. To my knowledge, Missouri's execution protocol provides no contingency for a failed execution, or a situation in which the prisoner starts gasping for air or experiences hemorrhaging. It is my understanding that there is no protocol or equipment for resuscitation or any other measures, even assuming that standard efforts to resuscitate an individual would succeed with Mr. Bucklew.

14 Mr. Bucklew's serious airway compromise will require physicians, expert in airway management, to be able to obtain an emergency airway in any situation that demands it. These expert physicians will necessarily require a full range of airway procurement devices and the capacity to perform a surgical airway. Airway management in Mr. Bucklew would require the physician to be at arm's length proximity to Mr. Bucklew and be able to observe Mr. Bucklew at all times. Mr. Bucklew has had a prior tracheostomy. The resulting scar tissue will make a new tracheostomy extremely difficult.

15. By way of comparison, if Mr. Bucklew was my patient and was undergoing a surgical procedure, the case would begin with a tracheostomy.

16. The bottom line is that there is no way to proceed with Mr. Bucklew's execution without a substantial risk to Mr. Bucklew of suffering grave adverse events during the execution, including hemorrhaging, suffocating or experiencing excruciating pain.

17. Because of the immense risks associated with executing Mr. Bucklew, it is critical to obtain adequate imaging studies, including an MRI or high resolution CT as stated in my original affidavit. An angiogram is also necessary to better define the risks, and would be helpful in determining the degree of vascularity of Mr. Bucklew's hemangiomas.

Further affiant sayeth not.

I swear or affirm that the foregoing statements are true and accurate.

Date:

Joel B. Zivot, M.D.

State of Georgia
County of DeKalb

Subscribed and sworn to before me on this 14th day of May 2014

Notary Public

KAREN S WOODS
NOTARY PUBLIC
GWINNETT CO., GEORGIA
MY COMMISSION EXPIRES
APRIL 19 2018

My commission expires on: 4-19-2018

DECLARATION OF JOEL ZIVOT, M.D., FRCP(C)

I, Joel Zivot, being of sound mind and lawful age, hereby state under penalty of perjury as follows:

1. I am an associate professor and senior member of the Departments of Anesthesiology and Surgery, Emory University School of Medicine, in Atlanta, Georgia. I am the Medical Director of the Cardiothoracic Intensive Care Unit at Emory University Hospital. I am also the fellowship director for training in Critical Care Medicine. I hold board certification in Anesthesiology from the Royal College of Physicians and Surgeons of Canada and The American Board of Anesthesiology. I am board certified in Critical Care Medicine from the American Board of Anesthesiology.

2. I have practiced anesthesiology and critical care medicine for 20 years, and in that capacity, I have personally performed or supervised the care of more than 40,000 patients.

3. I hold a medical license from the state of Georgia and have held unrestricted medical licenses in Ohio, the District of Columbia, Michigan, and the Canadian provinces of Ontario and Manitoba. I hold a license to prescribe narcotics and other controlled substances from the US Drug Enforcement Administration (DEA).

4. I have been consulting with attorneys for Missouri death row prisoner Russell Bucklew regarding Mr. Bucklew's medical condition and the risks attendant to executing him by lethal injection. I have reviewed Mr. Bucklew's medical records, and, in May 2014, conducted a limited examination of Mr. Bucklew at Potosi Correctional Center. On October 1, 2015, I spoke with Mr. Bucklew on the telephone in an effort to obtain updated information about his condition.

5. As a medical doctor, I am ethically prevented from prescribing or proscribing a method of executing a person. I cannot treat Mr. Bucklew's severe and life threatening medical condition if the purpose of medical treatment is to render him fit for execution. The use of medical personnel in execution by lethal injection is prohibited by professional medical associations, including the American Society of Anesthesiology, of which I am a member. If any board-certified anesthesiologist participated in lethal injection, he or she would lose board certification. I am bound by these ethics. I can assess Mr. Bucklew's current medical status and render an expert opinion as to the documented and significant risks associated with executing Mr. Bucklew under Missouri's current protocol, but I cannot advise counsel or the Court on how to execute Mr. Bucklew in a way that would satisfy Constitutional requirements.

6. I have examined Mr. Bucklew's medical records, including imaging reports. As extensively documented in his medical records, Mr. Bucklew suffers from progressive vascular (blood-filled) tumors in his face and throat. These blood-filled masses continue to grow and cannot be effectively reduced in size by medical or surgical intervention. His condition is severe and lifelong.

7. I reviewed radiology scans of Mr. Bucklew from August 2005 and compared them to the written report from imaging performed at the Department of Correction's (DOC) request in 2010. The findings are consistent and show an extensive soft tissue mass involving the post pharyngeal and masticator space, including a significant mass effect.

8. As the scans showed, the tumor is also visualized in the right ethmoid air cells and right orbit, and very likely extends into the brain. In lay terms, this means that Mr. Bucklew has a very large tumor growing in his face, occupying his nose, throat, and airway passages and causing him to experience constant facial and nasal cavity pain and pressure, as well as constant difficulty breathing.

9. On May 12, 2014, I traveled to Potosi Correctional Center and personally examined Mr. Bucklew. I did not have access at that time to appropriate medical equipment or an

adequately lit medical setting. Despite these limitations, I was still able to conduct a limited examination of Mr. Bucklew. During my examination, I noted that Mr. Bucklew's airway is severely compromised and obstructed due to the vascular tumors, or hemangiomas. Mr. Bucklew's airway is also friable, meaning it is weak and could readily tear or rupture. If you touch it, it bleeds.

10. As a consequence of my findings regarding Mr. Bucklew, I raised the very serious concern in May 2014 that, under the State of Missouri's lethal injection protocol, Mr. Bucklew was at great risk of choking to death on his own blood during an execution as a result of the rupture of the blood-filled tumors in his throat. In such a circumstance, Mr. Bucklew would experience feelings of suffocation and extreme or excruciating pain.

11. Further, based on my review of Mr. Bucklew's medical records, it is my opinion that a substantial risk exists that during an execution conducted under Missouri's current lethal injection protocol, Mr. Bucklew will suffer from extreme or excruciating pain as a result of hemorrhaging or the abnormal circulation of the lethal drug. Because of his vascular malformations, a substantial risk exists that the lethal drug will not circulate as intended, leading to a prolonged and very painful execution.

12. As previously noted, Mr. Bucklew's airway is severely compromised, which raises a very substantial risk that during an execution, Mr. Bucklew may gasp and struggle to breathe. This will likely start a dangerous cycle in which more strenuous attempts to breathe will only increase the degree of Mr. Bucklew's airway obstruction. If blood enters Mr. Bucklew's airway, it will likely cause choking and coughing, which Mr. Bucklew will experience as severe pain and suffocation.

13. During my work on Mr. Bucklew's case in 2014, I executed affidavits on May 8, 2014 and May 14, 2014 stating the expert opinions summarized above. Those affidavits have already been filed with this Court.

14. On May 21, 2014, Mr. Bucklew's execution was stayed to allow for further judicial review of his legal claims. Recently, Mr. Bucklew's attorneys have again contacted me and requested that I review more recent medical records including a list of Mr. Bucklew's current medications and provide an opinion on the examination and testing needed to further identify the risks to Mr. Bucklew during an execution under Missouri's protocol.

15. According to reports from Mr. Bucklew's attorneys and Mr. Bucklew's current medical records, it is clear that Mr. Bucklew continues to suffer from these abnormal blood-filled tumors and that the severity of his condition has only increased. As I noted above, Mr. Bucklew's condition is progressive and has continued to worsen throughout his life. As early as 1991, physicians examining and treating Mr. Bucklew expressed concern about surgical treatment, opining that "any surgical attempt ... would be mutilating and very risky as far as blood loss." In 2000, a doctor refused to perform surgery on Mr. Bucklew unless the DOC could find another doctor willing to perform the embolization prior to surgery stating, he "would not do this" because of the significant risk to Mr. Bucklew. I agree with these assessments.

16. To properly identify the risks to Mr. Bucklew during an execution under Missouri's protocol, it is necessary to understand the present extent of the tumor's involvement in Mr. Bucklew's airway and brain. Therefore, a high-resolution CT scan of Mr. Bucklew's chest, neck, head, and brain should be performed. A CT study should be performed with and without contrast to characterize the extent of the abnormal intercranial structures. The CT scan is necessary to characterize the location and extent of the tumor and to assess the severe degree of compromise of Mr. Bucklew's airway.

17. An angiogram is also necessary and would confirm the degree of vascularity of Mr. Bucklew's hemangiomas. This information is essential in assessing how the lethal drug may circulate in Mr. Bucklew.

18. In order to have complete information regarding all of the risks involved in executing Mr. Bucklew by lethal injection, a comprehensive clinical examination should also be

performed. The examination should take place in a setting equipped to conduct direct and indirect medical examinations. Indirect evaluation would include bronchoscopy and the use of a GlideScope.

19. My previous examination of Mr. Bucklew showed extensive vascular tumors along with a severely compromised airway. This examination was carried out in a prison cafeteria, because no proper facility was made available. A proper evaluation in a clinical setting, with proper equipment and lighting, would have resulted in even more precise and extensive findings than I was able to document in May 2014. For example, Mr. Bucklew's vascular tumor fills a substantial portion of his nasal cavity and extends into his throat. Proper lighting and tools are required to view this area of the body.

20. Mr. Bucklew's counsel recently informed me that Mr. Bucklew's speech has, in their opinion, become increasingly impaired. Counsel indicated that Mr. Bucklew's speech is often muddled and that he sometimes has difficulty speaking clearly.

21. On October 1, 2015, I was able to speak with Mr. Bucklew by telephone. Mr. Bucklew's speech is impaired, and this is almost certainly the result of the massive hemangioma growing in his airway. Any mass that obstructs or narrows the airway commonly causes stridor (noisy breathing) and speech difficulties like those of Mr. Bucklew. Without examining Mr. Bucklew, it is impossible to determine whether his hemangioma has in fact grown and caused further obstruction to his airway. However, his condition is progressive and his vascular tumors will continue to grow in size and complexity.

22. Having reviewed records and discussed Mr. Bucklew's condition with his attorneys, I also understand that Mr. Bucklew continues to deteriorate psychologically. Since facing execution in May of 2014, a mental health professional with the DOC noted:

> "Pt. [patient] seen at his request. States he has been feeling as if he is losing it. Been through a lot of stress while awaiting execution at Bonne Terre in May 2014 and then getting a stay in the last minute. A lot of

> flashbacks. Nightmares of being injected with poison. Wakes up. Seeing a lot of spiders and snakes. Usually able to recognize that they are not real but still feels very scared. Crying uncontrollably recently. Can't sleep. States he got about 11 hrs of sleep in last week. Racing thoughts. States he is "tripping" when asked to explain[,] he stated he sees red linear objects on some correctional officers [sic] arms and then he wonders if they are androids/autonomous robots like in the movie transformers....Assessment: stress induced psychotic reaction. RO [Rule out] PTSD [Post-traumatic Stress Disorder]. PLAN: increase perphanazine and Remeron. Continue other meds. Discussed the situation with ICMHS Phil Senter. We agreed that he needs to be monitored closely for worsening of mental state."

Potosi Correctional Center Medical Record.

23. A diagnosis of Stress Induced Psychotic Reaction reflects serious concerns about Mr. Bucklew's mental health, and, as is typical, Mr. Bucklew was, and currently is, treated with a regimen of antipsychotic, antianxiety and antidepressant medications. A review of Mr. Bucklew's medical administration record (MAR) is critical to any assessment of the risks that Missouri's lethal injection protocol poses to him.

24. There should be a current evaluation of Mr. Bucklew's psychological condition by a qualified mental health professional, such as a neuropsychiatrist, as the diagnosis of stress induced psychotic reaction, anxiety disorder, and possible Post-Traumatic Stress Disorder (PTSD) suggests a likelihood that he may experience extreme stress during an execution, potentially raising his blood pressure and putting him at greater risk of the complications that I discuss below.

25. According Mr. Bucklew is prescribed and taking the following medications:

- Perphenazine (antipsychotic used to treat psychosis, Schizophrenia);
- Clonazepam (benzodiazepine used to treat Bipolar Disorder, panic/anxiety, seizures);
- Hydroxyzine (H1 antagonist used to treat anxiety, tension, allergic conditions;
- Mirtazapine (antidepressant used to treat major depression); and,
- Tramadol (opioid used to treat moderate to severe chronic pain).

Potosi Correctional Center, Medication Administration Record.

26. This combination of medications treats Mr. Bucklew's psychosis, anxiety, depression, and his chronic and unremitting facial pain. As discussed below, these drugs raise a substantial risk of adverse drug interactions.

27. The lethal injection protocol contemplated by the state of Missouri apparently involves the injection of an unspecified quantity of the drug methylene blue[1]. The use of methylene blue raises significant risks, both on its own and in combination with other drugs.

28. As I opined in my May 8, 2014 affidavit, methylene blue is a nitric oxide scavenger, which will likely cause a spike in blood pressure when injected. A spike in Mr. Bucklew's blood pressure raises a very substantial risk of hemorrhage. Mr. Bucklew's cavernous hemangiomas are a plexus of blood vessels that are abnormally weak and prone to rupture, even when blood pressure is normal.

29. If Mr. Bucklew's blood pressure spikes after the injection of methylene blue, the hemangiomas, now further engorged with blood, are highly likely to rupture, resulting in significant bleeding in the face, mouth, and throat. As discussed above, if blood enters Mr. Bucklew's airway, it would cause choking and coughing, which Mr. Bucklew would experience as pain and suffocation.

30. As noted above, Mr. Bucklew currently takes Clonazepam and Tramadol to treat chronic pain and anxiety. These drugs, like pentobarbital, are central nervous system ("CNS") depressants. CNS depressants may enhance the adverse/toxic effect of other CNS depressants. Pentobarbital is a drug in the barbiturate class that has several effects on the CNS and works via GABA receptors. It is important to understand, in the present

[1] Very little is known about Missouri's current protocol or the State's implementation of that protocol. Missouri has used methylene blue in past executions, and its execution team training protocol provides for the use of methylene blue.

context, that pentobarbital is not an analgesic and that it has no effect on reducing pain. Like other barbiturates, pentobarbital is an *antalgesic*, that is, it tends to increase or worsen pain.

31. In addition to the risk that methylene blue will cause a spike in Mr. Bucklew's blood pressure, the FDA has warned of serious drug interactions between methylene blue and certain antidepressant and antipsychotic medications, including one or more of the medications that Mr. Bucklew is presently being administered. Those interactions can result in a condition called Serotonin Syndrome.

32. Serotonin Syndrome is a well-documented, potentially life threatening drug reaction and most often occurs when two drugs that affect the body's level of serotonin are taken together. Due to a risk of serotonin toxicity/Serotonin Syndrome, the U.S. Food and Drug Administration recommends discontinuation of mirtazapine (one of Mr. Bucklew's prescribed medications) for a period of two weeks prior to administration of methylene blue. Methylene blue can interact with serotonergic psychiatric medications such as mirtazapine and cause serious CNS toxicity, including Serotonin Syndrome.

33. Adverse and serious CNS reactions reported to the FDA and reported in medical literature include lethargy, delirium, agitation, aggression, and coma. Adverse symptoms were frequently accompanied by neurological symptoms, such as myoclonus, expressive aphasia, hypertonia, and seizures, or autonomic symptoms, such as pyrexia (dangerously high fever) and elevated blood pressure. Because of these serious reactions, the FDA issued a formal Safety Announcement in 2011 warning of the severe, adverse reactions from the combination of drugs such as methylene blue and mirtazapine.

34. Of course, Serotonin Syndrome is also known to physicians attempting to treat Mr. Bucklew at the DOC. In March of 2015, a notation in Mr. Bucklew's medical record indicates "Avoid SSRI's as pt. [patient] is on Tramadol (risk of serotonin syndrome, decrease in Sz [Serotonin] threshold)." The risk of very serious, adverse reactions from the extensive use of SSRI's (Selective Serotonin Reuptake Inhibitors) is well known to

the medical community. Such risks are substantially increased by administering methylene blue to an individual already at risk for Serotonin Syndrome.

35. Making any changes in Mr. Bucklew's medication regimen carries its own significant risks. Abrupt discontinuation of mirtazapine can cause dizziness, abnormal dreams, paresthesias, agitation, anxiety, fatigue, confusion, headache, tremor, nausea, vomiting, and sweating.

36. Further, discontinuation of antidepressants can result in severe rebound depression and agitation.

37. All common antidepressant medications now prescribed have the potential to be associated with Serotonin Syndrome in the setting of methylene blue injection.

38. Because of the immense and known risks associated with executing Mr. Bucklew, it is critical to:

(a) thoroughly review Mr. Bucklew's current medications and evaluate the risks of adverse drug interactions;

(b) obtain current and adequate imaging studies of Mr. Bucklew, including a high resolution CT scan, a MRI and an angiogram; and,

(c) conduct a thorough physical examination of Mr. Bucklew in a setting properly equipped for clinical examinations.

All of these steps are necessary in order to properly identify and assess the extreme risks posed to Mr. Bucklew during any execution under Missouri's lethal injection protocol.

39. As an expert in this case, it is also essential that, prior to my providing any further opinions, that I have an opportunity to examine Mr. Bucklew in a proper medical setting with access to necessary equipment, as described above in paragraph 18. The costs associated with such an examination would be as follows:

(a) An expert fee of $400 per hour;

(b) Eight (8) hours of record and document review, report writing, and consultation with counsel with an estimated cost of $3,200;

(c) Ten (10) hours is estimated for travel and examination[2] of Mr. Bucklew with a estimated cost of $4,000; and,

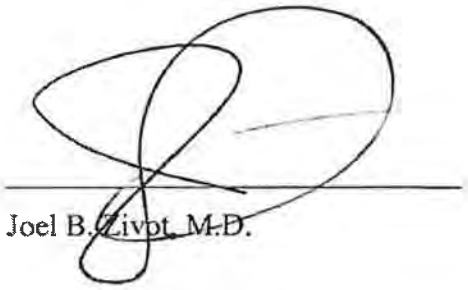
(d) The cost of a roundtrip, economy airline ticket and one night hotel accommodations, estimated at $500.

The estimated total for my expert services would be $7,700, with this amount reflecting my intention to provide expert services in the most efficient and cost effective way possible.

40. I hold the opinions stated in this Declaration to a reasonable degree of medical certainty. Should additional information become available at a later date, I reserve the opportunity to update or add to the opinions stated herein.

I hereby declare under penalty of perjury that the foregoing statements are true and accurate.

Date: Oct. 13, 2015



Joel B. Zivot, M.D.

[2] This assumes that I can examine Mr. Bucklew in a facility designated for clinical examinations and that I have access to the medical instruments and tools required to conduct a clinical examination.

IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MISSOURI

RUSSELL BUCKLEW,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	**Case No. 4:14-CV-8000-BP**
	)	
GEORGE A. LOMBARDI,	)	
DAVID A. DORMIRE	)	
And	)	
TERRY RUSSELL,	)	
	)	
Defendants.	)	

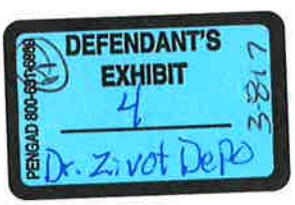
RULE 26(a)(2) EXPERT REPORT

SUPPLEMENTAL DECLARATION OF JOSEPH F. ANTOGNINI, M.D., M.B.A.

JOSEPH F. ANTOGNINI, acting in accordance with 28 U.S.C. § 1746, Rule 26(a)(2)(B), Fed. R. Civ. P., and Rules 702 and 703, Fed. R. Evid., does hereby declare and say:

1. I am submitting this supplemental report in the aforementioned case. All opinions expressed herein are stated to a reasonable degree of medical and scientific certainty unless otherwise noted.

2. Subsequent to my report of November 8, 2016 I have provided testimony in another case (Case No. 2:11-cv-1016; Plaintiffs Phillips, Tibbetts and Otte).



3. On February 3, 2017 I examined Bucklew at the Potosi Correctional Center in the presence of his attorney and Mr. Spillane. My examination of Bucklew revealed the following pertinent findings:

His blood pressure was 144/100, pulse 79 bpm. He had a hemangioma involving the right side of his face, manifested externally primarily as slight swelling of his face, and involvement of his upper lip; examination of his mouth and oropharynx revealed involvement of the mucosal portion of his upper lip, as well as the buccal oral mucosa on the right-side and his uvula. He had a Mallampati 4 airway. He was able to breathe through both nostrils, although breathing through the right nostril was more difficult than through the left. He had a normal gait, 5/5 strength in all four extremities. His patellar reflexes were decreased; his biceps reflexes were normal. On examination, he was not able to smile, consistent with the diagnosis of bilateral Bell's palsy. He was able to move his tongue from side to side, and he moved his eyes in all directions. His speech was normal. His lungs were clear to auscultation and his heart sounds were normal. Examination of his chest, neck and arms did not show any signs of venous congestion. There were small superficial veins in his hands (right greater than left).

Assessment:

1. Hemangioma involving his face on right side and oropharynx, with potential for difficult airway if the inmate needed to undergo a medical or surgical procedure requiring sedation or anesthesia.

2. Residual effects of bilateral Bell's palsy, but no other neurological

signs suggesting a prior stroke.

3. No evidence of superior vena cava syndrome.

4. Limited sites for IV access in upper extremities.

4. My assessment of the inmate's airway does not alter my opinion regarding the actions of pentobarbital, that is, a large dose of pentobarbital will cause rapid unconsciousness and respiratory arrest. The resultant unconsciousness and lack of respiratory drive, renders the airway issue irrelevant.

5. The intravenous administration of five (5) grams of pentobarbital would result in rapid unconsciousness, notwithstanding Dr. Zivot's claim that, in my first declaration, I wrote or inferred that pentobarbital would cause instantaneous unconsciousness. (In fact, I never used the word "instantaneous".) I did write (and do so in this declaration) that pentobarbital would result in "…rapid onset of unconsciousness followed by death." I clarify that opinion that the rapid onset of unconsciousness would occur within 20-30 sec after the administration of the large dose of pentobarbital. To reiterate and expand on my earlier statements:

> Pentobarbital (5 grams) will cause 1) rapid and deep unconsciousness within 20-30 sec, followed by 2) markedly depressed drive to breathe, followed by 3) absence of breathing, followed by 4) decreased oxygen levels in the body, followed by 5) slowing of the heart beat, followed by 6) the heart stopping, i.e., death. During this period there will also be cardiovascular depression and collapse.

Even if the inmate did have bleeding in his airway after the administration of pentobarbital, the deep unconsciousness produced by the pentobarbital would prevent the inmate from sensing this bleeding.

6. A large dose of pentobarbital, such as the 5 grams, would cause respiratory arrest and cardiovascular collapse, leading to death.

(see http://emedicine.medscape.com/article/813155-overview#a5 accessed 2-6-17)

7. Dr. Zivot has written in a publication (*Zivot*, 2016) that:

> "As a consequence of these airway tumors, Bucklew cannot lie flat because gravity tugs on the tumors and blocks his breathing. Execution by administration of lethal injections, for physiological efficacy, requires a prisoner to lie flat. If Bucklew were to be executed, he would have to be sitting up."

Bucklew can, in fact, lie flat— according to the inmate, he did so for about 1 hour while undergoing his recent imaging studies (December 19, 2016). While he stated he was not comfortable, he was nonetheless able to be flat. Secondly, pentobarbital (or any other intravenous drug) does not require the subject to be supine. Many patients are anesthetized in the sitting or semi-sitting position—I have done this many times in my career. Dr. Zivot's statement implies that intravenous drugs will not work properly when a subject is not supine. In any case, if there are concerns about the inmate's ability to be supine, Dr. Zivot has provided the State of Missouri guidance on how to execute Bucklew.

8. Dr. Zivot's conclusions do not fit with the facts and how pentobarbital works. As stated above, pentobarbital (5 grams) causes rapid unconsciousness followed by respiratory arrest, cardiovascular collapse and death. After intravenous injection of 5 grams pentobarbital, concentrations of pentobarbital will far exceed the lethal concentrations (see Table 1, package insert, and extrapolating from data of *Ehrnebo*, 1974). Once respiratory depression and arrest occurs within 1-2 minutes, the unconscious inmate then begins to use up the oxygen stores in his body, which are estimated to be 1200 ml (*Campbell & Beatty*, 1994). Normal oxygen consumption is about 250-300 ml/min, and virtually all the oxygen in the inmate's body will be used after 4-5 min. In fact, estimates of oxygen saturation after apnea confirm this relationship (*Farmery & Roe*, 1996). Before all the oxygen is used, however, the heart will be affected and will begin to slow, and will then have agonal beats and it likely will take several minutes before the heart stops all together. At that point, death is declared. This process, as described, is irrefutable. It is based on the known actions of pentobarbital, eyewitness statements and sound pharmacological and physiological principles.

9. Dr. Zivot seems to imply that, after administration of a large dose of pentobarbital, the inmate will languish in a zone of being neither awake nor completely unconscious, and will thereby suffer from the sensations he describes (excruciating pain, air hunger, choking, etc.). Such a scenario is incompatible with the known effects of pentobarbital, especially in view of the statements (previously cited) of witnesses to prior Missouri executions using pentobarbital. Furthermore, Dr. Zivot's "Objective Factual Bases For Opinion" (Sections

IV.A-E of his January 19, 2017 declaration) are only pertinent to a person who is breathing. As previously stated, a large dose of pentobarbital will induce rapid unconsciousness and stop the drive to breathe.

10. The term "air hunger" has been used by Dr. Zivot in an inappropriate, mis-leading and inaccurate manner. Air hunger describes the sensation a conscious person would have when they are unable to breathe sufficiently. The definition is here:

1: a sensation of not being able to breathe in sufficient air or of needing to breathe in more air that typically results in deep, rapid, labored breathing and occurs especially in those affected with acidosis

2: abnormal deep, rapid, labored breathing : kussmaul breathing

https://www.merriam-webster.com/medical/air%20hunger (Accessed 2-2-17)

Sensation is defined:

1a: a mental process (as seeing, hearing, or smelling) resulting from the immediate external stimulation of a sense organ often as distinguised [sic] from a conscious awareness of the sensory process—compare perception b: awareness (as of heat or pain) due to stimulation of a sense organ c: a state of consciousness due to internal bodily changes <a sensation of hunger>

2: something (as a physical stimulus, sense-datum, pain, or afterimage) that causes or is the object of sensation

https://www.merriam-webster.com/dictionary/sensation#medicalDictionary (Accessed 2-2-17)

11. The logical interpretation of these definitions is that a person must be awake to perceive air hunger, and clearly the inmate would not be conscious 20-30 sec after administration of the large supra-clinical dose of pentobarbital that is described in the Missouri execution protocol.

12. Respiratory depression is a known consequence of sedative and anesthetic drugs, including barbiturates, such as pentobarbital, and opiates, such as fentanyl, morphine and heroin. Indeed, respiratory depression is the primary cause of death from overdose of these drugs. But it makes no logical sense how, on the one hand, these drugs (opiates, barbiturates) can stop breathing, and on the other hand, produce the sensation of air hunger. After all, if the person senses air hunger as a result of these drugs, why wouldn't they breathe? Indeed, in the clinical setting, when patients have drug-induced respiratory depression, if conscious, they can be told to breathe, which they do. But, if not continually encouraged, they will fail to breathe on their own. The most logical way to reconcile these two situations (respiratory depression and the purported air hunger) is that the drugs remove the sensation of air hunger.

13. Dr. Zivot seems to claim in his declaration dated January 19, 2017, section V.A.5, that my delineation of the numerous surgical procedures that the inmate has had was provided only as evidence that no special precautions were needed with regard to management of his airway. This is not so. The main reason for my discussion of these procedures was that the inmate reacted normally to the anesthetic drugs, i.e., the inmate's hemangioma did not

significantly alter his response to the anesthetic drugs (both intravenous anesthetics and inhaled anesthetics).

14. In the clinical setting many patients have abnormal or difficult airways. For example, obese patients often have redundant tissue in the airway. It makes no sense that, after the administration of pentobarbital, and the onset of unconsciousness within 20-30 sec, that this inmate will make attempts to breathe and he will somehow regain consciousness because of it. The analogy Dr. Zivot draws between airway obstruction during sleep and airway obstruction after administration of a large supra-clinical dose of pentobarbital is inappropriate and misleading. A person can be awakened from sleep from various stimuli (including airway obstruction) but a person cannot be awakened from a large supra-clinical dose pentobarbital. After all, pentobarbital is an anesthetic, and by definition, anesthetics prevent awakening from stimuli, including airway obstruction.

15. This inmate's airway could be difficult to manage in the clinical setting (although there was no mention of difficulty with past anesthetics for which endotracheal intubation was used, as I previously cited). There would be increased risk attendant to general anesthesia that would be required for a medical or surgical procedure, specifically, when the intended outcome is that the patient is alive at the end of the procedure. But we are not assessing the inmate's risk for that scenario. By definition, the inmate is not undergoing a medical procedure, and the intended outcome of Missouri's execution protocol is death, so a discussion of risk in the clinical setting is simply not germane.

16. The opinions and statements in this supplemental declaration and my original declaration dated November 8, 2016 are provided as expert testimony regarding the pharmacological agents discussed herein and their pharmacological and clinical effects. Nothing in these declarations is meant to be, or should be construed as, advice or recommendations to the State of Missouri or any other entity, person or persons on how to conduct a lawful execution, especially with regard to one method of execution being favorable compared to another.

CONCLUSIONS

17. The above Report is based upon facts, documents and circumstances that have been made available to me through and including February 10, 2017. If I become aware of additional facts, documents and circumstances, I may revise, extend and/or supplement this report as may be appropriate under the circumstances and/or include further or amended opinions on issues that may lie within my field of expertise.

In accordance with 28 U.S.C § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 10, 2017.

Joseph F. Antognini, M.D.,M.B.A.

EXHIBIT A—MATERIALS REVIEWED

REFERENCES CITED

Campbell IT, Beatty PCW. Measuring pre-oxygenation. British J Anaesthesia 1994; 72:3-4.

Ehrnebo M. Pharmacokinetics and distribution properties of pentobarbital in humans following oral and intravenous administration. J Pharm Sciences 1974; 63:1114-18.

Farmery AD, Roe PG. A model to describe the rate of oxyhaemoglobin desaturation during apnoea. British J Anaesthesia 1996; 76:284-91

Zivot J. Too sick to be executed: shocking punishment and the brain. Fordham Law Review. Vol. 85, pp 697-703, 2016.

Pentobarbital package insert (accessed 2-10-17):

http://www.akorn.com/documents/catalog/sell_sheets/76478-501-20.pdf

Interview and examination of Russell Bucklew on February 3, 2017 (noted above).

Medical records of Bucklew through February 3, 2017.

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Diego)

On 2/10/17 before me, MA Guendling Notary Public
(insert name and title of the officer)

personally appeared Joseph F. Antognini,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

M. A. GUENDLING
Notary Public - California
San Diego County
Commission # 2177983
My Comm. Expires Jan 28, 2021

Signature _____ (Seal)

IN THE UNITED STATES DISTRICT COURT

WESTERN DISTRICT OF MISSOURI

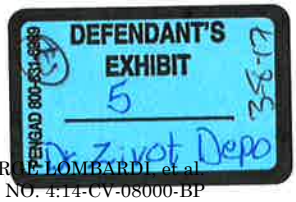
RUSSELL BUCKLEW,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	**Case No. 4:14-CV-8000-BP**
	)	
GEORGE A. LOMBARDI,	)	
DAVID A. DORMIRE	)	
And	)	
TERRY RUSSELL,	)	
	)	
Defendants.	)	

RULE 26(a)(2) EXPERT REPORT

DECLARATION OF JOSEPH F. ANTOGNINI, M.D., M.B.A.

JOSEPH F. ANTOGNINI, acting in accordance with 28 U.S.C. § 1746, Rule 26(a)(2)(B), Fed. R. Civ. P., and Rules 702 and 703, Fed. R. Evid., does hereby declare and say:

1. My name is Joseph F. Antognini. I am a medical doctor, board-certified in anesthesiology. I received a B.A. degree from the University of California, Berkeley in



Economics in 1980. I received my M.D. degree from the University of Southern California in 1984. I also received an M.B.A. from California State University, Sacramento in 2010. I was previously the Director of Peri-operative Services at the University of California, Davis Health System and a Professor of Anesthesiology and Pain Medicine and Professor of Neurobiology, Physiology and Behavior at the University of California, Davis. I am licensed to practice medicine in the State of California. I have over 30 years of experience practicing anesthesiology since 1984 when I began my residency at the University of California, Davis Health System. I am the author or co-author of over 200 publications. My area of research has been focused on anesthetic mechanisms, specifically related to where anesthetics produce unconsciousness, amnesia and immobility. A true and correct copy of my curriculum vitae is attached hereto as Exhibit A.

2. I have reviewed, and am familiar with, the allegations made in the amended complaints, the reports and/or declarations of Plaintiffs' experts, and additional information in the documents described below including medical records dated from May 1997 to September 2016 (see also #7 below).

Scope of Engagement

3. I have been asked to render expert opinions in the fields of general medicine and anesthesiology, especially regarding the use, actions and efficacy of pentobarbital, in relation to Missouri's lethal injection protocol, and the effectiveness of the procedures therein. I have also been asked to render opinions regarding the efficacy of pentobarbital in the case of Russell Bucklew, a condemned prisoner who has a congenital cavernous hemangioma, and whether that hemangioma would affect the efficacy of pentobarbital or otherwise inflict a substantial risk of

severe pain as the result of Missouri's lethal injection procedure. This report contains a complete statement of my opinions, and the basis and reasons therefor, including the facts or data I have considered in forming them. The opinions that I do provide are within my field of anesthesiology and such fields as are necessarily related to anesthesiology, including general medicine, and fall within the scope of my expertise. All opinions expressed herein are stated to a reasonable degree of medical and scientific certainty unless otherwise noted.

4. I have reviewed Rules 702 and 703 of the Federal Rules of Evidence and Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure. I am generally familiar with their provisions and requirements, and of what is expected of a person providing opinions subject to these rules. Within my understanding of the meaning of Rule 702, I am, by reason of my knowledge and skill, which are a function of my experience, training and education, an expert in the fields of anesthesiology and general medicine. This declaration constitutes my expert report pursuant to Rule 26(a)(2), of the Federal Rules of Civil Procedure.

5. I have been deposed and/or given expert testimony twice in the last four years: 1) January 2016, California Department of Public Health vs. Garden Grove Hospital. I gave testimony at an administrative hearing on behalf of Garden Grove Hospital regarding the actions of midazolam given to an elderly patient (Prime Healthcare Services-Garden Grove, LLC DBA Garden Grove Hospital and Medical Center, Appeal Nos. LNC15-0615-941-VB and LNC15-0415-774-VB); 2) I have submitted a report in *Richard Jordan, et al., v. Marshall L. Fisher, et al.*, (Civil Action No. 3:15-cv-00295) a case related to the use of midazolam for lethal injection.

Compensation

6. My fee schedule for this matter is as follows: a. Preliminary Case Review and Oral Opinion: $400/hour; b. Case Review, Consultation, Research, Reports, Pretrial Preparation, and Miscellaneous Services: $400 per hour; c. Deposition Appearance: $2000; e. Courtroom Appearance: $4,000 per day or partial day; f. Travel time at $2000 per travel day (excludes day or days of trial or hearing).

Materials Reviewed

7. I have reviewed the pleadings in this case to gain a general familiarity with the matters at issue and the contentions of the parties. I have conferred with attorneys for Defendants. Among the documents I have reviewed in connection with this case are: Missouri's lethal injection protocol, as amended in October 2013; the Declarations (initial and supplemental) by Dr. Joel Zivot and filed in this case; the Declaration of Dr. Larry Sasich filed in this case; the Declaration of Dr. Gregory Jamroz filed in this case; and the Supplemental Declaration of Dr. Joel Zivot filed in this case; medical records of Russell Bucklew dated May 23, 1997 to September 2, 2016; and various published papers in the "References Cited" section. A complete list of documents I reviewed in preparation of this report is included in "Materials Reviewed" attached hereto as Exhibit B.

8. I am advised that discovery is not complete in this case and that more documents and information may become available to me at a later date. Should additional documents or information be provided to me for review and analysis, I reserve the right to take those additional materials into account, and to modify and/or supplement my opinions accordingly. I may also be present at hearings and/or trial. I may take into account any testimony or other evidence to the extent related to my opinions; I may modify and/or supplement my opinions accordingly. In performing my analysis, I have relied on my professional training, education and experience.

The opinions presented in this report are my opinions and mine alone. I have reviewed and considered other documents and information, and identified those materials (Exhibit B). These documents and other information that I reviewed and considered are of a type reasonably relied upon by experts in the field of anesthesiology in forming opinions or inferences on questions in this area. I have looked upon all of these as valuable sources of information that I am obliged to consider.

Background

9. Inmate Russell Bucklew suffers from a congenital cavernous hemangioma that involves his face, upper neck, nasopharynx and oral cavity. His hemangioma has progressively caused bleeding and difficulty breathing, especially when laying supine. Medical consultants, including an otolaryngologist, have concluded that the hemangioma is inoperable, to the extent that surgery would carry a high risk of severe intraoperative and postoperative bleeding, with a concomitant risk to his life.

The expert witnesses for the plaintiff give several reasons why lethal injection would not work effectively in the inmate, including 1) the drugs would not be distributed normally; 2) the abnormal drug distribution would be the result of the cavernous hemangioma "stealing" blood from normal tissues, especially the brain; 3) the inmate would suffocate and choke as the result of inadequate action of the drugs. All these reasons and conclusions are not based on sound interpretation of the known relevant anatomic, physiological and pharmacological factors pertinent to this inmate and situation, as outlined below.

10. Several facts are relevant to this case. On October 11, 2000, the inmate had an angiogram to delineate the blood flow to his hemangioma. The radiologist's conclusion was "....no true

fistula was seen in this angio a very slow flow type of lesion is very likely". Importantly, the inmate's hemangioma was large and symptomatic during this period when he was being evaluated. This finding indicates that the inmate's hemangioma does not have high blood flow, and thus would not alter drug distribution. Furthermore, cavernous hemangiomas, while they can grow progressively larger, do not change their blood flow characteristics, i.e., the hemangiomas maintain relatively low blood flow. (Note: I do not believe a high flow lesion, even if present, would significantly affect drug distribution, as discussed in section 14).

11. Between December 2000 and November 2003 the inmate underwent at least eight (8) surgical procedures requiring general anesthesia. Of note, on December 6, 2000, Bucklew had a tracheostomy and sclerotherapy for his hemangioma. He had been symptomatic for many months prior to this procedure, including bleeding episodes. His medical record clearly documents that his hemangioma was large and involved his soft palate and hard palate. During this procedure on Dec 6, 2000 he was supine, received a tracheosotomy with local anesthesia (i.e., he was awake for this portion of the procedure), and then he received general anesthetic drugs intravenously. The record indicates that he reacted normally to the drugs, i.e., he was unconscious. He received general anesthesia uneventfully over the next three years for additional sclerotherapy treatments, thoracotomies (chest surgery) and dental extractions. The dental extractions were performed on November 3, 2003, and prior to this surgery the record indicates that his hemangioma was large. These various facts show that the inmate reacted normally to anesthetic drugs during periods when his hemangioma was large, indicating that the hemangioma did not alter his response to general anesthetic drugs.

Physiological, Anatomical and Pharmacological Considerations

12. Drugs injected intravenously would enter the venous system and travel to the right side of the heart, flow through the lungs, back to the left side of the heart, and then out through the arterial system. Some of that blood would travel to the head and neck, including the brain. Both Dr. Zivot and Dr. Jamroz, in my opinion, misapply basic anatomic and physiological principles. For example, Dr. Zivot writes (#13 and #19 of his 5-8-14 declaration) that the hemangioma would "….steal blood flow from normal adjacent tissues, thereby depriving those tissues of necessary oxygen" and the hemangioma "…creates alternative low-resistance pathways to injected drugs". Dr. Jamroz writes (#21 of his declaration) that the "…presence of the vascular malformations compromises the supply of blood to the brain".

13. It is my opinion that Drs. Zivot and Jamroz conflate the anatomical and physiological characteristics of various abnormal vascular growths, including arteriovenous malformations (AVMs) and cavernous hemangiomas. Arteriovenous malformations have a direct connection between the small feeding arteries and the draining veins, so the AVM acts as a low resistance, high flow system. Cavernous hemangiomas (as is present in the inmate), however, have large intervening "caverns" between the arteries and veins, and these caverns act like pools, which limit blood flow. Studies have reported blood flow through AVMs and cavernous hemangiomas, and there is clear documentation that blood flow in the cavernous hemangioma, unlike blood flow in an AVM, is low compared to surrounding tissue (*De Reuck et al., 1994; Little et al., 1990 Xiao et al., 2014*). For this reason, it is my opinion that overall blood flow to this inmate's cavernous hemangioma is relatively low compared to the blood flow to his brain. Furthermore, as noted above, the inmate had an angiogram demonstrating the hemangioma was low-flow.

Nevertheless, even if there was a "steal" phenomenon, it is my opinion that it would not materially alter the distribution and action of drugs affecting the brain (see #14, next).

14. The argument by Drs. Zivot and Jamroz goes something like this: the cavernous hemangioma takes blood flow away from the brain or parts of the brain, and thereby alters the drug distribution. Taking their argument to its necessary conclusion, in order that the drug not get to the brain requires that the hemangioma takes all the blood away from the brain. But this clearly cannot happen without obvious effect. If the hemangioma "steals" more and more blood, it would deprive the brain (or parts of the brain) of blood, which eventually would cause death of those brain areas so deprived. Clearly, this is not happening, as the inmate has not suffered a stroke. He has recently been observed to speak normally and walk without difficulty. Furthermore, following a large pentobarbital dose, brain areas that might have low blood flow would still receive blood with high concentrations of the drug, and thereby depress those brain areas. Finally, if these brain areas have died because of low, or no blood flow, drug action there is immaterial. Thus, the "steal" argument by Drs. Zivot and Jamroz is specious and fundamentally flawed because 1) cavernous hemangiomas do not have high blood flow; 2) this inmate has a low-flow hemangioma documented by angiogram; 3) a "steal" phenomenon would not significantly alter the drug distribution; 4) brain areas with low blood flow would still receive blood with high drug concentrations. And, as noted above, the inmate has indeed reacted normally to anesthetic drugs—as expected.

15. Dr. Zivot states that "…. Mr. Bucklew's airway is severely compromised, which raises a very substantial risk that during an execution, Mr. Bucklew may gasp and struggle to breathe"

(Declaration 10-13-15, #12). Anesthetic drugs normally cause some degree of upper airway narrowing. Dr. Zivot rests his opinion on a scenario whereby the inmate would be in a light level of sedation and would then have airway collapse. For the reasons noted above, the inmate would achieve rapid unconsciousness and would not experience any feelings of suffocation and choking.

16. Inmate Bucklew apparently has breathing difficulty when laying supine and it is not clear from the records what position he favors when sleeping. In some medical notes, he has been observed to sleep on his side while at other times he has been seen to sleep supine. If he were to undergo a medical procedure that required general anesthesia, and laying supine caused him difficulty, then the normal practice would be to induce anesthesia with him in the semi-recumbent or sitting position.

17. Dr. Zivot states that, based on his examination, Bucklew's airway is "....friable, meaning it is weak and could readily tear and rupture. If you touch it, it bleeds" (#9, 10-13-15 declaration). Dr. Zivot uses this observation as evidence that Bucklew could suffer "feelings of suffocation and extreme or excruciating pain" (#10, 10-13-15 declaration). Yet, curiously, further in his declaration, Dr. Zivot recommends that Bucklew undergo a clinical examination that would "...include bronchoscopy and the use of a Glidescope" (#18, 10-13-15 declaration). These procedures, especially using a Glidescope, would require airway manipulations that are counter to Dr. Zivot's concerns regarding Bucklew's airway. Brochoscopy involves placing a small plastic tube with a camera into either the nose or mouth and advancing the tube through the upper airway and into the trachea (windpipe), for the purpose of visualizing the airway anatomy.

This procedure almost always requires administration of local anesthesia in the nose/mouth and oropharynx, as well as the windpipe. Patients commonly gag and cough during bronchoscopies (*Kajekar et al., 2014*). Furthermore, blood pressure can increase substantially in some patients undergoing bronchoscopy (*Davies et al., 1997*). The Glidescope is a trade name for a brand of videolaryngoscope, a device which is used to visualize the mouth and oropharynx during airway manipulation. As with bronchoscopy, topical local anesthesia is required in an awake patient, and there is risk of gagging and coughing with the use of a Glidescope, or other videolaryngoscopes. It is difficult to reconcile Dr. Zivot's concern about the risk of bleeding as the result of the execution protocol with the real risk of gagging, coughing, increased blood pressure and bleeding from the bronchoscopy and videolaryngoscopic examinations he proposes to do (*Rosenstock et al., 2012; Kajecar et al., 2014*). Finally, to emphasize the inherent contradiction in his argument, Dr. Zivot states "…the placement of any device in the pharynx will cause instant bleeding" (#15, 12-4-15 declaration).

18. Dr. Zivot, in his declaration dated 12-4-2015 (#21), states the use of "… standard airway equipment creates an extreme risk during any execution by lethal injection, as the use of such equipment would cause immediate bleeding and lead to coughing, choking and feelings of suffocation". Because resuscitation (including airway manipulation) is not intended to be used during the execution process, this argument is not germane.

19. Dr. Zivot also claims that the inmate might suffer from serotonin syndrome if he were injected with methylene blue. Missouri does not intend to use methylene blue. Nevertheless, the serotonin syndrome manifests with varying signs and symptoms, including agitation, confusion, increased heart rate, increased temperature, however, importantly, these manifestations occur

over the course of hours and days (*Volpi-Abadie J, et al. 2013*), and not the few minutes between injection of pentobarbital and death.

20. Dr. Zivot claims that central nervous system depressants that Bucklew takes, including clonazepam and tramadol, would enhance the effects of pentobarbital. This enhancement would be inconsequential compared to the overwhelming (and intended) effect of the pentobarbital doses used during the lethal injection protocol. Furthermore, Dr. Zivot raises the issue of pentobarbital having antalgesic properties (Note: hyperalgesia is the preferred term). This effect has only been demonstrated at low doses of barbiturates (i.e., doses that cause sedation but not unconsciousness), although the human evidence is equivocal, with some reports showing no such effect in humans (*Anker-Møller, et al. 1991; Wilder-Smith, et al., 1995*). Nonetheless, the pentobarbital dose used for lethal injection would cause rapid unconsciousness and precludes any potential hyperalgesic effects of pentobarbital.

21. Dr. Sasich, in his declaration dated May 8, 2014, raises two main issues related to Missouri's use of its lethal injection protocol for Bucklew: 1) the use of methylene blue would cause an increase in blood pressure; 2) the use of compounded pentobarbital poses increased risks, including increased risk of bleeding. With regard to methylene blue, Missouri does not intend to use methylene blue. Even so, the blood pressure increase Dr. Sasich quotes is small and within the range of blood pressure increases that occur during everyday activities, such as defecation, awakening from sleep, and mild exercise (*Imai et al., 2015 Tsimakouridze et al., 2015; Wielemborek-Musial et al., 2016*).

22. While Dr. Sasich uses recent episodes of compounded drugs and fungal meningitis to bolster his claims, he provides no direct evidence that compounded pentobarbital would put the prisoner at increased risk. At most, he invokes the specter of various contaminants and impurities, a risk that also applies to drugs produced using good manufacturing practices. Indeed, contamination (chemical, particulate, bacterial and fungal) is a problem that plagues manufacture and administration of medications in various healthcare settings (*Tran et al., 2006*). The FDA has archived recalls of products, including drugs that have been found to have contaminants (see FDA Archives website in Ref Cited). Furthermore, impurities cannot be eliminated and the United States Pharmacopeia has set lower limits on elemental contamination and particulate matter—and these lower limits are not zero (see USP, 2nd Suppl. website in Ref Cited).

23. In this inmate the use of lethal gas does not hold any advantage compared to lethal injection with respect to pain and suffering. Both methods would result in minimal pain and suffering. Specifically, the intravenous injection of a large dose of pentobarbital would result in rapid unconsciousness. The inmate claims, through counsel, that execution by a gas would be preferable because "…the lethal agent enters the body through the lungs…" and it "….bypasses Mr. Bucklew's circulatory system…" (Doc 53, 4th amended complaint, at #29). This assertion is incorrect. The use of various gases (hydrogen cyanide, nitrogen, for example) work by the gas entering the lungs, and then being transported by the circulatory system. Whether the effect is the presence of an active poison (hydrogen cyanide) or the displacement of oxygen by an otherwise inert gas (nitrogen) the circulatory system is needed.

24. The inmate's medical records are replete with episodes documented over many years describing his pain, bleeding and choking sensations. He would likely continue to have these symptoms up to the point of death (either natural death or by execution from pentobarbital).

25. Numerous eyewitness observations of nineteen (19) executions in Missouri (from 11-20-13 to 5-11-16) indicate that pentobarbital has its intended effect: a rapid onset of unconsciousness followed by death. It is my opinion, to a reasonable degree of medical and scientific certainty, that Bucklew would react to pentobarbital nearly identical to the reactions of the inmates described in the eyewitness accounts, that is, Bucklew would have the rapid onset of unconsciousness followed by death.

Conclusion

26. It is my opinion, to a reasonable degree of medical and scientific certainty, that 1) Bucklew has reacted normally to anesthetic drugs numerous times during periods when his hemangioma was large and symptomatic; 2) the hemangioma in this inmate would not significantly alter his response to intravenous drugs, including barbiturates at usual clinical doses as well as at massive doses; 3) injection of massive doses of barbiturates in this inmate would not inflict mild, moderate or severe pain; 4) the use of lethal gas would not significantly lessen any suffering or be less painful than lethal injection in this inmate; 5) any pain and suffering that he risks during an execution using pentobarbital is not of greater quality or magnitude than the risk of pain and suffering that he currently experiences, and the risk would end with rapid unconsciousness from the injection of pentobarbital.

27. Should additional information become available I reserve the opportunity to amend my statements herein.

Date: November 8, 2016

Joseph F. Antognini, M.D., M.B.A.

References Cited

Anker-Møller E, Spangsberg N, Arendt-Nielsen L, Schultz P, et al. Subhypnotic doses of thiopentone and propofol cause analgesia to experimentally induced acute pain. Brit J Anaesth 1991;66:185-88.

Davies L, Mister R, Spence et al., Cardiovascular consequences of fiberoptic bronchoscopy. Eur Respir J. 1997; 10:695-98

De Reuck J, De la Meilleure G, Boon P, et al. Comparison of cerebral haemodynamic and oxygen metabolic changes due to cavernous angiomas and arteriovenous malformations of the brain. A positron emission tomography study. Acta Neurol Belg 1994; 94:239-44

Ehsan Z, Mahmoud M, Shott S, et al. The effects of anesthesia and opioids on the upper airway: a systematic review. The Laryngoscope 2016; 126:270-84

FDA Archives for recalled products, including drugs (Accessed 11-5-16):

http://www.fda.gov/Safety/Recalls/ArchiveRecalls/default.htm

Imai M, Kuwahara Y, Hirai M, et al. Effects of Defecation Strain at Various Bed Reclining Angles on Intrarectal Pressure and Cardiovascular Responses. Nursing Res 2015,; 64: 413–421

Kajejar P, Mendonca C, Danha R, Hillerman C. Awake tracheal intubation using Pentax airway scope in 30 patients: A Case series. Indian J Anaesth 2014; 58:447-51

Little JR, Awad IA, Jones SC, Ebrahim ZY. Vascular pressures and cortical blood flow in cavernous angioma of the brain. J Neurosurg 1990; 73:555-59

Rosenstock CV, Thogersen B, Afshari A et al. Awake fiberoptic or awake video laryngoscopic tracheal intubation in patients with anticipated difficult airway management. A randomized clinical trial. Anesthesiology 2012; 116:1210-6.

Tran T, Kupiec TC, Trissel LA. Quality-control analytical methods: Particulate matter in injections: what is it and what is the concern? Int J Pharmaceutical Compound 2006; 10:202-4

Tsimakouridze EV, Alibhai FJ, Martino TA. Therapeutic applications of circadian rhythms for the cardiovascular system. Frontiers Pharmacology 2015; 6:1-10; doi: 10.3389/fphar.2015.00077

United States Pharmacopeia: Second Supplement to USP 35–NF 30; 2⟨232⟩Elemental Impurities—Limits/ Chemical Tests (Accessed 11-5-16)

http://www.usp.org/sites/default/files/usp_pdf/EN/USPNF/key-issues/232---2s_usp_35--final.pdf

Volpie-Abadie J, Kaye AM, Kaye AD. Serotonin syndrome. Ochsner J 2013; 13:533-40

Wielemborek-Musial K, Szmigielska K, Leszczynska J, Jegier A. Blood pressure response to submaximal exercise test in adults. BioMed Research International 2016; http://dx.doi.org/10.1155/2016/5607507

Wilder-Smith OHG, Kolletzki M, Wilder-Smith CH. Sedation with intravenous infusions of propofol or thiopentone. Effects on pain perception. Anaesthesia 1995; 50:218-222

Xiao HF, Lou X, Liu MY, et al. The role of magnetic resonance diffusion-weighted imaging and three-dimensional arterial spin labelling perfusion imaging in the differentiation of parasellar meningioma and cavernous haemangioma. J Int Med Res 2014; 42:915-25

EXHIBIT A

CURRICULUM VITAE
Joseph F. Antognini, M.D., M.B.A.

ADDRESS:

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EDUCATION:

1980	University of California, Berkeley (B.A., Economics)
1984	University of Southern California (M.D., Medicine)
2010	California State University, Sacramento (M.B.A., Business)

INTERNSHIP/RESIDENCY:

1984-1987	Anesthesiology, UC Davis Medical Center
1986-1987	Chief Resident

PROFESSIONAL POSITIONS:

9/16-present	Physician Surveyor The Joint Commission Oakbrook Terrace, IL

7/11-present	Clinical Professor of Anesthesiology and Pain Medicine (Volunteer Clincal Faculty appointment) University of California, Davis—School of Medicine
11/10-6/16	Director of Peri-operative Services UC Davis Health System
7/00-7/11	Professor of Anesthesiology and Pain Medicine (with tenure) Department of Anesthesiology and Pain Medicine University of California, Davis—School of Medicine
12/02-7/11	Professor of Neurobiology, Physiology and Behavior (with tenure; WOS appointment) College of Biological Sciences University of California, Davis
11/98-7/10	Vice Chairman, Director of Research
11/98-3/02	Director of Malignant Hyperthermia Diagnostic Laboratory Department of Anesthesiology
7/96-7/00	Associate Professor (with tenure) Department of Anesthesiology University of California, Davis—School of Medicine
10/91-6/96	Assistant Professor

	Department of Anesthesiology
	University of California, Davis—School of Medicine
7/87-9/91	Staff Anesthesiologist (Private Practice)
	American River Hospital
	Department of Anesthesiology
	Carmichael, CA
7/87-9/91	Assistant Clinical Professor (volunteer)
	Department of Anesthesiology
	University of California, Davis—School of Medicine

LICENSURE & CERTIFICATIONS:

State of California #G55662 (active)

Diplomate, National Board of Medical Examiners (1985)

Diplomate, American Board of Anesthesiology (1989)

Certificate of Recertification, American Board of Anesthesiology (1999, 2009)

PROFESSIONAL SOCIETIES:

American Society of Anesthesiologists

California Society of Anesthesiologists

International Anesthesia Research Society

Association of University Anesthesiologists

RESEARCH INTERESTS:

Mechanisms of anesthesia; factors influencing anesthetic requirements

AWARDS AND HONORS

Dean's Mentoring Award, UC Davis School of Medicine, 2006

Associated Students of UC Davis "Excellence in Education Award" College of Biological Sciences, 2007

Associated Students of UC Davis "Excellence in Education Award" Outstanding Educator, 2007

Foundation for Anesthesia Education and Research, Mentor Academy, 2008

Phi Kappa Phi Honor Society, 2010

GRANTS

1. UC Davis Faculty Research Grant 1991-92—The effect of intrathecal aspirin on anesthetic requirements in rabbits, $2500
2. UC Davis Faculty Research Grant 1993-94—Validation of a preferentially anesthetized goat brain model, $1500
3. Foundation for Anesthesia Education and Research 1994—Determination of gross anatomic sites of anesthetic action, $25,000 ($25,000 matching departmental funds)
4. UC Davis Faculty Research Grant 1994-95—The effects of general anesthesia on cerebral blood flow patterns as assessed by functional magnetic resonance imaging, $1500
5. UC Davis Faculty Research Grant 1996-97—The effect of differential isoflurane delivery to brain and spinal cord on inhibitory and excitatory output from the brain, $10,000
6. Foundation for Anesthesia Education and Research 1997-99—The effect of differential isoflurane delivery to brain and spinal cord on inhibitory and excitatory output from the brain, $70,000 ($70,000 matching departmental funds)
7. NIH R01 GM57970 Brain and Spinal Cord Contributions to Anesthetic Action 8/98-4/02 (Priority Score 120, Percentile 1.0). Total costs $713,026
8. NIH R01 GM61283 Anesthetic Effects on Sensorimotor Integration 2/01-2/06 (Priority Score 194, Percentile 16.9). Total costs $672,791
9. U.C. Davis Faculty Research Grant. Indirect effect of isoflurane and lidocaine on EEG activation. 7/1/01-6/30/02, $4,000
10. NIH R01 GM57970-4A1 Brain and Spinal Cord Contributions to Anesthetic Action 4/02-12/05 (Priority Score 197, Percentile 20). Total costs $1,284,689
11. NIH 3R01GM057970-05S1 Brain and Spinal Cord Contributions to Anesthetic Action. Minority Supplement grant. 7/03-7/04. Total costs $55,932

12. NIH P01 GM47818 Anesthetic Effects on Spinal Nociceptive Processing 8/04-7/09 (Priority Score 185). Total costs $804,325
13. NIH R01 GM61283A1 Anesthetic Effects on Sensorimotor Integration 12/05-12/9 (Priority Score 158, Percentile 9). Total costs $748,432

TEACHING

Post-Graduate:

Resident lectures on neuroanesthesia, anesthetic mechanisms, malignant hyperthermia, neuromuscular blocking drugs, volatile anesthetics, anesthesia research. 1991-2015

Department Journal Club 2013-2016

Graduate:

Guest lecturer for NPB 219 (E. Carstens, Instructor). 1998-2003

Guest lecturer for NPB 112 (E. Carstens, Instructor). 2001-2008

Guest lecturer for first year medical students—pain physiology 2002-2003

Facilitator, Application of Medical Principles 2002-2008

Guest Lecturer, 210B (Systemic Physiology) January 2006

Instructor of Record, Applied Physiology and Pharmacology 2007, 2008

Undergraduate:

NPB 10—Elementary Human Physiology (4 units). 2001-2009

Freshman Seminar: The Supreme Court and You. (2 units) 1998-2010

MENTORED STUDENTS, RESIDENTS AND POST-DOCTORAL SCHOLARS

1.	Kevin Schwartz, M.D.	Resident	1993
2.	Michael Borges, M.D	Resident	1994
3.	Agi Melton, M.D.	Resident	1994
4.	Etsuo Tabo, M.D.	Post-Doctoral Scholar	1997
5.	Steven Jinks	Graduate Student	1998-2001
6.	Chris Simons	Graduate Student	1998
7.	Xiao Wei Wang, M.D.	Post-Doctoral Scholar	1999
8.	Xiaoguang Chen, M.D.	Post-Doctoral Scholar	2000
9.	Makoto Sudo, M.D.	Post-Doctoral Scholar	2000
10.	Satoko Sudo, M.D.	Post-Doctoral Scholar	2000
11.	Alison Fitzgerald	Undergraduate Student	2000-2001
12.	Andrew Hall	Undergraduate Student	2001
13.	John Martin, M.D.	Resident	2001

14. Steve Jinks, PhD.	Post-Doctoral Scholar	2001-2004
15. Jason Cuellar, BS	Graduate Student	2003-2004
16. Linda Barter, MsVM	Graduate Student	2004-2007
17. Mashawn Orth	Graduate Student	2004-2005
18. Carmen Dominguez, MD	Assistant Professor	2003-2005
19. Lauire Mark	Undergraduate Student	2005, 2006
20. Matthew LeDuc	Medical Student	2005
21. Toshi Mitsuyo, M.D.	Post-Doctoral Scholar	2004-2005
22. Kevin Ng, M.D.	Resident	2005-2006
23. JongBun Kim, M.D.	Post-Doctoral Scholar	2006
24. Sean Shargh	Undergraduate Student	2006-2007
25. Aubrey Yao, M.D.	Resident	2006-2007
26. Alana Sulger	Undergraduate Student	2006-2007
27. Gudrun Kungys, M.D.	Resident	2007-2008
28. Jason Talavera	Medical student	2007
29. Onkar Judge	Medical student	2008
30. Andrew Cunningham	Undergraduate Student	2008
31. Lauren Boudewyn	Undergraduate Student	2008
32. Austin Kim	Undergraduate Student	2008
33. Jason Andrada	Graduate Student	2009-2010
34. Jun Ye	Graduate Student	2014-2015

SPECIAL ACTIVITIES:

Staff Anesthesiologist, American River Hospital, 1991-1992

Medical Advisor, CMT International (Charcot-Marie-Tooth), 1991-2000

Director, Case Conferences, Department of Anesthesiology, April-June, 1992

Proctor, Medical Board of California, 1992

Staff Membership, Sutter Davis Hospital, Davis, CA, 1992-1995

Consultant, Malignant Hyperthermia Hotline, Malignant Hyperthermia Association of the United States (MHAUS), 1992-2002

Associate, UC Davis Diagnostic Malignant Hyperthermia Laboratory, 1992-2010

Member, Subcommittee on Experimental Neuroscience and Biochemistry, American Society of Anesthesiologists, 1996

Finance and Executive Committees, U.C. Davis Department of Anesthesiology, 1996-2002
Quality Assurance Committee, U.C. Davis Department of Anesthesiology, 1998-2004

Course Director, Annual U.C. Davis Anesthesiology Update (CME meeting), 1996-2003
California Society of Anesthesiologists: Educational Programs Committee, 1998-2000

Coordinator, Grand Rounds, Department of Anesthesiology, 1996

Professional Billing Workgroup, U.C. Davis, 1996-98

Question Writer, American Board of Anesthesiology, 1998-2001

Member, UC Davis Animal Care Committee, 2000-2003

Member, UC Davis School of Medicine Personnel Committee, 2003—2007; Chair 2007

Management Advisory Committee, Department of Anesthesiology, 2007

Ad Hoc Reviewer for *Anesthesiology*, *Journal of Clinical Anesthesia*, *Journal of Comparative Neurology*, *Regional Anesthesia and Pain Medicine*, *Pain*, *Brain Research*, *Journal of Neuroscience*, *Anesthesia and Analgesia, British Journal of Anaesthesia, Neuroscience, Cephalgia, Neuroscience Letters, Jounral of Chromatography, Basic & Clinical Pharmacology & Toxicology, Therapeutics and Clinical Risk Management.*

Member, VA Merit Review Subcommittee, Alcohol and Drug Dependence, 2002-2005

Editor, American Board of Anesthesiology/ American Society of Anesthesiologists In-Training Examination 2003-2008

Associate Editor, *Anesthesiology* 2005—2011

Faculty Execuitve Committee, School of Medicine 2009-2010

Chair, Faculty Execuitve Committee, School of Medicine 2010-2011

Member of various hospital committees 2011-2016: Medical Staff Executive Committee, Quality Safety Committee, OR Committee, Surgical Services Steering Committee

BIBLIOGRAPHY

EDITED BOOKS

1. Antognini JF, Carstens EE, Raines DE. Neural Mechanisms of Anesthesia, Humana Press, Totowa, NJ, 2002.

PUBLICATIONS

1. Antognini JF. Anaesthesia for Charcot-Marie-Tooth disease: a review of 86 cases. Canadian Journal of Anaesthesia 1992; 39(4):398-400.

2. Antognini JF and ND Kien. Cardiopulmonary bypass does not alter canine enflurane requirements. Anesthesiology 1992; 76:953-957.

3. Antognini JF. Intrathecal acetylsalicylic acid and indomethacin are not analgesic for a supramaximal stimulus. Anesthesia and Analgesia 1993; 76:1079-1082.

4. Antognini JF. Hypothermia eliminates isoflurane requirements at 20°C. Anesthesiology 1993; 78:1152-1156.

5. Antognini JF and GA Gronert. Succinylcholine causes profound hyperkalemia in hemorrhagic, acidotic rabbits. Anesthesia and Analgesia 1993; 77:585-588.

6. Melton AT, JF Antognini and GA Gronert. Prolonged duration of succinylcholine in patients receiving anticonvulsants: evidence for mild up-regulation of acetylcholine receptors? Canadian Journal of Anaesthesia 1993; 40(10):939-942.

7. Antognini JF and K Schwartz. Exaggerated anesthetic requirements in the preferentially anesthetized brain. Anesthesiology 1993; 79:1244-1249.

8. Antognini JF and PH Eisele. Anesthetic potency and cardiopulmonary effects of enflurane, halothane, and isoflurane in goats. Laboratory Animal Science 1993; 43(6):607-610.

9. Antognini JF. Splanchnic release of potassium after hemorrhage and succinylcholine in rabbits. Anesthesia and Analgesia 1994; 78:687-690.

10. Antognini JF, M Anderson, M Cronan, JP McGahan and GA Gronert. Ultrasonography: not useful in detecting susceptibility to malignant hyperthermia. Journal of Ultrasound in Medicine 1994; 13:371-374.

11. Antognini JF and ND Kien. A method for preferential delivery of volatile anesthetics to the *in situ* goat brain. Anesthesiology 1994; 80:1148-1154.

12. Antognini JF, BK Lewis and JA Reitan. Hypothermia minimally decreases nitrous oxide anesthetic requirements. Anesthesia and Analgesia 1994; 79:980-982.

13. Borges M and JF Antognini. Does the brain influence somatic responses to noxious stimuli during isoflurane anesthesia? Anesthesiology 1994; 81:1511-1515.

14. Antognini JF and ND Kien. Potency (minimum alveolar anesthetic concentration) of isoflurane is independent of peripheral anesthetic effects. Anesthesia and Analgesia 1995; 81:69-72.

15. Antognini JF and K Berg. Cardiovascular responses to noxious stimuli during isoflurane anesthesia are minimally affected by anesthetic action in the brain. Anesthesia and Analgesia 1995; 81:843-848.

16. Antognini JF. Creatine kinase alterations after acute malignant hyperthermia episodes and common surgical procedures. Anesthesia and Analgesia 1995; 81:1039-1042.

17. Gronert GA, NW Fleming and JF Antognini. Aberrant responses to muscle relaxants produced by diseases or drugs. Seminars in Anesthesia 1995; 14(4):283-290.

18. Hwang F, K Chun, JF Antognini and GA Gronert. Caffeine-halothane accuracy in MH testing. Acta Anaesthesiologica Scandinavica 1995; 39:1036-1040.

19. Antognini JF and K Mark. Hyperkalaemia associated with haemorrhagic shock in rabbits: modification by succinylcholine, vecuronium and blood transfusion. Acta Anaesthesiologica Scandinavica 1995; 39:1125-1127.

20. Antognini JF, R Wood and GA Gronert. Metocurine pharmacokinetics and pharmacodynamics in goats. Journal of Veterinary Pharmacology and Therapeutics 1995; 18:464-467.

21. Antognini JF. Movement associated with high cerebral concentrations of isoflurane: no evidence of seizure activity. Canadian Journal of Anaesthesia 1996; 43(3):310-314.

22. Antognini JF and GA Gronert. Extra-junctional receptors and neuromuscular blocking drugs. Current Opinion in Anaesthesiology 1996; 9:344-347.

23. Kien ND, JF Antognini, DA Reilly and PG Moore. Small-volume resuscitation using hypertonic saline improves organ perfusion in burned rats. Anesthesia and Analgesia 1996; 83:782-788.

24. Fleming NW, S Macres, JF Antognini and J Vengco. Neuromuscular blocking action of suxamethonium after antagonism of vecuronium by edrophonium, pyridostigmine or neostigmine. British Journal of Anaesthesia 1996; 77:492-495.

25. Antognini JF, PH Eisele and GA Gronert. Evaluation for malignant hyperthermia susceptibility in black-tailed deer. Journal of Wildlife Diseases 1996; 32(4): 678-681.

26. Antognini JF. The relationship among brain, spinal cord and anesthetic requirements. Medical Hypotheses 1997; 48:83-87.

27. Antognini JF and GA Gronert. Continued puzzles in malignant hyperthermia. Journal of Clinical Anesthesia 1997; 9:1-3.

28. Antognini JF and GA Gronert. Effect of temperature variation (22°C-44°C) on halothane and caffeine contracture testing in normal humans. Acta Anaesthesiologica Scandinavica 1997; 41: 639-642.

29. Antognini JF, MH Buonocore, EA Disbrow and E Carstens. Isoflurane anesthesia blunts cerebral responses to noxious and innocuous stimuli: a fMRI study. Life Sciences 1997; 61:PL349-354.

30. Antognini JF. Isoflurane potentiates metocurine via peripheral not central nervous system action. Journal of Veterinary Anaesthesia 1997; 24:6-9.

31. Disbrow E, M Buonocore, J Antognini, E Carstens and HA Rowley. The somatosensory cortex: a comparison of the response to noxious thermal, mechanical and electrical stimuli using functional magnetic resonance imaging. Human Brain Mapping 1998; 6:150-59.

32. Antognini JF, E Carstens, E Tabo and V Buzin. Effect of differential delivery of isoflurane to head and torso on lumbar dorsal horn activity. Anesthesiology 1998; 88:1055-61

33. Antognini JF, E. Carstens. A simple, quantifiable, and accurate method for applying a noxious mechanical stimulus. Anesthesia and Analgesia 1998; 87:1446-9.

34. Antognini JF, S. Jinks, V. Buzin, E. Carstens. A method for differential deilvery of intravenous drugs to the head and torso of the goat. Anesthesia and Analgesia 1998; 87:1450-2.

35. Antognini JF, E. Carstens. Macroscopic sites of anesthetic action: brain versus spinal cord. Toxicology Letters 1998; 100-101:51-58.

36 Antognini JF, E Carstens. Increasing isoflurane from 0.9 to 1.1 minimum alveolar concentration minimally affects dorsal horn cell responses to noxious stimulation. Anesthesiology 1999; 90:208-14.

37. Antognini JF, E Carstens, V Buzin. Isoflurane depresses motoneuron excitability by a direct spinal action: an F-wave study. Anesthesia and Analgesia 1999; 88:681-5.

38. Jinks S, JF Antognini, E Carstens V Buzin, C Simons. Isoflurane can indirectly depress lumbar dorsal horn activity via action within the brain. British Journal of Anaesthesia 1999; 82:244-49

39. Antognini JF, XW Wang. Isoflurane can indirectly depress auditory evoked potentials by action in the spinal cord. Canadian Journal of Anaesthesia 1999; 46:692-95

40. Melton AT, JF Antognini, GA Gronert. Caffeine- or halothane-induced contractures of masseter muscle are similar to those of vastus muscle in normal humans. Acta Anaesthesiologica Scandinavica 1999; 43:764-69

41. Antognini JF, XW Wang, E Carstens. Quantitative and qualitative effects of isoflurane on movement occurring after noxious stimulation. Anesthesiology 1999; 91:1064-71

42. Antognini JF, E Carstens. Isoflurane blunts electroencephalographic and thalamic/reticular formation responses to noxious stimulation in goats. Anesthesiology 1999; 91:1770-9

43. Antognini JF, XW Wang, E Carstens. Isoflurane action in the spinal cord blunts electroencephalographic and thalamic-reticular formation responses to noxious stimulation in goats. Anesthesiology 2000; 92:559-66

44. Antognini JF, XW Wang, M Piercy, E Carstens. Propofol directly depresses lumbar dorsal horn neuronal responses to noxious stimulation. Canadian Journal of Anesthesia 2000; 47:273-79

45. Antognini JF, Saadi J, Wang XW, Carstens E, Piercy M. Propofol action in both spinal cord and brain blunts electroencephalographic responses to noxious stimulation in goats. Sleep 2000; 24:26-31

46. Antognini JF, XW Wang, E Carstens. Isoflurane anaesthetic depth in goats monitored using the bispectral index of the electroencephalogram. Veterinary Research Communications 2000; 24:361-370

47. Antognini JF, Sudo M, Sudo S, Carstens E. Isoflurane depresses electroencephalographic and medial thalamic responses to noxious stimulation via an indirect spinal action. Anesthesia and Analgesia 2000; 91:1282-8

48. Sudo M, Sudo S, Chen XG, Piercy M, Carstens E, Antognini JF. Thiopental directly depresses lumbar dorsal horn neuronal responses to noxious mechanical stimulation. Acta Anaesthesiologica Scandinavica 2001; 45:823-829

49. Antognini JF, Chen XG, Sudo M, Sudo S, Carstens E. Variable effects of nitrous oxide at multiple levels of the central nervous system in goats. Veterinary Research Communications 2001; 25:523-538

50. Rosenberg H, Antognini JF, Muldoon S. Testing for malignant hyperthermia. Anesthesiology 2002; 96:232-37

51. Antognini JF, Carstens E, Atherley R. Does the immobilizing effect of thiopental in brain exceed that of halothane? Anesthesiology 2002; 96:980-6

52. Jinks SL, Antognini JF, Martin JT, Jung S, Carstens E, Atherley R. Isoflurane, but not halothane, depresses c-fos expression in rat spinal cord at concentrations that suppress reflex movement after supramaximal noxious stimulation. Anesth Analg 2002; 95:1622-8

53. Martin JT, Tautz TJ, Antognini JF. Safety of regional anesthesia in Eisenmenger's syndrome.Reg Anesth Pain Med. 2002;27:509-13.

54. Antognini JF, Carstens E. In vivo characterization of clinical anaesthesia and its components.Br J Anaesth. 2002;89:156-66.

55. Jinks SL, Simons CT, Dessirier JM, Carstens MI, Antognini JF, Carstens E. C-fos induction in rat superficial dorsal horn following cutaneous application of noxious chemical or mechanical stimuli. Exp Brain Res. 2002;145:261-9.

56. Jinks SL, Martin JT, Carstens E, Jung SW, Antognini JF. Peri-mac depression of a nociceptive withdrawal reflex is accompanied by reduced dorsal horn activity with halothane but not isoflurane. Anesthesiology 2003; 98:1128-38

57. Antognini JF, Atherley RJ, Carstens E. Isoflurane action in spinal cord indirectly depresses cortical activity associated with electrical stimulation of the reticular formation. Anesthesia Analgesia 2003; 96:999-1003

58. Jinks SL, Antognini JF, Carstens E. Isoflurane depresses diffuse noxious inhibitory controls in rats between 0.8-1.2 MAC. Anesthesia Analgesia 2003; 97:111-116

59. Eger EI 2nd, Xing Y, Laster M, Sonner J, Antognini JF, Carstens E. Halothane and isoflurane have additive minimum alveolar concentration (MAC) effects in rats.Anesth Analg. 2003;96:1350-3

60. Antognini JF, Jinks SL, Atherley R, Clayton C, Carstens E. Spinal anaesthesia indirectly depresses cortical activity associated with electrical stimulation of the reticular formation.Br J Anaesth. 2003;91:233-8

61. Sonner JM, Antognini JF, Dutton RC, Flood P, Gray AT, Harris RA, Homanics GE, Kendig J, Orser B, Raines DE, Trudell J, Vissel B, Eger EI 2nd. Inhaled anesthetics and immobility: mechanisms, mysteries, and minimum alveolar anesthetic concentration. Anesth Analg. 2003;97:718-40.

62. Jinks SL, Antognini JF, Carstens E. Spectral analysis of movement patterns during anesthesia.Anesth Analg. 2004; 98:698-702.

63. Jinks SJ, Antognini JF, Dutton RC, Carstens E, Eger EI. Isoflurane depresses windup of c-fiber evoked limb withdrawal with variable effects on nociceptive lumbar spinal neurons in rats. Anesth Analg 2004; 99:1413-9

64. Atherley RJ, Antognini JF. A rapid and simple method for determination of halothane, isoflurane and sevoflurane in blood using gas chromatography. Biomedical Chromatography 2004; 18:714-8

65. Jinks SJ, Antognini JF, Carstens E. Isoflurane differentially modulates medullary on and off neurons while suppressing hind-limb motor withdrawals. Anesthesiology 2004; 100:1224-34

66. Antognini JF, Jinks SJ, Carstens E, Atherley RJ. Preserved reticular neuronal activity during selective delivery of supra-clinical isoflurane concentrations to brain in goats and its association with spontaneous movement. Neuroscience Letters 2004; 361:94-7

67. Cuellar JC, Antognini JF, Carstens E. An in vivo method for recording single unit activity in lumbar spinal cord in mice anesthetized with a volatile anesthetic. Brain Res Prot 2004; 13:126-34

68. Cuellar JC, Antognini JF, Eger EI, Carstens E. Halothane depresses C-fiber-evoked windup of deep dorsal horn neurons in mice. Neurosci Letters 2004; 363:207-11

69. Atherley RJ, Weatherford V, Antognini JF, Jinks SL, Carstens E. A model for differential volatile anesthetic delivery to the upper and lower torso of the rabbit. J Pharmacol Tox Methods 2004; 50:145-52

70. Dominguez CL, Carstens E, Antognini JF. Carbon dioxide depresses the f-wave by a central, not peripheral, mechanism during isoflurane anesthesia.Anesth Analg 2005; 100:398-403

71. Jinks SL, Dominguez CL, Antognini JF. Drastic decreases in isoflurane MAC and limb movement force following acute reversible spinal cold-block and chronic spinalization in rats. Anesthesiology 2005; 102:624-32

72. Cuellar JM, Dutton RC, Antognini JF, Carstens E. Differential effects of halothane and isoflurane on lumbar dorsal horn neuronal windup and excitability. Brit J Anaesth 2005; 94:617-25

73. Antognini JF, Carstens E. Anesthesia, Amnesia and the Amygdala: reducing the fear of intraoperative awareness. (Editorial) Anesthesiology 2005; 102:711-2

74. Cuellar JM, Montesano PX, Antognini JF, Carstens E. Application of nucleus pulposus to L5 dorsal root ganglion in rats enhances nociceptive dorsal horn neuronal windup. J Neurophysiol 2005 Mar 2.

75. Barter L, Dominguez CL, Carstens E, Antognini JF. The effect of isoflurane and halothane on electroencephalographic activation elicited by repetitive noxious c-fiber stimulation. Neurosci Lett 2005 382:242-7.

76. Dominguez CL, Barter LS, Antognini JF. Intrathecal picrotoxin minimally alters electroencephalographic responses to noxious stimulation during halothane and isoflurane anesthesia. Acta Anaesth Scan 2005; 49:763-70

77. Orth M, Barter L, Dominguez C, Atherley R, Carstens E, Antognini JF. Halothane and propofol differentially affect electroencephalographic responses to noxious stimulation. Brit J Anaesth 2005; 95:477-84

78. Jinks SL, Atherley RJ, Dominguez CL, Sigvardt KA, Antognini JF. Isoflurane disrupts central pattern generator activity and coordination in the lamprey isolated spinal cord. Anesthesiology 2005; 103:567-75.

79. Antognini JF, Jinks SL, Carstens EE. The spinal cord, anesthesia and immobility: a re-examination. International Congress Series 2005

80. Carstens E, Antognini JF. Anesthetic effects on the thalamus, reticular formation and related systems. Thalamus and Related Systems. 2005

81. Antognini JF, Barter L, Carstens E. Overview movement as an index of anesthetic depth in humans and experimental animals. Comp Med, 2005; 55(5): 413-8.

82. Antognini JF, Carstens E. Measuring minimum alveolar concentration: more than meets the tail. Anesthesiology, 2005; 103(4): 679-80.

83. LeDuc ML, Atherley RJ, Jinks SL, Antognini JF. Nitrous oxide depresses electroencephalographic responses to repetitive noxious stimulation in the rat. Brit J Anaesth 2006; 96:216-21.

84. Barter LS, Hawkins MG, Brosnan RJ, Antognini JF, Pypendop BH.

Median effective dose of isoflurane, sevoflurane, and desflurane in green iguanas. Am J Vet Res. 2006; 67:392-7.

85. Mitsuyo T, Antognini JF, Carstens E. Etomidate depresses lumbar dorsal horn neuronal responses to noxious thermal stimulation in rats. Anesth Analg. 2006; 102:1169-73.

86. Orth M, Bravo E, Barter L, Carstens E, Antognini JF. The differential effects of halothane and isoflurane on electroencephalographic responses to electrical microstimulation of the reticular formation. Anesth Analg. 2006; 102:1709-14.

87. Hemmings HC, Jr, , Antognini JF. Do general anesthetics add up? Anesthesiology. 2006; 104:1120-2.

88. Merrill AW, Barter LS, Rudolph U, Eger EI 2nd, Antognini JF Carstens MI, Carstens E,. Propofol's effects on nociceptive behavior and spinal c-fos expression after intraplantar formalin injection in mice with a mutation in the gamma-aminobutyric acid-type(A) receptor beta3 subunit. Anesth Analg. 2006; 103:478-83

89. Antognini JF, Atherley RJ, Laster MJ, Carstens E, Dutton RC, Eger EI. A method for recording single unit activity in lumbar spinal cord in rats anesthetized with nitrous oxide in a hyperbaric chamber. J Neurosci Methods, 2006; 160(2): 215-22.

90. Ng KP, Antognini JF. Isoflurane and propofol have similar effects on spinal neuronal windup at concentrations that block movement. Anesth Analg, 2006, 103(6): 1453-8.

91. Antognini JF, Bravo E, Atherley R, Carstens E. Propofol, more than halothane, depresses electroencephalographic activation resulting from electrical stimulation in reticular formation. Acta Anaesthesiol Scand, 2006, 50(8): 993-8.

92. Mitsuyo T, Dutton RC, Antognini JF, Carstens E. The differential effects of halothane and isoflurane on windup of dorsal horn neurons selected in unanesthetized decerebrated rats. Anesth Analg, 2006, 103(3): 753-60.

93. Dutton RC, Carstens MI, Antognini JF, Carstens E. Long ascending propriospinal projections from lumbosacral to upper cervical spinal cord in the rat. Brain Res, 2006; 1119(1): 76-85.

94. Barter LS, Mark LO, Smith AC, Antognini JF. Isoflurane potency in the Northern Leopard Frog Rana pipiens is similar to that in mammalian species and is unaffected by decerebration. Vet Res Commun, 2007; 31(6): 757-63.

95. Antognini JF, Atherley RJ, Dutton RC, Laster MJ, Eger EI, Carstens E. The excitatory and inhibitory effects of nitrous oxide on spinal neuronal responses to

noxious stimulation. Anesth Analg, 2007; 104(4): 829-35.

96. Antognini JF, Raines DE, Solt K, Barter LS, Atherley RJ, Bravo E, Laster MJ, Jankowska K, Eger EI. Hexafluorobenzene acts in the spinal cord, whereas o-difluorobenzene acts in both brain and spinal cord, to produce immobility. Anesth Analg, 2007; 104(4): 822-8.

97. Kim J, Atherley R, Werner DF, Homanics GE, Carstens E, Antognini JF. Isoflurane depression of spinal nociceptive processing and minimum alveolar anesthetic concentration are not attenuated in mice expressing isoflurane resistant gamma-aminobutyric acid type-A receptors. Neurosci Lett, 2007; 420(3): 209-12.

98. Jinks SL, Carstens EE, Antognini JF. Glutamate receptor blockade in the rostral ventromedial medulla reduces the force of multisegmental motor responses to supramaximal noxious stimuli. Neurosci Lett, 2007; 426(3): 175-80.

99. Dutton RC, Cuellar JM, Eger EI, Antognini JF, Carstens E. Temporal and spatial determinants of sacral dorsal horn neuronal windup in relation to isoflurane-induced immobility. Anesth Analg, 2007; 105(6): 1665-74.

100. Kim J, Yao A, Atherley R, Carstens E, Jinks SL, Antognini JF. Neurons in the ventral spinal cord are more depressed by isoflurane, halothane, and propofol than are neurons in the dorsal spinal cord. Anesth Analg, 2007; 105(4): 1020-6, table of contents.

101. Barter LS, Mark LO, Jinks SL, Carstens EE, Antognini JF. Immobilizing doses of halothane, isoflurane or propofol, do not preferentially depress noxious heat-evoked responses of rat lumbar dorsal horn neurons with ascending projections. Anesth Analg, 2008; 106(3): 985-90, table of contents.

102. Barter LS, Antognini JF. Kinetics and potency of halothane, isoflurane, and desflurane in the Northern Leopard frog Rana pipiens. Vet Res Commun, 2008; 32(5): 357-65.

103. Yao A, Kim J, Atherley R, Jinks SL, Carstens E, Shargh S, Sulger A, Antognini JF. The effects of aromatic anesthetics on dorsal horn neuronal responses to noxious stimulation. Anesth Analg, 2008; 106(6): 1759-64.

104. Shnayderman D, Laster MJ, Eger EI 2nd, Oh I, Jinks SL, Antognini JF, Raines DE. Increases in spinal cerebrospinal fluid potassium concentration do not increase isoflurane minimum alveolar concentration in rats. Anesth Analg, 2008; 107(3): 879-84.

105. Talavera JA, Esser SK, Amzica F, Hill S, Antognini JF. Modeling the GABAergic action of etomidate on the thalamocortical system. Anesth Analg, 2009; 108: 160-67.

106. Barter LS, Mark LO, Antognini JF. Proprioceptive function is more sensitive than motor function to desflurane anesthesia. Anesth Analg, 2009; 108: 867-72.

107. Kungys G, Kim J, Jinks SL, Atherley RJ, Antognini JF. Propofol produces immobility via action in the ventral horn of the spinal cord by a GABAergic mechanism. Anesth Analg, 2009; 108: 1531-37.

108. Rivera R, Antognini JF. Perioperative drug therapy in elderly patients. Anesthesiology, 2009; 110: 1176-81.

109. Barter LS, Carstens EE, Jinks SL, Antognini JF. Rat dorsal horn nociceptive-specific neurons are more sensitive than wide dynamic range neurons to depression by immobilizing doses of volatile anesthetics: an effect patially reversed by the opioid receptor antagonist naloxone. Anesth Analg 2009; 109: 641-47.

110. Jinks SL, Carstens E, Antognini JF. Nitrous oxide-induced analgesia does not influence its immobilizing requirements. Anesth Analg 2009; 109:1111-6.

111. Judge O, Hill S, Antognini JF. Modeling the effects of midazolam on cortical and thalamic neurons. Neuroscience Letters 2009; 464:135-9.

112. Tautz TJ, Urwyler A, Antognini JF. Case scenario: Increased end-tidal carbon dioxide: a diagnostic dilemma. Anesthesiology 2010; 112:440-6.

113. Antognini JF. Anesthetic action: the importance of the spinal cord to immobility. Vet J. 2011; 187:151:2

114. Singh A, Antognini JF. Perioperative pharmacology in elderly patients. Curr Opin Anaesthesiology 2010; 23:449-54.

115. Singh A, Antognini JF. Perioperative hypotension and myocardial ischemia: diagnostic and therapeutic approaches. Ann Card Anaesth 2011; 14:127-32.

116. Andrada J, Livingston P, Lee BJ, Antognini J. Propofol and etomidate depress cortical, thalamic and reticular formation neurons during anesthetic-induced unconsciousness. Anesth Analg 2012; 114:661-9.

117. Antognini JF. Adventures in anesthetic mechanisms. Anesthesiology 2012; 116:701-4.

118. Cuellar J, Alataris K, Walker A, Yeomans DC, Antognini JF. Effect of high-frequency alternating current on spinal afferent nociceptive transmission. Neuromodulation 2013; 16:318-27.

119. Sohrakoff K, Westlake C, Key E, Barth E, Antognini JF Johnson V. Optimizing the OR: a bottom-up approach. Hosp Top 2014; 92:21-7.

120. O'Brien-Antognini JM, Antognini JF, Khatri V. How many operating rooms are needed to manage non-elective surgical cases? A Monte Carlo simulation study. BMC Health Services Res 2015; 15:487.

CASE REPORTS

1. Antognini JF and LH Hanowell. Intraoperative hypoxemia complicating sequential resection of bilateral pulmonary metastases. Anesthesiology 1991; 74:1137-1139.

2. Antognini JF and S Andrews. Anaesthesia for caesarean section in a patient with acute fatty liver of pregnancy. Canadian Journal of Anaesthesia 1991; 38(7):904-907.

3. Antognini JF. Chronic pain after methysergide: a new cause of ischemic monomelic neuropathy. Regional Anesthesia 1991; 16:337-338.

4. Lee G, JF Antognini and GA Gronert. Complete recovery after prolonged resuscitation and cardiopulmonary bypass for hyperkalemic cardiac arrest. Anesthesia and Analgesia 1994; 79:172-174.

5. Ogletree JW, JF Antognini and GA Gronert. Postexercise muscle cramping associated with positive malignant hyperthermia contracture testing. American Journal of Sports Medicine 1996; 24(1):49-51.

BOOK CHAPTERS

1. Gronert GA and JF Antognini. Malignant hyperthermia. In: Anesthesia, 1994; 4th Edition, Chapter 31, Volume 1, RD Miller (Ed.), Churchill Livingstone, New York,; pp. 1075-1093.

2. Jaffe RS, GA Gronert, NW Fleming and JF Antognini. Neuromuscular disorders and muscle relaxants. In: Clinical Neuroanesthesia, 1998; RF Cucchiara and JD Michenfelder (Eds.), Churchill Livingstone, pp. 449-474.

3. Gronert GA and JF Antognini. Clinical management of malignant hyperthermia. In: Hyperthermic and Hypermetabolic Disorders, 1996; Chapter 9, PM Hopkins and FR Ellis (Eds.), Cambridge University Press, England, pp. 119-131.

4. Antognini JF, T Tautz. Human Stress Syndrome. In: Malignant Hyperthermia. Eds: Schulte am Esch J, Scholz J, Wappler F., 2000; pp 346-353.

5. Gronert GA, Antognini JF. How to perform animal experiments. In: Conducting research in anaesthesia and intensive care. Eds: Zbinden AM, Thomson R. Butterworth-Heinemann, Oxford, 2000; pp. 468-498

6. Gronert GA, JF Antognini, I Pessah. Malignant Hyperthermia. In: Anesthesia, 2000; 5th Edition, RD Miller (Ed.), Churchill Livingstone, New York.

7. Antognini JF. Research of anesthetic mechanisms. In: Neural Mechanisms of Anesthesia. Eds: Antognini JF, Raines DE, Carstens E. Humana Press, 2002; Totowa, NJ

8. Caton D, Antognini JF. The development of concepts of mechanisms of anesthesia. In: Neural Mechanisms of Anesthesia. Eds: Antognini JF, Raines DE, Carstens E. Humana Press, 2002; Totowa, NJ

9. Antognini JF, Carstens E. Anesthesia, the spinal cord and motor responses to noxious stimulation. In: Neural Mechanisms of Anesthesia. Eds: Antognini JF, Raines DE, Carstens E. Humana Press, 2002; Totowa, NJ

10. Antognini JF, Raines DE, Carstens E. The future of anesthetic mechanisms research. In: Neural Mechanisms of Anesthesia. Eds: Antognini JF, Raines DE, Carstens E. Humana Press, 2002; Totowa, NJ

11. Perounasky M, Antognini JF. Glutamate receptors: physiology and anesthetic pharmacology. In: Neural Mechanisms of Anesthesia. Eds: Antognini JF, Raines DE, Carstens E. Humana Press, 2002; Totowa, NJ

12. Antognini JF, Carstens E. Spinal cord actions of halothane, thiopental and isoflurane. In: Molecular and basic mechanisms of anesthesia. Eds: Urban BW, Barann M. Pabst, 2002, Berlin, pp 474-79.

13. Antognini JF, Carstens E, Sudo M, Sudo S. Thiopental directly depresses lumbar dorsal horn neurons in goats. In: Molecular and basic mechanisms of anesthesia. Eds: Urban BW, Barann M. Pabst, 2002, Berlin, pp 480-83.

14. Jinks SL, Antognini JF. Anesthetic-induced immobility. In: Neuroscientific Foundations of Anesthesiology. Eds: Mashour GA, Lydic R. Oxford University Press, 2011, Oxford, pp 107-119.

LETTERS TO THE EDITOR

1. Antognini JF. Response to Angell editorial regarding prior release of studies. New England Journal of Medicine 1992; 326(14):958.

2. Antognini JF. Anesthetic management in Charcot-Marie-Tooth disease. Anesthesia and Analgesia 1992; 75:313.

3. Borges M and JF Antognini. Anaesthesia for Mauriac's syndrome. Anaesthesia and Intensive Care 1993; 21(1): 123-124.

4. Antognini JF. Suppression of information by medical journals. New England Journal of Medicine 1993; 328(7):511.

5. Antognini JF. Response to Drs. Hall and Sullivan Letter to the Editor. Anesthesiology 1993; 79:1443-1444.

6. Antognini JF. Response to Dr. Adachi *et al* Letter to the Editor regarding exaggerated anesthetic requirements. Anesthesiology 1994; 81(2):522-523.

7. Antognini JF. Neurologic dysfunction after isoflurane sedation. Critical Care Medicine 1995; 23:789.

8. Antognini JF and GA Gronert. Succinylcholine sensitivity in cerebral palsy. Anesthesia and Analgesia 1995; 80:1250.

9. Fleming NW, S Macres, JF Antognini and J Vengco. Response to comment from Dr. Graham regarding anticholinesterases and subsequent duration of block of suxamethonium. British Journal of Anaesthesia 1997; 78(4):480-481.

10. Melton A, Gronert GA, Antognini JF. Chemical skinning artifact appears to increase sensitivity of masseter muscle to halothane and succinylcholine. Anesthesiology 2000; 92:628-629.

ABSTRACTS

1. Melton AT, JF Antognini and GA Gronert. Absence of abnormal potassium efflux after succinylcholine in patients on anticonvulsants: evidence for mild up-regulation of acetylcholine receptors. Western Anesthesia Residents Conference. 1993

2. Schwartz K and JF Antognini. Is the brain the major site of anesthetic action? Western Anesthesia Residents Conference. 1993

3. Macres SM, NW Fleming and JF Antognini. Neuromuscular blocking effects of succinylcholine before and after administration of cholinesterase inhibitors. Western Anesthesia Residents Conference. 1994

4. Borges MF and JF Antognini. Does the brain influence somatic responses to noxious stimuli? Western Anesthesia Residents Conference. 1994

5. Kien ND, JF Antognini, DA Reilly and PG Moore. Small-volume resuscitation using hypertonic saline improves organ perfusion in burn rats. European Journal of Emergencies 1994; 7:34.

6. Reilly DA, JF Antognini, PG Moore and ND Kien. Small volume resuscitation using hypertonic saline improves organ perfusion in burn rats. Proceedings of the American Burn Association 1994; 26:142.

7. Borges MF and JF Antognini. Does the brain influence somatic responses to noxious stimuli during isoflurane anesthesia? Third Annual Biomedical Research Colloquium, 1994; page 6.

8. Kien ND, JF Antognini, DA Reilly and PG Moore. A comparison of hypertonic to isotonic solution on organ blood flow in burned rats. Anesthesiology1994; 81(3A):A310.

9. Antognini JF, BK Lewis and JA Reitan. Hypothermia minimally decreases nitrous oxide anesthetic requirements. Anesthesiology 1994; 81(3A): A891.

10. Antognini JF and M Borges.Does the brain influence somatic responses to noxious stimuli during isoflurane anesthesia? Anesthesiology 1994; 81(3A): A1483.

11. Buonocore MH, RJ Maddock and J Antognini. Noise cancellation techniques for functional MRI. Cognitive Neuroscience Society Second Annual Meeting, 1995; page 54.

12. Disbrow E, M Buonocore, J Antognini, E Carstens and R Shumway. Time series analysis: an alternative method for processing FMRI data. Cognitive Neuroscience Society Second Annual Meeting, 1995; page 61.

13. Antognini JF, MH Buonocore, E Disbrow and E Carstens. The effect of isoflurane on cerebral responses to noxious stimuli as assessed by functional magnetic resonance imaging. Anesthesiology 1995; 83(3A):A861.

14. Antognini JF. Creatine kinase after acute malignant hyperthermia (MH) episodes compared to CK changes after common surgical procedures. Anesthesiology 1995; 83(3A):A1003.

15. Antognini JF and GA Gronert. Effect of temperature on halothane caffeine contracture testing in humans. VIIIth International Workshop on Malignant Hyperthermia, 1996; page 74.

16. Melton AT, JF Antognini and GA Gronert. In vitro contracture tests on normal human masseter muscle. Anesthesia and Analgesia 1997; 84:S368.

17. Antognini J, E Carstens, E Tabo and V Buzin. The effect of selective delivery of isoflurane to the brain on nociceptive responses of spinal dorsal horn neurons. Association of University Anesthesiologists, 1997; pp. 26-27.

18. Antognini J, E Carstens, E Tabo and V Buzin. Effects of selective delivery of isoflurane to the brain on nociceptive responses of lumbar dorsal horn neurons in the goat. American Pain Society Annual Meeting, 1997; May.

19. Antognini J, E Carstens, E Tabo and V Buzin. The effect of selective delivery of isoflurane to the brain on spinal dorsal horn neurons. Fifth International Conference on Molecular and Cellular Mechanisms of Anaesthesia, 1997; page 31.

20. Antognini JF, E Carstens, E Tabo and V Buzin.The effect of selective delivery of isoflurane to the brain on spinal dorsal horn neurons. American Society of Anesthesiologists Annual Meeting; Anesthesiology 1997; 87:A292

21. Buzin V, JF Antognini, S. Jinks, E. Carstens. Does isoflurane action in the brain influence lumbar dorsal horn activity? Association of University Anesthesiologists Annual meeting, San Francisco, 1998; CA pp 85-86.

22. Antognini JF, XW Wang, E Carstens. Quantitative and qualitative effects of isoflurane on movement occurring after noxious stimulation. Association of University Anesthesiologists Annual meeting, Pittsburgh, 1999; PA pp 185-186

23. Antognini JF, E Carstens. Isoflurane blunts EEG responses to noxious stimulation. Association of University Anesthesiologists Annual meeting, Pittsburgh, 1999; PA pp 187-188

24. Antognini JF, Wang XW, E Carstens. Isoflurane action in the spinal cord blunts EEG and thalamic/reticular formation responses to noxious stimulation in goats. American Society of Anesthesiologists Annual Meeting; Anesthesiology 1999; 91:A318

25. Antognini JF, Wang XW, E Carstens. Quantitative and qualitative effects of isoflurane on movement occurring after noxious stimulation. American Society of Anesthesiologists Annual Meeting; Anesthesiology 1999; 91:A324

26. Antognini JF, Sudo M, Sudo S, Carstens E. Isoflurane depresses electroencephalographic and medial thalamic responses to noxious stimulation via an indirect spinal action. Association of University Anesthesiologists Annual meeting, Salt Lake City, UT. 2000; May 2000

27. Antognini JF, Sudo M, Sudo S, Carstens E. Isoflurane depresses electroencephalographic and medial thalamic responses to noxious stimulation via an indirect spinal action. American Society of Anesthesiologists Annual Meeting; 2000; October 2000, A-746

28. Antognini JF, Carstens E, Atherley R, Hall A, Fitzgerald A. Halothane and thiopental ablate movement primarily via a spinal cord action. Soc Neurosci Annual Meeting Abstracts 2001; Nov 2001

29. Antognini JF, Carstens E, Atherley R, Hall A, Fitzgerald A. Halothane and thiopental ablate movement primarily via a spinal cord action. 6th International Meeting Molecular and Cellular Mechanisms of Anesthesia, June 2001, Bonn, Germany, 2001; 5B01, pg 45.

30. Sudo M, Sudo S, Antognini JF, Carstens E, Atherley R. Thiopental directly depresses lumbar dorsal horn neuronal responses to noxious mechanical stimulation in goats. 6th International Meeting Molecular and Cellular Mechanisms of Anesthesia, June 2001, Bonn, Germany, 2001; 5B11, pg 45.

31. Jinks SL, Antognini JF. Peri-mac isoflurane blocks the effect of noxious mechanical counterstimuli on heat-evoked responses of spinal dorsal horn neurons. Program No. 259.14. 2002 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2002. Online.

32. Antognini JF, Jinks SL, Martin JT, Carstens EE. Effects of volatile anesthetics on nociceptive sensorimotor integration. Program No. 667.7. 2002 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2002. Online.

33. Jinks SL, Antognini JF. Differential modulation of on- and off-neurons in the rostral ventromedial medulla by isoflurane is consistent with its depressant action on noxious stimulus-evoked movement. Program No. 481.12. 2003 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2003. Online.

34. S.L. Jinks, E. Carstens, J.F. Antognini. Medullary on-cells facilitate multilimb movements elicited by intense noxious stimulation Program No. 296.7. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

35. C.L. Dominguez, E. Carstens, J.F. Antognini. Carbon dioxide depresses the f-wave by a central, not peripheral, mechanism during isoflurane anesthesia Program No. 374.3. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

36. J.M. Cuellar, P.X. Montesano, J.F. Antognini, E. Carstens. Application of nucleus pulposus to l5 dorsal root ganglion in rats enhances nociceptive dorsal horn neuronal windup Program No. 407.4. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

37. J.M. Cuellar, R.C. Dutton, J.F. Antognini, S.L. Jinks, T. Mitsuyo, E. Carstens. Differential effects of halothane (hal) and isoflurane (iso) on dorsal horn neuronal windup Program No. 644.1. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

38. J.F. Antognini, S.L. Jinks, J.M. Cuellar, R.C. Dutton, E.I. Eger, E.E. Carstens. Isoflurane depresses windup of c-fiber evoked limb withdrawal with variable effects on nociceptive lumbar spinal neurons in rats Program No. 644.2. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

39. C.T. Simons, S.L. Jinks, C.L. Dominguez, R.J. Atherley, E.E. Carstens, K.A. Sigvardt, J.F. Antognini. Isoflurane disrupts inter-segmental coordination of central pattern generators in lamprey Program No. 644.3. *2004 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2004. Online.

40. J.F. Antognini T.Mitsuyo, R.C. Dutton, E. Carstens. Differential effects of halothane and isoflurane on windup of nociceptive dorsal horn neurons. Prog. No. 863.13, *2005 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2005. Online.

41. L.S. Barter, M.M. Orth, E.E. Carstens, J.F. Antognini. Isoflurane, more than halothane, depresses eeg responses to electrical stimulation in reticular formation Program No. 983.19. *2005 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2005. Online.

42. J.F. Antognini, L.S. Barter, K. Solt, D.E. Raines, E. Eger, M. Laster. Hexafluorobenzene acts in spinal cord, while o-difluorobenzene can act in either brain or spinal cord to produce immobility. Program No. 54.17. *2006 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2006. Online.

43. Carstens EE, Iodi Carstens M, Antognini JF, Dutton RC. Long ascending propriospinal projections from lumbosacral to upper cervical spinal cord in the rat. Program No. 983.19. *2005 Abstract Viewer/Itinerary Planner.* Washington, DC: Society for Neuroscience, 2005. Online.

44. Ferron J, Antognini JF, Amzica F. Impact of anesthesia induciton on the intrinsic properties of cortical neurons: An in vivo study. 2006 Abstract viewer/Itinerary Planner. Washington DC: Society for Neuroscience, Program No. 237.20 (Online).

45. Barter LS, Jinks SL, Carstens EE, Antognini JF. Anesthetic effects on spinal projection neurons. 2007 Abstract viewer/Itinerary Planner. Washington DC: Society for Neuroscience, Program No. 822.4 (Online).

46. Carstens EE, Dutton RC, Antognini JF, Cuellar JM, Eger EL. Temporal and spatial determinants of sacral dorsal horn neuronal windup in relation to isoflurane-induced immobility. 2007 Abstract viewer/Itinerary Planner. Washington DC: Society for Neuroscience, Program No. 822.8 (Online).

47. Antognini JF, Yao A, Kim J. Effects of aromatic anesthetics on dorsal horn neuronal responses to noxious stimulation. 2007 Abstract viewer/Itinerary Planner. Washington DC: Society for Neuroscience, Program No. 823.6 (Online).

48. Kim JB, Yao A, Carstens E, Jinks SL, Antognini JF. Ventral spinal cord neurons are more depressed by anesthesia than are dorsal spinal cord neurons. A-136,

Annual meeting of the American Society of Anesthesiologists; October 17th-21st, 2007, San Francisco, CA.

49. Yao A, Kim JB, Atherley RJ, Antognini JF. Effects of aromatic anesthetics on dorsal horn neuronal responses to noxious stimulation. A-1927, Annual meeting of the American Society of Anesthesiologists; October 17th-21st, 2007, San Francisco, CA.

50. Barter LS, Carstens E, Jinks SL, Antognini JF. Halothane and isoflurane depress dorsal horn nociceptive specific but not wide dynamic range neurons. A-1915, Annual meeting of the American Society of Anesthesiologists; October 17th-21st, 2007, San Francisco, CA.

51. Judge O, Antognini JF. Modeling the effects of midazolam on cortical and thalamic neurons. Annual meeting of the International Society for Anaesthetic Pharmacology; October 17th, 2008, Orlando, FL.

52. Antognini JF, Judge O. Modeling the effects of midazolam on cortical and thalamic neurons. S-280, Annual meeting of the International Anesthesia Research Society; March 16th, 2009, San Diego, CA.

LIMITED DISTRIBUTION

1. Antognini, JF. The HOTLINE. The Communicator 12(2):2-3, 1994; March-April.

2. Antognini JF. Neuroanesthesia, Parts I and II. U.C. Davis Anesthesiology Update: 1994; pp. 113-116.

3. Antognini JF. Anesthesia and the CMT patient. CMT Newsletter 12(3):10, 1995; June.

4. Antognini JF. Current research in anesthesia. U.C. Davis Anesthesiology Update: 1995; pp. 66-71.

5. Antognini JF. Anesthesia outcomes—what's important: what we do, or how we do it? U.C. Davis Anesthesiology Update: 1996; pp. 54-61.

6. Antognini JF. Basics of trauma anesthesia. U.C. Davis Anesthesiology Update: 1996; pp. 129-134.

7. Antognini JF. Current issues in trauma anesthesia. U.C. Davis Anesthesiology Update: 1998; pp. 118-122.

8. Antognini JF. Anesthesia outcomes—what's important: what we do, or how we do it? U.C. Davis Anesthesiology Update: 1999; pp. 3-9.

9. Antognini JF. Medical pain relief in childbirth. In: The Baby Guide. Ed: Smith TM. Hazen Publishing, Inc. Auburn, Calif. 1999; pp. 45-47.

Exhibit B—Materials reviewed

Medical Records of Russell Bucklew, dated 5-23-1997 to 9-2-2106

Declaration Dr. Joel Zivot Dated 5-8-14

Declaration Dr. Joel Zivot Dated 5-14-14

Declaration Dr. Joel Zivot Dated 10-13-15

Declaration Dr. Joel Zivot Dated 12-4-15

Declaration of Dr. Larry Sasich dated 5-8-14

Declaration of Dr. Gregory Zamroz dated 4-5-14

Letter from Dr. Franz Wippold to Honorable Beth Phillips dated 5-14-14 (Doc 71.2)

Letter from Dr. Franz Wippold to Cheryl Pilate dated 7-10-14 (Doc 71.2)

References cited in "References Cited" section of this declaration

Documents 53-Exh 1-6;

Doc 54;

Documents 55--Exh 1 and 2, Motion to dismiss;

Documents 61, Exhs 1-7;

Document 63;

Answer to 4th amended complaint;

Document 75;

Document 79;

Document 93;

Reply in support dated 7-15-2016;

Document 101;

Document 118;

Document 263;

Motion for judgement/memorandum in support dated 5-13-16;

8th Circuit Court decision *Zink et al., vs. Lombardi et al.*, dated 3-6-15

US Supreme Court Decision Glossip v. Gross, decided 6-29-15

Missouri lethal injection protocol dated Oct 18, 2013

Witness statements for 19 executions in Missouri (Memorandums dated 1-21-14 to 5-23-16)

Curricula Vitae of Drs. Wippold, Jamroz, Sasich and Zivot.

MRI scan of Russell Bucklew dated 6-25-10

Why I'm for a moratorium on lethal injections: Column

Joel Zivot 5:32 p.m. ET Dec. 15, 2013

As an anesthesiologist, my job is to save lives, not to take them.

(Photo: 2005 AP photo)

I am an anesthesiologist, and I possess the knowledge on how to render any person unconscious. You may call it sleep, but it is nothing of the sort.

I learned my craft with the use of sodium thiopental (http://www.rxlist.com/pentothal-drug.htm), a drug in the barbiturate class. To witness it for the first time, to watch as it raced into a vein, and in a moment, rendered the patient unconscious, was nothing short of astounding. In those moments, my job was to be reassuring and comforting, for I can imagine no greater moment of trust between a doctor and a patient.

Sodium thiopental is no longer in my pharmacology toolbox. Hospira, the last company to manufacture the drug, stopped making it (http://phx.corporate-ir.net/phoenix.zhtml?c=175550&p=irol-newsArticle&ID=1518610&highlight) to protest its use in carrying out the death penalty.

So other drugs have been substituted. One of them will be used Tuesday, when Oklahoma is scheduled to execute by lethal injection Johnny Dale Black (http://www.ok.gov/doc/Offenders/Death_Row/), who was convicted of murder.

An executioner and the condemned are not the same as a doctor and a patient, though it is easy to see how similarities can be drawn. Had this supposed similarity not been noticed, the death penalty in the U.S. would likely not have survived. Instead, lethal injection created an illusion of humane, professional execution. But the executioners are not doctors, and it's been well established that the executions themselves are not humane.

My right to use sodium thiopental was earned through thousands of hours of the study of pharmacology, anatomy, physiology, training and evaluation. It was earned by the granting of a medical degree. It was granted by state medical boards whose job is to protect the public. It was validated by the granting of hospital privileges based on proof of my sound, safe and sage practice and a license from the Drug Enforcement Administration (http://www.justice.gov/dea/index.shtml).

Rue my silence

As a physician, however, I am ethically prohibited from commenting on the details of lethal injection lest even casual association suggest support or oversight. I now see that my silence has created the opposite effect. My silence has sanctioned it, not prevented it.

States may choose to execute their citizens, but when they employ lethal injection, they are not practicing medicine. They are usurping the tools and arts of the medical trade and propagating a fiction.

When I gave a patient sodium thiopental, it was a medicine whose purpose was to heal. When the state gave sodium thiopental to a prisoner, it was a poisonous chemical whose purpose was to kill.

These days the debate is even more troubling. States are seeking alternatives (http://www.cnn.com/2011/US/02/09/execution.drug.shortage/) to sodium thiopental. They collude with compounding pharmacies to make pentobarbital (http://www.reuters.com/article/2013/10/03/us-usa-executions-texas-idUSBRE9920SG20131003), a cousin of sodium thiopental. When that is not available, they raid the pharmacology toolbox again.

In search of options

Missouri (http://www.washingtonpost.com/politics/missouri-gov-halts-1st-us-execution-by-propofol/2013/10/11/559e6af6-32d9-11e3-8627-c5d7de0a046b_story.html) recently obtained propofol, an exceedingly important anesthetic agent, and threatened to use it for executions. It would have succeeded if not for the threat of sanction by the European Union, which (http://propofol-info.com/risk-eu-sanctions.htm)opposes the death penalty. Because of our broken domestic drug manufacturing market, 90% (http://www.nature.com/news/death-row-incurs-drug-penalty-1.13996?WT.ec_id=N) of our propofol is produced in Europe. EU sanctions would have stopped propofol shipment to the U.S. and left physicians without this critical drug.

Most recently, Florida reported the use of midazolam (http://www.nbcnews.com/health/florida-execute-man-using-untried-lethal-injection-drug-8C11390762), another essential medication, in an execution. Midazolam is in the class referred to as a benzodiazepine (http://www.drugs.com/pro/midazolam-injection.html). These drugs replaced barbiturates, to a degree, because they were safer. That is, it is harder to

kill someone with them. How Florida granted itself expertise in the use of midazolam, now repurposed as a chemical used to kill, is known only to Florida.

Most shockingly, midazolam is in short supply (http://www.theguardian.com/world/2013/oct/02/texas-execution-drugs-pentobarbital). From an ethical perspective, I cannot make the case that a medicine in short supply should preferentially be used to kill rather than to heal. What appears as humane is theater alone.

What we need is a moratorium on the use of all anesthetic agents for lethal injection. If the state is inclined to execute, it might be the time again to take up hanging, the electric chair or the bullet.

Joel Zivot, M.D., is an assistant professor of anesthesiology and also the medical director of the cardio-thoracic and vascular intensive care unit at Emory University School of Medicine in Atlanta.

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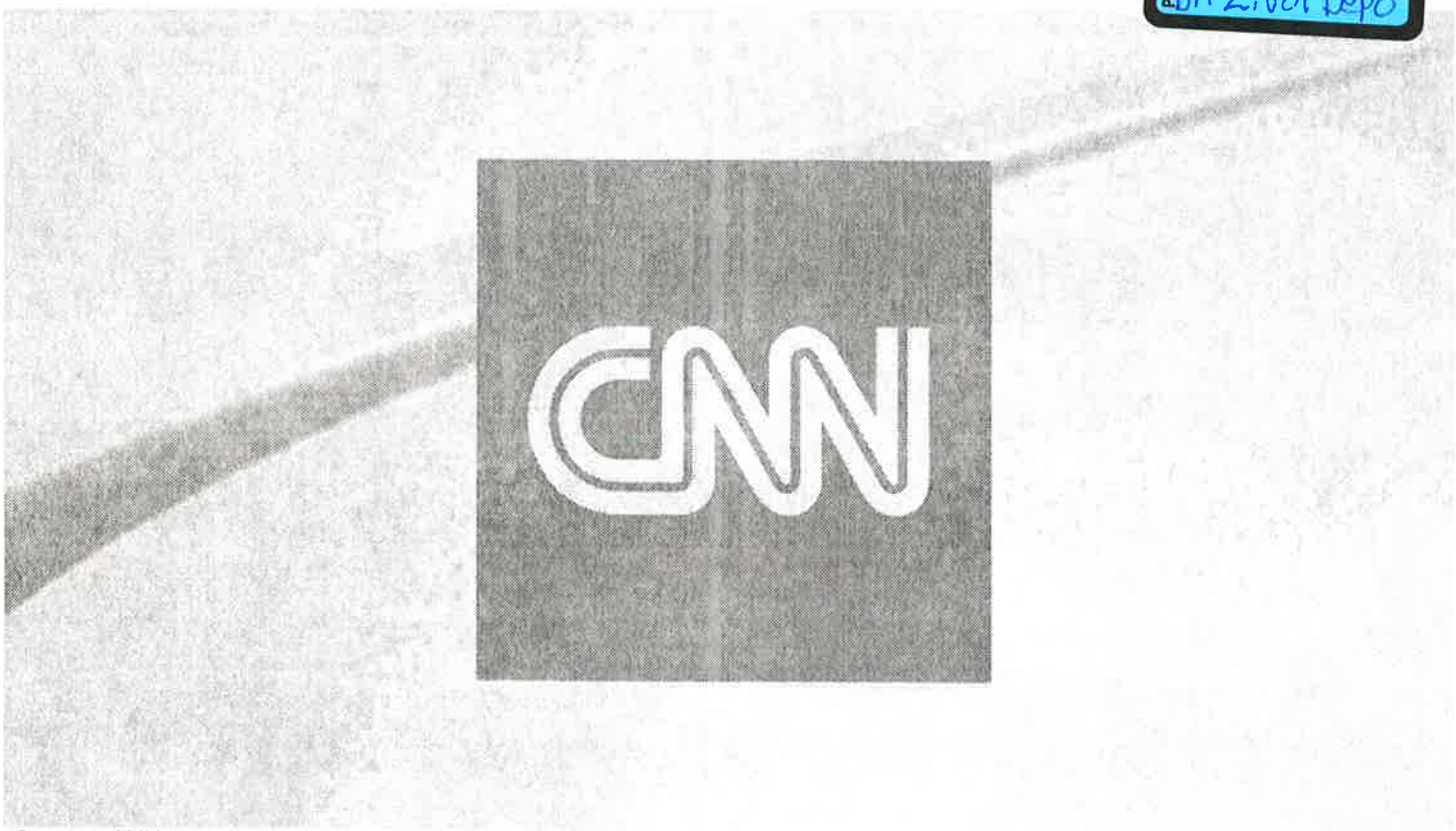
Opinion

Live TV

By Joel Zivot

Updated 10:39 PM ET, Wed January 18, 2017



Source: CNN

Lethal injection explained 01:27

Story highlights

Dr. Joel Zivot: Executions must be conducted in a certain way

He asks: How should physician respond if an execution fails?

Editor's Note: *Dr. Joel Zivot is an associate professor of anesthesiology and surgery at Emory University School of Medicine and adjunct professor of law at Emory Law School. A practicing anesthesiologist and intensive care specialist, Zivot has written extensively on the subject of physician participation in lethal injection and the problems of lethal injection in the circumstance of coexisting illness of the condemned. He opposes the use of lethal injection in executions.*

(CNN) — Virginia executed Ricky Gray, 39, by lethal injection on Wednesday evening at the Greensville Correctional Center. Virginia was to use compounded midazolam and compounded potassium chloride, as well as the paralytic drug, rocuronium bromide.

Midazolam has been highly problematic in past lethal injections. Lethal injection is a trick of chemistry, and contrary to appearances, does not cause a cruelty-free death. Lately, the practice of lethal injection has somehow gone awry as more states drop the paralytic drug from the traditional three-drug cocktail and drug shortages lead to suspicious drug substitutions.

Dr. Joel Zivot

used in the Virginia protocol have reversing antidotes or inhibitors of some kind and these agents could be used to halt an execution gone wrong.

Virginia made no claim that these reversing drugs would be on hand and further, it is not known whether anyone with expertise in the use of these agents was present during the execution. Suspicions are spreading throughout the population in capital punishment states, but even as demand for forthright and open public debate rises, these states respond by placing legal shrouds in the form of secrecy laws over the details of execution.

Execution is a kind of killing and to be lawful, it must occur without cruelty. Lethal injection has emerged as the latest method of execution without obvious cruelty, replacing the electric chair, the gas chamber, the firing squad and the noose. Lethal injection approximates a medical act and this is no accident.

Medical acts fall within the purview of physicians who now find themselves wittingly or unwittingly cast in the role of execution adviser. The American Medical Association and the American Board of Anesthesiology both have statements condemning physician involvement in capital punishment based on an ethical prohibition against killing, yet some physicians continue to linger around execution activity.

Physician participants in capital punishment claim that professional medical societies are playing at politics more than at ethics when they object to physician involvement by setting aside another ethical imperative to reduce suffering.

For physicians, the cluster of so-called "botched" executions presents a particular sort of ethical dilemma. Secular and religious ethics both direct against standing idly by in the face of suffering. Here, an inmate dying by lethal injection is compared to a patient dying of a terminal illness.

Public concerns about aggressive care at the end of life have led to medical interventions directed to control pain and distress as a primary therapeutic intervention, abandoning any notion of a traditional cure. Now, death is the cure; death has been reimagined as a treatment and lethal injection has been reimagined as another form of euthanasia.

How sound is the comparison between end-of-life care in the hospital setting and the end of life in the execution chamber? From a distance, the comparison may seem apt and for the physician who participates in the execution, a distant similarity is sufficient, but it is a false similarity.

An inmate facing death is not a patient by virtue of being connected to an intravenous device and having a doctor in a lab coat standing by. Physicians can only work with patient consent. Patients can only consent if they are freely weighing and deciding -- and an inmate on the brink of death has no such freedom. Circumstances exist under which an individual lacks this capacity and designates a relative to act as decision maker.

In the execution chamber, the warden seems a poor substitute and certainly never the physician. If a physician touches a patient without consent, the law regards it as a battery, although state laws immunize the physician in the execution chamber.

Lethal injection only impersonates a medical act and in order to be certain that suffering is reduced in a medical setting, much more information in the form of monitoring and testing is required. To date, lethal injection proponents have not sought to verify the claim that a doctor makes any difference at all. Medical practice is a highly regulated activity performed by highly trained and licensed individuals. When a doctor changes a tire, he is not practicing medicine. When a doctor is standing in the execution chamber, he is not practicing medicine either.

physician-assisted homicide?

The US Supreme Court has ruled that every inmate is entitled to medical care. If the execution method fails to cause death, the physician as the state agent, must be able to revive the inmate in order to avoid killing him, not by lawful execution but by unlawful manslaughter.

Lethal injection, as presently practiced, is an impersonation of medicine populated by real doctors who don't acknowledge the deception. The rightness or wrongness of capital punishment remains an open question but it's time to reject lethal injection. If capital punishment continues, it needs another method.

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U.S.

The Slippery Slope From Medicine to Lethal Injection

Dr. Joel B. Zivot
May 02, 2014

Convicted murderer and rapist Clayton Lockett died this week in Oklahoma, despite a "botched" execution. I've been asked how the "botching" could have been avoided. As a physician, I find that a strange and disturbing question, similar to asking a lifeguard to advise people on how to drown better. Though I did not witness the execution firsthand, I can put my mind to the question--but with great difficulty because as a physician I am in the business of saving lives, not taking them.

To suggest that Lockett's execution was "botched" raises an ethical question for physicians who are asked how it can be improved. Doctors swear an oath, the Hippocratic Oath, that they are concerned with the relief of suffering in others. States that utilize lethal injection appeal to a doctor's oath to lend assistance during execution in order to reduce suffering, but that's a suspect and misplaced appeal. Inmates who are being executed are not patients, and yet it seems that lethal injection attempts to turn them into such. But if Lockett were my patient, my duty would be to cure his sickness and reduce his suffering. At no time would it be to seek his death over his life, even if he were dying from a terminal illness.

midazolam may feel anxious, but he won't recall that anxiety later. In the circumstance of Lockett's death, such effect of the drug was moot—there was no later.

Lockett was then administered vecuronium bromide. This drug paralyzes all the muscles in the body, including those that control breathing. If all else fails, the eventual lack of oxygen will cause the heart to fail. Vecuronium bromide doesn't effect consciousness, though, so an individual would be very much awake but unable to breath or move. Ironically, if Lockett had received only vecuromium bromide, he would have remained motionless and died an outwardly peaceful but inwardly painful and terrifying death. By report, Lockett did try to move, perhaps as some of the paralyzing drug may not have circulated or the quantity was insufficient. In that moment, he likely began to suffocate. His death appeared painful, according to witnesses on the scene, and most likely it was. But we will never know if Lockett, or any other person executed by lethal injection, experiences his or her own death as needlessly cruel.

The last drug given was potassium chloride. In sufficient quantities, this drug will stop the heart, though, again, not in an instant and not without pain. Oklahoma corrections claimed that Lockett died of a "massive heart attack." Pending autopsy, that is mere speculation. My view, based on a review of events as best can be determined, was that Oklahoma executed Lockett by subjecting him to a painful and terrifying death by suffocation.

Lethal injection is merely an impersonation of medicine, nothing more. It wastes scarce drugs that could serve dozens of patients in medical need. When I study the details of the lethal injection protocol, my medical knowledge feels more like a curse, as I see the mistakes that lead to unnecessary cruelty.

Whether one is for or against capital punishment, nearly all of us abhor needless suffering and cruelty. The Constitution of the United States wisely forbids our punishments to be needlessly cruel, even for those we despise. Can lethal injection be improved? Lethal injection was never anything other than a façade for punishment, never not needlessly cruel. If capital punishment is to go on, it must set aside lethal injection, for it is time for that method to suffer its own execution.

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LETHAL INJECTION: STATES MEDICALIZE EXECUTION
University of Richmond Law Review
March, 2015

Joel B. Zivot, MD University of Richmond Law Review (Approx. 21 pages)

Lethal Injection, Politics, and the Future of the Death Penalty
The Death Penalty and Lethal Injection

LETHAL INJECTION: STATES MEDICALIZE EXECUTION

Joel B. Zivot, MD[a1]

INTRODUCTION

In *Baze v. Rees*, the Supreme Court of the United States upheld the constitutionality of a method of lethal injection used for capital punishment.[1] The three-drug protocol referenced in *Baze* consisted of three chemicals injected into the condemned inmate via an intravenous drip.[2] The three-drug protocol began with sodium thiopental, followed by pancuronium bromide, and lastly, potassium chloride.[3] The claim that this lethal injection method would violate the Eighth Amendment's ban on cruel and unusual punishment was made on behalf of two individuals, Ralph Baze and Thomas Bowling, both sentenced to death in Kentucky.[4]

The findings of *Baze* had a national impact, as the Kentucky method was the same method used in most states practicing lethal injection.[5] Further, at the time of *Baze,* a moratorium on all lethal injection was effectively in place because the Supreme ***712** Court granted the case certiorari.[6] In a 7-2 decision,[7] the Court held that the three-drug protocol was constitutional.[8] However, the Court stressed that the first drug in the three-drug protocol must render the inmate unconscious to avoid an unacceptable risk that the inmate would be aware as he died by suffocation.[9]

Baze is noteworthy because the Court claimed that since the death penalty is constitutional, a method of execution must be available that does not violate the Eighth Amendment.[10] The *Baze* Court therefore claimed that the three-drug protocol for lethal injection is that constitutional method.[11] From a medical perspective, it is not apparent that the *Baze* Court understood how the drugs involved in the three-drug protocol worked in the body. It also appears that the *Baze* Court may have underestimated the full implications of this decision to the practice of medicine and the ethical dilemma that *Baze* now places on physicians.

I. LETHAL INJECTION THROUGH THE FILTER OF SCIENCE

A. *The Efficacy of Lethal Injection Drugs*

In order to satisfy *Baze,* states have struggled to verify that inmates are unconscious prior to pancuronium bromide and potassium chloride injection.[12]

To achieve that state of unconsciousness, the traditional three-drug protocol used sodium thiopental, a standard general anesthetic.[13] A general anesthetic renders an

SELECTED TOPICS

Sentencing and Punishment

Cruel and Unusual Punishment
Unnecessary and Wanton Infliction of Pain and Suffering

Secondary Sources

APPENDIX III - JUDICIAL OPINIONS

FDA Enforcement Man. Appendix III

...No. 74-215 Supreme Court of the United States 421 U.S. 658; 95 S. Ct. 1903 2d 489 Argued March 18-19, 1975 June 9, 1975 Mr. Chief Justice Burger delivered the opinion of the Court. We granted certiorar...

Comment Note.--Prison conditions as amounting to cruel and unusual punishment

51 A.L.R.3d 111 (Originally published in 1973)

...This comment collects and analyzes illustrative decisions in which the courts have addressed themselves to the question of what particular conditions of confinement will, individually or in combination...

APPENDIX IV - COURT CASES

Coordination of Benefits Handbook Appendix IV

...The table of cases provided in this appendix synopsizes court decisions in which coordination of benefits (COB) issues figured prominently. While other cases may relate to a COB issue and, for that rea...

See More Secondary Sources

Briefs

BRIEF FOR RESPONDENTS

1990 WL 505736
Wilson (Pearly L.) v. Seiter (Richard)
Supreme Court of the United States
Dec. 19, 1990

...Hocking Correctional Facility (HCF) is a medium security institution in Nelsonville, Ohio. (J.A. 47). The facility was originally constructed in 1956 and served as a tuberculosis hospital until its c...

Petition for a Writ of Certiorari

2007 WL 2781088
Ralph BAZE, et al., Petitioner, v. John D. REES, et al., Respondent
Supreme Court of the United States
July 11, 2007

...FN* Counsel of Record The plaintiffs in the state court trial and the appellants on appeal to the Kentucky Supreme Court were Ralph Baze and Thomas C. Bowling - - two Kentucky death-sentenced inmates. ...

Brief for Respondents

2007 WL 4244686
Ralph BAZE, et al., Petitioners, v. John D. REES, et al., Respondents.
Supreme Court of the United States
Dec. 03, 2007

...FN* Counsel of Record This case arises out of two sets of grisly murders for which the Commonwealth of Kentucky has imposed the penalty of death. On January 30, 1992, petitioner Ralph Baze ambushed and...

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individual insensate to **713* pain, blunts certain adverse physiologic reflexes, and blocks awareness and recall during and after the conduct of the anesthetic.[14] Sodium thiopental, once standard in the practice of anesthesiology, is no longer available in the United States due to concerns by the manufacturer over use in the death penalty via lethal injection.[15] Hospira, the last company to manufacture sodium thiopental for the American market, ceased production to avoid sanctions from the European Union, which forbids any member from manufacturing or distributing any drug for use in an execution.[16]

Pancuronium bromide is the second drug in the three-drug protocol.[17] Pancuronium bromide is a paralytic that, when administered, reversibly blocks the capacity of movement in a particular group of muscles in the body known as skeletal muscles.[18] Paralytics act only on skeletal muscles and have no effect on smooth or cardiac muscle.[19] In the setting of lethal injection, paralyzing **714* drugs have been extraordinarily effective in convincing the observer that death occurs without cruelty.[20] Since the dead can never tell us if they experienced cruelty in their own death, the responsibility to guard against cruelty is entirely in the hands of the observers.[21]

Potassium, available as potassium chloride, is a naturally occurring element necessary for normal bodily functions in a number of human physiological systems.[22] Of importance here is the effect of potassium chloride on the heart. As potassium rises outside of the heart cell, depolarization is increasingly blocked until a point at which the heart cell is essentially held in place and cannot contract.[23] At this point, the heart ceases to function in any capacity.[24] The lack of heart muscle contraction causes the blood pressure to drop.[25] The lack of blood flow, which carries oxygen to each cell in the body, ceases and progressive and rapid multi-organ failure ensues.[26] An additional concern is that potassium chloride, when injected into the body, produces an intense burning sensation in the veins.[27]

Expertise in the subject of unconsciousness in the setting of chemical injections is recognized as a skill possessed by physicians.[28] Further, lethal injection has the look and feel of a medical **715* act.[29] The intention here is to convey a message of seriousness and safety. However, employing the trappings of science and medicine do not create the safety and circumspection of the scientific method. Lethal injection simply occurs as a protocol, involves personnel, and is recorded by the state.[30]

B. *Pseudoscience*

Occasionally, an execution does not proceed according to plan and might be referred to as "botched."[31] These alarming public failures increase pressure on the states to "get it right" and to seek physician involvement.[32] If science were brought to bear on lethal injection, it would proceed by first generating a hypothesis and then designing a method of investigation free of bias to determine if the hypothesis is proven or disproven.[33] Science begins with the null hypothesis; the assumption is that the claim is false and must be proven to be true.[34]

Consider an experiment that requires subjects to participate. Can a prisoner be a subject in an experiment? Past examples of **716* performing experiments on prisoners have resulted in documents and directives from the Nuremberg Trials[35] and the Declaration of Helsinki[36] in order to protect against involuntary and harmful subject participation. In the Code of Federal Regulations, any experiment protocol that uses prisoners as research subjects and is generated under the Department of Health and Human Services must, at a minimum, personally benefit the prisoner.[37] It would be a dangerous claim to suggest that, as a rule, prisoners would benefit from their own death.

With the loss of sodium thiopental, states have sought alternatives allowed by *Baze*.[38] The question remains: On what scientific principle can substitutions occur? Substitution would not only require an understanding of the drugs, but also a test of

the change. If a drug substitution in lethal injection was evaluated according to science, the trial would ideally involve a prospective analysis,[39] employ the blinding of all the participants including impartial observers,[40] be subject to a power analysis,[41] establish a p-value, and be subject to statistical review to eliminate a result attributed to chance alone.[42] An institutional review board, or some body capable ***717** of ethical and methodological evaluation, must first approve any experiment.[43]

In reality, chemicals are changed up until the last minute before an execution, based on availability more than efficacy.[44] Personnel are inconsistently screened, facilities are poorly designed, and record keeping is inconsistent and unreliable.[45] Attempts to gain information about the details of lethal injection in order to critically evaluate methodology are met with resistance, or worse, the passing of secrecy laws that constrain medical board oversight.[46] The charge of a medical board is to regulate the practice of medicine, including the scientific practice, while acting in the public interest.[47]

Secrecy laws exclude medical practitioners that participate in lethal injection from medical board oversight.[48] In effect, secrecy laws empower the state as the authority on the science of medicine as applied to capital punishment. This cannot stand.

The real problem with lethal injection is that it can never pass through the filter of science as it is impossible to conduct ethical experiments involving lethal injection.[49] During World War II, Nazi scientists carried out hypothermia experiments on concentration ***718** camp prisoners.[50] After the war, much was made regarding whether such research could be cited in the scholarly literature.[51] Because the Nazis forced participation on prisoners--rather than utilizing volunteers--ethics should preclude the use of the data they produced. Separate from any ethical failing, these experiments were also determined to be methodologically flawed.[52] Lethal injection clearly lacks voluntary participation and is also bad science. No amount of adjusting will make it any better. It should be relegated to the scrap heap of dangerous pseudoscience.

II. THE ROLE OF PHYSICIANS

A. *Inmates Have a Constitutional Right to Health Care*

Inmates have a constitutional right to health care.[53] Prison officials are legally obligated to provide inmates health care until the prisoner is released, dies a natural death, or is executed.[54] Prison officials may not withhold health care out of neglect or in order to bring about a de facto execution.[55] Analytically, a nearly instantaneous death would protect the prisoner from unnecessary cruelty. An inmate who survives an execution but suffers injuries must receive medical treatment.[56] The failure by prison officials to provide adequate medical care in these circumstances may also violate the state law of some jurisdictions, Eighth Amendment concerns aside.[57]

B. *The Moral Obligation of Physicians*

As the stewards of the practice of medicine, physicians have a moral obligation to object to lethal injection. The physicians control ***719** the tools of the medical trade and protect the public interest. Lethal injection is a method of execution that repurposes chemicals developed to treat diseases and uses them for killing.

The process of lethal injection intentionally mimics a medical procedure, thereby deceiving physicians who imagine a medically necessary role, and the public which imagines safe oversight. In the hands of the state, lethal injection disguises killing as healing. The practice of medicine is fundamentally about the ethical treatment of illness.[58] Every medical act must first be filtered through an ethical model to be certain that the harm done does not exceed the benefit received.[59] For the physician

in the execution chamber, a traditional defense claims that a doctor's knowledge and practice will reduce the suffering of the condemned.[60] This claim will be false.

Suffering is not the same as pain and not all pain is malevolent.[61] Doctors have a duty to act against maleficence and in the interest of beneficence but this directive is bounded within the doctor-patient relationship.[62] Fundamentally, lethal injection blurs the lines between the doctor as a citizen and the doctor as a doctor. Does the act of lethal injection turn an inmate into a patient? If the inmate is a patient, the doctor's duty is to save his life, not take it.[63] If the inmate is not a patient then the doctor has no role beyond that of a citizen.[64] Can a doctor use what he knows ***720*** and what he does in his capacity as a medical practitioner to claim an exemption that permits him to use his skill and yet is not the practice of medicine? The state softly declares that lethal injection is not the practice of medicine yet demands the presence of the physician.[65]

III. STATES MEDICALIZE LETHAL INJECTION

The state medicalizes lethal injection in two distinct ways, yet claims that lethal injection is not a medical act. First, it demands the presence of physicians in the execution chamber and compels them to perform tasks that have the look and feel of medical acts.[66] Doctors wear white coats and carry stethoscopes in the execution chamber. The use of the white coat is specious and egregious here. Second, the state attempts to turn the inmate into a patient, which serves the dual purpose of drawing the doctor in, but also employing ethical notions of the doctor-patient relationship in a manner that turns the concept of consent upside down.[67]

A. *Consent and Do Not Resuscitate Orders*

Central to the doctor-patient relationship is the concept of consent.[68] Can an inmate facing his execution be said to have consented? Is execution a treatment to cure a wrongful act? In Missouri, death-row inmate Russell Bucklew was asked to sign a do not resuscitate ("DNR") order.[69] For a DNR to be valid, a moral agent must request it.[70] A prisoner is a person and apart from ***721*** physical constraint imposed as a consequence of incarceration, inmate moral agency should be assumed. However, this assumption requires further analysis. The mental health toll on incarceration cannot be understated.[71] In the circumstance of depression, doctors routinely weigh requests about treatment choices against that backdrop of the patient/inmate affect.[72] If a patient/inmate refuses treatment, leading to his death, how can the validity of his agency be considered?

If prisoners choose to sign a DNR, and that request is not contained within an advance directive document, it has the appearance of suicide. Advance directives are generated by a moral agent with the purpose of affirming autonomy in anticipation of a circumstance when further decisionmaking capacity is lost.[73] Advance directives are put forward as a legal right, recognized by all fifty states and the District of Columbia and, if so, impose a corollary duty of action on the part of others, including friends, families, and health care providers.[74] Advance directives include the designation of a person or persons to be the substitute decision-maker ("SDM") in the place of the person when they are unable.[75] The person or persons, designated as the SDM provides a critical element to the advance directive by turning the advance-directive document into something fluid and adaptable to the circumstance at hand.[76] The SDM named by the patient may be a spouse, adult child, sibling, close friend, or religious advisor, but not a treating physician.[77] A corrections officer or prison warden would be under the same clear conflict as a treating physician and cannot be the SDM.[78] Ultimately, a DNR order, as an autonomous request made ***722*** by a moral agent, can only be understood in the circumstance of the timing of death when death otherwise occurs naturally.[79]

B. *DNRs and Inmates' Right to Healthcare While Incarcerated*

Execution is not a natural death and DNR in this context nefariously serves the interests of prison officials for a very specific reason. Inmates have a constitutional right to healthcare and the warden is under a legal duty to provide it up until the moment the prisoner dies a natural death or is executed.[80] A prisoner condemned to death cannot be executed by stealth or neglect.[81] Capital punishment cannot be brought about in consequence of withholding necessary health care.[82] Nor can it occur by the infliction of sub-lethal injuries that, in the course of time, are expected to worsen and cause death.

Analytically, a death brought about nearly instantaneously eliminates subjective unnecessary cruelty. An inmate who survives an execution but suffers sub-lethal injuries that without treatment will or may lead to death or disability is again entitled to healthcare and the warden is under a duty to provide it.[83] Therefore, an execution must cause nearly instant death and if the execution fails, the inmate must be substantially free of risk of disabling injuries or pain due to the failed execution, or medical intervention must be immediately available to reduce that risk.[84] If an inmate survives an execution attempt, the constitutional duty requiring the delivery of necessary health care is revived. ***723** [85] Execution is a form of killing; however, in the setting of an execution, if an inmate is killed or dies, it is not necessarily a result of execution.[86]

Execution, as a method of killing is a bounded concept not defined by death alone.[87] The definition of killing by execution warrants analysis. To be lawful, an execution should be timely, that is, the execution itself cannot be expected to require a protracted amount of time.[88] In 1996, the United States Court of Appeals for the Ninth Circuit declared the gas chamber to be an unconstitutional method of execution and sited the length of time necessary to complete the execution as a cause of unnecessary cruelty.[89]

Recently, a few executions in the United States have not gone as predicted.[90] If an execution is "botched," the suggestion is made that it can be improved. However, if an inmate is DNR, a botched execution only occurs if the inmate fails to die.[91] If the inmate is ***724** not dead but merely dying, a DNR order may constrain resuscitation.[92]

The execution of Clayton Lockett in Oklahoma illustrates this point.[93] Oklahoma execution protocol requires the placing of intravenous catheters for the purpose of delivering the chemicals.[94] Technically, this action can be challenging and in Lockett's case the catheters were inserted improperly.[95] As the chemicals were infused, the inmate began to complain of distress.[96] An exchange took place between prison officials and those on the execution team when it became clear that Lockett had not died as anticipated.[97] A question was asked if more medication was available to deliver an additional dose.[98]

Forty-three minutes after the execution began, it was announced that Lockett died of a "massive heart attack."[99] Two points are worth noting: (1) the diagnosis of a "massive heart attack" is not a term of art, and (2) a diagnosis of a heart attack of any degree cannot be made without a laboratory to evaluate specific ***725** blood work and without appropriate electrocardiogram monitoring at a minimum.[100] An autopsy was performed and a report was issued, "though the report does not settle the question of how Lockett died, concluding only that the cause of death was 'judicial execution by lethal injection.'"[101] This execution was widely regarded as botched; that is, Lockett did not die by execution, rather he died by another method.[102] No evidence has been brought forward to suggest that the state attempted to resuscitate him when it was clear that the execution attempt had failed to kill him.[103]

If Lockett was DNR, the state could claim that no resuscitation obligation exists.[104] No such claim has been made. A physician was present at Lockett's execution and made

no attempt to resuscitate him.[105] As Lockett lay dying, not as a consequence of execution, he became a patient. The warden placed a physician in the chamber who could have acted. In that moment, the physician present was ethically obliged to attempt resuscitation.[106] In a hospital setting, physicians recognize a potential problem of ethical double agency when they act as both resuscitator and paliator.[107] The warden may have never told the physician in the execution chamber to consider that he may be required to switch roles. The ***726** execution chamber is so far removed from a therapeutic environment that a physician's normal bioethical inclinations are subverted.

Ethical conduct is benefited by context. Physicians need the support of colleagues and a setting conducive to healing to promote proper bioethical values. This created setting leads and misleads. Lethal injection employs terminology and equipment that falsely suggests a medical setting and encourages the physician to participate.[108] In Lockett's case, the therapeutic façade quickly evaporated and the result was a cruel death witnessed by a doctor.

The Lockett case demonstrates a further ethical dilemma. On the day of the execution, the inmate refused to be removed from his cell.[109] In response, the corrections officers used a Taser--an electronic shock device--to disable him so that he could be extracted.[110] Upon examination, medical staff discovered a laceration on Lockett's arm.[111] An evaluation determined that the laceration did not require sutures.[112] One may ask why officials would consider suturing a laceration hours before an execution. In so doing, the state acknowledges its duty to deliver healthcare to the inmate up until the execution.[113] In the case of Lockett's injury, a doctor-patient relationship could be imagined. In that moment, a doctor's ethical duty to deliver treatment existed, but an additional conflict could be imagined.

In a deontological construct, a doctor's duty consists of following rules that, to a degree, internally conflict with one another.[114] ***727** The directive to first avoid malevolence might conflict with beneficence. It is necessary, on occasion, to first cause harm to produce a greater good. The physician draws right conduct from the combination of these rules filtered through a "greatest good" standard. In the hand of the physician, conduct is aspirational and practical. At the apex of right conduct is the directive to do no harm.[115] It is the first rule from which all other rules and decisions follow.

C. *Physicians Caring for Inmates Headed for Execution*

In the case of a physician who cares for an injured inmate destined for execution, what is the endpoint and whose interests are served? As a model, consider the rule of double effect.[116] This rule distinguishes between intended effects and foreseen effects.[117] In a circumstance where an action brings about two results--one good and one harmful–the rule suggests that such an arrangement is not always morally wrong.[118] A physician may claim that the care rendered to an injured or ill inmate who will soon be executed satisfies the directive to restore health and act with beneficence.

The traditional application of the rule of double effect involves providing pain relief at the end of life. A physician never intends to shorten that life.[119] Death occurs naturally. A physician called to care for an inmate does not intend to cause death as a result of treatment, but in effect, the primary purpose for treatment is to make the inmate medically fit for execution. As an extreme example, if an inmate attempts suicide prior to his execution, the physician is under an obligation to resuscitate him.[120]

***728** Capital punishment does not provide the inmate with an option of suicide. In the case of Russell Bucklew, the Supreme Court temporarily stayed his execution at the last moment over concerns that a health-related issue would render lethal injection needlessly cruel.[121] Bucklew suffers from congenital cavernous hemangiomas of the

face and airways.[122] His vascular tumors continue to expand and could cause choking or hemorrhaging during his execution.[123] The Supreme Court ruled that the lower court erred when it set aside unchallenged physician testimony that first raised these concerns.[124] In effect, the Court determined Bucklew was too sick to execute.[125] The question now remains on how Bucklew will be treated presently in order to be executed later.[126]

In Bucklew's case, his facial tumors cannot be removed and the only recourse to maintain a patent airway would be to perform a tracheostomy on him.[127] If Bucklew is compelled to undergo such a medical procedure and he refuses to consent, can the procedure be forced upon him? If a doctor performs the procedure without consent and a complication, as a result of negligence, arises, does Bucklew now have a claim against the doctor? A perfect outcome would now make Bucklew fit for his own death by execution. Under the normal ethical practice of medicine, no such treatment could take place. A physician still may be identified who would be willing to perform a tracheostomy. To lay the blame exclusively at the feet of physicians for wayward ethical conduct would be incorrect. Governments obfuscate on matters of medical ethics and seem to send mixed messages to the physician and the public they ***729** serve. State governments have overridden medical board ethical directives and have successfully prevented the disciplining of physicians who participate in the death penalty.[128]

CONCLUSION

Botched executions disturb the public and the state, leading to calls for change. Lethal injection as a form of execution now sits at the crossroads. Some argue that the way forward is further lethal injection refinement. That is, lethal injection will benefit from an increased physician presence, charged anew, with making it right. A group of legal professionals known as the Death Penalty Committee of the Constitution Project (the "Death Penalty Committee") was recently convened.[129] The Death Penalty Committee generated a list of thirty-nine recommendations intended to resolve problems with lethal injection as the method of execution for capital punishment.[130]

The Death Penalty Committee's final recommendation calls for the presence of qualified medical personnel at every lethal injection execution to ensure that the medically related elements are properly conducted.[131] This astonishing conclusion needs careful analysis. It remains entirely unresolved as to what constitutes successful lethal injection beyond the presence of the killing of the inmate. We cannot improve what we cannot define. Further, the Death Penalty Committee lacks the credentials to direct medical practitioners under the normal practice of medicine.[132] It suggests that physicians should be responsible for all future lethal injection executions.[133] By setting the physician as the responsible party here, it is conceivable that an inmate or his estate might have a claim of negligence against a physician if the execution ***730** should occur outside of some sort of standard. The practice of medicine is self-regulated and it rests with medical boards empowered to set the standards and protect the public.[134] The Death Penalty Committee lacks a mandate here and demonstrates a lack of understanding of ethical medical practice by tasking physicians in this way.[135]

The ethical practice of medicine means to hold oneself out to the public as being engaged in the diagnosis or treatment of diseases, defects, or injuries of human beings.[136] Life is not a disease cured by death and killing is not a medical act. Lethal injection cannot be further refined by the presence of medicine, in fact, the opposite is true. When lethal injection failed to kill Lockett, did he not become entitled to medical care in order to resuscitate him? Why has there been no public investigation of this homicide? Was a crime committed by the failure to resuscitate? Lethal injection, as the method to carry out execution, creates an unresolvable dilemma for the ethical practice of medicine and perhaps for the legal regime on which it rests. If physicians

and medicine have any role here, it is in the role of the ethical practice of medicine, that is, as a resuscitator, not an executioner.

Footnotes

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1 553 U.S. 35, 47 (2008).

2 *Id.* at 44.

3 *Id.*

4 *Id.* at 46-47.

5 *Id.* at 41, 44; Robert Schwartz, *The Effect of* Baze v. Rees *on Death Penalty Reform*, LEADERSHIP CONFERENCE (Apr. 18, 2008), http://www.civilrights.org/criminal-justice/death-penalty/baze-v-rees.html.

6 Baze v. Rees: *Lethal Injection, Cruel and Unusual Punishment, Eighth Amendment, Death Penalty*, CORNELL UNIV. L. SCH. LEGAL INFO. INST., http://www.law.cornell.edu/supct/cert/07-5439 (last visited Feb. 27, 2015).

7 Schwartz, *supra* note 5.

8 *Baze*, 553 U.S. at 63.

9 *See id.* at 59.

10 *Id.* at 47.

11 *Id.* at 62.

12 *See id.* at 53 ("It is uncontested that, failing a proper dose of sodium thiopental that would render the prisoner unconscious, there is a substantial, constitutionally unacceptable risk of suffocation from the administration of pancuronium bromide and pain from the injection of potassium chloride."); *see, e.g.*, Deborah W. Denno, *Lethal Injection Chaos Post-*Baze, 102 GEO. L.J. 1331, 1354-60 (2014) (explaining how states have shifted away from a three-drug protocol to a one- or two-drug protocol to avoid running afoul of the standard set in *Baze* regarding an inmate's consciousness).

13 *Thiopental Sodium*, DRUGS.COM, http://www.drugs.com/ppa/thiopental-sodium.html?rintable=1 (last visited Feb. 27, 2015).

14 *See What Is General Anesthesia?*, MED. NEWS TODAY, http://www.medicalnewstoday.com/articles/265592.php (last updated Sept. 5, 2013, 7:00 AM).

15 *See* Erik Eckholm & Katie Zezima, *Drug Used in Executions Dropped by U.S. Supplier*, N.Y. TIMES, Jan. 22, 2011, at A11.

16

See Council Regulation 1236/2005, 2005 O.J. (L 200) 1 (EC); Matt Ford, *Can Europe End the Death Penalty in America?*, ATLANTIC (Feb. 18, 2014, 7:06 PM), http://www.theatlantic.com/international/archive/2014/02/can-europe-end-the-death-penalty-in-america/283790/. Hospira, a United States company, was manufacturing sodium thiopental in Italy, a member of the EU, so the Italian government requested a guarantee from Hospira that Italian-produced sodium thiopental would not be used in executions. The company claimed it could not comply and ceased manufacturing sodium thiopental. *See* Chris McGreal, *Lethal Injection Drug Production Ends in the US*, GUARDIAN (Jan. 23, 2011, 1:17 PM), http://www.theguardian.com/world/2011/jan/23/lethal-injection-sodium-thiopental-hospira.

17 Peter Sergo, *How Does Lethal Injection Work?*, SCIENCELINE (Nov. 12, 2007), http://scienceline.org/2007/11/ask-sergo-deathpenalty/. Pancuronium bromide is not widely available, as newer paralyzing agents have replaced it. *See* Larry O'Dell, *Rocuronium Bromide: Lethal Injection Drug Replaces One in Short Supply in Virginia*, HUFFINGTON POST (July 27, 2012, 11:38 AM), http://www.huffingtonpost.com/2012/07/27/rocuronium-bromide_n_1710223.html; *Virginia Adds New Lethal Injection Drug: Rocuronium Bromide*, CBS LOCAL (July 27, 2012, 7:24 PM), http://washington.cbslocal.com/2012/07/27/virginia-adds-new-lethal-injection-drug-rocuronium-bromide/. These new agents work similarly to pancuronium bromide, but even if substituting drugs by class or intent may be permitted in a medical setting, *Baze* includes no provision for such substitutions. *See* Baze v. Rees, 553 U.S. 47, 56-57 (2008); WORLD MED. ASS'N, WMA STATEMENT ON DRUG SUBSTITUTION (Oct. 2005), *available at* http:// www.wma.net/en/30publications/10policies/d13/.

18 Adam Liptak, *Critics Say Execution Drug May Hide Suffering*, N.Y. TIMES, Oct. 7, 2003, at A1.

19 NANCY L. CAROLINE ET AL., NANCY CAROLINE'S EMERGENCY CARE IN THE STREETS 811 (Andrew N. Pollak ed., 7th ed. 2012).

20 *See* Deborah W. Denno, *When Legislatures Delegate Death: The Troubling Paradox Behind State Uses of Electrocution and Lethal Injection and What It Says About Us*, 63 OHIO ST. L.J. 63, 66 (2002).

21 *See* Emma Schwartz, *A Challenge to Lethal Injections*, U.S. NEWS (Nov. 3, 2007, 2:57 PM), http://www.usnews.com/news/articles/2007/11/03/challenge-to-lethal-injections.

22 *See What Is Potassium Chloride*, EVERYDAY HEALTH, http://www.everydayhealth.com/drugs/potassium-chloride (last visited Feb. 27, 2015).

23 *See generally* Brief of Kevin Concannon et al. as Amici Curiae Supporting Petitioners at 9, Baze v. Rees, 553 U.S. 35 (2008) (No. 07-5439), 2007 WL 3440946 at, *9 (explaining that increased levels of potassium in the body affects the heart's impulse generation).

24 *See* Mark Heath, *The Medicalization of Execution: Lethal Injection in the United States*, *in* PUBLIC HEALTH FROM BEHIND BARS: FROM PRISONS TO COMMUNITIES 88, 93 (Robert Greifinger ed., 2007).

25 Walter A. Brezezski, *Blood Pressure*, *in* CLINICAL METHODS: THE HISTORY, PHYSICAL, AND LABORATORY EXAMINATIONS 95, 97 (H. Kenneth Walker et al. eds., 3d ed. 1990).

26 *Id.*

27 *See* Heath, *supra* note 24, at 93.

28

Paul Litton, *Physician Participation in Executions, the Morality of Capital Punishment, and the Practical Implications of Their Relationship*, 41 J.L. MED. & ETHICS 333, 334-35 (2013).

29 *See id.* (describing a typical lethal injection protocol, which includes use of IVs, saline solution, various drugs and medical devices, and the presence of physicians).

30 *Id.*; *see, e.g.*, ARIZ. DEP'T OF CORRS., DEP'T ORDER 710, EXECUTION PROCEDURES 5 (Sept. 21, 2012), *available at* https://corrections.az.gov/sites/default/files/policies/700/0710u.pdf (providing an example of a state execution protocol that requires the state to record the event).

31 AUSTIN SARAT, GRUESOME SPECTACLES: BOTCHED EXECUTIONS AND AMERICA'S DEATH PENALTY 5 (2014).

32 *See, e.g.*, Radley Balko, *In Praise of the Firing Squad*, WASH. POST (Feb. 6, 2015), http://www.washingtonpost.com/news/the-watch/wp/2015/02/06/in-praise-of-the-firing-squad/ (examining opposition to lethal injections in light of a possible return to the firing squad as a more humane method of execution); The Editors, *Don't Botch Executions. End Them.*, BLOOMBERG VIEW (Aug. 5, 2014, 11:53 AM), http://www.bloombergview.com/articles/2014-08-05/don-t-botch-executions-end-them (arguing that lethal injection has not resulted in a humane manner of execution and the state should not resort to old methods, such as the electric chair or the gas chamber, to remedy the problem); Matt McCarthy, *What's the Best Way to Execute Someone? Doctors Say Lethal Injection Is Often Botched and Horrific*, SLATE (Mar. 27, 2014, 11:44 PM), http://www.slate.com/articles/health_and_science/medical_examiner/2014/03/death_penalty_drugs_lethal_injection_executions_are_so_bad_that_it_s_time.html (presenting the opinions of numerous doctors and anesthesiologists that current lethal injection drugs and protocols are medically incompetent, and thus more likely to result in botched executions).

33 *See* E. BRIGHT WILSON, JR., AN INTRODUCTION TO SCIENTIFIC RESEARCH 25-28, 44 (1952).

34 *See* MICHAEL HARRIS & GORDON TAYLOR, MEDICAL STATISTICS MADE EASY 27 (2003).

35 2 TRIALS OF WAR CRIMINALS BEFORE THE NUERNBERG MILITARY TRIBUNALS 181 (1949).

36 WORLD MED. ASS'N, DECLARATION OF HELSINKI--ETHICAL PRINCIPLES FOR MEDICAL RESEARCH INVOLVING HUMAN SUBJECTS 5 (2013), *available at* http://www.wma.net/en/30publications/10policies/b3/index.html.pdf?print-media-type&footer-right=[page]/[toPage].

37 Permitted Research Involving Prisoners, 45 C.F.R. § 46.306(a)(iv) (2014).

38 *See* Emma Marris, *Death-Row Drug Dilemma*, NATURE (Jan. 27, 2011), http://www.nature.com/news/2011/110121/full/news.2011.53.html.

39 A prospective analysis is one in which none of the subjects of the study have developed the outcomes of interest before the study begins. Wayne W. LaMorte, *Prospective and Retrospective Cohort Studies*, OVERVIEW OF ANALYTIC STUDIES, http://sphweb.bumc.bu.edu/otlt/MPH-Modules/EP/EP713_ AnalyticOverview/EP713_AnalyticOverview3.html (last

updated Jan. 22, 2015). In that way, the study can be designed to answer a specific question. *Id.*

40 Charles Warlow, *Comparing Like With Like and the Development of Randomisation–Goodbye Anecdotes*, *in* CLINICAL TRIALS 1, 4 (Lelia Duley & Barbara Farrell eds., 2002). Blinding prevents those involved in the study from being influenced by any conscious or unconscious bias. *Id.*

41 *Statistical Computing Seminars: Introduction to Power Analysis*, INST. DIGITAL RES. & EDUC., http://www.ats.ucla.edu/stat/seminars/Intro_power/ (last visited Feb. 27, 2015) ("A power analysis is a good way of making sure that you have thought through every aspect of the study and the statistical analysis before you start collecting data."). The "power" of a study is the probability of rejecting a null hypothesis that is actually false. *Id.*

42 P-value is the probability that an observed difference in a study happened by chance and is used to show the likelihood that a hypothesis is true. HARRIS & TAYLOR, *supra* note 34, at 24. "The lower the P value, the less likely it is that the difference happened by chance and so the higher the significance of the finding." *Id.* at 25.

43 Barbara Farrell & Patsy Spark, *Building Resources for Randomised Trials*, *in* CLINICAL TRIALS 81, 86 (Lelia Duley & Barbara Farrell eds., 2002).

44 *See* Press Release, Arizona Death Row Prisoners Sue State Officials Alleging Human Experimentation in Executions (June 26, 2014), *available at* http://www.deathpenaltyinfo.org/documents/az627.pdf.

45 K.W. PRUNTY, JR. ET AL., STATE OF CAL. DEP'T OF CORRS. & REHAB., LETHAL INJECTION PROTOCOL REV. 1 (2007).

46 *See Glance: Execution Drug Secrecy in 5 States*, ASSOC. PRESS (Apr. 5, 2014, 10:56 AM), http://bigstory.ap.org/article/glance-execution-drug-secrecy-5-states-1.

47 *See, e.g.*, MED. BD. OF CALIF., http://www.mbc.ca.gov/ (last visited Feb. 27, 2015) (stating that the mission of the Medical Board of California "is to protect health care consumers through the proper licensing and regulation of physicians and surgeons and certain allied health care professions"); STATE MED. BD. OF OHIO, http://www.med.ohio.gov/ (last visited Feb. 27, 2015) (stating its mission "[t]o protect and enhance the health and safety of the public through effective medical regulation").

48 *See* Maurice Chammah, *Ohio's New Frontier in Secrecy*, MARSHALL PROJECT (Dec. 1, 2014, 7:41 AM), https://www.themarshallproject.org/2014/12/01/ohio-s-new-frontier-in-secrecy; Andrew Cohen, *New 'Injection Secrecy' Law Threatens First Amendment Rights in Georgia*, COLUM. JOURNALISM REV. (July 17, 2013, 2:55 PM), http://www.cjr.org/behind_the_ news/georgia_lethal_injections_shie.php.

49 *Cf.* Leonidas G. Koniaris et al., *Ethical Implications of Modifying Lethal Injection Protocols*, 5 PLoS MED. 845, 848 (2008), *available at* http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0050126.

50 Robert L. Berger, *Nazi Science–The Dachau Hypothermia Experiments*, 322 NEW ENG. J. MED. 1435, 1435 (1990).

51 *See id.*

52 *See id.* at 1439-40.

53

See Estelle v. Gamble, 429 U.S. 97, 103-04 (1976) (citing Gregg v. Georgia, 428 U.S. 153, 173 (1976)).

54 *See id.* at 103.

55 *See id.* at 104-05 (citing *Gregg*, 428 U.S. at 173).

56 *See id.* at 103.

57 *See, e.g.*, CAL. PENAL CODE § 673 (West 2009).

58 *See Principles of Medical Ethics*, AM. MED. ASS'N (revised June 2001), http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/principles-medical-ethics.page? ("The medical profession has long subscribed to a body of ethical statements developed primarily for the benefit of the patient.").

59 *See id.*; Bryan A. Liang & Arthur M. Boudreaux, *Special Doctor's Docket. Lethal Injection: Policy Considerations for Medicine*, 18 J. CLINICAL ANESTHESIA 466, 467, 469 (2006).

60 *See* Liang & Boudreaux, *supra* note 59, at 468, 469.

61 *See* Wilbert E. Fordyce, *Pain and Suffering: A Reappraisal*, 43 AM. PSYCHOLOGIST 276, 278 (1988) (noting that pain arises from the stimulation of perceived nociception, and suffering is "an affective *or* emotional response in the central nervous system, triggered by nociception or other aversive events...."). Nociception is "mechanical, thermal, or chemical energy impinging on specialized nerved endings... thus initiating a signal to the central nervous system that aversive events are occurring." *Id.*

62 *See Opinion 10.01--Fundamental Elements of the Patient-Physician Relationship*, AM. MED. ASS'N (last updated 1993), *available at* http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion1001.page; Lee Black & Robert M. Sade, *Lethal Injection and Physicians: State Law vs. Medical Ethics*, 298 J. AM. MED. ASS'N 2779, 2780 (2007).

63 *See Principles of Medical Ethics*, *supra* note 58.

64 *See id.* ("A physician shall, in the provision of appropriate patient care, except in emergencies, be free to choose whom to serve, with whom to associate, and the environment in which to provide medical care.").

65 *See, e.g.*, Black & Sade, *supra* note 62, at 2779 ("Georgia law stipulates that physicians who participate in executions are not practicing medicine....").

66 *See id.*; *see also supra* Part II.B.

67 *See* Dennis Curry, *Lethal Injection and Medical Ethics: Physicians in the Execution Chamber*, 2 HARV. MED. STUDENT REV. 39, 39 (2015).

68 *See* Lawrence Nelson & Brandon Ashby, *Rethinking the Ethics of Physician Participation in Lethal Injection Execution*, 41 HASTINGS CTR. REP. 28, 32 (2011).

69 Personal communication with Russell Bucklew (May 2014) (on file with author).

70 *See Opinion 2.2--Do-Not-Resuscitate Orders*, AM. MED. ASS'N (last updated Nov. 2005), *available at* www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion222.page; Carol Ann Mooney, *Deciding Not to Resuscitate Hospital Patients: Medical and Legal Perspectives*, 1986 U. ILL. L. REV. 1025, 1034. A physician ignoring a person's right to bodily self-determination implies the patient's "moral and ethical beliefs

are secondary to his objectively-determined physical well-being." *See id.* at 1080-81.

71 *See, e.g.*, Seena Fazel & John Danesh, *Serious Mental Disorder in 23,000 Prisoners: A Systematic Review of 62 Surveys*, 359 LANCET 545, 545, 548 (2002).

72 FED. BUREAU OF PRISONS, MANAGEMENT OF MAJOR DEPRESSIVE DISORDER 7 (2014).

73 ANNE WILKINSON ET AL., LITERATURE REVIEW ON ADVANCE DIRECTIVES 1 (2007)..

74 *Id.*; *see also* Charles P. Sabatino, *10 Legal Myths About Advance Medical Directives*, *in* ABA COMM'N ON LEGAL PROBLEMS OF THE ELDERLY 2, *available at* http://www.ruralinstitute.umt.edu/transition/Handouts/10LegalMyths.pdf (last visited Feb. 27, 2015).

75 WILKINSON ET AL., *supra* note 73, at 1.

76 *Id.* at 3, 11.

77 *See, e.g.*, 12 VA. ADMIN. CODE § 35-115-146 (2010); N.H. CODE ADMIN. R. ANN. 137-J:8 (2014).

78 *See* M. Scott Smith et al., *Healthcare Decision-Making for Mentally Incapacitated Incarcerated Individuals*, 22 ELDER L.J. 175, 197-99 (2014) [hereinafter Smith et al., *Healthcare Decision-Making*] ("[J]ust as fear of malpractice litigation can often influence a physician's treatment decisions, a prison administrator's decisions regarding treatment may be influenced by the fear of litigation.").

79 *See infra* Part III.B.

80 *See* Estelle v. Gamble, 429 U.S. 97, 104-05 (1976); Smith et al., *Healthcare Decision-Making*, *supra* note 78, at 197.

81 *See Estelle*, 429 U.S. at 104-05 (concluding that "deliberate indifference to serious medical needs of prisoners" is prohibited by the Eighth Amendment); *see also* Baze v. Rees, 553 U.S. 35, 48-49 (2008) (noting that forbidden methods of execution are those that add "pain to the death sentence through torture or the like").

82 *See Estelle*, 429 U.S. at 104-05.

83 *Id.* ("[D]eliberate indifference to serious medical needs of prisoners... [is] proscribed by the Eighth Amendment. This is true whether the indifference is manifested by prison doctors in their response to the prisoner's needs or by prison guards in intentionally denying or delaying access to medical care....").

84 *Id.*

85 *See* Smith et al., *Healthcare Decision-Making*, *supra* note 78, at 197 ("Prison administrators are obligated to provide adequate medical treatment to prisoners in their custody.").

86 *See e.g.*, Cary Aspinwall, *Inmate Clayton Lockett Dies of Heart Attack After Botched Execution; Second Execution Postponed*, TULSA WORLD (Apr. 30, 2014, 12:00 AM), http://www.tulsaworld.com/news/state/inmate-clayton-lockett-dies-of-heart-attack-after-botched-execution/article_80cc060a-cff2-11e3-967c-0017a43b2370.html (indicating Clayton Lockett died during execution as a result of a massive heart attack).

87 *See* Austin Sarat, *What Botched Executions Tell Us About the Death Penalty*, BOS. GLOBE (Apr. 5, 2014) (suggesting that executions are partly about technology making a final punishment less painful); *see also Execution Definition*, WEBSTER'S NEW WORLD DICTIONARY 490 (2d ed. 1980) (demonstrating that execution by definition includes death and a legal sentence).

88 *See* Fierro v. Gomez, 77 F.3d 301, 308 (9th Cir. 1996) (stating that the risk an execution will last for several minutes is enough to violate the Eighth Amendment); *see also* People v. Stewart, 520 N.E.2d 348, 358 (Ill. 1988) (indicating that unnecessary pain is unlawful if protracted for an extended period).

89 *Fierro*, 77 F.3d at 309.

90 *See* Mark Berman, *Inmate Dies Following Botched Oklahoma Execution, Second Execution Delayed*, WASH. POST (Apr. 29, 2014), http://www.washingtonpost.com/news/post-nation/wp/2014/04/29/oklahoma-execution-botched-inmate-still-dies-second-execution-delayed/ (stating that inmate Clayton Lockett's execution was botched); *see also* Mark Berman, *Execution Takes Nearly Two Hours*, WASH. POST, July 24, 2014, at A3 (stating that inmate Joseph Wood gasped and snorted for air while taking nearly two hours to die); Mark Berman, *The Recent History of States Scrambling to Keep Using Lethal Injections*, WASH. POST (Feb. 19, 2014), http://www.washingtonpost.com/news/post-nation/wp/2014/02/19/the-recent-history-of-states-scrambling-to-keep-using-lethal-injections/ (stating that inmate Dennis McGuire took nearly twenty-five minutes to die and choked several minutes before dying).

91 *Cf. So Long as They Die: Lethal Injections in the United States*, 18 HUM. RTS. WATCH, 1, 46, 53 (2006) [hereinafter *So Long as They Die*] (suggesting that Clarence Ray Allen's execution was botched even though he eventually died); *see also* Don Thompson, *Death Row's Oldest Executed*, DAILYNEWS (Jan. 17, 2006, 12:01 AM), http://www.dailynews.com/general-news/20060117/death-rows-oldest-executed (stating that executed inmate Clarence Ray Allen had a DNR order).

92 *See e.g.*, *Op-140138, Offender Living Will/Advance Directive for Health Care and Do Not Resuscitate (DNR) Consent* , OKLA. DEP'T. OF CORRS. ((2014) (indicating that a DNR order provides that an inmate cannot receive CPR if the heart stops beating).

93 *See* Erik Eckholm, *IV Misplaced in Oklahoma Execution, Report Says*, N.Y. TIMES, Sept. 5, 2014, at A14 (stating that after Clayton Lockett's execution was called off, no steps were taken to provide emergency resuscitation as the inmate's heart failed).

94 *See Oklahoma Execution Protocol Calls for Specific Procedure*, NEWSOK (May 1, 2014), http://newsok.com/oklahoma-execution-protocol-calls-for-specific-procedure/article/4744678 (indicating Oklahoma execution protocol calls for IV catheter to administer the drugs).

95 *See* Jessica Glenza, *Autopsy on Oklahoma Death Row Inmate Shows IV Not Inserted Correctly*, GUARDIAN (June 13, 2014, 12:48 PM), http://www.theguardian.com/world/2014/jun/13/autopsy-oklahoma-death-row-inmate-clayton-lockett (stating that the intravenous needles were not inserted correctly); *see also So Long as They Die*, *supra* note 91, at 3 (stating that inserting an intravenous catheter can be difficult if veins have been compromised).

96 *See* Katie Fretland, *Clayton Lockett Writhed and Groaned. After 43 Minutes, He Was Declared Dead*, GUARDIAN (Apr. 30, 2014, 11:19 AM), http://www.theguardian.com/world/2014/apr/30/clayton-lockett-oklahoma-execution-witness (reporting that Lockett lunged forward and mumbled, "Man").

97 *See* Erick Eckholm & John Schwartz, *Timeline Describes Frantic Scene at Execution*, N.Y. TIMES, May 2, 2014, at A1 (describing the conversation between the warden and the doctor).

98 *See id.*

99 Fretland, *supra* note 96.

100 *See About Heart Attacks*, AM. HEART ASS'N, http://www.heart.org/HEARTORG/Conditions/HeartAttack/AboutHeartAttacks/About-Heart-Attacks_UCM_002038_Article.jsp (last visited Feb. 27, 2015) (stating a heart attack is referred to as a myocardial infarction); *How is a Heart Attack Diagnosed?*, NAT'L HEART, LUNG, & BLOOD INST., http://www.nhlbi.nih.gov/health/health-topics/topics/heartattack/diagnosis (last visited Feb. 27, 2015).

101 *See* THE EXECUTION OF CLAYTON D. LOCKETT, OKLA. DEP'T OF PUB. SAFETY 13, *available at* http://www.dps.state.ok.us/investigation/14-0189SI%20Summary.pdf (last visited Feb. 27, 2015); Ed Pilkington, *Clayton Lockett Didn't Die of Heart Attack, Oklahoma Official Autopsy Shows*, GUARDIAN (Aug. 28, 2014, 5:02 PM), http://www.theguardian.com/world/2014/aug/28/clayton-lockett-official-autopsy-released.

102 *See* Fretland, *supra* note 96 (explaining Lockett died from a "massive heart attack" after the execution was halted).

103 *See* Katie Fretland & Jessica Glenza, *Oklahoma State Report on Botched Lethal Injection Cites Medical Failures*, GUARDIAN (Sep. 4, 2014, 4:47 PM), http://www.theguardian.com/world/2014/sep/04/oklahoma-inquiry-botched-lethal-injection-clayton-lockett.

104 *See Do-Not-Resuscitate Order*, U.S. NAT'L LIBRARY MED., http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000473.htm (last visited Feb. 27, 2015).

105 *See* Fretland & Glenza, *supra* note 103.

106 *See Ethical Issues of Resuscitation*, AM. C. EMERGENCY PHYSICIANS, http://www.acep.org/Clinical---Practice-Management/Ethical-Issues-of-Resuscitation/ (last visited Feb. 27, 2015).

107 *See, e.g.*, Tony Back, *Ethics in Medicine*, U. WASH. SCH. MED., https://depts.washington.edu/bioethx/topics/eol.html (last visited Feb. 27.2015) (discussing the ethical dilemma between preservation of life and a patient's plan for care).

108 *See* Joel B. Zivot, *The Absence of Cruelty Is Not the Presence of Humanness: Physicians and the Death Penalty in the United States*, 7 PHIL., ETHICS, & HUMAN MED. 13 (2012), *available at* http://www.peh-med.com/content/7/1/13.

109 Michael McLaughlin, *Clayton Lockett Was Tasered on the Day of His Execution*, HUFFINGTON POST (May 1, 2014, 6:54 PM), http://www.huffingtonpost.com/2014/05/01/clayton-lockett-taser-execution_n_5249690.html.

110 *Id.*

111

Letter from Robert Patton, Dir., Okla. Dep't of Corr., to Mary Fallin, Governor, State of Okla. (May 1, 2014), *available at* https://www.documentcloud.org/documents/1151378-5-1-14-doc-letter-re-clayton-lockett.html.

112 *Id.*

113 *See* Estelle v. Gamble, 429 U.S. 97, 103 (1976) (discussing the government's duty to provide medical services to the incarcerated).

114 *Compare* Cedric M. Smith, *Origin and Uses of* Primum Non Nocere-- *Above All, Do No Harm!*, 45 J. CLINICAL PHARMACOLOGY 371, 375 (2005) (discussing the origin of "do no harm" as a "general maxim for medical practice") (citations omitted), *with* B.P. White et al., *Palliative Care, Double Effect, and the Law in Australia*, 41 INTERNAL MED. J. 485, 486 (2011) (discussing the palliative care industry's acceptance of the doctrine of double effect, in which "an act performed with good intent can still be moral despite negative side-effects").

115 *Cf.* Smith, *supra* note 114, at 374-75 (examining the use and meaning of the phrase "above all, do no harm" but disputing its sufficiency as a guideline for medical ethics).

116 Joseph T. Mangan, *An Historical Analysis of the Principle of Double Effect*, 10 THEOLOGICAL STUD. 41, 43 (1949).

117 *Id.* at 42-44, 57.

118 *Id.* at 60.

119 White et al., *supra* note 114, at 486.

120 *See* Estelle v. Gamble, 429 U.S. 97, 103 (1976) (discussing the government's duty to provide medical services to the incarcerated).

121 Bucklew v. Lombardi, ___ U.S. ___, ___, 134 S. Ct. 2333, 2333 (2014); Lyle Denniston, *Execution Delayed in Unusual Case*, SCOTUSBLOG (May 21, 2014, 10:58 PM), http://www.scotusblog.com/2014/05/execution-delayed-in-unusual-case/.

122 *See* Denniston, *supra* note 121. *See generally* T.N. Sas & N. Boutsiadis, *Facial Hemangiomas Diagnosis*, 36 CURRENT HEALTH & SCI. J. 166 (2010) (describing facial hemangiomas).

123 Declaration of Joel. B. Zivot (May 8, 2014) (on file with author).

124 *See* Bucklew v. Lombardi, 565 F. App'x 562, 566, 571 (8th Cir. 2014) (en banc) (including testimony by Dr. Zivot stating "it is my opinion that a substantial risk exists that, during the execution, Mr. Bucklew will suffer from extreme or excruciating pain as a result of hemorrhaging or abnormal circulation of the lethal drug, leading to a prolonged execution").

125 *Id.* at 564.

126 *Id.* at 568.

127 *Id.* at 565.

128 Zivot, *supra* note 108, at 13.

129 Robert D. Truog et al., *Physician, Medical Ethics, and Execution by Lethal Injection*, 311 JAMA 2375 (2014).

130 *Id.*

131

IRREVERSIBLE ERROR: RECOMMENDED REFORMS FOR PREVENTING AND CORRECTING ERRORS IN THE ADMINISTRATION OF CAPITAL PUNISHMENT, CONST. PROJECT 143 (2014), *available at* http://www.constitutionproject.org/wp-content/uploads/2014/06/Irreversible-Error_FINAL.pdf.

132 *See About Us* , CONST. PROJECT, http:// www.constitutionproject.org/about-us/ (last visited Feb. 27, 2015) (indicating that they are essentially a lobby group and not experts in the medical field).

133 IRREVERSIBLE ERROR, *supra* note 131, at 143.

134 *See* Drew Carlson & James N. Thompson, *The Role of State Medical Boards*, 7 AMA J. ETHICS (Apr. 2005), http://journalofethics.ama-assn.org/2005/04/pfor1-0504.html.

135 *See generally id.* (identifying the related duties of physicians and medical boards, thereby clarifying the lack of understanding demonstrated by the Death Penalty Committee of the Constitution Project).

136 *See* Rodriguez v. Krancer, 984 F. Supp. 2d 356, 358-59 (M.D. Pa. 2013).

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http://www.peh-med.com/content/7/1/13

PEHM PHILOSOPHY, ETHICS, AND HUMANITIES IN MEDICINE

COMMENTARY Open Access

The absence of cruelty is not the presence of humanness: physicians and the death penalty in the United States

Joel B Zivot

Abstract

The death penalty by lethal injection is a legal punishment in the United States. Sodium Thiopental, once used in the death penalty cocktail, is no longer available for use in the United States as a consequence of this association. Anesthesiologists possess knowledge of Sodium Thiopental and possible chemical alternatives. Further, lethal injection has the look and feel of a medical act thereby encouraging physician participation and comment. Concern has been raised that the death penalty by lethal injection, is cruel. Physicians are ethically directed to prevent cruelty within the doctor-patient relationship and ethically prohibited from participation in any component of the death penalty. The US Supreme Court ruled that the death penalty is not cruel per se and is not in conflict with the 8th amendment of the US constitution. If the death penalty is not cruel, it requires no further refinement. If, on the other hand, the death penalty is in fact cruel, physicians have no mandate outside of the doctor patient relationship to reduce cruelty. Any intervention in the name of cruelty reduction, in the setting of lethal injection, does not lead to a more humane form of punishment. If physicians contend that the death penalty can be botched, they wrongly direct that it can be improved. The death penalty cocktail, as a method to reduce suffering during execution, is an unverifiable claim. At best, anesthetics produce an outward appearance of calmness only and do not address suffering as a consequence of the anticipation of death on the part of the condemned.

Sodium thiopental, a drug once standard in the practice of anesthesiology, is no longer available in the USA. This is due to concerns by the manufacturer over use in the death penalty via lethal injection. [a]Anesthesiologists possess the pharmacological and technical expertise required to utilize alternatives to sodium thiopental injection in the setting of medical practice. From a technical and pharmacological perspective, the death penalty, by lethal injection, appears to possess common elements to the practice of Anesthesiology. As a consequence, death penalty proponents have sought advice from anesthesiologists and derive benefit both from the applicable knowledge possessed in the medical practitioner and the ability to usurp a civilized image by association. Death penalty opponents have used the 8th amendment of the US constitution as justification against the death penalty [1,2]. The argument asserts that death by injection would constitute cruel and unusual punishment. Indeed, evidence exists that the death penalty by lethal injection, as practiced in the United States, falls below the standard of veterinary euthanasia [3] or the normal conduct of an anesthetic performed within a medical setting [4]. States that practice the death penalty have attempted to answer this concern by asserting that the death penalty is in fact constitutional by imposing a standard of humanness [5]. This paper will address the following concerns: First, what is meant by cruelty in the context of the death penalty? Second, what are the moral duties and obligations of the physician, both as doctor and citizen, with respect to conduct in society? Last, what is the role of the physician with respect to mitigation of cruelty and promotion of humanness in the setting of the death penalty?

It is important to draw the distinction between cruel acts and cruel individuals. When we say that a person is "cruel" we are referring to their motives. They want to

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inflict pain on others, take pleasure in the pain of others, or are indifferent to the pain of others. When we say that an action is cruel we are referring to its consequences: it causes unnecessary or excessive pain. Cruel people are prone to engage in cruel practices but sometimes kind and gentle people engage in cruel practices from a professed motive of mercy: they want to diminish the pain/suffering involved in the cruel practices. Cruel punishment was defined by the original framers of the constitution according to the prevailing notions of the time. The legal system recognizes that cruelty will always reflect a standard commensurate with the maturation of a civil society and that punishment should be proportionate to the severity of the crime. The U.S. Supreme Court has held that the death penalty itself is not inherently cruel, but has described it as "an extreme sanction, suitable to the most extreme of crimes" [6] It is important to recognize that constitutional protection is concerned with the method of punishment, not what is considered as the necessary suffering inherent in any method utilized to end a life humanely [7]. The court has considered the death penalty from a consequentialist perspective, that is, fundamentally, the death penalty is successful when the result is death of the condemned. From time to time, as society evolves, the court will evaluate the method of execution against the current cruelty standard only, not the rightness or wrongness of the death penalty.

In the setting of the doctor-patient relationship, medical ethics directs the physician to act without maleficence, that is, to do no harm. Is it reasonable that a physician, acting in ones own professional capacity, has no moral duty/obligation to anyone other than the patient? Many would argue that physicians have multiple other obligations, e.g., to public health and safety, to obey the law, the duty to warn, the duty to report, and various other public-spirited duties. On occasion, military physicians have duties that potentially place them in situations where medical ethics and military interests collide. Physicians' desire to reduce cruelty in the setting of the death penalty may be compared to the actions of military physicians' who use medical knowledge to enhance prisoner interrogation, resolve hunger strikes and prescribe psychotropic medications to retain soldiers in combat areas or accelerate a return to active duty [8]. Rather than affirming the universal ethical duties of physicians, recent Department of Defense memoranda create vagueness by distinguishing treating from non-treating physicians, [9] in order to justify participation of non-treating physicians in using their medical knowledge to inflict cruelty. The American Medical Association, Council on Ethical and Judicial Affairs, adopted the World Medical Association Declaration of Tokyo (1975) [10] which refutes the claim that physician participation in torture or other coercive, non-therapeutic activities benefits the detainee by affording some form of protection [11]. Physicians are citizens, but in a free society, the adherence to a rule is not inviolate. The conduct of a citizen allows thoughtful dissent from certain activities. A physician may refuse to perform certain military duties as a form of conscientious objection. With regard to the death penalty, physician refusal carries a higher moral authority than participatory complicity. Moral self-deception is created when a small purpose close at hand interferes with a greater purpose, perhaps more distant [12].

David Waisel makes the case for physician involvement in the death penalty by lethal injection from the perspective of "humanness [13]." He refers to numerous reports of executions that proceeded with difficulties including problems with intravenous access, [10,11] subjective assessments by observers that suffering occurred in the condemned, [14] and drug and dosage errors [15]. The claim that the death penalty by lethal injection can be botched suggests that it can therefore be improved. The appeal for improvement in the name of humaneness succeeds in drawing physicians in, [16] by appealing to a sympathetic concern for the welfare of others. From the above considerations of ethics and cruelty, the argument in support of humanness fails for several reasons. Physicians who participate in the death penalty are not concerned with prolonging life. This would certainly be the basic activity of medical practice. Physician participation then is in the name of mercy, or a reduction in the cruelty of lethal injection, except when it addresses that the purpose of the injection is to produce death. How cruel are the details of lethal injection apart from the lethality itself? By how much does a doctor's intervention reduce cruelty during execution? Non-physicians can establish intravenous access, and are able to draw up and inject medication. Non-physicians can provide comfort to the condemned as they anticipate and finally approach the execution table. It is conceivable that physician participation might increase cruelty from the perspective of the condemned. Physician endorsement of execution is so counter to normal medical practice that in the prisoners final moments, all vestiges of hope of a better society, should that be imagined, would be lost. Ultimately, the assertion that physician participation reduces cruelty is unverifiable. Only outwardly does it seem so by the witnesses. The administration of the death penalty is absolutely silent on the experience of the witness and needs not be addressed further.

Physicians are ethically directed to act with beneficence, and humanness may be subsumed within beneficence. Beneficence and humanness, as acts of conduct by physicians, are only directives within the doctor-patient relationship. Though acting humanely as a

general activity may benefit society, it is not enforceable as a general standard of human conduct. If it is asserted that physicians are required to perform humane actions outside of the doctor-patient relationship, operationalizing such activity would be impossible. Within the complete rendering of human affairs, much inhumanity exists. No method exists to rank order humane tasks yet some method of humane triage would be required. If physicians position themselves as possessing statutory requirement for humane intervention in all affairs, they would otherwise be rightly accused of acting in one area at the seemingly arbitrary, or value laden, neglect of another. Physicians, like all citizens, may choose to act with humanity. Physicians may claim that in certain circumstances, they are not acting as a physician but as a private citizen.

Arguing that within the context of the death penalty the physician is a private citizen acting with "humanness" is flawed. Physician involvement is sanctioned by the state because physicians posses the medical knowledge of the components of lethal injection. Physicians, however, are not able to separate their medical knowledge and conduct in circumstances that possess the look and feel of a medical act. The death penalty does not claim to be a medical act and is therefore not subject to the standards within the performance of medical acts. Yet, it has chosen to usurp the tools of the medical trade thereby misleading physicians to believe they are working within the framework of medicine, and the public to believe that civility and safe oversight are in place.

Physicians are unambiguously prohibited from active participation in the death penalty according to the American Medical Associations opinion on capital punishment [17]. In the United States, only 20% of physicians are members of the AMA [18]. Additionally, only 7 of the 35 states that use the death penalty have statutory or regulatory incorporation of AMA ethical guidelines [19]. States have successfully barred medical boards from disciplining physicians who have been involved with the death penalty [20]. The AMA is limited in ability to punish physicians who are at odds with AMA policy beyond revocation of AMA membership. AMA membership is not a requirement by physicians to obtain medical licensure or practice medicine. State governments affirm legal authority in the regulation of medical practice, even in circumstance where the state medical board objects. In this regard, medical ethical conduct and state legal authority are at odds. The Nuremberg defense has clearly defined that medical practice, outside of ethical conduct is not made right by state fiat [21].

The death penalty by lethal injection is a two-fold process. First, a state government acquires a chemical, or a combination of chemicals that when injected, causes death in people. Second, these chemicals are given as a punishment to individuals who have been lawfully convicted of certain offences with the purpose of causing them to die. In this situation, the convicted individual is not a patient and therefore physicians have no role in this activity. Physicians are neither capable nor required to remove cruelty in circumstances outside of the doctor-patient relationship. Physicians as citizens are not charged with the promotion of humanness outside of the practice of medicine. Physicians therefore have no obligation or mandate to be involved. It remains the states prerogative to execute individuals but it should be prohibited from using words or methods that are terms of art, which are used by physicians to describe medical practice.

In summary, physicians have no ethical requirement to participate in the death penalty. Fundamentally, any invocation of a reduction in suffering consequent to physician activity should exist within a doctor-patient relationship. A physician and a condemned prisoner have no doctor-patient relationship in the context of the administration of the death penalty by lethal injection. If, according to the United States Supreme Court, the death penalty is not cruel per se, it needs no improvement. If the death penalty is cruel, then attempts to reduce cruelty by pharmacological adjustments are not necessarily humane, or worse, create an illusion of humanness as they are physician directed.

Endnotes

[a]http://www.ashp.org/drugshortages/current/bulletin.aspx?id=563.

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References

1. Constitution of the United States. Amendment 8 - Cruel and Unusual Punishment. 1791.
2. Baze LL, et al. [illegible] COMMISSIONER, KENTUCKY DEPARTMENT OF CORRECTIONS ET AL. CERTIORARI TO THE SUPREME COURT OF KENTUCKY No. 07-5439. 2008. Argued January 7, 2008 – Decided April 16, 2008.
3. Ty A: Anesthetizing the Public Conscience: Lethal Injection and Animal Euthanasia. Fordham Urban Law Journal Volume 35. 140 W. 62nd Street New York, NY 10023 USA: Fordham University Law School; [illegible]
4. Koniaris LG, Zimmers TA, Lubarsky DA, Sheldon JP: **Inadequate anaesthesia in lethal injection for execution.** Lancet 2005, **365**:[illegible]
5. IN RE KEMMLER. 136 U.S. 436. 1890. 136 U.S. 436.
6. Georgia GV. 1976. 428 U.S. 153 96 S. Ct. 2909 (1976) U.S. LEXIS 82 49 L. Ed. 2d 859.
7. Resweber FV. 1947. Louisiana ex rel. 329 U.S. 459 67 S. Ct. 374 91 L. Ed. 422.
8. Annas CL, Annas GJ, Contemp J: **Enhancing the fighting force: medical research on American soldiers.** J Contemp Health L & Pol'y 2009, **283** Spring.
9. Kelam EA: **Will medical ethics be a casualty of the war on terror?** J Am Acad Psychiatry Law 2006, **34**:[illegible]
10. Chapman R: **Witnesses describe killer's 'macabre' final few minutes.** Chicago Sun-Times 1994, **5**.
11. Patrick Demons VI: Brief for Patrick Demons, Walker as Amicus Curiae supporting Petitioner at [illegible] v. McDonough, 547 U.S. 573, 2006 WL 558286.

1. [illegible]
2. Physician Participation in Capital Punishment
82
3. Lethal injection is on hold in 2 states
4. Problems bog down execution of Clark
5. Physician participation in lethal injection executions
6. [illegible]
7. The role of state medical boards in regulating physician participation in executions
8. The Legacy of Nuremberg
34(1):[illegible]

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TOO SICK TO BE EXECUTED: SHOCKING PUNISHMENT AND THE BRAIN

Joel Zivot [a1]

INTRODUCTION

On February 12, 1994, Ernest Johnson, born August 20, 1960, killed three employees of a Columbia, Missouri convenience store during a robbery.[1] The victims, Mary Bratcher (age forty-six), Fred Jones (age fifty-eight), and Mabel Scruggs (age fifty-seven), died from head injuries inflicted with a hammer that was found covered in blood at the scene.[2] On June 20, 1995, Johnson was sentenced to death.[3] Johnson has a lifelong history of intellectual disability.[4] He likely suffers from fetal alcohol syndrome,[5] as his mother was known to have consumed alcohol excessively during her pregnancy.[6] Johnson was the victim of sexual abuse on multiple occasions and suffered at least two traumatic head injuries during his childhood.[7] Intellectually, Johnson withdrew from formal education after the ninth grade and has a history of chronic poor academic performance.[8] On August 28, 2008, Johnson underwent surgery on his brain to remove a tumor, referred to as a parafalcine meningioma.[9] The surgical procedure was unable to remove the tumor and small remnants remain.[10] Magnetic ***698** resonance imaging (MRI) of Johnson's brain on April 18, 2011, and July 9, 2015, revealed a consistent finding of a small bony defect in the top of his skull and a large area of missing brain tissue in the region responsible for movement and sensation in the legs.[11]

Capital punishment, to be lawfully delivered, must occur without needless cruelty.[12] Cruelty, defined in the setting of punishment, will naturally evolve with the maturation of civil society.[13] Cruel punishment will always be a relative standard, and punishment cannot exceed what is morally shocking. In the setting of public executions, observers and victims share an aspect of the experience of punishment. The inmate has little opportunity to evaluate and report back on cruelty in the moments before death. Once dead, the inmate is necessarily silent on the matter. Empathy allows observers to evaluate punishment as cruel or not. Attempts by the state to block unfettered observation of all aspects of an execution deny Eighth Amendment protection, which stipulates that inflicted punishment shall not be cruel and unusual.[14] Observation necessarily involves more than what a casual observer can surmise. Execution, as a form of killing, is a technical matter and, as such, requires more than casual knowledge of the details of that killing. Lethal injection is now the standard method of execution[15] and while never a medical act, co-opts the tools of the medical trade and engenders comment. Ethically, professional medical societies, including the American Medical Association[16] and the American Board of Anesthesiology,[17] object to

physician participation in lethal injection. As a consequence, physicians find themselves caught on the horns of a dilemma: How can the balance be struck between the benefit of some sort of technical evaluation that would reduce cruelty in executions, while refraining from instructing the state on how to kill without cruelty?

I. A PRISONER HAS A RIGHT TO HEALTHCARE

After *Estelle v. Gamble*,[18] indifference to prisoner health constitutes cruel and unusual punishment and, therefore, violates the Eighth Amendment.[19] We now interpret this to mean that a prisoner has a right to health care and that the warden is under a legal duty to provide it up until the prisoner dies a natural death.[20] If death occurs as a consequence of the execution, at ***699** what moment during the execution is this right to health care set aside, if ever? Death by execution is not instantaneous; methods of execution have been set aside as cruel because they have lasted for an uncomfortable duration.[21] Lethal injection, as the preferred method of execution, has also begun to unravel as a consequence of drug shortages.[22] States seek execution drugs from questionable sources and respond to suppliers' and participants' demands for details by passing secrecy laws.[23] Prisoners condemned to death cannot be executed by stealth or neglect.[24] Capital punishment cannot be brought about as a consequence of withholding necessary health care.[25] Nor can it occur by the infliction of sublethal injuries that, in the course of time, are expected to worsen and cause death.[26] Analytically, a death brought about nearly instantaneously would eliminate a prisoner's subjective unnecessary cruelty. An inmate who survives an execution but suffers sublethal injuries that, without treatment, will or may lead to death or disability is again entitled to health care, and the warden is under a duty to provide it.[27] A warden's failure to provide adequate medical care in these circumstances may be a criminal offense in some states, separate from any Eighth Amendment constitutional violation.[28] If an inmate survives an execution attempt, the constitutional duty requiring the delivery of necessary health care, if ever set aside, would now certainly be revived.

Practically, the state would be under an obligation to resuscitate and restore to life an inmate injured, but not killed, in the setting of an execution. As a pointed example, when the State of Oklahoma killed Clayton Lockett, it is important to understand that Lockett's death was not the result of execution.[29] By all accounts, Clayton Lockett survived the state's attempt to execute him.[30] If a physician was in the execution chamber, and Clayton Lockett was alive after an execution attempt, that physician would have a duty to try to revive him. Clayton Lockett received ***700** no such care and, having survived his execution, died slowly over the next forty minutes while others watched.[31]

II. TOO SICK TO BE EXECUTED

Missouri death row inmate Russell Bucklew was to be executed on May 21, 2014.[32] On March 21, 1996, Bucklew shot and killed Michael Sanders in a jealous rage over a former girlfriend.[33] Bucklew is plagued by the presence of large, blood-filled, vascular tumors in his face and throat known as cavernous angioma.[34] These vascular tumors have been present since birth and will continue to grow.[35] They are resistant to definitive treatment and will eventually obstruct Bucklew's airway and kill him by self-strangulation, if he is not executed first.[36] I was asked to examine him and gave an opinion for his Eighth Amendment stay application, which concluded he had a substantial risk of "suffering grave adverse events during the execution, including hemorrhaging, suffocating, and experiencing excruciating pain."[37] On May 21, 2014, Justice Samuel A. Alito restored a stay granted by a 2-1 vote of a panel of the Eighth Circuit, which had been overturned by a 7-4 vote of the participating judges of the entire circuit.[38] If Bucklew then sought medical treatment, a physician would be conflicted because treatment now could render Mr. Bucklew potentially able to be punished and was not for the restoration of health. Ethically, the doctrine of the double

effect intends to draw a distinction between what is intended and what is foreseen.[39] A physician may claim treatment is intended only to improve immediate symptoms, setting aside the foreseeable medical fitness to execute question.[40] As a consequence of these airway tumors, Bucklew cannot lie flat because gravity tugs on the tumors and blocks his breathing.[41] Execution by administration of lethal injections, for physiological efficacy, requires a prisoner to lie flat. If Bucklew were to be executed, he would have to be sitting up. In lethal injection, chemicals used by the state would worsen his breathing before rendering him unconscious.[42] It was these considerations of Bucklew's confounding medical condition that led the U.S. Supreme Court and the ***701** Eighth Circuit panel to grant the last minute stay of his execution.[43] Bucklew remains alive and the matter continues to be litigated.

Recall that Johnson, discussed in the Introduction, suffers from seizures, likely as a result of prior brain trauma and his parafalcine meningioma resection.[44] A seizure is the result of electrical hypersynchronization of networks of neurons within the cerebral cortex.[45] In the most striking cases, seizures manifest as violent and rhythmic muscle contractions associated with a loss of consciousness.[46] During a seizure, an individual may involuntarily urinate.[47] Seizures occur in a variety of settings. In the case of Johnson, structural brain defects caused by prior head trauma and brain tumor surgery are very likely seizure triggers. Medications exist that can reduce seizure events and can be prescribed to an individual suffering from recurrent seizures.[48] These medications have varying degrees of effectiveness, affected by coexisting health conditions and drug-to-drug interactions. Broadly, medications may be categorized as pro- or antiseizure, and some medications can both promote and inhibit seizure occurrences, depending on dosage and other factors.[49]

III. PENTOBARBITAL: NOT FIT FOR THE PURPOSE

Pentobarbital, a drug in the barbiturate class,[50] is now the single chemical used to cause death in the State of Missouri's lethal injection protocol.[51] Prior to the execution event, inmates may receive varying quantities of the drug midazolam, here intended to reduce anxiety.[52] Midazolam is a drug in the benzodiazepine class.[53] Barbiturates are used as medical therapy and treatment for intractable seizures.[54] Sodium thiopental, another drug in the ***702** barbiturate class, is no longer available worldwide as a consequence of a prior association with executions.[55] Sodium thiopental used to be a standard drug administered at the commencement of an anesthetic in the setting of surgery.[56] Hospira, the last remaining manufacturer of sodium thiopental, discontinued production of the drug to avoid a European Union sanction that proscribes drug manufacturing if that drug could be used in executions.[57] Barbiturates, as a class, possess two properties worth noting: First, although barbiturates are used to treat seizures, drugs in this class may also produce seizures. Second, barbiturates do not produce pain relief.[58] Barbiturates are described as "anti-algesic," meaning they worsen pain symptoms.[59]

CONCLUSION

On November 3, 2015, the Supreme Court effectively issued a temporary stay of execution for Johnson that overturned the lower court's decision to dismiss based on failure to state a claim.[60] Johnson contended that his medical condition would lead to a seizure at the time of his execution, resulting in cruel punishment in violation of the Eighth Amendment.[61] Johnson remains alive on death row. I appended MRI images of Johnson's brain structure to my affidavit in this case, which showed his brain defect.[62] These images were, arguably, persuasive in the final decision. MRI imaging is distinguishable because it creates imaging of extremely high fidelity.[63] With minor explanation, nonmedical individuals can understand the significance of these images. In Johnson's case, the brain defect is easily observed and dramatic.[64]

In the setting of a planned execution, Johnson's coexisting neurological medical condition creates an unusual problem for courts and for the medical system. For courts, execution must not violate the Eighth Amendment.[65] The use of lethal injection as the method for execution creates a circumstance not intended to be a medical act but nonetheless impinges ***703** enough that it demands medical consideration. For medicine, the problem is the opposite. Lethal injection is not a medical act but approximates it to a sufficient degree that it compels the involvement of doctors. If a doctor comments or advises on aspects of execution, he or she risks being sanctioned or reprimanded by professional medical societies.[66] From a medical practice perspective, the doctor-patient relationship is predicated on consent as expressed and evaluated by a person at liberty. Prisoners have concerns about health that can be fundamentally different than individuals at liberty. It may be in the interest of a prisoner to reject medical care, if that care would make them fit for execution. In the circumstance when a prisoner lacks capacity, a substitute decision maker would be required to consider treatment, or the rejection of it, in the same fashion as the prisoner. The Supreme Court seems to agree that Johnson was likely too sick to be executed, setting the matter aside for the lower courts to decide. Owing to prolonged periods of delay faced by the average death row prisoner facing execution, coexisting medical problems are likely to occur. If the state continues to use lethal injection in some form, the medical questions cannot be easily set aside. Between the interests of the state and the interests of the medical profession, lethal injection does not offer an ethical, halfway compromise.

Footnotes

a1 M.D., FRCP(C); Associate Professor of Anesthesiology and Surgery, Emory University School of Medicine; Adjunct Professor of Law, Emory School of Law. Thanks to Ken Arenson, JD, for editorial assistance. This Article is part of a symposium entitled *Criminal Behavior and the Brain: When Law and Neuroscience Collide* held at Fordham University School of Law. For an overview of the symposium, see Deborah W. Denno, *Foreword: Criminal Behavior and the Brain: When Law and Neuroscience Collide*, 85 FORDHAM L. REV. 399 (2016).

1 *See* State v. Johnson, 968 S.W.2d 686, 689-90 (Mo. 1998) (en banc).

2 *Id.* at 690.

3 *Ernest Lee Johnson*, MURDERPEDIA, http://murderpedia.org/male.J/j/johnson-ernestlee.htm (last visited Oct. 16, 2016) [https://perma.cc/YW9W-L3ZD].

4 *See Johnson*, 968 S.W.2d at 700.

5 *See generally* Keshav K. Gupta et al., *An Update on Fetal Alcohol Syndrome-Pathogenesis, Risks, and Treatment*, 40 ALCOHOLISM 1594 (2016), http://onlinelibrary.wiley.com/doi/10.1111/acer.13135/epdf [https://perma.cc/RQU7-JRSK].

6 *See* Brief for Respondent, *Johnson*, 968 S.W.2d 686 (No. SC90582), 2010 WL 4875200, at *34.

7 *See Johnson*, 968 S.W.2d at 696, 700.

8 *See id.* at 700.

9 *See Meningioma Brain Tumor*, UCLA HEALTH, http://neurosurgery.ucla.edu/meningioma-brain-tumor (last visited Oct. 16, 2016) [https://perma.cc/GU2C-QLE9].

10 *See* Johnson v. Lombardi, 809 F.3d 386, 390 (8th Cir.), *cert. denied*, 136 S. Ct. 601 (2015).

11 *See* E. Johnson MRIs performed by Dr. Zivot on Apr 18, 2011 and July 9, 2015 [hereinafter E. Johnson MRIs] (on file with the author).

12 *See* Baze v. Rees, 553 U.S. 35, 50 (2008).

13 *See id.* at 62.

14 U.S. CONST. amend. VIII.

15 *See Baze*, 553 U.S. at 44.

16 *AMA Code of Medical Ethics Chapter 9.7.3*, AM. MED. ASS'N, https://download.ama-assn.org/resources/doc/code-medical-ethics/code-2016-ch9.pdf?cb=1473808459&retrieve=yes (last visited Oct. 16, 2016) [https://perma.cc/VQ78-EHBB].

17 J. Jeffrey Andrews, *Anesthesiologists and Capital Punishment*, AM. BOARD ANESTHESIOLOGY, INC. (May 2014), http://www.theaba.org/PDFs/BOI/CapitalPunishmentCommentary [https://perma.cc/Z8RD-5JLK].

18 429 U.S. 97 (1976).

19 *See id.* at 104.

20 *See id.* at 104-05.

21 *See* LaGrand v. Stewart, 173 F.3d 1144, 1149 (9th Cir. 1999) (quoting Fierro v. Gomez, 77 F.3d 301, 308-09 (9th Cir.), *vacated*, 519 U.S. 918 (1996)).

22 *See* Maurice Chammah & Tom Meagher, *How the Drug Shortage Has Slowed the Death-Penalty Treadmill*, MARSHALL PROJECT (Apr. 12, 2016, 5:29 PM), https://www.themarshallproject.org/2016/04/12/how-the-drug-shortage-has-slowed-the-deathpenaltytreadmill#.5sDGiYkA1 [https://perma.cc/LFR3-RBKD].

23 *See* Deborah W. Denno, *Lethal Injection Chaos Post-*Blaze, 102 GEO. L.J. 1331, 1377-81 (2014).

24 *See Estelle*, 429 U.S. at 104.

25 *See id.*; *see also* Wilkerson v. Utah, 99 U.S. 130, 136 (1879).

26 *See In re* Kemmler, 136 U.S. 436, 447 (1890).

27 See Craig A. Conway, *A Right of Access to Medical and Mental Health Care for the Incarcerated*, HEALTH L. PERSP. (June 2009), https://www.law.uh.edu/healthlaw/perspectives/2009/(CC)%20Prison%20Health.pdf [https://perma.cc/5K3H-EY88].

28 *See id.*

29 *See* Jeffrey E. Stern, *The Cruel and Unusual Execution of Clayton Lockett: The Untold Story of Oklahoma's Botched Lethal Injection—and America's Intensifying Fight Over the Death Penalty*, ATLANTIC (June 2015), http://www.theatlantic.com/magazine/archive/2015/06/execution-clayton-lockett/392069/ [https://perma.cc/T4T6-L4DM].

30 *See id.*

31 *See id.*

32 Warrant of Execution at 2, State v. Bucklew, 973 S.W.2d 83 (Mo. Apr. 9, 2014) (No. SC80052).

33 State v. Bucklew, 973 S.W.2d 83, 86-87 (Mo. 1998).

34 *Cavernous Angioma*, UCLA HEALTH, http://neurosurgery.ucla.edu/cavernousangioma (last visited Oct. 16, 2016) [https://perma.cc/PBA5-J8NB].

35 *See* Bucklew v. Lombardi, 783 F.3d 1120, 1124 (8th Cir. 2015).

36 *See id.*

37 *Id.* at 1126.

38 *See* Bucklew v. Missouri, 134 S. Ct. 2333, 2333 (2014); *Bucklew*, 783 F.3d at 1120.

39 *Doctrine of Double Effect*, STAN. ENCYCLOPEDIA PHIL. (Sept 23, 2014), http://plato.stanford.edu/entries/double-effect/ [https://perma.cc/QY5G-N5EG].

40 *See id.*

41 *See Bucklew*, 783 F.3d at 1125.

42 *See id.* at 1125-26.

43 *See Bucklew*, 134 S. Ct. at 2333; *Bucklew*, 783 F.3d at 1120.

44 *See Meningioma Brain Tumor*, *supra* note 9 and accompanying text.

45 Robert S. Fisher et al., *Epileptic Seizures and Epilepsy: Definitions Proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE)*, 46 EPILEPSIA 470, 470-72 (2005).

46 *See id.*

47 *See Epilepsy Signs and Symptoms*, UCSF MED. CTR., https://www.ucsfhealth.org/conditions/epilepsy/signs_and_symptoms.html (last visited Oct. 16, 2016) [https://perma.cc/9BCQ-ADLX].

48 *See* Steven C. Schachter, *Antiseizure Drugs: Mechanism of Action, Pharmacology, and Adverse Effects*, UPTODATE, http://www.uptodate.com/contents/antiseizure-drugsmechanismof-action-pharmacology-and-adverse-effects (last visited Oct. 16, 2016) [https://perma.cc/LSP7-FMVM].

49 *See generally* Hannah R. Cock, *Drug-Induced Status Epilepticus*, 49 EPILEPSY & BEHAV. 76, 76-82 (2015).

50 *Pentobarbital*, DRUGS.COM, https://www.drugs.com/ppa/pentobarbital.html (last visited Oct. 16, 2016) [https://perma.cc/KED3-MYU5].

51 *See, e.g.*, Clayton v. Lombardi, 780 F.3d 900, 903 (8th Cir. 2015).

52 *See* Chris McDaniel, *Missouri Used Midazolam in Its Most Recent Execution*, ST. LOUIS PUB. RADIO (Jan. 22, 2015), http://news.stlpublicradio.org/post/missouri-usedmidazolamits-most-recent-execution#stream/0 [https://perma.cc/6492-NEVG].

53 *Midazolam*, DRUGS.COM, https://www.drugs.com/mtm/midazolam.html (last visited Oct. 16, 2016) [https://perma.cc/3THU-45QG].

54 *See Barbiturate Anticonvulsants*, DRUGS.COM, https://www.drugs.com/drugclass/barbiturate-anticonvulsants.html (last visited Oct. 16, 2016) [https://perma.cc/5LRZ9Q2G].

55 *See* Ralph Ellis et al., *Pfizer Moves to Block Its Drugs from Being Used in Lethal Injections*, CNN (May 14, 2016, 6:12 AM),

http://www.cnn.com/2016/05/13/health/pfizerdeathpenalty-drugs/ [https://perma.cc/HQ3B-ESB3].

56 *See Thiopental Sodium*, DRUGS.COM, https://www.drugs.com/ppa/thiopentalsodium.html (last visited Oct. 16, 2016) [https://perma.cc/CA2K-Q2ZX].

57 *Statement from Hospira Regarding Its Halt of Production of Pentothal (Sodium Thiopental)*, DEATH PENALTY INFO. CTR. (Jan. 21, 2011), http://www.deathpenaltyinfo.org/documents/HospiraJan2011.pdf [https://perma.cc/K6G4-3D3J].

58 *See* J. Clutton-Brock, *Pain and the Barbiturates*, 16 ANAESTHESIA 60, 60 (1961).

59 *See id.*

60 *See* Johnson v. Griffith, 136 S. Ct. 444, 444 (2015).

61 Johnson v. Lombardi, No. 2:15-CV-4237-DGK, 2015 WL 6501083, at *2 (W.D. Mo. Oct. 27, 2015), *appeal dismissed*, 815 F.3d 451 (8th Cir. 2016).

62 *See* E. Johnson MRIs, *supra* note 11.

63 One note of caution: other brain-imaging technologies, if aimed at ongoing brain function as opposed to the brain structure shown by MRI, can result in vagueness and uncertainty.

64 *See* E. Johnson MRIs, *supra* note 11.

65 *See* U.S. CONST. amend. VIII.

66 *See, e.g.*, *AMA Code of Medical Ethics Chapter 9.7.3*, *supra* note 16.

85 FDMLR 697

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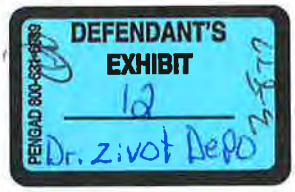
Public Health & Policy

The White Coat: A Veil for State Killing?



by Joel Zivot, MD

August 17, 2014

In this guest post, Joel Zivot, MD, of Emory University Hospital, recounts witnessing an execution by lethal injection, and laments the secrecy surrounding the identity of physicians who participate.

I am dropped off at the Georgia Diagnostic and Classification State Prison as a witness to an execution. I am uncomfortable, but as a physician providing expert anesthesiology testimony in lethal injection cases, I feel compelled to see this for myself.

The afternoon is hot and muggy, and I am standing in a field bounded by a yellow rope. I am overdressed in a suit jacket and was not planning on being outside. What does one wear to an execution?

Several corrections officers soon approach. This staging area is full of corrections officers in paramilitary regalia. It's off-putting, and I can't help but wonder what the show of firepower and force is supposed to convey. What army would attack such an event?

I am expected. My name is found on the invited list, and I am addressed politely as Dr. Zivot, but I am asked to hand over my suit jacket (which actually is a relief) and also my cell phone, watch, pen, and wallet -- everything except for my driver's license. They inform me that all will be returned at my departure.

Now I am alone, unable to communicate with anyone or even note the passage of time. They reassure me that a van will arrive shortly to drive me to the prison. I am struck by my loss of independence. Usually, when it is known that I am a physician, some social deference is shown me without asking, and the loss of control unnerves me. I have been warned in advance that I cannot protest or I will be refused entry, and so I go along obediently.

A corrections officer pulls up in a van and takes me to another building where I pass through a metal detector and am asked to produce my identification. I soon realize that my driver is actually my guard and I am unsure if he is protecting me or constraining me.

We are taken to an office and I am told to wait for further instruction. A clock is on the wall and I am grateful for that information. Five hours pass. From time to time, I am provided with an odd selection of food, a sort of prison hospitality. It doesn't feel like I can refuse these offerings and I cannot imagine what social custom applies here.

At some point, I need to use the restroom and after asking permission, I am followed into the toilet itself. No one is unkind and some are even pleasant. Still, my loss of freedom is complete, and deep within this prison I rely on my host/captors to guide me.

An official arrives and informs me that it is time to leave, and we drive to yet another building. It is dark now and the road is poorly lit, lined by corrections officers in body armor holding automatic weapons. We pass through a barbed-wire gate, probably 20 feet in height. The van is trapped in a fenced area. More corrections officers inspect it. They open the hood and use mirrors to examine its chassis.

When we're waved through, we drive across an open field to a small, unmarked building -- no larger than a trailer -- next to a basketball court. A van marked "Coroner" pulls up next to us. Men in body armor, with weapons drawn, guard this building. We wait outside. The night is still and the air is warm and muggy, typical for Georgia at this time of year.

Looking at the basketball court, I wonder: who uses it?

In the Execution Chamber

Without notice, the door to the small building opens and I am ushered in. The room is small and already full of people. Benches are arranged like church pews and the front row with eight seats is full of men who do not turn around as I take my place, as instructed, in the second row. In a moment another man sits beside me. I see he has a watch and a pen.

Before me on the other side of a large window I see a man lying on a gurney. The gurney is tipped forward, head higher than feet -- reverse Trendelenburg in my lexicon. His arms

are at 45-degree angles and secured to arm boards with leather straps. He is covered in a sheet from just below his chin. I count three intravenous puncture sites visible on his arms. Two are connected to IV tubing that disappears through a small hole in the rear of the room. Also at the rear, I see the half-mirrored, one-way viewing window.

My eyes drift back to his arms. Oddly, I notice that his fingers are taped palm-down to each arm board. In the operating room this position might lead to ulnar nerve injury, but here, I see at once that another purpose is intended. With his fingers secured, he will be unable to clench his fists, should he be so inclined.

Now the warden stands next to him and asks if he has a statement to make. In a calm voice, the inmate replies that he does, and the warden informs him that he has 2 minutes. I wonder if someone is actually timing this. The inmate offers an apology, thanks God and his family, and is done. This is broadcast to us. The speakers must have been turned on and off because I heard no other sounds from the chamber until then or after.

The warden leaves that room. Next to the inmate stands a woman in a short white coat. I see two corrections officers standing motionless on either side of the inmate. I have no watch, and I start to count in my head as a way of trying to sort out the timing of all of this. I try to look at the watch of the person next to me, without him noticing.

The inmate has an apparent change in his respiratory pattern and I assume the execution has therefore begun. He twitches strongly once, mostly on the left side of his body. I am looking hard now for something in his breathing or in his movements that I could construe as consciousness or the lack of it.

I lose count, when, suddenly, one of the corrections officers faints and falls forward, striking the legs of the inmate. The officer has his eyes open as he falls but he clearly is without consciousness. It is so startling that I fail to notice if the inmate reacts. In a moment, the execution chamber fills with people who drag out the unconscious officer and another assumes his position.

Somewhere in this room are two doctors who are participating in this execution -- but I wonder why neither of them has come to the aid of the unconscious officer.

The Georgia Secrecy Act

As a practicing doctor, when I see someone collapse in the hospital, I immediately move towards them. Did the doctors overseeing the execution have qualms about helping

someone stay alive if it meant leaving their post that required them to monitor the killing of the inmate? Did a grotesque conflict arise in this unlikely circumstance between their interest and their duty?

It begins to strike me that they may have a serious ethical problem.

I can't feel sorry for them, but I do see the shame they can bring to my profession if "doctors" can be hired to assure that death occurs.

Later, I look up the rules about this. The Georgia Composite Medical Board licenses physicians. Like all medical boards in the U.S. and Canada, it is self-governed by physicians who set the standards for all who wish to practice medicine in the state. It operates under legislative authority according to the Medical Practice Act. In this act, to practice medicine means "to hold oneself out to the public as being engaged in the diagnosis or treatment of disease, defects, or injuries of human beings."

Life is not a disease, defect, or injury. Nothing in the Medical Practice Act authorizes a physician to cure someone of his life. In return for being allowed to govern themselves, physicians who are elected by their peers to run these medical boards are bound to protect the public interest from those who do not observe the board's ethical and practice standards. The board is a "public authority" and enjoys certain historic rights and privileges as well as statutory rights to obtain subpoenas and compel disclosure to help it discover what it needs to know to govern doctors in their medical practice, or to discipline those who violate the norms under the Medical Practice Act.

I wonder why the board has allowed the two men who are overseeing the execution to call themselves physicians.

I dig deeper. It appears these doctors cannot easily be governed by the Georgia Composite Medical Board because their identity is a state secret.

In Georgia, House Bill 122: Sexual Offender Registration Review Board and Board of Pardons and Parole Record; Death Penalty Record, signed into law by Governor Nathan Deal in 2013, contains a provision that protects the identity of these men as a confidential state secret.

It effectively forbids the state from divulging information on anyone who participates in executions -- and extends that privacy to "any person or entity that manufactures, supplies, compounds, or prescribes the drugs, medical supplies, or medical equipment utilized in the execution of a death sentence."

In Georgia, and in other states that have secrecy laws, medical boards are usurped and the state now authorizes what behavior constitutes acceptable medical practice.

This cannot be permitted. If the state prevents the board from regulating certain doctors, public health can be undermined in secret. If the state has the power to immunize physicians from oversight of their peers and colleagues, they have a terrible power to pervert the delivery of healthcare for some bureaucrat's idea of the public good. It is a horrific precedent that can be abused, even with the best of intentions.

Let us not allow the continued slide down that slippery slope. Until now, the Georgia Composite Medical Board has remained silent. It could, however, mount a case for the names of the men whom I saw behave discreditably and who should have their licenses to practice as physicians revoked.

Executions will go on in one way or another, just as they have for centuries, without the involvement of physicians. A court may weigh the state's interest in providing a cosmetic appearance of a medical procedure as the veil for an execution by lethal injection against the ancient constitutional or common law right or freedom of public health, which includes an effective system of regulating physicians' practice.

If the Georgia Composite Medical Board, or any other state medical board, refuses to be a plaintiff against the warden for an order of mandamus to force disclosure of the identities of physicians hired to supervise the lethal injections, then probably any resident in that state has a sufficient interest in knowing whether the men in question are his or her doctors (let's call one of them Mr. Jones).

Residents may bring a relator action against the warden and may name the medical board as a defendant in whose name Mr. Jones moves the court for mandamus. The citation of the case would read: Georgia Composite Medical Board, ex rel. Jones v. Warden, Georgia Diagnostic and Classification State Prison.

Final Moments

After the corrections officer fainted, we, the witnesses, sat in stunned silence, although our attention slowly returned to the inmate. I saw no further breathing and in moments, perhaps 10 or 15 minutes after the inmate's last statement, the two doctors finally appeared in the room. Both had stethoscopes and one was wearing a white lab coat.

I am struck by the lab coat, worn by TV doctors and in a few medical specialties, although in the operating room I wear a green top and pants, and in my intensive care unit I wear a shirt and tie.

So, who is that for? The execution is bloodless.

The doctors listen to the inmate's chest and look into his eyes. This takes a few minutes, and then they both turn towards the warden. Finally, the speakers turn on as the warden announces the time of death.

Since neither of these men with their medical equipment came forward when the corrections officer collapsed, is the white coat merely a veil for state killing in the execution chamber?

The official record makes no mention of the collapsed corrections officer. I suppose it was believed to be unnecessary information. The execution did succeed, and the inmate never once clenched his fists.

Related:

Three Strikes: Time to End Lethal Injection?

Lethal Injection: A Cruel, Painful, Terrifying Execution

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The New York Times https://nyti.ms/1ilG624

U.S.

Timeline Describes Frantic Scene at Oklahoma Execution

By ERIK ECKHOLM and JOHN SCHWARTZ MAY 1, 2014

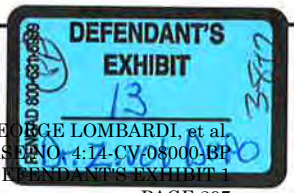
McALESTER, Okla. — Early on the morning of Clayton D. Lockett's scheduled execution, he defied prison officers seeking to shackle him for the required walk to get X-rays. So they shocked him with a Taser, Oklahoma's chief of corrections stated in an account released Thursday of Mr. Lockett's final day, before his execution went awry.

Once Mr. Lockett was in an examining room, the staff discovered that he had slashed his own arm; a physician assistant determined that sutures would not be needed.

Hours later on that Tuesday, as his 6 p.m. time for lethal injection approached, Mr. Lockett lay strapped on a gurney in the execution chamber.

Finding a suitable vein and placing an IV line took 51 minutes. A medical technician searched both of his arms, both of his legs and both of his feet for a vein into which to insert the needle, but "no viable point of entry was located," reported the corrections chief, Robert Patton, in a letter to Gov. Mary Fallin that her office released. A doctor, the letter said, "went to the groin area."

A catheter was inserted into Mr. Lockett's groin, and officials placed a sheet over him for privacy. The account did not make clear who inserted the catheter.



its secret sources of lethal drugs.

The detailed timeline raised further questions about Mr. Lockett's treatment before and during the bungled execution and subsequent death. Mr. Patton recommended indefinitely suspending further executions, an independent review of what took place, and that he be given power over execution protocol and decision making, rather than the state penitentiary warden.

"I believe the report will be perceived as more credible if conducted by an external entity," Mr. Patton said. The governor had previously called for a review by state officials.

The account gave greater detail about Mr. Lockett's final minutes and the frantic scene that unfolded after the blinds were drawn on witnesses. With something clearly going terribly wrong, the doctor "checked the IV and reported that the blood vein had collapsed, and the drugs had either absorbed into the tissue, leaked out or both," Mr. Patton wrote.

The warden called Mr. Patton, who asked, "Have enough drugs been administered to cause death?" The doctor answered no.

"Is another vein available, and if so, are there enough drugs remaining?" The doctor responded no again. Mr. Patton then asked about Mr. Lockett's condition; the warden said that the doctor "found a faint heartbeat" and that Mr. Lockett was unconscious.

At 6:56, Mr. Patton called off the execution. Ten minutes later, at 7:06, "Doctor pronounced Offender Lockett dead," the letter states.

Legal experts on the death penalty said they were surprised, and even shocked, by several things revealed in the new letter. "I've never heard of a case of an inmate being Tasered before being executed," said Deborah Denno, an expert on execution at Fordham Law School and a death penalty opponent.

David Dow, a death penalty appellate lawyer in Texas, said that prisoners

not have a second vein ready in case of problems with the first. "For a state that executes people," he said, "they are awfully bad at it."

Madeline Cohen, a federal public defender who is counsel to a second prisoner who was originally to have been executed on Tuesday night, issued a statement criticizing the incremental release of information.

"Oklahoma is revealing information about this excruciatingly inhumane execution in a chaotic manner, with the threat of execution looming over Charles Warner," she said, referring to the second prisoner. "This most recent information about the tortuous death of Mr. Lockett, and the state's efforts to whitewash the situation, only intensifies the need for transparency."

Mr. Lockett was condemned for the murder of a 19-year-old woman whom he shot and buried alive. Mr. Warner was convicted of raping and killing an 11-month-old girl.

The disorderly execution, Mr. Lockett's apparent suffering and the legal battles within Oklahoma that preceded it over the state's refusal to disclose where it obtained execution drugs have drawn international attention to problems with lethal injections. Accidents have become more common, experts say, as states, facing shortages in critical drugs, are trying new drugs and combinations from secret sources.

But Oklahoma officials said that problems with the IV delivery, not the drugs themselves, accounted for Tuesday night's problems.

Anesthesiologists said that while they sometimes use a femoral vein accessible from the groin when those in the arms and legs are not accessible, the procedure is more complicated and potentially painful.

Putting a line in the groin "is a highly invasive and complex procedure which requires extensive experience, training and credentialing," said Dr. Mark Heath, an anesthesiologist at Columbia University. Oklahoma does not reveal the personnel

"There are a number of ways of checking whether a central line is properly placed in a vein, and had those been done they ought to have known ahead of time that the catheter was improperly positioned," Dr. Heath said.

Dr. Joel Zivot, an anesthesiologist at the Emory University School of Medicine, said that the prison's initial account that the vein had collapsed or blown was almost certainly incorrect.

"The femoral vein is a big vessel," Dr. Zivot said. Finding the vein, however, can be tricky. The vein is not visible from the surface, and is near a major artery and nerves. "You can't feel it, you can't see it," he said.

Without special expertise, Dr. Zivot said, the failure was not surprising.

Alex Weintz, a spokesman for the governor, said that Ms. Fallin could grant a stay only of up to 60 days, and that a request for an indefinite stay would have to be made by the attorney general to the state's Court of Criminal Appeals.

"If he chooses to make that request, Governor Fallin would support him," Mr. Weintz said. "Ultimately, Governor Fallin's goal, as well as Director Patton's, is to review the procedures at the Department of Corrections, ensure they work and then proceed with lawful executions in Oklahoma."

Erik Eckholm reported from McAlester, and John Schwartz from New York.

A version of this article appears in print on May 2, 2014, on Page A1 of the New York edition with the headline: Timeline Describes Frantic Scene at Execution.

The Washington Post

The Watch

Florida's gruesome execution theater

By Liliana Segura March 19, 2014

(*Liliana Segura is currently a senior editor for The Intercept, where she will be launching and contributing to the site's criminal justice coverage.*)

In the decades he spent filing stories from Jacksonville after visits to Florida's execution chamber, former AP reporter Ron Word saw a lot that still lingers in the back of his mind. There are the images from the old days of the electric chair: The executioner's black hood, only visible through a slit in the wall; or the electrician's thick rubber gloves, worn in the event of mechanical problems. And there are the dramatic episodes: the execution of Ted Bundy; electrocutions in which "there were flames coming off the inmates' heads"; the botched, bloody death of Allen Lee "Tiny" Davis in 1999, in a special electric chair built for his 344-pound body, then never used again.

There were the times the Florida Department of Corrections (DOC) tried to alter the narrative. Once, Word remembers, in the early days of lethal injection, he got a call from prison officials telling him, "You're gonna' have to change the times in your story. They don't agree with our times." Word refused. Another time, after the agonizing 34-minute death of Angel Diaz — executioners pushed the IV needles into his flesh instead of his veins — Word says the DOC "pretty much lied to us that night." Prison officials claimed Diaz had some sort of liver problem, "but as it turned out there was nothing wrong with his liver. It was because of the procedure they used."

That happened around Christmas of 2006. Afterward, Florida temporarily halted executions and revised its protocol. And that's when they brought in the moon suits.

"At all Florida lethal injections, a man in a purple moon suit leans over the dying inmate to listen for a heartbeat and feel for a pulse," Word reported in the summer of 2007. "After a few seconds, he nods, and the witnesses are informed that the death sentence has been duly carried out. The man is a doctor, and the gear shields his identity — not just from the prisoner's family and friends, but from the American Medical Association, whose code of ethics bars members from participating in executions."

The moon suits still stick out in Word's memories. "It kind of surprised me when they first showed up. It was kind of bizarre." Regardless, he says, "after two or three executions they quit using them." The moon suits appeared to attract rather than deflect attention. Other states had developed less theatrical ways of hiding the identities of doctors who helped them kill prisoners.

Word was laid off in 2009, after witnessing some 60 executions. Speaking over the phone from Jacksonville, he says that most of them blend together in his mind. Whether they used the electric chair or lethal injection, state officials aimed to make the procedure bear as little resemblance as possible to what was actually happening — the taking of a human life. "The result was the same," he says, and both involved practiced rituals and procedures that "made it as sanitized as possible." But Word adds, "I think it used to be more open than it is now. More transparent." From what he could tell, "lethal injection was kind of a learning exercise."

A learning curve for killing

"Learning exercise" is a pretty good way to describe Florida's approach to lethal injection these days. On Thursday, the state plans to execute 55-year-old Robert Henry for a gruesome double murder committed in 1987. To kill him, prison officials will use a new protocol implemented last fall, which introduced the sedative midazolam into the state's lethal drug mix. Commonly used for a variety of medical purposes, including patients undergoing surgery, midazolam had never before been used in executions until Florida adopted it. It's also unclear how the state, which is now killing prisoners at a brisk pace, came up with the idea to use the drug in the first place.

Nevertheless, in a letter to Governor Rick Scott last September, Florida Department of Corrections Secretary Michael Crews provided lofty assurances that the new procedure "is compatible with evolving standards of decency that mark the progress of a maturing society, the concepts of the dignity of man, and advances in science, research, pharmacology, and technology."

"The foremost objective of the lethal injection process," Crews wrote, "is a humane and dignified death."

But the first Florida prisoner executed with the new method, William Happ, died last October "in what seemed like a labored process," according to a reporter for the *Sun Sentinel*. "At times his eyes fluttered, he swallowed hard, his head twitched, his chest heaved." An AP report said "it appeared Happ remained conscious longer and made more body movements after losing consciousness than other people executed . . . under the old formula."

But a circuit court judge later concluded there was "no credible evidence" that Happ had suffered. So Florida stuck with the new process. Barring a last-minute stay of execution, tomorrow Robert Henry will be the fifth prisoner killed in this manner.

In the 2008 case *Baze v. Rees*, the U.S. Supreme Court upheld the three-drug lethal injection protocol that had been used for years by most death penalty states. Ironically, a couple years after, many states began moving away from it. Shortages of the drugs used in that protocol have since forced states find new ways to kill prisoners. Those shortages are in part due to a

campaign by the U.K.-based human rights group Reprieve. The group has enormous success convincing overseas companies to bar their drugs from export to the U.S. for use in executions. "Pharmaceutical companies make medicine to cure people," Reprieve founder Clive Stafford Smith recently wrote, "so they object to their drugs being used to kill."

What has followed is chaos, controversy and improvisation, all played out on the bodies of prisoners. States are now choosing new drugs based more on their availability than on medical science. State prison officials have been inventing protocols as they go along and conducting what amount to experimental executions.

The trend began in 2010, when diminishing supplies of sodium thiopental—the first drug in the three-drug "cocktail" upheld by the Court in *Rees*—prompted death penalty states to get creative in their search for execution drugs. In 2011, I wrote an article for *The Nation* describing the consequences in Georgia, where two inmates had recently died with their eyes open—a grim indication that the sodium thiopental had not worked as intended, and that the men had likely suffered agonizing deaths. There was also evidence that the drugs had been used past their expiration dates. Lawyers for death row inmates traced source of the drugs overseas to a sketchy pharmaceutical wholesaler named Dream Pharma, which advertised that it could discreetly sell "discontinued" and "hard to find" drugs.

Death penalty states have since given up on getting sodium thiopental — its U.S. manufacturer no longer makes the drug, and European makers are now banned from exporting it for executions — but the scattered, secretive searches have continued. Today, unregulated compounding pharmacies are increasingly the go-to source (despite few guarantees about the effectiveness of the drugs they sell) and pentobarbital — a barbituate like sodium thiopental — has become the go-to drug (despite no guarantees about how it functions in an execution). These changes have come quickly, quietly, and secretively. After Ohio became the first to use a single lethal dose of pentobarbital to kill a prisoner in March 2011, Texas swiftly announced that it would do the same. Lawyers for Cleve Foster, the next in line to die, protested the complete lack of transparency with which the drug had been adopted (which also happened to violate state law). As Foster's attorney, Maurie Levin, told me the day before his scheduled execution in April 2011, pentobarbital "has not been vetted. It certainly hasn't been vetted in Texas." (After several stays from the Supreme Court, Foster was executed in September 2012.) Nevertheless, according to the Death Penalty Information Center (DPIC), fourteen states now plan to use pentobarbital to kill prisoners—and five more plan to use it going forward.

No state has been more eager to experiment than Ohio, which boasts a number of lethal injection "firsts," according to the DPIC. On January 16, the state killed Dennis McGuire using the unprecedented combination of midazolam and the pain medication hydromorphone. The execution was so dramatically botched that it made international headlines. Horrified witnesses watched as the 253-lb McGuire "repeated cycles of snorting, gurgling and arching his back" and appeared to "writhe in pain," according to a subsequent lawsuit filed by his family. Making matters worse, state officials had been warned in advance that the use of the untested drugs put McGuire at risk of a horrific, suffocating death. They went ahead with the execution anyway.

As Florida's execution of Robert Henry approaches, his attorneys warn that he, too, is likely to suffer. At an evidentiary hearing on March 10, Emory University anesthesiologist Dr. Joel Zivot — a vocal critic of this form of lethal injection—said that "science is being misused and misunderstood" in his case. Zivot testified that Henry's combined health problems—

including hypertension, high cholesterol, and coronary artery disease—provide a "high degree of certainty" he will suffer a heart attack on the gurney. The Florida Supreme Court rejected that argument. In response, Henry's supporters denounced the ruling, pointing out that the court had relied on the testimony of "the Government's go-to doctor for death," Dr. Mark Dershwitz. Dershwitz has lent his medical expertise to reassure states of the soundness of their killing protocols in dozens of cases, including the experiments that led to Ohio's disastrous execution of Dennis McGuire.

State secrets

Earlier this year, the Florida Supreme Court ordered a hearing in which Florida DOC officials explained what precautions they take to ensure that inmates experience "a humane and dignified death." But instead of discussing why and how the state chose what drugs it uses, the hearing was a farcical discussion of minutia. As A.P. journalist Tamara Lush reported, DOC Assistant Secretary Timothy Cannon testified that DOC officials had come up with a new way of performing a "consciousness check" on a prisoner. In his capacity as the execution "team leader," Cannon testified that whereas he previously used what he called a "shake and shout"—grabbing an inmate's shoulders and yelling his name—he now relies on the more subtle "trapezoid pinch," or squeezing the flesh between a prisoner's neck and shoulder.

Cannon also explained that as part of their training, members of the execution team would take turns playing the role of the condemned. That practice, he said, generated some helpful feedback. "We've changed several aspects of just the comfort level for the inmate while lying on the gurney," he testified. "Maybe we put sponges under the hand or padding under the hands to make it more comfortable, changed the pillow, the angle of things, just to try to make it a little more comfortable, more humane and more dignified as we move along."

So while Florida DOC officials proved they have pondered the ways in which gurneys can be turned into a cozier death beds, they provided no answers regarding the efficacy, origin or humaneness of the methods they are using to kill people. In fact, a spokesperson told the National Journal last fall that the official DOC policy is to refuse "to go into any detail about how or why the protocol was designed. Those decisions are exempt from public record because they could impact the safety and security of inmates and officers who are involved in that process."

But Florida isn't alone in its secrecy. *The Atlantic*'s Andrew Cohen has written at length about how "state officials all over the nation have sought to protect this information from public disclosure." In Missouri, the only state that still carries out executions at midnight, state officials are embroiled in an ugly, ongoing battle to deny inmates any information about the drugs that will be used to kill them. In Georgia, where the federal Drug Enforcement Administration ultimately raided the Department of Correction in 2011 to seize the supply of sodium thiopental the state got from Dream Pharma, lawmakers have responded by pushing legislation that would make the origins and procurement of lethal injection drugs a "confidential state secret." Other states whose supplies were also raided by the DEA have responded similarly. In Tennessee, which intends to execute ten prisoners beginning later this year, officials waited for such a secrecy law to pass the state legislature before announcing the parade of executions. The DPIC estimates that seven states have passed similar laws.

If today's executions truly represented the heights of moral advancement suggested by Secretary Crews in his letter to Rick Scott last fall, it may seem odd that state governments would go to such lengths to keep the public from knowing anything about them. Of course, part of that is likely due to the success of groups like Reprieve. If states don't reveal what drugs they're using, Reprieve can't pressure the drugs' makers to refuse to sell the drugs for executions.

But today's fight over transparency and lack of concern over botched executions are good reminders of the fundamental lie at the heart of lethal injection: It is a punishment that, by its very design, has always been rooted in secrecy rather than medical science. Never mind the rhetoric about "humane and dignified death." However brutish the electric chair or gas chamber might appear by comparison, the only thing that truly sets lethal injection apart is that it was devised to mask what it was doing to its victims. As states have been forced to abandon that original design, lethal injection has been exposed for what it actually is: an experimental, unscientific form of premeditated killing.

"To hell with them. Let's do this."

Perhaps the best illustration of just how little consideration went into the design of lethal injection is the story behind the development of the protocol later used by most death penalty states and eventually approved by the Supreme Court in *Rees*. In a 2007 article for the *Fordham Law Review*, law professor Deborah Denno explained how Oklahoma first came up with the idea in 1977.

Like much criminal justice policy, it was based more on hunches and gut reactions than science and empirical data. "At each step in the political process," Denno wrote, "concerns about cost, speed, aesthetics, and legislative marketability trumped any medical interest that the procedure would ensure a humane execution." Although government-appointed commissions in both the U.S. and U.K. had by then studied and rejected lethal injection — with the latter finding "a lack of 'reasonable certainty' that lethal injections could be performed 'quickly, painlessly and decently'"— Oklahoma legislators resurrected the idea after the U.S. Supreme Court reinstated the death penalty with *Gregg v. Georgia* in 1976. "Seemingly oblivious to prior concerns, American lawmakers emphasized that lethal injection appeared more humane and visually palatable relative to other methods," Denno wrote.

That the method be "visually palatable" was of particular importance. In Oklahoma, two politicians led the push for lethal injection: State Rep. Bill Wiseman and state Sen. Bill Dawson. Wiseman was disturbed by the ugliness of electrocutions, later telling the *Tulsa World* they were "kind of a combination of Barnum & Bailey and reform." Describing himself as a reluctant supporter of executions, he wrote a bill in 1977 to replace the electric chair with lethal injection, which he was convinced would be more humane. According to the *World*, he then 'placed on every legislator's desk an envelope containing two pictures of a man who had been electrocuted. 'It looked like seared meat,' he said. 'Some people just didn't like it.'"

As Denno explains, Wiseman was eventually told by his own physician, who was also the head of the Oklahoma Medical Association, that the organization wanted no involvement in his lethal injection project. Anxious to give the process even the thinnest medical veneer, Wiseman and Dawson settled on the help of the state's chief medical examiner, Jay Chapman, who

candidly admitted that he was more of "an expert in dead bodies" than "an expert in getting them that way." Still, he was eager to help. When the lawmakers expressed concerns over what it could mean for his reputation within the medical community, Chapman was cavalier. "To hell with them," he said. "Let's do this."

Despite his lacking credentials, Chapman devised the famed "three-drug cocktail" that would become the established protocol for the rest of the country for years. The first drug (generally sodium thiopental) anesthetized the prisoner. The second (pancuronium bromide) caused paralysis, including of the muscles used for respiration. And the third (potassium chloride) stopped the heart.

In combination, the drugs created the impression of a peaceful and humane process — the pancuronium bromide masked any ugly outward signs of what may have been happening in the prisoners' bodies. But the states would later discover that if the anesthetic failed to work properly, the inmates would suffocate, and fall into cardiac arrest. They would experience an excruciating death, but the paralytic would prevent inmates from crying out or exhibiting obvious signs of distress. The risk of such suffering was particularly senseless given the lack of evidence that the paralyzing drug played anything other than a cosmetic role in the process. As a Tennessee judge wrote in 2003, pancuronium bromide serves "no legitimate purpose" aside from providing the "false impression of serenity to viewers, making punishment by death more palatable and acceptable to society." Indeed, as Adam Liptak wrote in the *New York Times* that year, the "American Veterinary Medical Association condemns pancuronium bromide" for euthanizing animals, "because, an association report in 2000 said, 'the animal may perceive pain and distress after it is immobilized.'"

In its ruling in *Baze v. Rees* years later, the Supreme Court dismissed the AVMA's position, along with the risks inherent in the use of pancuronium bromide, concluding that the drug played a legitimate role in providing a "quick, certain death." But by then, even Chapman himself — who has expressed disgust at the way his lethal injection protocol has been bungled by "complete idiots" — had acknowledged that the paralyzing agent may have been a mistake. Asked by CNN in 2007 why he included it in the first place, he said, "It's a good question. If I were doing it now, I would probably eliminate it."

Given that many states are now doing just that as they move onto other lethal injection protocols, the use of pancuronium bromide has become a mostly moot point. Still, its removal from the process could have one important, if unintended effect: It could make killing look like killing. As Mike Brickner of the ACLU of Ohio told me after Dennis McGuire's harrowing death, "Now that we're using drug combinations where there's no paralytic, maybe we're seeing inmates die in ways that were always 'botched' — except that their body could not physically show it."

Such bad optics were precisely what Chapman always wished to avoid. (He has called it "ludicrous," for instance, to allow witnesses to watch as execution teams, "feeling nervous and fiddling around," look for an inmate's vein.) As the ongoing controversy over lethal injection continues, Chapman's legacy as patriarch of the killing cocktail exposes our quest for "humane executions" for what it really is. It's less about finding a dignified way for prisoners to die, and more about finding a way to kill them that preserves the humanity of the prison staff, the medical professionals, and a public largely indifferent to the Constitutional requirement that prisoners be spared from "torture or lingering death."

Chapman himself once reflected that indifference in an exasperated email to Denno, "Perhaps hemlock is the answer for all the bleeding hearts who forget about the victims—and their suffering—Socrates style . . . the things that I have seen that have been done to victims [are] beyond belief . . . And we should worry that these horses' patoots should have a bit of pain, awareness of anything — give me a break."

One could perhaps understand Chapman's perspective, given the time he spent up close with the corpses of murder victims. But the law *does* demand a humane death. The initial decision to turn to a man who doesn't believe in that principle to devise a method of execution was exceptionally cynical. That Chapman's lethal injection experiment was then replicated across the country for decades, despite it's fundamental flaws, is a shameful history.

Worse, we seem to have learned very little from it. As the anesthesiologist Joel Zivot wrote last December, these states are "usurping the tools and arts of the medical trade and propagating a fiction." The state of Florida plans to kill Robert Henry tomorrow by using a drug designed, tested, and sold for healing. We don't know its effects when it's used for killing. To borrow from Zivot, when it comes to the death penalty, "What appears as humane is theater alone."

CRIME 02/12/2015 03:43 pm ET | **Updated** Feb 13, 2015

Oklahoma Wants To Reinstate The Gas Chamber, And Experts Say It's A Bad Idea

By Kim Bellware

01:11

Oklahoma Considers Alternative To Lethal Injection

Facing dwindling supplies of lethal injection chemicals and increased legal scrutiny of the practice, some states are considering a return to antiquated execution methods like firing squads and gas chambers — and Oklahoma is considering using a new type of gas. But experts warn the problem with both new and old methods is the same: They may violate the Constitution's ban on cruel and unusual punishment.

"States have painted themselves into a corner with lethal injection and are trying to bring back these old methods," Richard Dieter, executive director of the Death Penalty Information Center, a nonprofit that distributes information about capital punishment, told The Huffington Post Tuesday. "There is no painless method."

Allegations of torture and cruel and unusual punishment surfaced in the wake of botched lethal injections last year, like those of Oklahoma inmate Clayton Lockett and Arizona inmate Joseph Wood. Last month, the U.S. Supreme Court delayed execution for three Oklahoma prisoners while it reviews the state's protocol.

In response, Oklahoma legislators recently advanced bills that would authorize "nitrogen hypoxia" — which causes death by depleting the oxygen supply in the blood — as a gas chamber alternative to poisonous hydrogen cyanide gas.

Rep. Mike Christian (R-Oklahoma City), who sponsored the House bill on nitrogen hypoxia, told The Huffington Post via email that "nitrogen hypoxia is a painless form of capital punishment that is simple to administer, doesn't depend upon

three drug cocktail protocol." (Supply for the three-drug lethal injection cocktail was disrupted after its European manufacturer refused to further supply the drug to the U.S. for executions.)

Christian noted the idea for nitrogen hypoxia came from a 2014 Slate article on the subject. No countries in the world use nitrogen gas as a state-sanctioned execution method, according to the article.

Oklahoma state Sen. Anthony Sykes (R-Moore), who sponsored the state Senate version of the nitrogen hypoxia bill, told the Associated Press the method is "recognized as the most humane by those who oppose the death penalty," adding that "it causes a very quick and sudden loss of consciousness and of life almost simultaneously." Sykes did not cite a specific expert or entity in his claim and did not immediately respond to The Huffington Post's request for comment.

But Fordham Law Professor Deborah Denno, one of the nation's foremost death penalty experts, said such claims are similar to ones death penalty supporters made about lethal injection in the 1970s.

"If you look at all the statements and newspaper clippings made in 1977 when lethal injection was introduced [in Oklahoma], they sound very similar," Denno told The Huffington Post. "You would read comments about how this would be painless and immediate."

Dr. Joel Zivot, assistant professor of anesthesiology and surgery at Emory University School of Medicine, told HuffPost it's ethically impossible for a doctor to conduct tests — and therefore reach conclusions — on execution procedures.

"No physician is an expert in killing, and medicine doesn't position itself intentionally in taking a life," Zivot said. He added, "There's no therapeutic use of nitrogen gas, and there's no way to ethically or practically test if nitrogen gas is a humane alternative."

Meanwhile, Utah is considering a measure to bring back firing squads if it's unable to maintain its supply of lethal injection drugs. In May 2014, Tennessee lawmakers authorized a re-use of the electric chair as a back-up to lethal injection. Months later, Tennessee inmates sued the state and called the chair an unconstitutional "torture device."

Lethal injection rose to prominence in the early 1990s and is the primary method of execution in the 32 states that still allow the death penalty. Other methods may still be used, typically at the inmates' discretion. Eight states still have the electric chair, four have the gas chamber, three still permit hanging and two allow firing squads on certain technicalities. The last use of the gas chamber was in Arizona in 1999.

Both experts and capital punishment abolitionists have criticized the secretive nature of many state executions. States are less than forthcoming about many details of the procedure, including protocols; the identity of drug manufacturers; the identity of prison personnel involved in executions; and what personnel training for executions entails. (Medical professionals are ethically barred from participating in executions and are only present to declare time of death.) In 2014, The Guardian, The Associated Press and three Missouri newspapers sued Missouri for withholding such information. Similar lawsuits were filed by Ohio death row inmates last year.

Denno said since execution methods don't have trial runs, any new or adjusted protocol is effectively an experiment on the inmate.

"You can't ask a person who was executed if their death was cruel," Zivot said.

Denno added that what little research is available has suggested that the gas chamber is the most painful form of

said. "There's no question that people are dying a slow death in a very painful way."

While gas chamber victims slowly suffocate, Denno said, electrocution imparts an extra indignity by leaving its victims "mutilated."

"Some people scream out when the electricity is first being applied, but you're essentially burning to death," Denno explained. "Your body fluids are boiling. One's eyeballs can pop out — that's why they put a cap over people's head."

In other instances, like that of the 1997 Florida execution of Pedro Medina, the head, skin or hair can catch on fire mid-execution.

Ironically, Denno said, firing squads are perhaps the most effective execution method. "We've had three firing squad executions in the modern area — since the '70s — that have gone off without a hitch," she said.

Zivot criticized Oklahoma as having shown "a lack of seriousness" about determining whether its methods meet both ethical and constitutional requirements.

"You're left with the state declaring this to be safe and a form of execution that's not needlessly cruel," Zivot said. "I would ask the state, 'Prove that.'"

ALSO ON HUFFPOST:

Kim Bellware
Associate Chicago Editor

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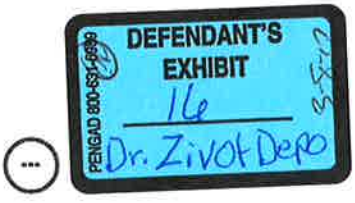
The firing squad execution chamber at the Utah State Prison in Draper, Utah in 2010. Trent Nelson—AP

CRIME

The Harsh Reality of Execution by Firing Squad

Josh Sanburn



The Utah State Senate voted Tuesday to bring back firing squads if lethal injection drugs become unavailable, which would make it the only state in the union to allow the method.

Only three death row inmates have been executed by firing squad since 1976, all in Utah, with the last being Ronnie Lee Gardner in 2010. The method is considered cruel by many Americans; only 12% said they would be open to it in a 2014 NBC News poll. But experts say it may actually be the most effective way for states to execute inmates.

"Firing squad is the only execution method for which people are trained," says Fordham University law professor Deborah Denno, who studies lethal injection and other execution methods. "It's the most certain, the most expert way of executing and from all we know it would be the quickest."

In previous executions, Utah has used five gunmen who each aim at the inmate's heart. One of the executioners fires a blank, so it remains uncertain as to who fired the fatal shots. Any trained marksman willing to participate could theoretically be an executioner, whereas with lethal injections, prison officials or others with no certified medical training must hook up death row inmates to IVs.

There are few, if any, ways to determine how painful an execution by firing squad would be. But it does appear to bring about death more quickly than lethal injection. In 1977, when Gary Gilmore was the first person executed by firing squad in Utah following the moratorium on capital punishment in the U.S., a doctor pronounced Gilmore dead within two minutes.

MORE: Execution Problems Revive Talk of Using Firing Squads and the Electric Chair

There have been at least two firing squad executions that could be considered botched. One occurred in 1879, when Wallace Wilkerson moved just enough for the executioners to miss his heart. Another came in 1951 when gunmen misfired

injection. Last year, three lethal injection executions were considered botched.

"The death probably happens within seconds," says Dr. Jonathan Groner, a pediatric surgeon at The Ohio State University who studies executions. "There is no way to measure the pain, but there's anecdotal evidence that it's less painful."

Groner cites several lethal injections in the last year, including the executions of Clayton Lockett in Oklahoma and Dennis McGuire in Ohio, which resulted in prolonged deaths in which witnesses described the inmates groaning and writhing on the gurney.

But patients who die from heart complications can lose consciousness within seconds, he says. There is also a bizarre experiment from 1938 in which doctors monitored the electrical activity of the heart of a Utah man who was being executed, which showed that his heart essentially became inactive within about 20 seconds of the shots being fired.

But over the years, the public has largely decided that firing squad is cruel in a modern society that has the tools to put inmates to sleep, which often appears painless. Even Gardner's brother, Randy, came out this week describing the brutality of Ronnie's execution in 2010. Death by firing squad seems like an antiquated and crude practice, whereas death by lethal injection can appear comparatively humane—even though it's unclear what sort of pain inmates are in. A number of legal challenges claim it fails the Eighth Amendment's prohibition on cruel and unusual punishment.

"Is the firing squad needlessly cruel punishment? The executed cannot say," says Joel Zivot, an Emory Healthcare anesthesiologist who studies executions and lethal injection. "These days, debates about methods of execution seem to be setting aside questions of cruelty evaluation and are more about having any method on hand."

[PUBLISH]

IN THE UNITED STATES COURT OF APPEALS

FOR THE ELEVENTH CIRCUIT

No. 15-10797
Non-Argument Calendar

D.C. Docket No. 1:15-cv-00523-TWT

KELLY RENEE GISSENDANER,

Plaintiff-Appellant,

versus

COMMISSIONER, GEORGIA DEPARTMENT OF CORRECTIONS,
WARDEN, GEORGIA DIAGNOSTIC AND CLASSIFICATION PRISON,
OTHER UNKNOWN EMPLOYEES AND AGENTS,
Georgia Department of Corrections,

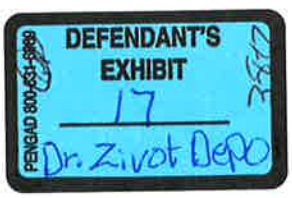
Defendants-Appellees.

Appeal from the United States District Court
for the Northern District of Georgia

(March 2, 2015)

Before ED CARNES, Chief Judge, TJOFLAT and JORDAN, Circuit Judges.

PER CURIAM:



Kelly Gissendaner masterminded the brutal murder of her husband, Douglas, by her paramour, Gregory Owen. See Gissendaner v. State, 532 S.E.2d 677, 681–83 (Ga. 2000). Facing impending execution by lethal injection, Gissendaner has filed a 42 U.S.C. § 1983 lawsuit alleging that the State of Georgia's method of execution violates the Eighth Amendment's prohibition on cruel and unusual punishment. After holding a hearing, the district court denied Gissendaner's request for a temporary restraining order and dismissed her complaint for failing to state a claim for relief. This is her appeal.[1]

I. BACKGROUND

The Superior Court of Gwinnett County issued an order on February 9, 2015, directing the Georgia Department of Corrections to execute Gissendaner. Her execution is scheduled for March 2, 2015. The week after the order was issued, Gissendaner filed a 42 U.S.C. § 1983 lawsuit challenging the constitutionality of Georgia's lethal injection protocol.

The latest iteration of Georgia's written protocol for lethal injections, which was adopted on July 17, 2012, establishes a detailed procedure for executing a condemned prisoner.[2] The individuals involved in the execution procedure include

[1] Gissendaner's unsuccessful challenges to set aside her conviction and death sentence are set out in Gissendaner v. Seaboldt, 735 F.3d 1311 (11th Cir. 2013); Gissendaner v. State, 532 S.E.2d 677 (Ga. 2000); and Gissendaner v. State, 500 S.E.2d 577 (Ga. 1998).

[2] We omit many of those details because they are not relevant to the issues raised in this appeal.

an "IV Team" to establish access to one of the prisoner's veins, a physician to provide medical assistance during the process, and an "Injection Team" to deliver the drugs. The IV Team must include at least two trained personnel, one of whom must be an IV nurse, and the Injection Team must include three prison staff members trained to deliver the injections. The protocol calls for the IV Team to initially attempt to provide two "intravenous accesses" for the injection.[3] If the IV nurse is unable to identify a suitable vein in the prisoner's legs or arms, the physician on hand "will provide access by central venous cannulation or other medically approved alternative."[4]

Once access to a vein is established, the members of the Injection Team then administer a series of three injections, one delivered by each team member. The sequence consists of: (1) an initial 2.5 gram dose of pentobarbital, (2) a second 2.5 gram dose of pentobarbital, and (3) 60 cubic centimeters of saline to flush the IV line. Regarding the drug used in the first two injections, the protocol specifies only that it be "pentobarbital." "If, after a sufficient time for death to have occurred," the prisoner "exhibits visible signs of life," the protocol calls for another five

[3] Intravenous access means entry to a vein and is typically established with a needle. See Nelson v. Campbell, 541 U.S. 637, 640, 124 S. Ct. 2117, 2121 (2004).

[4] Central venous cannulation is a technique for gaining access to one of the major veins in an individual's body, such as the jugular or femoral veins. See generally Jane M. Lavelle & Andrew T. Costarino, Central Venous Cannulation, in Textbook of Pediatric Emergency Procedures 247, 247 (Christopher King & Fred M. Henretig eds., 2d ed. 2008)

grams of pentobarbital to be administered using the same procedure. And if the prisoner "shows residual signs of life within a reasonable period" of receiving that second round of injections, the protocol calls for five more grams of pentobarbital using the same procedure.

In carrying out its written protocol, Georgia has refused to reveal the source of its pentobarbital or the identities and qualifications of the individuals who will participate in the execution process. The State has refused to do so based on what is called its "lethal injection secrecy act," which was enacted in March 2013 and took effect that July. See Ga. Code Ann. § 42-5-36(d). The act extends "confidential state secret" status to the "identifying information" of the individuals and entities who are involved in carrying out an execution or supplying the drugs and other materials used in an execution. See id. It provides that such identifying information "shall be confidential and shall not be subject to disclosure under [a state public records request] or under judicial process." Id.

Gissendaner's § 1983 complaint contains a series of allegations about Georgia's lethal injection protocol and the State's refusal to reveal certain details about its execution process. Her principal claim regarding the protocol is that Georgia's switch in March 2013 from using FDA-approved pentobarbital to compounded pentobarbital creates a substantial risk that the drugs used in her

execution will cause her to suffer unnecessary and excruciating pain.[5] She alleges that the pharmacies that produce compounded pentobarbital are subject to the laxer monitoring by, and lower standards of, state pharmacy boards, with a resulting risk that the drugs they produce will lack the "identity, potency, and purity" that is ensured by FDA monitoring. She supports her allegations with two sets of documents. The first is an affidavit from Dr. Larry Sasich that describes the general risks of using compounded pentobarbital. The second is a series of news stories about three recent executions using compounded pentobarbital — Michael Lee Wilson in Oklahoma, Jose Luis Villegas in Texas, and Eric Robert in South Dakota.

Gissendaner also contends that Georgia obtained its supply of compounded pentobarbital in violation of both state and federal law. She neither proffers nor cites any evidence to support this claim. Instead, she argues that Georgia could not possibly have acquired its compounded pentobarbital without violating state and federal laws and regulations. For example, she argues that, because the execution of a prisoner is not a legitimate medical purpose, Georgia has violated the Controlled Substances Act's requirements that Schedule II drugs such as pentobarbital be dispensed only for a "medical purpose," 21 U.S.C. § 829(c), and

[5] The terms "FDA-approved pentobarbital" and "compounded pentobarbital" come from the complaint. The difference between the two, according to the allegations of the complaint, is that the former is manufactured by a company that is subject to FDA monitoring and standards, while the latter is produced by a compounding pharmacy that is subject only to state monitoring and standards.

pursuant to a "valid prescription" that was "issued for a legitimate medical purpose," id. § 830(b)(3)(A)(ii).

In addition to Gissendaner's claims based on compounded pentobarbital, she also contends that Georgia's protocol does not ensure that the IV Team is qualified to establish reliable intravenous access for a prisoner like her — one who is female, obese, and at risk for obstructive sleep apnea. She bases that contention on two sets of documents. The first is a series of newspaper stories describing the executions (and one attempted execution) of three male prisoners in three other states: Clayton Lockett in Oklahoma, Angel Diaz in Florida, and Romell Broom in Ohio. According to those news stories, there were complications in all three instances because of the difficulty of establishing reliable intravenous access for the prisoners. The second document is an affidavit from Dr. Joel Zivot, which states his opinion that establishing reliable intravenous access will be especially difficult in Gissendaner's case because she is female and obese. It also states his opinion that Gissendaner's obesity puts her at risk for sleep apnea, which can contribute to choking and gasping during an execution.

Gissendaner also claims that Georgia had aggressively interpreted and applied its lethal injection secrecy act to prevent her from obtaining the details she needs to make an Eighth Amendment challenge to the State's protocol. She

argues, among other things, that the use of the act is grounds to deny Georgia officials the presumption of good faith usually afforded to state officials.

In addition to her allegations about Georgia's lethal injection protocol, Gissendaner seeks a stay of her execution based on the Supreme Court's grant of certiorari in Glossip v. Gross, No. 14-7955, 574 U.S. —, reported sub nom. Warner v. Gross, 2015 WL 302647, at *1 (Jan. 23, 2015). She argues that the grant of certiorari is a sign the Court will be reshaping its standard for Eighth Amendment challenges to lethal injection protocols, and that her execution should be stayed so that she can challenge Georgia's protocol under the Court's new standard, whatever it turns out to be.

Georgia filed a motion to dismiss the complaint and deny Gissendaner's motion for a temporary restraining order. After holding a hearing on the motions, the district court issued a written order reasoning that our decision in Wellons v. Commissioner, Georgia Department of Corrections, 754 F.3d 1260, 1265 (11th Cir. 2014), forecloses Gissendaner's claims because her allegations and evidence are so similar to those we rejected in Wellons. The district court concluded that Gissendaner has not demonstrated a substantial likelihood of success on the merits or stated a claim for relief under the standard established by the Supreme Court in Baze v. Rees, 553 U.S. 35, 50–52 128 S. Ct. 1520, 1531–32 (2008) (plurality

opinion). It denied Gissendaner's motion for a temporary restraining order, granted the State's motion to dismiss, and entered judgment dismissing the action.

Gissendaner then filed in this Court a timely appeal challenging the district court's judgment, and a motion seeking a stay of execution.

II. DISCUSSION

The standard for granting a temporary restraining order or a stay of execution is the same. Either action is appropriate only if the moving party establishes all of the following four elements:

> (1) a substantial likelihood of success on the merits; (2) that the preliminary injunction is necessary to prevent irreparable injury; (3) that the threatened injury outweighs the harm the preliminary injunction would cause the other litigant; and (4) that the preliminary injunction would not be averse to the public interest.

Wellons, 754 F.3d at 1263 (quoting Chavez v. Fla. SP Warden, 742 F.3d 1267, 1271 (11th Cir. 2014)). We review the district court's denial of a motion for a temporary restraining order only for an abuse of discretion. DeYoung v. Owens, 646 F.3d 1319, 1324 n.2 (11th Cir. 2011). We review de novo the grant of a motion to dismiss, accepting the complaint's allegations as true and construing them in the light most favorable to the plaintiff. Powell v. Thomas, 643 F.3d 1300, 1302 (11th Cir. 2011).

A.

The State contends that Gissendaner's § 1983 complaint is time-barred, and that the district court therefore did not abuse its discretion in denying her motion for a temporary restraining order or stay. If a complaint is untimely, it will not succeed on the merits. Crowe v. Donald, 528 F.3d 1290, 1293 (11th Cir. 2008). Though the district court's order did not address the statute of limitations when Georgia raised it as a ground for denying Gissendaner's motion, we may consider it as a basis for affirming that court's judgment. See Wellons, 754 F.3d at 1263; see also Crowe, 528 F.3d at 1292 (relying on the statute of limitations, instead of the district court's actual grounds, because an appellate court may "affirm on any ground supported by the record") (quotation marks omitted).

Like other actions brought under § 1983, a challenge to a state's method of execution is subject to the statute of limitations governing personal injury actions in the state where the challenge was brought. McNair v. Allen, 515 F.3d 1168, 1173 (11th Cir. 2008). Gissendaner brought her claim in Georgia, which has a two-year statute of limitations period. Crowe, 528 F.3d at 1292 (citing Ga. Code Ann. § 9-3-33). A claim challenging the state's method of execution "accrues on the later of the date on which" direct review is completed by denial of certiorari, "or the date on which the capital litigant becomes subject to a new or substantially

changed execution protocol." McNair, 515 F.3d at 1174.[6] Of course, a claim that accrues by virtue of a substantial change in a state's execution protocol is limited to the particular part of the protocol that changed. See Henyard v. Sec'y, DOC, 543 F.3d 644, 647–48 (11th Cir. 2008). In other words, a substantial change to one aspect of a state's execution protocol does not allow a prisoner whose complaint would otherwise be time-barred to make a "wholesale challenge" to the State's protocol. See id. at 647.

Gissendaner's state review became final in April 2001, see Gissendaner v. Georgia, 531 U.S. 1196, 121 S. Ct. 1201 (2001), and Georgia adopted lethal injection as its method of execution in October 2001, see Wellons, 754 F.3d at 1264. So unless Gissendaner's complaint alleges facts or presents evidence showing that Georgia's lethal injection procedure has "substantially changed" in the twenty-four months before she filed her complaint on February 20, 2015, her challenge is time-barred. See Wellons, 754 F.3d at 1263–64; see also Mann v. Palmer, 713 F.3d 1306, 1313–14 (11th Cir. 2013) (stating that factual allegations and evidence attached to the complaint may establish a "substantial change" in an execution protocol).

[6] The McNair opinion refers to "the date on which state review is complete," and that occurred on October 1, 1990, 515 F.3d at 1173–74, which is the date that the Supreme Court denied certiorari review on direct appeal, id. at 1171.

Several of Gissendaner's claims are untimely because they rely on factual conditions that have not changed in the past twenty-four months. For example, she claims that Georgia does not have adequate training and procedures to establish intravenous access, but she does not identify any change in the past twenty-four months that Georgia has made either to the prescribed method for establishing intravenous access or to the requisite qualifications of the individuals on the IV Team.[7]

The affidavit from Dr. Zivot relies on the July 17, 2012, written protocol, which had been in place for more than two years before the complaint was filed. And the news stories regarding recent executions in other states do not establish a change in Georgia's protocol because they are not "evidence of how pentobarbital is actually administered in [Georgia]." Arthur v. Thomas, 674 F.3d 1257, 1262 (11th Cir. 2012). Similarly, Gissendaner claims that the fact that Georgia's written protocol does not make any specific provisions for the proper storage of the execution drugs creates a risk that the drugs will expire before they are used. But that claim is based on Dr. Sasich's reading of Georgia's written protocol, not on any facts about Georgia's recent storage practice or any of the recent executions it

[7] The risk factors that Gissendaner claims are particular to her execution do not affect the statute of limitations analysis. She has always been female, and her complaint contains no factual allegations suggesting that her obesity or her potential sleep apnea (the chance of which is increased by her obesity) are recent developments.

has carried out, and the written protocol has been in place since July 17, 2012 — more than two years before her complaint was filed.

There are two claims in Gissendaner's complaint that are based on changes to Georgia's lethal injection protocol that occurred in the twenty-four months before she filed her complaint on February 20, 2015. The first is her claim based on Georgia's March 2013 change from using FDA-approved pentobarbital to using compounded pentobarbital. The second is her claim based on Georgia's lethal injection secrecy act, which went into effect in July 2013. See Ga. Code Ann. § 42-5-36(d).

Any argument that these are "substantial changes" is squarely foreclosed by this Court's decision in Wellons, 754 F.3d at 1263–64. In that case, Georgia inmate Marcus Wellons also contended that the State had substantially changed its lethal injection protocol by "changing from pentobarbital to a compound pentobarbital" and by enacting its "lethal injection secrecy act." Id. at 1264. We held that (1) "the Georgia Department of Corrections' anticipated use of an adulterated pentobarbital does not establish a significant alteration in the method of execution"; and (2) the complaint had not "alleged facts sufficient to show that Georgia's legal [sic] injection procedure has 'substantially changed' based on the lethal injection secrecy act adopted by the Georgia legislature." Id. (quotation marks omitted). Those holdings make good sense. The switch from FDA-

approved pentobarbital to compounded pentobarbital is not a substantial change because the switch between two forms of the same drug does not significantly alter the method of execution. See id. As for the lethal injection secrecy act, it is not a change to the protocol itself. The act merely alters how the State responds to requests for information about executions, which is different from how it carries out the protocol.

In any event, Wellons is prior panel precedent that binds us unless Gissendaner presents facts that are materially different from those presented in Wellons. See Mann, 713 F.3d at 1313–14.[8] She has not done that. Indeed, the affidavit from Dr. Sasich that Gissendaner attaches to her complaint is almost identical to the affidavit from Dr. Sasich that Wellons attached to his complaint.[9]

[8] Gissendaner quotes language from our decision in Arthur v. Thomas to argue that we cannot hold that her complaint is untimely unless she is first given an opportunity to seek discovery in support of her allegations that Georgia has substantially altered its lethal injection protocol. See 674 F.3d at 1262 ("[T]he district court committed reversible error in dismissing Arthur's Eighth Amendment claim without any opportunity for factual development, including discovery between the parties."). Arthur does not, however, stand for such a broad proposition. As we clarified in Mann, a court may dismiss a complaint as untimely — without an evidentiary hearing or discovery — if the allegations and evidence presented are "materially the same" as those presented in a previous case in which the denial of relief was affirmed. 713 F.3d at 1313–14.

[9] The one difference is that the affidavit attached to Gissendaner's complaint includes Dr. Sasich's opinion that there is a risk that the drug used in Gissendaner's execution may degrade before her execution date because Georgia's written protocol does not contain any express provisions for storing the pentobarbital used in executions. As we have already explained, that portion of the Sasich affidavit relies on facts that have been in place for more than two years, which means any claim based on it is untimely.

That leaves Gissendaner's claim that Georgia has acquired its compounded pentobarbital in violation of federal and state laws. Our decision in Wellons dictates that this claim is time-barred as well. Wellons held that, given the similarity in the drugs, the switch from FDA-approved pentobarbital to compounded pentobarbital was not a substantial change for purposes of the statute of limitations. See 754 F.3d at 1264. Gissendaner's allegations regarding the legality of Georgia's procurement of compounded pentobarbital are just additional arguments about why the shift from one form of pentobarbital to another is a substantial change. Wellons already held that it was not a substantial change, and the new arguments that Gissendaner raises do not make that decision any less binding. See Mann, 713 F.3d at 1313 ("[T]he mere act of proffering additional reasons not expressly considered previously will not open the door to reconsideration of the [statute of limitations] question by a second panel.") (second alteration in original) (quoting Valle v. Singer, 655 F.3d 1223, 1231 (11th Cir. 2011)).

All of the claims in Gissendaner's complaint are untimely, so the district court did not abuse its discretion in denying her motion for a temporary restraining order.

B.

Alternatively, even if her claims were not barred by the statute of limitations, Gissendaner would be due no relief because her complaint fails to state a plausible claim for relief.[10] To succeed in an Eighth Amendment challenge to a lethal injection protocol, a prisoner "must establish 'an objectively intolerable risk of harm that prevents prison officials from pleading that they were subjectively blameless for purposes of the Eighth Amendment.'" Chavez, 742 F.3d at 1272 (quoting Baze, 553 U.S. at 50, 128 S. Ct. at 1531 (plurality opinion)). That requires the prisoner to show two things: "(1) the lethal injection protocol in question creates 'a substantial risk of serious harm,' and (2) there are 'known and available alternatives' that are 'feasible, readily implemented,' and that will 'in fact significantly reduce [the] substantial risk of severe pain.'" Id. (quoting Baze, 553 U.S. at 50, 52, 61, 128 S. Ct. at 1531–32, 1537) (alteration in Chavez).

As for the first requirement, Gissendaner's allegations and supporting documents — even when viewed in the light most favorable to her — do not establish the requisite level of risk. As Wellons makes clear, "where an Eighth Amendment cruel and unusual punishment claim alleges the risk of future harm, 'the conditions presenting the risk must be sure or very likely to cause serious

[10] In dismissing Gissendaner's complaint, the district court also denied her a stay of execution based on the Supreme Court's decision to grant certiorari in Glossip, 2015 WL 302647. It did not abuse its discretion in doing so. See infra Section II.C.

illness and needless suffering, and give rise to sufficiently imminent dangers.'" 754 F.3d at 1265 (quoting Baze, 553 U.S. at 50, 128 S. Ct. at 1531) (quotation marks omitted). None of Gissendaner's factual allegations or evidence present facts that establish a high level of likelihood that she will suffer serious illness or needless suffering during her execution.

As for the second showing, Gissendaner does not even attempt "to show that any . . . alternative procedure or drug is feasible, readily implemented, and in fact significantly reduce[s] a substantial risk of severe pain." Id. at 1266 (alterations in original) (quotation marks omitted). The allegations of the complaint are totally bereft of: (1) an alternative drug that would substantially reduce the risks she identifies with compounded pentobarbital; (2) an alternative means of procuring that alternative drug; or (3) an alternative method of establishing intravenous access that would substantially reduce the risks she identifies based on her gender, obesity, and possible sleep apnea. As a result, the claims based on those aspects of Georgia's protocol are fatally flawed — as is the claim based on the lethal injection secrecy act. In an Eighth Amendment challenge, the source of the drug and the qualifications of the officials administering it are not relevant "[w]ithout a plausible allegation of a feasible and more humane alternative." Id. at 1265 (quoting In re Lombardi, 741 F.3d 888, 896 (8th Cir. 2014) (en banc)) (quotation marks omitted).

For those reasons, in addition to being untimely, Gissendaner's complaint fails to state a plausible claim for relief. The district court did not err in dismissing it.

C.

Like her motion in the district court, Gissendaner's motion in this Court asserts that, even if she has not met the Baze standard, she nevertheless is entitled to a stay of execution because of the Supreme Court's decision to grant certiorari in Glossip, 2015 WL 302647. She argues that we should stay her execution because the grant of certiorari indicates that the Court is prepared to modify the Baze standard, and that modification will affect her prospects for challenging Georgia's lethal-injection protocol.

We rejected a nearly identical argument in Schwab v. Secretary, Department of Corrections, 507 F.3d 1297 (11th Cir. 2007). There, the district court had granted the condemned prisoner's motion for a stay of execution based on the Supreme Court's grant of certiorari in Baze. Id. at 1298. We vacated the stay "because grants of certiorari do not themselves change the law, [and] they must not be used by courts of this circuit as a basis for granting a stay of execution that would otherwise be denied." Id. Our decision in Schwab is the latest in a long line of cases refusing to assign precedential significance to grants of certiorari. See, e.g., Rutherford v. McDonough, 466 F.3d 970, 977 (11th Cir. 2006) ("[A] grant of

certiorari does not change the law."); Ritter v. Thigpen, 828 F.2d 662, 665–66 (11th Cir. 1987) ("A grant of certiorari does not constitute new law."); Thomas v. Wainwright, 788 F.2d 684, 689 (11th Cir. 1986) ("The grant of the writ of certiorari . . . is no authority to the contrary; any implications to be drawn therefrom may be discerned by application to the Supreme Court."). Until the Supreme Court issues a decision that actually changes the law, we are duty-bound to apply this Court's precedent and to use it and any existing decisions of the Supreme Court to measure the likelihood of a plaintiff's success on the merits. And as we have already explained, this Court's precedent forecloses her claims. See supra Section II.B.

In addition, our determination that Gissendaner's complaint is untimely, see supra Section II.A, means that a decision by the Supreme Court in Glossip is not likely to affect her chance of success on the merits. A time-barred complaint cannot justify a stay of execution, regardless of whether its claims have merit. See Henyard, 543 F.3d at 647; cf. Smith v. Johnson, 440 F.3d 262, 263–64 (5th Cir. 2006) (explaining that a pending Supreme Court decision was irrelevant to the prisoner's cause of action given that "he is not entitled to the relief he seeks due to his dilatory filing"); Neville v. Johnson, 440 F.3d 221, 223 (5th Cir. 2006) (applying the same principle).

Because Gissendaner has not established a substantial likelihood of success on the merits, she is not entitled to a stay of execution. See Chavez, 742 F.3d at 1273.

III. CONCLUSION

The district court's order denying Gissendaner's motion for a preliminary injunction and dismissing her complaint is **AFFIRMED**. Gissendaner's motion for a stay of execution is **DENIED**.

AFFIDAVIT OF JOEL ZIVOT, M.D., FRCP(C)

I, Joel Zivot, being of sound mind and lawful age, hereby state under penalty of perjury as follows:

1. I am an assistant professor and senior member of the Departments of Anesthesiology and Surgery, Emory University School of Medicine, in Atlanta, Georgia. I am the Medical Director of the Cardiothoracic Intensive Care Unit at Emory University Hospital. I am also the fellowship director for training in Critical Care Medicine. I hold board certification in Anesthesiology from the Royal College of Physicians and Surgeons of Canada and The American Board of Anesthesiology. I am board-certified in Critical Care Medicine from the American Board of Anesthesiology.

2. I have practiced anesthesiology and critical care medicine for 20 years and, in that capacity, I have personally performed or supervised the care of over 40,000 patients.

3. I hold a medical license from the state of Georgia, and have held unrestricted medical licenses in Ohio, the District of Columbia, Michigan, and the provinces of Ontario and Manitoba. I hold a license to prescribe narcotics and other controlled substances from the U.S. Drug Enforcement Administration (DEA).

4. I have been consulting with attorneys with the Federal Defender Program for Georgia death row prisoner Kelly Gissendaner regarding Ms. Gissendaner's medical condition and the risks attendant to executing her by lethal injection.

5. I have reviewed a document entitled "Georgia Department of Corrections Georgia Diagnostic and Classification Prison Lethal Injection Procedures" dated July 17, 2012. This lethal injection protocol has several serious flaws with respect to its use in the execution of Kelly Gissendaner.

6. According to sections I.A.5 and II.D.3, intravenous access will be started by an individual expert in this practice. But expertise in intravenous access for health-care purposes would provide little guidance for how to obtain intravenous access for use in lethal injections. Many people with expertise in a health-care setting would lack the expertise necessary to overcome the challenges posed by the setting and circumstances of lethal injection.

7. The protocol states that intravenous access takes place in the execution chamber when the inmate is already restrained. Placing an intravenous line requires the application of a tourniquet to the arm followed by the search for a vein. In a situation when an inmate is nervous or participating involuntarily, intravenous access is even more difficult. The person choosing the vein would also have to account for the effect of the restraints on the viability of the vein selected.

8. The standard of placing an intravenous line directs that the selected vein must be the most prominent vein for the purpose. If the first attempt to choose a vein fails, each subsequent attempt should occur in an increasingly undesirable vein. Therefore, repeated attempts are actually increasingly unlikely to succeed. The placing of intravenous catheters is painful, and that pain only increases with multiple, prolonged attempts.

9. According to section II.D.3, if the execution team cannot obtain peripheral intravenous access, a physician will provide access by central venous cannulation. The standard of care for that procedure requires the use of ultrasound to locate a central vein. Georgia's lethal injection protocol makes no mention of the details of the central venous access technique with respect to the use of ultrasound. Many physicians lack the necessary skill to use ultrasound and to place central venous access. The lethal injection protocol offers no guarantee that the physicians on hand possess the necessary skills set to place central venous access.

10. Failed central venous access occurred in the execution of Clayton Lockett in Oklahoma. In that case, the execution team attempted central vascular access, but they failed. The team did not use ultrasound to guide catheter placement, and their failure to do so, confirmed by post-mortem examination, resulted in what is widely acknowledged as an excruciatingly painful death.

11. I have been informed that Kelly Gissendaner is a 46-year-old woman with a height of 5 feet 10 inches and a weight of 210 pounds. This corresponds to a Body Mass Index (BMI) of 30.1 kg/m^2 and puts her in the "obese" category. Intravenous access is very difficult to obtain in obese individuals. Female gender also is a risk factor for difficult intravenous access, as their venous systems tend to be smaller than those of men. As a result of Kelly Gissendaner's diagnosis of obesity and her gender, I anticipate that establishing intravenous access will be extremely difficult. Obesity is also a known risk factor for obstructive sleep apnea (OSA).

12. In the execution of Dennis McGuire in the state of Ohio, it was determined that Mr. McGuire suffered from OSA. The execution of Mr. McGuire was widely observed to be cruel because his OSA resulted in choking and gasping.

13. STOP-Bang is a questionnaire administered to predict OSA. In order to establish the true risk for OSA in Kelly Gissendaner, it would be necessary to examine her, administer a STOP-Bang questionnaire, and obtain an appropriate medical history.

14. In section II.C.4, the nature of the drug and dosage intended for sedation are not stated. In a person with OSA, sedation drugs can result in an exaggerated response leading to premature airway obstruction and choking.

15. According to section II.E.2 of the execution protocol, 2.5 gms of pentobarbital are injected in two separate injections. The sodium salt of pentobarbital, known by the trade name Nembutal, is the only Food and Drug Administration form of pentobarbital that is suitable for human injection. The final concentration of this compound is 50 mg/ml, and the pH is 9.5.

16. The state of Georgia obtains pentobarbital from a compounder whose identity is secret. It is impossible to verify the purity and safety of the drug.

17. pH is a scale that describes the strength of acids and bases. A drug with a pH of 9.5 is a very caustic compound. It will burn when injected. If an execution-team member were to inadvertently inject pentobarbital directly into the tissue (through, for example, improper placement of the intravenous line) that tissue will be seriously and irretrievably damaged. This tissue destruction would result in intense pain for Ms. Gissendaner.

18. As a result of these facts, I hold the position that if the State of Georgia proceeds with the execution of Kelly Gissendaner as outlined in the referenced lethal injection procedures, she will suffer an excruciating death.

Further affiant sayeth not.

I swear or affirm that the foregoing statements are true and accurate.

Joel Zivot, MD, FRCP(C)

State of Georgia Georgia

County of Dekalb

Subscribed and sworn to before me on this 4th day of February 2015.

KAREN S WOODS
MY COMMISSION EXPIRES
APRIL
19
2018
GWINNETT CO., GEORGIA
NOTARY PUBLIC

Supreme Court of Florida

No. SC14-1178

EDDIE WAYNE DAVIS,
Appellant,

vs.

STATE OF FLORIDA,
Appellee.

[July 7, 2014]

PER CURIAM.

Eddie Wayne Davis, a prisoner under sentence of death for whom a death warrant has been signed, appeals the circuit court's denial of his successive motion for postconviction relief, which was filed pursuant to Florida Rule of Criminal Procedure 3.851 after his death warrant was signed. We have jurisdiction. See art. V, § 3(b)(1), Fla. Const. For the reasons set forth below, we affirm the circuit court's denial of postconviction relief. In addition, we deny Davis' motion for stay of execution, which he filed on June 23, 2014.

BACKGROUND

Davis was convicted of the first-degree murder of eleven-year-old Kimberly Waters, as well as burglary with assault or battery, kidnapping a child under thirteen years of age, and sexual battery on a child under twelve years of age. The murder conviction was based on Davis' confession and several pieces of incriminating evidence linking Davis to the crime, including DNA evidence that revealed Davis' DNA matched scrapings taken from the victim's fingernails and blood on boots found in Davis' recently vacated trailer that was consistent with the victim's blood. After the jury unanimously recommended the death penalty, the trial court imposed a sentence of death for the murder conviction. The trial court found that the following aggravators applied to the murder: (1) the murder was committed by a person under sentence of imprisonment; (2) the murder was committed during the commission of a kidnapping and sexual battery; (3) the murder was committed for the purpose of avoiding or preventing a lawful arrest; and (4) the murder was especially heinous, atrocious, or cruel. Davis v. State, 698 So. 2d 1182, 1187 (Fla. 1997). As statutory mitigation, the trial court found that the murder was committed "while the defendant was under the influence of extreme mental or emotional disturbance and gave this factor great weight." Id. In addition the trial court found several nonstatutory mitigating circumstances.[1]

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1. Specifically, the trial court found: (1) Davis was capable of accepting responsibility for his actions and showed remorse for his conduct in this case and offered through his attorneys to plead guilty (assigned medium weight); (2) Davis

This Court affirmed Davis' convictions and death sentence on direct appeal. Id. at 1194. Davis subsequently filed a motion for postconviction relief, which the circuit court denied following an evidentiary hearing. On appeal, this Court affirmed the circuit court's denial of postconviction relief and denied Davis' accompanying petition for a writ of habeas corpus. Davis v. State, 875 So. 2d 359, 374 (Fla. 2003). Additionally, Davis sought habeas corpus relief in the federal courts, which was also denied. Davis v. McNeil, No. 8:04–cv–2549–T–27MAP, 2009 WL 860628, at *44 (M.D. Fla. Mar. 30, 2009). Following the federal district court's denial of his petition for a writ of habeas corpus, Davis sought a certificate of appealability, which was subsequently denied by the Eleventh Circuit Court of Appeals. Davis v. Sec'y Dep't of Corr., No. 09–11907–P (11th Cir. Sept. 8, 2009).

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exhibited good behavior while in jail and prison (assigned little weight); (3) Davis demonstrated positive courtroom behavior (assigned very little weight); (4) Davis is capable of forming positive relationships with family members and others (assigned very little weight); (5) Davis had no history of violence in any of his past criminal activity (assigned very little weight); (6) Davis did not plan to kill or sexually assault the victim when he began his criminal conduct (assigned very little weight); (7) Davis cooperated with the police, confessed his involvement in this crime, did not resist arrest, and did not try to flee or escape (assigned little weight); (8) Davis has always confessed to crimes he has been arrested for in the past, accepted his responsibility, and pled guilty (assigned medium weight); (9) Davis suffered from the effects of being placed in institutional settings at an early age and by spending a significant portion of his life in such settings (assigned very little weight); and (10) Davis obtained his GED while in prison and participated in other self-improvement programs (assigned medium weight). Id.

On June 2, 2014, Governor Rick Scott signed a death warrant for Davis, and the execution was set for July 10, 2014. Subsequently, Davis filed a successive motion for postconviction relief, pursuant to Florida Rule of Criminal Procedure 3.851, in which he raised the following three claims: (1) an as-applied challenge to Florida's lethal injection protocol based on his allegation that he suffers from the medical condition porphyria; (2) that he is not eligible for the death penalty because, although age twenty-five at the time of the murder, he was "the functional equivalent of a child"; and (3) that his clemency proceedings were unconstitutional. The circuit court denied each of Davis' claims without holding an evidentiary hearing. In summarily denying Davis' challenge to Florida's lethal injection protocol, the circuit court stated that Davis had "not met his burden to demonstrate that the risk to him is sure or very likely to cause serious illness and needless suffering" because Davis had "not provided the Court with any evidence that the injection of Midazolam [as the first drug in the protocol] will not have the desired effect of rendering the Defendant unconscious and insensate and thereby eliminating any pain on the part of the Defendant as a result of his possible condition of suffering from Porphyria."

Davis appealed the circuit court's order, arguing that the circuit court erred in summarily denying his three claims, and also filed a motion for stay of execution. Along with his motion for stay of execution, Davis attached an

affidavit, which he had not produced during the circuit court proceedings, alleging that he suffers from the medical condition porphyria, and that the use of midazolam hydrochloride as the first drug of Florida's lethal injection protocol, as applied to him, is unconstitutional. Specifically, the affidavit of Dr. Joel Zivot stated that it is his expert medical opinion "that a substantial risk exists that, during the execution, Mr. Davis will suffer from extreme or excruciating pain as a result of abdominal pain, tachycardia, hypertension, nausea, and vomiting." Based on the allegations in the affidavit and our constitutional obligation to ensure that the method of lethal injection in this state comports with the Eighth Amendment, we relinquished jurisdiction to the circuit court, consistent with our prior decisions in Howell v. State, 133 So. 3d 511, 515 (Fla.), cert. denied, 134 S. Ct. 1376 (2014), and Henry v. State, 134 So. 3d 938, 944 (Fla.), cert. denied, 134 S. Ct. 1536 (2014), to permit the parties and the circuit court to address the allegations in Dr. Zivot's affidavit, as related to Davis' as-applied challenge. See Davis v. State, No. SC14-1178 (Fla. Sup. Ct. order filed June 26, 2014). After holding a hearing and taking testimony, the circuit court ultimately denied Davis' claim.

In addition to his claim on appeal regarding the circuit court's denial of his as-applied challenge to Florida's lethal injection protocol, Davis also asserts that it was error for the circuit court to allow the State's expert, Dr. Roswell Lee Evans, to render an expert opinion regarding Davis' as-applied challenge. Further, Davis

also appeals the circuit court's summary denial of his claims regarding his eligibility for the death penalty and the constitutionality of his clemency proceedings. For the reasons that follow, we affirm the postconviction court's denial of relief and deny Davis' motion for stay of execution.

ANALYSIS

Before this Court, Davis argues that the circuit court erred in denying his as-applied challenge to Florida's lethal injection protocol, and that the circuit court erred in summarily denying his remaining two claims: that he is not eligible for the death penalty because, although age twenty-five at the time of the murder, he "was the functional equivalent of a child" and that his constitutional rights were violated during the clemency proceedings. We address each claim in turn.

As-Applied Challenge to Florida's Lethal Injection Protocol

In his first issue on appeal, Davis argues that the circuit court erred in denying his as-applied challenge to Florida's lethal injection protocol. Davis contends that because he allegedly suffers from a medical condition called porphyria, the use of midazolam hydrochloride as the first drug of Florida's lethal injection protocol, as applied to him, is unconstitutional. "[M]ixed questions of law and fact that ultimately determine constitutional rights should be reviewed by appellate courts using a two-step approach, deferring to the trial court on questions of historical fact but conducting a de novo review of the constitutional issue."

Henry, 134 So. 3d at 946 (quoting Connor v. State, 803 So. 2d 598, 605 (Fla. 2001)).

As this Court has repeatedly recognized, "in order to prevail on an Eighth Amendment challenge, a claimant must show that 'the conditions presenting the risk must be sure or very likely to cause serious illness and needless suffering, and give rise to sufficiently imminent dangers.' " Howell, 133 So. 3d at 521 (quoting Pardo v. State, 108 So. 3d 558, 562 (Fla. 2012)). "In other words, 'there must be a substantial risk of serious harm, an objectively intolerable risk of harm that prevents prison officials from pleading that they were subjectively blameless for purposes of the Eighth Amendment.' " Id. (quoting Pardo, 108 So. 3d at 562). "This heavy burden is borne by the defendant—not the State." Id.

As an initial matter, Davis contends that it was error for the circuit court to allow the State's expert, Dr. Evans, to testify with respect to Davis' as-applied challenge to Florida's lethal injection protocol. Specifically, Davis asserts that because Dr. Evans is not an anesthesiologist and has no experience treating patients with porphyria or in administering midazolam, his testimony on Davis' as-applied challenge was pure speculation.

With respect to when the introduction of expert testimony is proper, section 90.702, Florida Statutes (2013), provides as follows:

> If scientific, technical, or other specialized knowledge will assist the trier of fact in understanding the evidence or in determining a fact in

> issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify about it in the form of an opinion or otherwise, if:
>
> (1) The testimony is based upon sufficient facts or data;
>
> (2) The testimony is the product of reliable principles and methods; and
>
> (3) The witness has applied the principles and methods reliably to the facts of the case.

This Court has previously stated that, "[t]he qualification of a person as an expert is within the sound discretion of the trial judge." Penalver v. State, 926 So. 2d 1118, 1134 (Fla. 2006). Further, a trial court "has broad discretion in determining the range of the subjects on which an expert can testify, and the trial judge's ruling will be upheld absent a clear error." Id.

The record indicates that Dr. Evans' educational background, academic experience, and clinical experience were presented prior to his testimony. Although defense counsel objected to Dr. Evans being called as an expert in pharmacology, the circuit court overruled defense counsel's objection after allowing the defense to undertake voir dire and hearing additional testimony regarding Dr. Evans' qualifications. The record demonstrates that Dr. Evans' background along with his review of pertinent scientific literature allowed him to assist the finder of fact in addressing Davis' as-applied challenge to Florida's lethal injection protocol. Accordingly, we conclude that it was not error for the circuit court to allow Dr. Evans to testify as an expert in this case with respect to Davis'

as-applied challenge to Florida's lethal injection protocol. Alternatively, even if the circuit court did not consider Dr. Evans' testimony, Davis would still be unable to carry his burden of proof for this claim because Dr. Zivot failed to demonstrate that the injection of midazolam, as the first drug in the lethal injection protocol, would not render Davis unconscious and insensate prior to him experiencing any possible symptoms of a porphyria attack.

At the June 30, 2014, hearing, the circuit court assumed, for purposes of this claim, that Davis suffers from the medical condition alleged in Dr. Zivot's affidavit, even though no finding was made to this effect. In support of his claim, Davis called Dr. Zivot, the Medical Director of the Cardiothoracic Intensive Care Unit at Emory University Hospital and a faculty member of the Department of Anesthesiology and Surgery at Emory University School of Medicine. The circuit court summarized Dr. Zivot's testimony as follows: "Dr. Zivot testified that, in his opinion, the injection of 500 mg of midazolam will cause an increased accumulation of porphyrin in Mr. Davis' tissues and the possible acute onset of porphyria symptoms including abdominal pain, tachycardia, high blood pressure, nausea, possible vomiting and resulting pain from those symptoms."

In response, the State called Dr. Evans, a doctor of pharmacology who is a dean and professor at the Harrison School of Pharmacy at Auburn University. The circuit court summarized Dr. Evans' testimony as follows:

> Dr. Evans testified that the injection of midazolam will cause the Defendant to go into a state of unconsciousness within the time it takes for a person to count to ten and then backwards to zero. A person injected with 500 mg of midazolam will be totally unconscious within two to three minutes and in a comatose state soon thereafter. Dr. Zivot agreed that the person injected with the large dose [of] midazolam will be unconscious within two to three minutes.

After considering this testimony and argument from the parties, the circuit court denied Davis' as-applied challenge, rejecting the claim that Davis' execution would violate the Eighth Amendment:

> In this case, the Defendant has not met his heavy burden to establish that he is "sure or very likely" to experience serious illness or needless suffering. The very purpose of the initial injection of midazolam is to render the Defendant unconscious before further proceeding with the execution. There is a chance that the Defendant may suffer an acute onset of porphyria by an accumulation of porphyrin in his tissues which could lead to the onset of pain but, based on the evidence presented, it is the Court's conclusion that the effects of midazolam will have rendered the Defendant unconscious and probably comatose by the time there is any risk of pain. The Defendant will be both unconscious and insensate before he would experience any possible onset of pain or a porphyria attack.

We conclude that the circuit court's factual findings are supported by competent, substantial evidence, and that the circuit court did not err in its legal conclusions. Dr. Evans testified that having porphyria will not "interfere with [Davis'] ability to be placed unconscious and rendered insensate" by the injection of midazolam. Dr. Evans further testified that midazolam will render an individual unconscious within the span of time necessary to count down from ten to one, and would effectively place an individual in a coma within "5 to 10 minutes." Dr.

Zivot similarly testified that fifty milligrams of midazolam, which is ten times less than the dose administered under Florida's lethal injection protocol, would render an individual unconscious within "a matter of a few minutes."

Although Dr. Zivot testified that the amount of midazolam contemplated by the execution protocol "will lead to a porphyria crisis," and a porphyria attack could "potentially" occur within minutes of the introduction of midazolam, Dr. Zivot did not present any evidence that this result was sure or very likely to occur. In fact, Dr. Zivot's testimony was directly refuted by Dr. Evans, who stated, in discussing how a porphyria attack proceeds, that "regardless of what drug is inducing the increased production of porphyrin, it's not an immediate response." Dr. Evans stated that it was his professional opinion that it was "highly unlikely" that Davis would suffer from the symptoms of a porphyria attack before the onset of the midazolam and, when asked whether an attack could take place within minutes, responded, "I don't think so. I think you're talking about hours and maybe days." The circuit court credited Dr. Evans' testimony that any possible porphyria attack would occur, if at all, only after Davis was rendered unconscious and insensate by the injection of midazolam.

Davis has not demonstrated that Florida's lethal injection protocol—as applied to him—violates the Eighth Amendment to the United States Constitution because he has not shown that allegedly suffering from porphyria creates a

"substantial risk of serious harm." Howell, 133 So. 3d at 521. Specifically, Davis has not met his "heavy burden" to show that the injection of midazolam in the amount prescribed by the lethal injection protocol will not render him unconscious and insensate before he suffers any of the effects of a possible porphyria attack.

Accordingly, the postconviction court did not err in denying Davis' as-applied challenge to Florida's lethal injection protocol, and we affirm the circuit court's denial of relief. Additionally, for the same reasons that we conclude the circuit court did not err in denying relief on this claim, we deny Davis' motion for stay of execution, which is premised on the same as-applied challenge to Florida's lethal injection protocol. See Buenoano v. State, 708 So. 2d 941, 951 (Fla. 1998) (explaining that a stay of execution on a successive motion for postconviction relief is warranted only where there are substantial grounds upon which relief might be granted).

Ineligibility for the Death Penalty

In Davis' second claim on appeal, he asserts that he is ineligible for the death penalty, relying on allegedly newly discovered evidence regarding the effects of alcoholism and sexual abuse on brain development in children, and the United States Supreme Court's decision in Roper v. Simmons, 543 U.S. 551, 578 (2005), which held that "the Eighth and Fourteenth Amendments forbid imposition of the death penalty on offenders who were under the age of 18 when their crimes were

committed." Although he acknowledges that he was actually twenty-five years old when he committed the crimes, Davis contends that he "was the functional equivalent of a child" because he "likely had the mind of a juvenile" as opposed to his actual chronological age, and thus, his execution would be unconstitutional.

In addressing a similar constitutional challenge to a defendant's death sentence premised on Roper, this Court stated in Schoenwetter v. State, 46 So. 3d 535, 561 (Fla. 2010), that we have "consistently rejected such claims in cases where the defendant was not below eighteen years of age at the time of the criminal offense." Thus, because this Court has held that "Roper only prohibits the execution of those defendants whose chronological age is below eighteen," Hill v. State, 921 So. 2d 579, 584 (Fla. 2006), Davis' challenge is without merit.

While Davis acknowledges that he was over the age of eighteen at the time of the crimes, he nevertheless asks this Court to reconsider its precedent on the issue based on allegedly newly discovered evidence, consisting of recently published studies addressing the effects of alcoholism and sexual abuse on brain development, that he asserts illustrate that he "was the functional equivalent of a child," which renders him ineligible for the death penalty. Davis also "requests a stay from execution, and an evidentiary hearing to litigate the weight to be afforded the statutory and non-statutory mitigators related to age and maturity levels" in light of the recently published studies.

After thoroughly reviewing the record, we cannot find any indication that Davis ever previously argued or presented any evidence regarding his claim that he was the "functional equivalent of a child" at the time of the murder. At trial, Davis' theory of mitigation, as found by the trial court, was that he committed the murder while he was under the influence of an extreme mental or emotional disturbance. See Davis, 698 So. 2d at 1187. In finding the existence of this mitigating circumstance, the trial court stated that

> it is apparent to this Court the defendant came from a dysfunctional family; the defendant is an alcoholic, with low self-esteem; the defendant had an abused, neglected childhood; the defendant has had learning disabilities, which he has overcome; the defendant is immature for his age; the defendant may have an anti-social personality disorder; the defendant may have suffered from post-traumatic stress disorder; the defendant has suffered from chronic depression and anxiety; the defendant has had poor impulse control and defective judgment at times and the defendant has suffered from attention deficit hyperactivity disorder.

State v. Davis, No. CF94–1248A1–XX (Fla. 10th Jud. Cir. Ct. order filed June 30, 1995).

Further, on direct appeal and in seeking postconviction relief, Davis did not assert any claims analogous to the one he now raises before this Court, after the signing of his death warrant. Instead, on direct appeal, Davis failed to raise a claim involving his "emotional development," see Davis, 698 So. 2d 1182, and, in his postconviction proceedings, Davis argued with respect to his mental health only that his penalty-phase counsel was ineffective for failing to present expert

testimony on post-traumatic stress disorder that Davis suffered as a result of prior sexual abuse. See Davis, 875 So. 2d at 369. Further, between the time of the Roper decision in 2005 and these post-warrant proceedings, Davis has never raised a claim based on Roper.

Rule 3.851 provides the applicable pleading requirements for initial and successive postconviction motions. Fla. R. Crim. P. 3.851(e)(1)-(2). Davis' post-warrant motion is subject to the rules governing postconviction motions, which require the defendant to submit "a detailed allegation of the factual basis for any claim for which an evidentiary hearing is sought." Parker v. State, 89 So. 3d 844, 855 (Fla. 2011) (quoting Fla. R. Crim. P. 3.851(e)(1)(D)).

An evidentiary hearing on a rule 3.851 motion "should be held 'whenever the movant makes a facially sufficient claim that requires a factual determination.' " Pardo, 108 So. 3d at 560 (quoting Parker, 89 So. 3d at 855). "However, '[p]ostconviction claims may be summarily denied when they are legally insufficient, should have been brought on direct appeal, or are positively refuted by the record.' " Id. at 560-61 (quoting Parker, 89 So. 3d at 855). Because the circuit court denied Davis' claim without holding an evidentiary hearing, we review the circuit court's decision de novo, "accepting [Davis'] factual allegations as true to the extent they are not refuted by the record, and affirming the ruling if the record conclusively shows that [Davis] is entitled to no relief." Gore v. State,

91 So. 3d 769, 774 (Fla.) (quoting Walton v. State, 3 So. 3d 1000, 1005 (Fla. 2009)), cert. denied, 132 S. Ct. 1904 (2012).

This Court has set forth a two-prong test that a defendant must satisfy in order to obtain relief based on newly discovered evidence:

> First, the evidence must not have been known by the trial court, the party, or counsel at the time of trial, and it must appear that the defendant or defense counsel could not have known of it by the use of diligence. Second, the newly discovered evidence must be of such nature that it would probably produce an acquittal on retrial.

Marek v. State, 14 So. 3d 985, 990 (Fla. 2009) (citing Jones v. State, 709 So. 2d 512, 521 (Fla. 1998)). "If the defendant is seeking to vacate a sentence, the second prong requires that the newly discovered evidence would probably yield a less severe sentence." Id.

The studies cited by Davis, addressing the effects of alcoholism and sexual abuse on brain development, do not constitute newly discovered evidence. This Court has previously stated that it "has not recognized 'new opinions' or 'new research studies' as newly discovered evidence." Schwab v. State, 969 So. 2d 318, 325 (Fla. 2007). The articles that Davis relies upon fall squarely within this subject area and therefore do not constitute newly discovered evidence. See Farina v. State, 992 So. 2d 819 (Fla. 2008) (table decision) (holding that a "study on brain mapping is not newly discovered evidence"); Schwab, 969 So. 2d at 325

(concluding that "two recent scientific articles regarding brain anatomy and sexual offense" did not constitute newly discovered evidence).

Further, as explained above, even if these recently published articles were considered newly discovered evidence, Davis still fails to put forth a cognizable claim. The United States Supreme Court's decision in Roper prohibits the execution of those individuals "who were under the age of 18 when their crimes were committed." 543 U.S. at 578. In interpreting the Supreme Court's decision, this Court has previously stated that "Roper only prohibits the execution of those defendants whose chronological age is below eighteen." Hill, 921 So. 2d at 584. Therefore, because Davis was over the age of eighteen when he committed murder, Roper does not apply, and his claim is without merit.

Accordingly, we affirm the circuit court's summary denial of relief on this claim.

Clemency Proceedings

In his final claim on appeal, Davis challenges the constitutionality of his clemency proceedings. With respect to this claim, Davis does not contend that he was completely denied clemency review. In fact, Davis concedes that he was selected for clemency review determination in 2013, and that he did in fact receive an interview before the Florida Commission on Offender Review (formerly known as the Florida Parole Commission), during which he was represented by counsel

from the Office of the Polk County Public Defender. Further, Davis does not contest that his death warrant specifically includes language stating that "executive clemency . . . was considered pursuant to the Rules of Executive Clemency and it has been determined that executive clemency is not appropriate."

Nevertheless, Davis asserts that his due process rights were violated during the clemency proceedings because one of the parole commissioners present during Davis' interview before the Florida Commission on Offender Review was retired. Davis also argues that communications between the Polk County State Attorney and Assistant General Counsel for Governor Scott prior to Davis' clemency proceedings, in which the Office of the Governor expressed disapproval of Davis' crimes, illustrate that Governor Scott was predisposed to denying Davis clemency relief and call into question the validity of his clemency proceedings. The circuit court summarily denied this claim without holding an evidentiary hearing. We agree with the circuit court and conclude that these arguments are without merit for several reasons.

With respect to Davis' first argument, section 947.04(1), Florida Statutes (2013), specifically authorizes the chair of the Florida Commission on Offender Review to "assign consenting retired commissioners or former commissioners to temporary duty when there is a workload need." The record indicates that the retired parole commissioner at issue in this case was temporarily assigned for duty

in conformance with section 947.04(1). "In Ohio Adult Parole Authority v. Woodard, 523 U.S. 272 (1998), five justices of the United States Supreme Court concluded that some minimal procedural due process requirements should apply to clemency proceedings." Marek v. State, 14 So. 3d 985, 998 (Fla. 2009). However, the Court explained that "none of the opinions in that case required any specific procedures or criteria to guide the executive's signing of warrants for death-sentenced inmates." Id. Accordingly, in light of the fact that Davis concedes that he was selected for clemency review determination in 2013, and that he did in fact receive an interview before the Florida Commission on Offender Review, during which he was represented by counsel, and the assignment of retired parole commissioners to temporary duty is specifically authorized by statute, Davis has not provided any basis for this Court to grant relief based on his first argument.

Further, as this Court has previously noted, "[t]he clemency process in Florida derives solely from the Florida Constitution and [this Court has] recognized that the people of the State of Florida have vested 'sole, unrestricted, unlimited discretion exclusively in the executive in exercising this act of grace.' " Carroll v. State, 114 So. 3d 883, 888 (Fla.) (quoting Sullivan v. Askew, 348 So. 2d 312, 315 (Fla. 1977)), cert. denied, 133 S. Ct. 2762 (2013). Indeed, "[t]he Florida Rules of Executive Clemency expressly provide that '[t]he Governor has the unfettered discretion to deny clemency at any time, for any reason.' " Gore, 91 So.

3d at 779 (quoting Fla. R. Exec. Clem. 4) (second alteration in original). Accordingly, this Court "will not generally second-guess the executive's determination that clemency is not warranted." Pardo, 108 So. 3d at 568.

In its order denying relief on this claim, the circuit court based its denial on these general principles, stating as follows: "Clemency reviews and proceedings are within the exclusive purview of the Executive Branch. It is not up to the Judicial Branch to second guess the Executive Branch in this regard, and the Judicial Branch must respect the separation of powers between the branches of government." This conclusion is fully consistent with this Court's precedent. See Johnston v. State, 27 So. 3d 11, 26 (Fla. 2010) (declining to "depart from the Court's precedent, based on the doctrine of separation of powers, in which we have held that it is not our prerogative to second-guess the executive on matters of clemency in capital cases"); Rutherford v. State, 940 So. 2d 1112, 1122-23 (Fla. 2006) (denying a clemency claim because the defendant had a hearing and because clemency is an executive function). Davis concedes that he was selected for clemency review determination in 2013 and that he did in fact receive an interview before the Florida Commission on Offender Review. In light of the fact that his death warrant, signed by the Governor, makes clear that "executive clemency . . . was considered pursuant to the Rules of Executive Clemency and it has been determined that executive clemency is not appropriate," this Court will not

"second-guess the executive's determination that clemency is not warranted." Pardo, 108 So. 3d at 568.

Accordingly, we conclude that the circuit court did not err in summarily denying this claim.[2]

CONCLUSION

For the reasons stated above, we affirm the circuit court's denial of Davis' successive motion for postconviction relief. Additionally, we deny Davis' motion for a stay of execution. No motion for rehearing will be entertained by this Court. The mandate shall issue immediately.

It is so ordered.

LABARGA, C.J., and PARIENTE, LEWIS, QUINCE, CANADY, POLSTON, and PERRY, JJ., concur.

An Appeal from the Circuit Court in and for Polk County,
Donald G. Jacobsen, Judge - Case No. 1994-CF-1248A-XX

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2. While this appeal was pending before this Court, Davis' clemency counsel filed a notice of joinder or, alternatively, a motion to intervene in Davis' appeal of the denial of his successive postconviction motion, which this Court struck after receiving a response from the State. Subsequently, Davis, through clemency counsel, filed in the circuit court an "Emergency Petition for a Writ of Mandamus or Common Law Certiorari and Complaint for Declaratory, Injunctive and Other Relief Pursuant to 42 USC § 1983" against Governor Rick Scott, Attorney General Pam Bondi, Chief Financial Officer Jeff Atwater, and Commissioner of Agriculture Adam Putnam, as members of the Clemency Board of Florida. In this filing, Davis also challenged the constitutionality of his clemency proceedings. The circuit court denied Davis' petition on July 1, 2014. Davis, represented by clemency counsel, appealed the circuit court's denial of his petition to this Court, which we have treated as a petition to invoke this Court's all writs jurisdiction. By separate order, we have denied clemency counsel's petition.

Ali Andrew Shakoor and Richard E. Kiley, Assistant Capital Collateral Regional Counsels – Middle Region, Tampa, Florida,

for Appellant

Pamela Jo Bondi, Attorney General, Tallahassee, Florida; Stephen D. Ake and Timothy A. Freeland, Assistant Attorneys General, Tampa, Florida,

for Appellee

(21)

IN THE CIRCUIT COURT OF THE TENTH JUDICIAL CIRCUIT
IN AND FOR POLK COUNTY, FLORIDA

STATE OF FLORIDA,
Plaintiff,

v.

EDDIE WAYNE DAVIS,
Defendant.
_____/

CF94-001248-XX
DEATH WARRANT SIGNED
EXECUTION SCHEDULED
July 10, 2014

ORDER DENYING DEFENDANT'S CLAIM THAT THE FLORIDA LETHAL INJECTION PROTOCOL VIOLATES THE DEFENDANT'S EIGHTH AMENDMENT RIGHTS CONCERNING INFLICTION OF CRUEL AND UNUSUAL PUNISHMENT

The above captioned matter came before the Court on June 30, 2014, upon the Order entered by the Florida Supreme Court on June 26, 2014, relinquishing jurisdiction for the trial court to address the Defendant's claim that the Florida lethal injection protocol violates the Defendant's Eighth Amendment Rights concerning infliction of cruel and unusual punishment. The Court has reviewed the pleadings and taken testimony from the Defendant, Eddie Wayne Davis, Dr. Joel Zivot (a practicing anesthesiologist who is an Assistant Professor of Anesthesiology and Surgery and the Medical Director of the Cardiothoracic Intensive Care Unit at Emory University Hospital) and Dr. Roswell Lee Evans (a doctor of pharmacology who is a Professor and Dean at the Harris School of Pharmacy at Auburn University), heard argument of counsel, and has otherwise been more fully informed in the premises. Based thereon, the Court finds as follows:

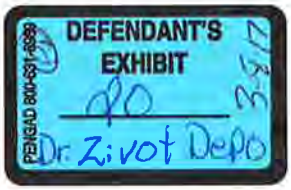
FACTS

The Court, for the purpose of its analysis, is assuming that the Defendant suffers from the disease porphyria and the question before the Court is whether or not the injection of the first of Florida's lethal injection protocol drugs, midazolam, will cause the Defendant needless suffering before he is rendered unconscious and eventually comatose.

Dr. Zivot testified that, in his opinion, the injection of 500mg of midazolam will cause an increased accumulation of porphyrin in Mr. Davis' tissues and the possible acute onset of porphyria symptoms including abdominal pain, tachycardia, high blood pressure, nausea, possible vomiting and resulting pain from those symptoms.

Dr. Evans testified that the injection of midazolam will cause the Defendant to go into a state of unconsciousness within the time it takes for a person to count to ten and then backwards to zero. A person injected with 500mg of midazolam will be totally unconscious within two to three minutes and in a comatose state soon thereafter. Dr. Zivot agreed that the person injected with the large dose midazolam will be unconscious within two to three minutes.

The Defendant is challenging the constitutionality of the Florida lethal injection protocol which calls for the initial injection of 500mg midazolam and thereafter the injection of vecuronium bromide, and then potassium chloride.



ANALYSIS

In *Mohammad v. State*, 132 So.3d 176 (Fla. 2013), the Florida Supreme Court rejected the Defendant's constitutional challenge regarding the use as midazolam in the lethal injection procedure in general. The question before this Court is, therefore, whether the use of midazolam is unconstitutional "as applied" to Eddie Wayne Davis.

"In order for a punishment to constitute cruel or unusual punishment, it must involve 'torture or a lingering death' or the infliction of 'unnecessary and wanton pain'." *Lightbourne v. McCollum*, 969 So.2d 326, 349 (Fla. 2007) citing, *Gregg v. Georgia*, 428 U.S. 153, 96 S. Ct. 2909, 49 L.Ed. 2d 859 (1976)

In *Howell v. State*, 133 So.3d 511, 517 (Fla. 2014), the Florida Supreme Court stated, "[i]n the lethal injection context, 'the condemned inmate's lack of consciousness is the focus of the constitutional inquiry' ". *Valle v. State*, 70 So.3d 530, 539-540 (Fla. 2011). Also see, *Ventura v. State*, 2 So.3d 194 (Fla. 2009), and *Lightbourne v. McCollum*, 969 So.2d 326 (Fla. 2007).

In *Henry v. State*, 134 So.3d 938, 947 (Fla. 2014), the Florida Supreme Court stated, " The Supreme Court has held that to state a claim under the Eighth Amendment, a defendant must show that the state's lethal injection protocol is " ' *sure or very likely* to cause serious illness and needless suffering.' " *Brewer v. Landrigan*, —— U.S. ——, 131 S.Ct. 445, 445, 178 L.Ed.2d 346 (2010) (quoting *Baze v. Rees*, 553 U.S. 35, 50, 128 S.Ct. 1520, 170 L.Ed.2d 420 (2008) (plurality opinion))." The Florida Supreme Court went on to quote *Howell*, 133 So.3d at 517 (internal quotation marks omitted), "In other words, there must be a substantial risk of serious harm, an objectively intolerable risk of harm that prevents prison officials from pleading that they were subjectively blameless for purposes of the Eighth Amendment."

The heavy burden to prove a substantial risk of serious harm or needless suffering is upon the Defendant, not the state, *Howell v. State*, 133 So.3d. 511 (Fla. 2014), and *Henry v. State*, 134 So.3d 938 (Fla. 2014).

In this case, the Defendant has not met his heavy burden to establish that he is "*sure or very likely*" to experience serious illness or needless suffering. The very purpose of the initial injection of midazolam is to render the Defendant unconscious before further proceeding with the execution. There is a chance that the Defendant may suffer an acute onset of porphyria by an accumulation of porphyrin in his tissues which could lead to the onset of pain but, based on the evidence presented, it is the Court's conclusion that the effects of midazolam will have rendered the Defendant unconscious and probably comatose by the time there is any risk of pain. The Defendant will be both unconscious and insensate before he would experience any possible onset of pain or a porphyria attack.

Based thereon, it is

ORDERED AND ADJUDGED that the Defendant's successive Motion to Vacate Judgment and Stay of Execution is **DENIED** as the Defendant has failed to meet his burden that Florida's lethal injection protocol, as applied to him, would violate the Eighth Amendment of the United States Constitution prohibiting the infliction of cruel and unusual punishment.

DONE AND ORDERED in Bartow, Polk County, Florida, on this 1st day of July, 2014.

DONALD G. JACOBSEN, Circuit Judge

cc:

Eddie Wayne Davis #097852
Florida State Prison
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FILED-CIRCUIT CRIMINAL
14 JUL -1 PM 2:25
STACY M. BUTTERFIELD
CLERK OF CIRCUIT COURT
POLK COUNTY, FLORIDA

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Assistant General Counsel
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The Honorable Wm. Bruce Smith,
Chief Judge

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Assistant General Counsel
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Rex Dimmig, Public Defender
Peter Mills, Asst. Public Defender

I CERTIFY the foregoing is a true copy of the original as it appears on file in the office of the Clerk of the Circuit Court of Polk County, Florida, and that I have furnished copies of this order and its attachments to the above-listed on this 1st day of July, 2014.

CLERK OF THE CIRCUIT COURT

By: Theresa L. Medler

FILED-CIRCUIT CRIMINAL
14 JUN 31 PM 1:53
STACY M. BUTTERFIELD
CLERK OF CIRCUIT COURT
POLK COUNTY, FLORIDA

ORIGINAL

(1)

IN THE CIRCUIT COURT OF THE TENTH JUDICIAL CIRCUIT
IN AND FOR POLK COUNTY, FLORIDA
LOWER TRIBUNAL NO.: CF94-1248A-XX
CASE NO.: SC14-1178

EDDIE WAYNE DAVIS,

Appellant,

vs.

STATE OF FLORIDA,

Appellee.

TRANSCRIPT OF EVIDENTIARY HEARING
SUPPLEMENTAL RECORD VOLUME 2

DATE TAKEN: Monday, June 30, 2014
TIME: 12:53 p.m. - 4:00 p.m.
PLACE: Polk County Courthouse
Courtroom 9C
255 North Broadway Avenue
Bartow, Florida 33803
BEFORE: Honorable Donald G. Jacobsen
Circuit Judge

This cause came on to be heard at the time and place aforesaid, when and where the following proceedings were reported by:

Linda S. Blackburn
Registered Professional Reporter
Certified Realtime Reporter
Certified CART Provider

APPEARANCES

Counsel for Defendant/Appellant:

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Counsel for Office of the State Attorney:

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Also Present:

Howard L. "Rex" Dimmig, II, Public Defender
Eddie Wayne Davis, Appellant

I N D E X

SUPPLEMENTAL RECORD VOLUME 2

JUNE 30, 2014

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SUPPLEMENTAL RECORD VOLUME 2

JUNE 30, 2014

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SUPPLEMENTAL RECORD VOLUME 2

JUNE 30, 2014

THEREUPON, the following proceedings were had and taken:

THE COURT: Okay. We have one preliminary matter. We're here this afternoon regarding State versus Davis in case number, at this level, CF94-1248, their Supreme Court case number SC14-1178.

And I received a call from Mr. Dimmig's office indicating that the Public Defender's Office desired to have an opportunity to have an opportunity to have initial contact with Mr. Davis to get him to sign some matters. Has that been discussed with his attorneys? Any objection to that?

MR. KILEY: Your Honor, we have no objection with that.

THE COURT: And I think it was just a matter of some administrative type matters of some sort, so --

MS. GARRETT: Indigency affidavits, Your Honor, and I have them here and I'd be happy to just review them perhaps in a break in the proceedings now since you've begun the hearing. But I was advised by the officers of the Department of Corrections that the court had to order me -- them to grant me access to Mr. Davis.

THE COURT: And without any objection from his

attorneys, I'll grant that assess for those administrative matters when we get the opportunity.

Okay. We have here -- and let me just run down everyone that is here so our court reporter can identify who is here. We have Mr. Kiley here on behalf of the defendant, Mr. Viggiano --

MR. VIGGIANO: Yes.

THE COURT: -- here on behalf of the defendant.

And who else is at the --

MR. SHAKOOR: Mr. Shakoor, Your Honor.

THE COURT: Mr. Shakoor, I've seen your name any number of times. I've not met you. Good afternoon, sir.

MR. SHAKOOR: Good afternoon.

THE COURT: And with you is?

MR. KILEY: Dr. Joel Zivot, sir.

THE COURT: That's our witness apparently.

On behalf of the State Attorney's Office, we have Mr. Aguero. And on behalf of the Attorney General's Office, we have Mr. Ake --

MR. AKE: Good afternoon.

THE COURT: -- and Mr. Freeland, no, that's Mr. Freeland back there and --

MR. BROWNE: Good afternoon, Your Honor. Scott Browne, also with the Attorney General's Office.

MS. SABELLA: And, Your Honor, I'm Candance Sabella also with the Attorney General's Office.

THE COURT: Ms. Sabella, thank you.

And is Mr. Wallace here? Is she going to attend on behalf of the Department of Corrections at all? She's been involved.

Okay. We are here pursuant to the mandate entered by the Supreme Court on June 26th, 2014, relinquishing jurisdiction to the trial court for the necessity of having an evidentiary hearing on one of the issues that is before the Supreme Court and initially before me.

And is the defense ready to proceed?

MR. KILEY: Defense is ready, Your Honor.

THE COURT: And is the State ready to proceed?

MR. BROWNE: Yes, Your Honor.

THE COURT: Is there anything we need to take up preliminarily from your all's point of view? I mean, any --

MR. KILEY: Not from the defense, sir.

THE COURT: Any type of opening statement anybody would like to make?

MR. AGUERO: I would just advise the court that Mr. Browne and Mr. Freeland are going to be the ones involved in doing the questioning and so forth here

this afternoon. I will not be doing that at this point unless Mr. Davis testifies perhaps.

THE COURT: Okay. Mr. Kiley, is there anything you'd like to do by way of opening, or do you want to get right into the evidentiary aspect?

MR. KILEY: I'd like to get right into the evidentiary aspect, Your Honor.

THE COURT: You may call your witness then.

MR. KILEY: Your Honor, the defense calls Eddie Wayne David -- Davis rather.

THE COURT: Sir, if you'd step on down here, and watch your step.

THE BAILIFF: As you're facing the judge, to the best of your ability, raise your right hand.

THE COURT: Step on up. Just watch your step coming up. And I do need you to raise your right hand.

Do you swear or affirm to tell the truth, the whole truth, and nothing but the truth?

THE DEFENDANT: I do.

THE COURT: You may have a seat.

EDDIE WAYNE DAVIS, called as a witness by the Defense, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KILEY:

Q. Would you state your name for the record, please, sir?

MR. AGUERO: Judge, could we get him to move up? Even I can't see him.

THE COURT: Could you move over here this way a little bit? Slide him towards that.

DOC OFFICER: Just stand up.

MR. AGUERO: Thank you very much, Your Honor.

THE COURT: You may proceed.

BY MR. KILEY:

Q. Would you state your name for the record, please, sir?

A. Eddie Wayne Davis.

Q. And where do you currently reside, sir?

A. Florida state prison.

Q. Where specifically, sir?

A. Death Watch.

Q. Sir, will you tell the court about the growths on your body?

A. They're like giant rash. I mean, I don't know how to really describe them. They're like a flesh -- something's eating the flesh away.

Q. Okay. Are they there now?

A. Yes.
Q. Do they come and go?
A. Yes.
Q. How often do they come and go?
A. This is the second time that they've come up. They come up once before and then went -- kind of went away, and now they've come back.
Q. Once before when?
A. Several months ago.
Q. All right. Sir, if medical records indicate that you have a history of mouth blisters, would you have any reason to dispute that?
A. No.
Q. Do you -- have you -- since you've been on -- in the Florida state prison system, how many times have the mouth blisters and the growths appeared on your body?
A. The growths, only twice that I know of. I don't know how many times the mouth.
Q. Okay. Would you tell the court about the pain in your legs?
A. It's -- I have a burning pain in my feet and my legs, bottom of --
Q. That's --
A. -- my toes, my feet.

Q. Is that now?
A. Yes.
Q. All right. Now, do you have any other sensations of pain? Do you have numbness --
A. Yes.
Q. -- heat and cold, tingling?
A. My right -- I mean my left leg, excuse me, has -- in the upper thigh is numb, and it's been numb for almost a year.
Q. How about tingling, do you or do you not have tingling?
A. At times, yes.
Q. At times, sir?
A. Yes, sir.
Q. Okay. How about heat and cold?
A. Sometimes it feels like you step on hot coals if you stand up. Or you're just laying down, it -- sometimes it feels like that. Sometimes it can get a little cold, but --
Q. And other times --
A. Yes.
Q. -- do you have cold?
A. Yes.
Q. All right. Regarding the growths on your body, what treatment was prescribed for you?

A. I went to what they call sick call. The people there prescribed a -- it's like a dandruff shampoo, but it's a T-Gel shampoo is the name of it, and it was prescribed to wash with it and it didn't do anything.

Q. Okay. That was my next question.

How about the numbness, the heat and cold and the tingling in your legs, what were you given for that?

A. Nothing. They've never given me nothing.

MR. KILEY: I have no further questions.

THE COURT: Thank you.

Cross-exam? And it's Mister?

MR. BROWNE: Browne, Your Honor.

THE COURT: Thank you.

CROSS-EXAMINATION

BY MR. BROWNE:

Q. Mr. Davis?

A. Yes, sir.

Q. You were convicted of kidnapping, sexually assaulting --

MR. KILEY: Objection. Out of the scope, Your Honor.

THE COURT: Sustained.

MR. BROWNE: Your Honor, I was going to connect it.

Q. You're under an active death warrant. Is that

current, Mr. Davis?

A. Yes, I'm under it.

Q. And you have an execution date set?

A. Yes, sir, I do.

Q. Have you read the pleadings that were submitted on your behalf by your defense attorneys?

A. No.

Q. You haven't read or --

A. No. I don't even --

Q. -- signed a motion for postconviction relief?

A. For post?

Q. Postconviction relief.

A. When? I mean, talking about now since this --

Q. Yes, recently.

A. I've signed papers, but I haven't read anything.

Q. Did your attorneys explain to you that they were seeking to delay your execution based upon a diagnosis of porphyria?

A. Yes, they did come and explain that.

Q. And, Mr. Davis, have you, in fact, ever been diagnosed with porphyria?

A. Not that I know of.

Q. Did you have any knee surgery while you were incarcerated?

A. No.
Q. Did you have any knee problems?
A. Yes. I've had knee problems since I was 14 years old.
Q. And can you tell this court what the diagnosis was for the knee problem?
A. Arthritis.
Q. Arthritis. So you've had a history of arthritis; is that -- would that be fair to say?
A. That's what -- that's what DOC says, yes.
Q. And you've also been prescribed Valtrex, have you not? Valtrex for herpes sores or sores?
A. Yes, yes, yes.
Q. So, in other words, you've complained about the sores on your skin and received treatment from the Department?
A. On my mouth, yes.
Q. Okay. And, in fact, you believe that the Valtrex actually helped with those sores and --
A. Yes. They were fever blisters.
Q. Fever blisters?
A. Yes, sir.
MR. BROWNE: Your Honor, may I have one moment?
THE COURT: You may.
You just dropped something.

MR. BROWNE: Thank you, Your Honor.

I have no further questions, Your Honor.

MR. KILEY: Your Honor, brief redirect?

THE COURT: You may.

REDIRECT EXAMINATION

BY MR. KILEY:

Q. Mr. Davis, regarding this latest pleading, the successor 3851 --

A. Right.

Q. -- did anybody say you had to verify that and read it?

A. No.

Q. At the time, sir, it was written, you were approximately two and a half hours away in Death Row, and the pleading was written in Tampa, right?

A. Right.

Q. Okay. Now, regarding the porphyria, sir, do you remember being diagnosed by a Dr. Maher --

A. No.

Q. -- in -- in 2000?

A. No, I don't.

Q. All right. Before your evidentiary hearing?

A. No, I don't.

Q. Do you remember being at your evidentiary hearing?

A. Yes. I was right here with you.
Q. All right. And do you remember a doctor being called?
A. I think there was a couple doctors called.
Q. Right. Not your trial, but your evidentiary --
A. Right.
Q. -- hearing?
A. Right.
Q. Do you remember if one of those doctors was Dr. Maher?
A. Yes, sir. I think so, yes.
Q. Okay. A little short guy with a moustache?
A. I couldn't tell you.
MR. KILEY: Okay. Nothing further, Your Honor.
THE COURT: Thank you.
You may step down, sir.
(The witness stepped down from the witness stand.)
MR. KILEY: Your Honor, Your Honor, I would ask the court, since Mr. Davis is done testifying, Ms. Garrett can get up and sign her pleadings.
THE COURT: Sure.
MS. GARRETT: Can we do that in the holding cell?
MR. VIGGIANO: Is it something you need to

discuss with him?

MS. GARRETT: I need to explain it to him at least.

THE COURT: Okay. Okay. We'll take just a short recess and put him back in there so that she can look through, talk to him through the bars to explain what's going on.

DOC OFFICER: Yes, sir.

THE COURT: So we're going to take a short recess so that that administrative matter can be taken care of.

MS. GARRETT: Okay.

THE BAILIFF: All rise, please.

THE COURT: And I'll be right outside.

(Recess from 1:05 p.m. until 1:14 p.m.)

THE BAILIFF: All rise, please. Circuit court's back in session. Please be seated.

THE COURT: Thank you.

Mr. Kiley, you may proceed with your next witness.

MR. KILEY: My next witness, Your Honor, will be Dr. Joel Zivot.

THE BAILIFF: Step this way, sir.

THE COURT: Come on up, sir.

THE BAILIFF: Just come right this way. Sir,

as you're stepping, just watch your step, face the judge, and raise your right hand.

THE COURT: Do you swear or affirm to tell the truth, the whole truth, and nothing but the truth?

THE WITNESS: I do.

THE COURT: Please have a seat.

THE WITNESS: Thanks.

THE COURT: You may proceed.

MR. KILEY: Thank you, Your Honor.

JOEL B. ZIVOT, MD, called as a witness by the Defense, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KILEY:

Q. Would you state your name for the record, please, sir?

A. Joel Bruce Zivot.

Q. And are you a medical doctor, sir?

A. I am.

Q. Doctor, let's start a little bit with your background. Why don't you tell the court generally what your qualifications are, sir?

A. I went to medical school at the University of Manitoba in Winnipeg, Canada. I graduated in 1988. I then went to the University of Toronto and completed a

residency in anesthesiology.

I then moved to Cleveland, Ohio at the Cleveland Clinic and completed specialty training in anesthesiology and critical care medicine. I'm board certified in anesthesiology from the Royal College of Physicians of Canada and also from the American Board of Anesthesiology in both anesthesiology and critical care medicine.

And presently I'm on the faculty at Emory University Hospital in Atlanta, Georgia. I'm the medical director of the Cardiothoracic Intensive Care Unit, and I'm a member of the Department of Anesthesiology and Surgery. And I practice anesthesiology about a third of the time in the operating room, and the rest of the time I'm working in intensive care.

Q. Getting ahead of me, Doctor.

Can you give the court an idea of what an anesthesiologist does in a surgical setting?

A. Sure. Well, an anesthesiologist's job is to -- to facilitate surgical procedure, and it can be something very simple or very complicated depending upon the coexisting medical condition of a -- of a patient. Most would people understand that the anesthesiologist is the person whose job it is to make sure that the

operation's not painful and that a person does not have a recollection of a surgical procedure. So anesthesiologists monitor physiologic functions, establish intravenous access, provide the combination of medications and support that allows surgical or -- and painful procedure to take place in the interests of making somebody better at the end of it.

Q. Well, sir, why is it important that the person not remember?

A. Well, I think that the reason why we recognize that amnesia, which is the term that we use, is important for most people is that if one can imagine being in the operating room under a circumstance where one is going to have something done to them that's quite painful, first of all, the anticipation of that and the experience of that could be very disturbing. We understand that when people are subjected to painful experiences, they can -- they can -- it can result in serious long-term and sometimes permanent consequences in the effect of things, for example, like posttraumatic stress disorder.

Q. Oh, I see.

A. So the purpose of suppressing the recollection of the experience is to prevent, you know, the -- you know, the experience in the moment and also the

experience after the fact when it's recalled or not to be recalled, to prevent things like posttraumatic stress disorder.

Q. Well, it doesn't deaden pain, correct, sir?

A. Well, anesthetics, when done correctly, do take away pain. Pain, we recognize, you know, is something that most of us are not interested in experiencing, and so modern anesthesia really, I think, has revolutionized the capacity to do surgery. There was a time in the past where surgery was conducted without anesthetics and surgery was not very popular, so clearly the capacity to withstand painful experiences has made, you know, surgery advancement possible.

Q. Do you -- let me go back to your experience a little bit. How often would you say you actually perform an anesthesiology in a surgical setting?

A. My time, probably these days, about a third of my time is spent as an anesthesiologist in the operating room.

Q. In the operating room?

A. Yes.

Q. Well, sir, how many surgeries have you been involved in, in your career?

A. Thousands.

Q. Okay. Doctor, what's porphyria?

A. Porphyria is a -- is a complicated condition. It's a condition that has to do with the -- an abnormal regulation in the production of a compound called heme. So heme is a compound in the body. This compound is normally made. It's -- we call it -- say it's biosynthesized, so it's created.

And heme is a compound that is a part of other compounds. For example, heme is a part of something called hemoglobin. Hemoglobin is the molecule in all the red blood cells in the body that are responsible for the carrying of oxygen.

Heme also becomes other sorts of compounds as well. It's a very common and important compound. And it's tightly regulated in the way that heme is made. We make just enough of it, not too much, and if we don't make enough of it, then its regulation and is -- it's changed.

Q. Where is it made?

A. So heme is made mostly in the bone marrow, but also in the liver.

Q. Okay.

A. And it's -- and the way that these systems work is that they have what's called a feedback, so when the -- when the body senses that heme levels are of a certain -- certain amount, say insufficient, then the

body detects that there's not enough heme and it starts to make more. And also when the body detects that there's too much heme, it starts to make less, because heme itself has no purpose except as a product that turns into something else, and, in fact, heme by itself, you know, has some negative consequences.

Q. And what are they?

A. Well, they can cause a variety of things. They can cause the symptoms -- and maybe before I -- let me just -- if I could just comment again, so porphyria, to answer your question, is a condition where there's a -- there's a break, if you will, in the normal regulation of the production of heme, and it has to do with -- with defects in various enzymes that are responsible that move -- you know, that generate this end compound, and there are several steps along the way where these enzymes can be broken or disregulated.

It's a condition that can occur actually genetically, so you can be born with it. It's a condition also that can be acquired. And classically, there are certain kinds of stimuli, certain kinds of effects that when the body's exposed to these effects, then the condition becomes manifest.

Q. Like what, sir?

A. So, classically, porphyria can manifest as

abdominal pain, severe abdominal pain. It can create -- it can manifest as rashes, and then it's referred to as cutaneous porphyria. That's -- cutaneous just means on the skin. It can cause what's called neuropathy. Neuropathy is basically a condition where the nerves themselves that are responsible for the transmission of information from, say, the body to the brain and back become broken or they become, you know, they become affected, and when the nerves become affected, when they become dysfunctional, they can create a series of symptoms that can be very difficult for patients.

Q. For example, sir?

A. So when we have neuropathy, neuropathy can be experienced by people as a burning sensation or as a problem of heat and cold intolerance.

Or there's something called allodynia. Allodynia is where even just the gentle touching of the skin with your hand can actually create a circumstance that it feels like pain. So we say that a stimulus that is -- normally should not be noxious -- and noxious meaning something that we would all agree that that degree of stimulus would cause pain -- it's a non-noxious stimuli actually causing pain.

For severe neuropathy, for example, even the sensation of the breeze on skin can be experienced as

quite painful.

So that's one of the problems of porphyria as well. There's also neurological problems, I'm sorry, there are neurological problems that affect awareness that can lead to confusion. There can even be seizures. Porphyria can also cause nausea and vomiting and a variety of, again, sort of significant and unpleasant effects.

Q. Sir, what is the difference between cutaneous porphyria and acute porphyria?

A. Well, porphyria, again, is -- there are -- three are several different kinds of porphyria conditions, and they're all distinguished by which of these kind of side products end up becoming created in excess that would normally not be created because of this enzyme break.

Cutaneous porphyria, again, just means that you can see it on the skin. And that sort of -- and the way that it happens, usually it's these -- these compounds that are referred to as porphyrins, which are, again, part of these kind of side products, end up being deposited in the skin, and it's actually the combination of sunlight or light of a certain wavelength that when it touches or when it interacts with these porphyrins that cause tissue destruction. So cutaneous just means

that it can be seen.

But people may have varieties of manifestations, not purely one or the other, and, you know, it's quite detailed as to the way that porphyria is actually broken down. But in common, it's a defect in this enzyme that regulates the production of this heme, and when that breaks, you know, all these things back up and they deposit in different parts of the body and that's --

Q. How do you treat it?

A. Well, there's a couple things. First of all -- and I'm sorry. You also asked me about acute?

Q. Yes.

A. So the -- the acute, of course, means that it happens in an instant, in a moment, so -- and what we understand by that is that a certain kind of initiating event occurs and the reaction is immediate. So it's not something that would, say, be chronic, for example, or maybe some exposure over long periods of time, you know, may have something. I mean, it can have that too. But acute really means that it's the -- it's the explanation for a severe and intense reaction, a porphyria crisis, if you will, that occurs when certain kinds of stimuli occur.

Q. Well, sir, if you have -- if you're presenting

with cutaneous porphyria --

A. Yes.

Q. -- can you also have acute porphyria?

A. Yes. Yes, you can.

Q. How about if you're not presenting with cutaneous porphyria, can you have acute porphyria?

A. Yes, you can.

Q. It's two different things?

A. Yes.

Q. All right. Well, sir, why does an anesthesiologist have to be aware of porphyria in patients?

A. Well, the reason is because we understand that there are a number of drugs that we use in the normal conduct of an anesthetic that have been shown to -- to create, to initiate, a porphyria crisis, and so it's important to know what porphyria is, to recognize it, and then when knowing it, to know that in the normal way of the medication that I would select to use, if I had a patient before me who had porphyria, I would use one group of medications, and if I know that the patient did not have porphyria, then I would use another group of medication.

So it really is very critically important to know that there are certain medication that need to be

avoided, and some of these medications, again, are kind of common medications that we use under a normal conduct with anesthetic, and so we have to set those medications aside and not use them.

Q. So what's midazolam?

A. Midazolam is a drug in the class called a benzodiazepine, and a benzodiazepine is a -- is a chemical that has an effect when given to a person that results basically in a couple of things. It results in some sedation, some sleepiness. It can have an effect on anxiety. It can reduce anxiety. It can have some effects on the acquisition of memory. And midazolam is actually known for its capacity to -- to prevent or to create what would be called anterograde amnesia. That is to say that after the fact, something may not be remembered.

So to make this point a bit clearer, I -- if I have a patient before me who I give midazolam to, what I'm -- what classically will happen is that that patient and I can still have a conversation, we could have a conversation, and then, say, the -- then I use other medications to render that person now unresponsive and in an anesthetic state, and then after the fact, when the anesthetic is done and the -- and the patient is now revived, I could say to them afterwards, you know, do

you recall that conversation that we had, and the person may -- commonly will say no. So what's interesting about midazolam is that can you have a very kind of normal conversation with someone, but after the fact, it's not recalled at all. So it's powerful in that way.

Q. Well, sir, if someone had acute porphyria, abdominal pain, tachycardia, anything involving acute porphyria, would midazolam ease that pain?

A. Well, what's -- the way that we classify compounds is that they have, again, certain properties. The one thing that I -- that when I described what benzodiazepines do, what they don't do is they don't take away pain.

So to something -- something that takes away pain is called an analgesic. So midazolam has no analgesic properties, not at any dose. And I would certainly never employ midazolam only for an anesthetic where I thought the -- where the procedure was going to be painful. I would never do that. That would be an improper thing to do because I know that no matter how much midazolam I give, that --

MR. BROWNE: Your Honor, objection, relevance. We're here on a very narrow issue. Midazolam's effectiveness and efficacy has been addressed in multiple hearings and that issue has been resolved

against the defense position.

MR. KILEY: Judge --

THE COURT: I'll give you some latitude on this.

MR. KILEY: Thank you.

THE COURT: Go ahead.

BY MR. KILEY:

Q. All right. Doctor, you're aware of porphyria's effect -- or rather midazolam's effect on porphyria, are you not, sir?

A. I am.

Q. And are you aware of a study, to wit, the Effects of Antidepressants and Benzodiazepine-Type Axilot -- Exotic [sic] Agents on Hepatic Porphyrin Accumulation in Primary Cultures of Chick Embryo Liver Cells?

A. Yes, I am.

Q. Okay. Doctor -- yeah.

THE COURT: You need to give her perhaps the title.

MR. BROWNE: I'll give her the article, Judge, when I'm done.

THE COURT: Thank you.

Q. Doctor, is it possible if someone classifies midazolam as a safe drug for porphyrics in five

milligram doses, what would happen if you gave someone 500 milligrams of midazolam?

A. Well, I think that the -- let me just address your question by, first of all, saying that whether or not midazolam is safe in a low dose is not clear. It's not clear, so -- and I think that the study that you mentioned suggests that even in a low dose, midazolam may not be safe. That is to say that it still actually has been shown to create something that looks like porphyria. It will accumulate porphyrin when -- when -- in that study where liver cells were exposed to midazolam.

So I would even -- I'm not sure that I would agree that midazolam has necessarily been shown to be safe even in a low dose. But certainly in a larger dose, I think that what that paper shows, that since even in low dosages midazolam has shown to create the accumulation of these porphyrin compounds, then the large dose, it would certainly create the accumulation of porphyrin.

Q. And bring about an attack of acute porphyria?

A. Yes.

Q. Sir, you stated in your affidavit, quote, based on my review of Mr. Davis's medical record, it is my opinion that a substantial risk that during the

execution --

MR. BROWNE: Objection, Your Honor, leading.

THE COURT: It is leading. Sustained.

Q. Doctor, did you -- did you sign an affidavit to this effect?

A. I did.

Q. All right. And what was your conclusion as a result of --

A. Well, given that -- that your client carries the diagnosis of porphyria, that if your client --

MR. BROWNE: Objection, foundation, Your Honor.

THE COURT: I have assumed for purposes of all of this at this point, to avoid the necessity of having further evaluations done to clinically determine whether or not he has porphyria or not, I've assumed for the purpose of all of this that he has porphyria. That is not a finding that he, indeed, has it, but only a finding that I'm assuming that he has it for purposes of our issues here.

MR. KILEY: Very well, sir.

BY MR. KILEY:

Q. You may answer, Doctor.

A. So in an individual who has porphyria and in the circumstance that your inmate, we say, has porphyria, then if he is given a dose of midazolam that

is contemplated in the execution protocol as I understand it, that is a very, very, very large dose, much larger than we would ever use in a clinical setting, and since to my point that a small dose can lead to a porphyria crisis, an extremely large dose will very likely lead -- you know, will lead to a porphyria crisis. With a very high degree of certainty, I make this claim.

Q. So would it lead to an attack of acute porphyria quicker than if you gave him a small dose of --

A. My opinion is yes, it will.

Q. Okay. And the side effects in Mr. Davis's case would be abdominal pain, correct, sir?

A. Yes.

Q. What is t-a-c-h-y-c-a-r-d-i-a?

A. Tachycardia.

Q. What does it do?

A. It's an accelerated heart rate.

Q. Hypertension, what is that, sir?

A. High blood pressure.

Q. Nausea? Well, I think--

A. We know what nausea is.

Q. Yes, I do, sir.

And vomiting?

A. Yes.

Q. So he would be in pain as a result of the introduction of a massive dose of --

A. Midazolam.

Q. -- midazolam?

Doctor, have you ever administered anesthetic to a patient whom you expected to vomit?

A. Yes, I have.

Q. And what position -- how do you place this man in a position to vomit if you're expecting him to get sick?

A. Well, let me say that the reason that vomiting is of such grave concern is because if an individual vomits as they are losing consciousness, then the -- the vomit, first of all, from the stomach is a very corrosive substance, and if that corrosive substance enters into the mouth and then goes into the lungs, then the corrosiveness of that substance can cause, you know, permanent and serious damage to the lungs, and so we're very mindful and concerned about the possibility of even a small amount of stomach contents entering the lungs, so we take steps to ensure that that does not happen.

So, for example, when a person -- one method would actually be to put a plastic tube or breathing tube in a person's mouth when they're actually basically

awake by using medication that numbs the skin and so on to tolerate, because it's something that no one would normally tolerate. But by putting the plastic tube in the airway, then that seals off, if you will, that if -- the airway from the effects of vomit. That would be in an operating room.

Another thing that we might do is that we'll certainly -- we'll have an individual, say, sitting up as opposed to lying flat, because at least the effect of gravity then is working in our favor and not against it. We might apply some pressure to the neck, something called cricoid pressure, where we push on the throat and push the cartilaginous portion of the trachea against the esophagus, the food pipe, and that prevents, again, passive regurgitation into the trachea, that's something else we might do.

Q. Sir, why did you say that Davis will suffer excruciating pain?

MR. BROWNE: Objection, Your Honor.

THE COURT: Sustained.

Q. Doctor, if the patient is experiencing pain, will the paralytic affect the pain?

A. Paralytics are -- let me just say that paralytics are drugs that are given where the -- where the effect is that they cause muscles in the body to

become immobile, and so we -- you know, they result in paralysis that is temporary.

So a person who is subjected to a paralyzing drug cannot move a muscle, cannot move an inch, cannot move their finger. Now, what they can do is that they can have awareness that they cannot move.

And paralyzing drugs don't affect the heart, so the -- which is a muscle itself, but they affect all the muscles that are involved in breathing and moving and so on, but they have -- they have no effect on a person's ability to know that something is happening around them. And certainly they have no effect on producing analgesia, and they have no effect on producing amnesia. All they do is that they paralyze the muscles of the body, and so if you get this, you can't move.

Q. Sir, what's neuropathy?

A. Neuropathy is a condition I think I had mentioned where nerves are -- are injured for a variety of reasons such that when they -- when they -- when they fire their information, because the nerves themselves are damaged, the way that they conduct information becomes disrupted. And the experience of neuropathy is anything from the nerve just not working at all to giving constant feelings that are painful to people who have neuropathy.

Q. Would a massive dose of midazolam trigger neuropathy?

A. Well, I think that the mechanism of how porphyria causes abdominal pain likely is related to the effect on the nerves, if you will, so that's the defect, that's the mechanism. You know, pain, to be experienced, has to be propagated along nerves, so whenever you have pain, a nerve is the -- is the, if you will, the highway where the information is being -- is traveling, or the wire.

Think of maybe nerves are like wires and you've got electrical signals going along them, so when the wire itself is frayed or broken, then, again, the signal becomes all disrupted. Like imagine maybe taking a wire that's normally covered in plastic and then cutting the plastic off and then dipping it in water. And what would happen? It's something akin to that experience is what happens when these nerves are damaged, if you will, by, say, porphyria.

Q. Well, sir, you know, the scope of this hearing is to determine if midazolam will affect the pain rather.

MR. KILEY: One moment, Your Honor?

THE COURT: You may.

Q. Sir, do you have an opinion whether Davis's

alleged porphyria creates a risk that is sure or very likely to cause serious illness and needless suffering and give rise to sufficiently imminent dangers?

A. Yes, I do have an opinion about that.

Q. What is your opinion, sir?

A. My opinion is that the exposure of midazolam in the dose that is planned will cause a significant porphyria reaction that will be experienced as pain, nausea, and vomiting and -- and other very significant and disquieting experiences after being -- after being subjected to midazolam.

Q. And that is your -- is that your opinion based upon your experience as a medical doctor and an anesthesiologist?

A. And based upon my review of studies that have shown this to be -- be the case.

Q. Most notably the study of -- I don't want to say it again, the effects of antidepressants in benzodiazepines?

A. Yes, that one.

Q. You studied that?

A. I did.

MR. KILEY: Very well, sir.

Nothing further, Your Honor.

THE COURT: Thank you.

Cross-examination, Mr. Browne?

MR. BROWNE: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. BROWNE:

Q. Good afternoon, Doctor.

A. Hi.

Q. Let me set up here.

Doctor, you've been a somewhat vocal opponent of lethal injection and its use in capital punishment; would that be fair to say?

A. I've been a vocal opponent of lethal injection, yes.

Q. In fact, you have written an opinion piece that was published in the USA Today newspaper; is that correct?

A. Yes.

Q. And that was published in 2013; would that be fair to say?

A. Yes.

Q. And the title of that was "Why I'm for a Moratorium on Lethal Injections." The title of that article sound familiar?

A. Yes.

Q. And you are the same Dr. Joel Zivot who authored that and submitted it for publication?

A. Yes.

Q. And you knew that was a widely distributed and read publication in the United States?

A. Yes.

Q. Did you also author -- this one I'm not familiar with -- an article which you submitted for publication in the Philosophy of Ethics and Humanities in Medicine?

A. Yes.

Q. And that was -- you authored that also in the year 2013, I believe it was -- actually 2012. I apologize.

A. Yes.

Q. It was published in that journal, correct?

A. Yes.

Q. And your conclusion in that article could be summed up as: At best, anesthetics produce an outward appearance of calmness only and do not address suffering as a consequence of the anticipation of death on the part of the condemned.

That be a fair statement?

A. I wrote that, yes.

Q. Okay. So not only are you personally opposed to it, you've been vocal in your opposition to lethal injection?

A. To lethal injection, yes.

Q. And in your professional life, you have consulted on behalf of a number of defendants or plaintiffs, depending on the procedural posture of the case, when those individuals are actually challenging a state's lethal injection protocol; is that correct?

A. Yes.

Q. And that would include several states, correct?

A. I don't know how you define several.

Q. More than two.

A. More than -- more than two.

Q. Okay. In fact, this is your second time actually testifying in court on behalf of a criminal defendant; would that be fair to say?

A. Third time.

Q. Third time. Okay.

And it's a happy coincidence for you that your professional views actually support your public opposition?

MR. KILEY: Objection, argumentative, Judge.

THE COURT: Sustained.

Q. Say, Doctor, you've never testified on behalf of the State in defense of any lethal injection protocols?

A. Never been asked.

Q. Now, how are you compensated for your appearance here today?

MR. KILEY: Objection, relevance, Judge.

THE COURT: Sustained -- overruled. It goes to bias.

A. I'm paid a standard fee for the work.

Q. Can you tell the court what that fee is?

A. For this case, my hourly rate is $400 an hour.

Q. Okay. Would that include travel time?

A. I think that that's inclusive of everything, yes.

Q. Can you estimate how many hours you've spent in this case?

A. I think when it's done, it will be maybe 10 hours.

Q. Maybe 10 hours?

A. Uh-huh.

Q. Now, Doctor, you remember, and I was present for this, the Henry case in Broward County?

A. Yes.

Q. In fact, there was a courtroom much like this one. I believe we were in front of Judge Siegel?

A. I don't remember the name of the judge.

Q. Okay. And your testimony in that case was, based on Mr. Henry's history of hypertension and high

cholesterol, that the lethal injection procedures as applied to him would likely precipitate a very painful heart attack?

A. Yes.

Q. That correct?

A. Yes.

Q. And, in fact, you indicated that -- remember that little scenario you gave the court and me on cross-examination, that somehow the midazolam would be injected and his blood pressure would drop and then he'd have a heart attack before the midazolam could actually render him unconscious; do you remember that testimony?

A. Yes.

Q. Have you heard or been presented with any evidence that your prediction in the Henry case was correct?

A. Well, the problem is that Henry got a paralytic, and so once you give an inmate a paralytic, there's no way to really know. It can't be proven that what I said didn't occur, because when you're paralyzed, you can't move and you can't cry out, and there's no way to know.

Q. Well, Doctor, the paralytic in Florida's protocol comes after administration of the midazolam. So your testimony was while he was conscious, he would

feel the painful effects of a heart attack.

Do you have any account from either the press or Mr. Kiley or Mr. Shakoor, who are very competent attorneys, that Mr. Henry suffered any visible signs of distress during his execution?

A. I think a visible sign is really not at all a yardstick of whether or not that occurred. In medicine, that would not at all be the standard.

Q. So despite the fact that in Mr. Happ's execution -- you're aware that it was widely reported that he breathed heavily and his chest moved, right? Are you familiar with Mr. Happ's execution?

A. No.

Q. Okay. So your testimony before this court is that Mr. Henry had a very painful -- what you considered very painful event, a heart attack, and not so much as a grimace was noted --

A. A grimace --

Q. -- before he was rendered unconscious?

A. I don't know like --

MR. KILEY: Judge, first of all, I'd object as to relevance. We are here for a very narrow purpose.

THE COURT: Sustained.

MR. BROWNE: Your Honor, I agree. I'm going to

move on. But I think the fact that his predictions are -- in a recent case, were flat-out wrong was relevant, but thank you, I'll move on.

THE COURT: That's your --

MR. KILEY: Objection, Your Honor, counsel's test --

THE COURT: Sustained, sustained. That's your opinion. That's no evidence of that.

MR. BROWNE: Thank you, Your Honor.

BY MR. BROWNE:

Q. Doctor, have you actually had occasion to treat someone with porphyria?

A. I've had patients who have had anesthetics who have had porphyria as a diagnosis, yes.

Q. But as a doctor, your specialty is anesthetics; would be fair to say?

A. And critical care medicine.

Q. And cardiac care?

A. Critical care medicine.

Q. Critical, okay.

And you agree that midazolam is frequently used by anesthesiologists throughout the country?

A. Yes.

Q. And it's used in virtually every emergency room in this country?

A. I don't think that that's -- I don't know what you refer to exactly when you say -- under what circumstance?

Q. In other words, it's frequently used, it's generally considered by people in your profession as safe and effective for the general purposes of for which it can be used?

A. In the hands of a physician, yes.

Q. And, in fact, you can tell us and calculate us, as a professional, how much midazolam would render the average person unconscious? It's not a mystery in other words.

A. Well, it is a mystery, because consciousness is actually not ever verifiable until after the fact.

Q. Well, if you gave me 50 milligrams of midazolam, you would expect me to be unconscious?

A. Well, expectation is not the same thing as reality. That's why we're empiricists and we do checks afterwards to see whether or not the effects are as we believe them to be, but that's when I have someone who ends up alive. I can ask them that question. But if they're ending up dead, then I really can't ask them anything.

Q. But in theory, the answer to that question is yes, you can look it up and --

MR. KILEY: Objection, Your Honor, argumentative. He -- asked and answered. He already answered his question.

THE COURT: Overruled. Repeat your question.

Q. But, in other words, you can look to source material and calculate based on body weight how much midazolam can be expected to render someone unconscious; would that be a fair statement, Doctor?

A. In the aggregate, but not in the case before me. I mean, can I speculate that something might happen? I can speculate, yes.

Q. But, Doctor, in this case you've not personally examined Mr. Davis; is that correct?

A. Correct.

Q. And, therefore, are you aware -- you indicated in your affidavit that it was reported to you that Mr. Davis had been diagnosed with porphyria?

A. Correct.

Q. Can you tell this court the source of that information?

A. The medical record and the -- and the opinion of a physician that examined him.

Q. Would that be Dr. Maher?

A. I believe so.

Q. And was it reported to you, or did you actually

view the testimony in that case?

A. I read his statement on it.

MR. BROWNE: Your Honor, may I approach and have this marked as an exhibit?

THE COURT: You may.

MR. BROWNE: Mark that as the first State exhibit for identification.

THE CLERK: (Inaudible).

MR. BROWNE: Oh, this would be Exhibit Number 2 for ID then.

(State's Exhibit No. 2 was marked for identification.)

MR. BROWNE: Thank you.

May I approach the witness, Your Honor.

THE COURT: You may.

BY MR. BROWNE:

Q. I hope you have your reading glasses, Doctor.

A. I have them.

Q. All right. Doctor, can you look at the first page of that transcript that I just handed you?

A. Is this page 58 in the top right corner; is that what you're calling the first page, or the very first, first page?

Q. The first page is State hearing held on October 8th and 9th, 2001.

A. Yes.
Q. Does that appear to be State of Florida versus Eddie Wayne Davis?
A. It does.
MR. BROWNE: And, Your Honor, I think Mr. Kiley has this, but I do have a courtesy copy so he can follow along.
MR. KILEY: My compliments. Thank you.
Q. Can you go to page 58? It's the first page. And does that appear to be line 11?
A. Yes.
Q. Michael Scott Maher --
A. Yes.
Q. -- MD?
A. Yes.
Q. And that's the same doctor that you believe had diagnosed Mr. Davis with porphyria?
A. Yes.
Q. Can you turn now to page 63?
MR. KILEY: Your Honor, I object, relevance. The court is already assuming for the purposes of this hearing that Mr. Davis does have porphyria.
THE COURT: Correct. I think it's irrelevant as to what his opinion -- whether or not he has it or not. I'm assuming that he does for purpose of

the question you --

MR. BROWNE: Agreed, Your Honor. But I think this doctor indicated that he's had some report of a doctor, that is completely inaccurate, that he did not diagnose this defendant with prophyria. And so this doctor, his affidavit --

THE COURT: I'll -- I'll assume right now that there's been no doctor that specifically diagnosed him as having porphyria. It's been alleged that he has it. And my specific question and the issue before me is whether or not the existence of porphyria would be affected by the use of the drug that is intended to be used here. So I have assumed for the purposes of this hearing that he does, indeed, have it and, thereby, made it not necessary that we have a physician actually physically do all the testing to diagnose it.

MR. BROWNE: Your Honor, may I?

THE COURT: Sure. But, again, for the record's sake, I am not -- that is not a judicial determination that he does, indeed, have it. I'm just assuming that he has porphyria for purposes of the hearing.

MR. BROWNE: Agreed, Your Honor. And I think my purpose of questioning the doctor on this was

two-part, credibility and whether or not, you know, he submitted an affidavit in reliance upon a doctor who had never diagnosed him, so I think his opinion may be attacked on credibility grounds. But, again, if you want me to move on, I have plenty of material.

THE COURT: I'm going to sustain the objection because I really think it is irrelevant for the purposes of my consideration in this case.

MR. BROWNE: May I approach, Your Honor --

THE COURT: You may.

MR. BROWNE: -- to retrieve the exhibit?

THE COURT: And if you'd like to still attach --

MR. BROWNE: Yeah.

THE COURT: -- it to the record, we'll attach it to the record.

MR. BROWNE: I will, Your Honor.

BY MR. BROWNE:

Q. Doctor, have you reviewed Mr. Davis's medical records from the Department of Corrections?

A. Some.

Q. Have you seen any diagnosis in the medical records of porphyria?

MR. KILEY: Judge, that's already been decided.

MR. BROWNE: I'll move on, Your Honor.

THE COURT: Thank you. And let me just -- the actual -- for our court reporter, because -- it's actually porphyria.

MR. BROWNE: Porphyria, correct.

THE COURT: P-o-r-p-h-y-r-i-a, because I've been pronouncing it prophyria every so often and porphyria.

THE WITNESS: I was going to say something, but I didn't want to say anything.

MR. BROWNE: I'm glad I learned it incorrectly the first time I heard it, which was very recently.

THE COURT: As did I.

MR. BROWNE: Porphyria.

THE COURT: It is with -- and if you need a spelling on any of these words after the fact, just let us know.

BY MR. BROWNE:

Q. Would you agree, Doctor, that porphyria generally requires specific testing of the blood and urine and there are specific tests designed to determine whether or not an individual has porphyria?

MR. KILEY: Judge, same objection.

THE COURT: I'm sustaining the objection again. I'm assuming that he has it. If he -- if it's the

State's contention that he does not have it, then the State might be facing him having to be tested for it for the purposes of the Supreme Court evaluation of this. I'm assuming that he has it for purposes of this hearing. If it's the State's desire to have him tested, then you'll have to file a motion with the Florida Supreme Court to stay the execution.

MR. BROWNE: Very well, Your Honor, I will move on.

BY MR. BROWNE:

Q. We're assuming he has porphyria. Which type? There are several types of porphyria.

A. I'm not sure what you're asking me. If you're asking me to talk about whether or not, again, to discuss --

Q. How many types are there, first of all?

A. Several different kinds of -- maybe four or -- it depends on how it's classified. You know, it could be classified as kind of broad categories. It could be classified as specific categories. There's probably more categories that are even classified because the enzymatic process is very complicated, and there can be lots of disruptions along the way.

So one way of classifying it is, you know, is

either the cutaneous variety, there's -- it can be classified by the -- by the elevation of an enzyme called ALA synthase, that's another way it can be classified. So I'm not sure what you're asking me as to how you want me to classify it.

Q. Well, it wasn't a complicated question. How many types are there?

A. I think it's -- the answer is not a number of simple types. It depends upon what you call a type, because you could classify is under various different ways.

Q. Would you agree that the concern of an anesthesiologist with someone with porphyria is that the medication might actually trigger an acute episode?

A. Yes.

Q. And the literature that you have indicates that actually that person will have to have a history of acute episodes before you even take that concern into account; is that correct, Doctor?

A. Well, to the extent that if I imagine -- if I have a patient before me and what -- of course, the way that that relationship will begin will be a series of questions followed by an examination. So if, in the examination of the questions, I discover either the suspicion of or the documentation of porphyria, then I

will act accordingly, or, for that matter, any disease.

Q. Well, so the answer to that is yes? Because if you're worried about bringing on an acute episode of porphyria, the concern is those -- those conditions, vomiting, nausea, and -- and stomach upset, correct; those are --

A. And other things.

Q. -- the general symptoms that you --

A. Seizures.

Q. -- discussed?

A. Seizures as well, so....

Q. So that is part of the concern, is you want to make sure his recovery isn't hampered or impeded by an acute outbreak of porphyria?

A. Porphyria is a strange condition, and the way that it manifests can be, you know, can be quite dramatic or less so. Remember that what you're -- if you're asking me as to how a physician conducts himself or herself in the setting of a patient who has porphyria, I can answer that question.

Also, the medications that are used are very much different than what -- the example that you're talking about here, which is midazolam in a setting of lethal injection. That's something entirely different.

Q. And your research on this matter included in

your primary reliance was an article "Effects of Antidepressants and Benzodiazepine-Type Anoxila -- Anoxila Agents --

A. Anxiolytics.

Q. Thank you.

A. That means to take away anxiety.

Q. -- Agents on Hepatic Porphyrin Accumulation in Primary Cultures of Chick Embryo Liver Cells, would that be the title of the article?

A. That's the title of the article.

That's not the sum total of my investigation, but that's a particular article that's been cited here.

Q. That's the primary one that you relied on?

A. That's the one that we're here talking about.

MR. BROWNE: Your Honor, may I approach?

THE COURT: You may.

MR. BROWNE: Have this next marked as the next State exhibit. I believe we're on Number 3. Marked for ID.

THE CLERK: That's correct.

(State's Exhibit No. 3 was marked for identification.)

MR. BROWNE: Thank you.

May I approach the witness, Your Honor?

THE COURT: You may.

THE WITNESS: Taking my glasses out again.
BY MR. BROWNE:
Q. Does that article -- I have mine out -- does that article look familiar, Doctor?
A. Yes.
Q. And correct me if I'm wrong, but this was a study that was done on chicken embryos, right?
A. The liver cells.
Q. The liver cells?
A. Yes.
Q. So it wasn't an actual clinical study?
A. A clinical study like answering this question could not be ethically done. And this chick embryo model for liver cells has been validated in a half a dozen other studies that it could be used in this way. So this is a standard way of addressing the question like this having to do with certain kinds of chemicals and the way that the livers -- liver produces certain sorts of things.
Q. But you would agree, as the authors did in here, that it's difficult sometimes to correlate to actual clinical settings the findings that they get using nonhuman subjects, correct?
A. Yes.
Q. And, in fact, they admit that. Can you turn to

page 1153 of this article, please?

A. Yes.

Q. The last paragraph?

A. You're talking about where it says "The use of intact animals"? Is that --

Q. No. The last paragraph on the left-hand side, the left column. "The usefulness of --"

A. Yes.

Q. "-- these lists --"

A. Yeah.

Q. "-- of course --"

A. Right.

Q. Does that indicate that although clinical experience with porphyric agent -- patients is the best approach, it is hampered by several factors; is that basically what we just discussed, Doctor?

A. I think that the -- like the way that studies are written, and this, to be clear, is a study, so a study begins with a clinical question, and the question here that they're asking is are these classes of medications -- what is their effect on the production of porphyrin. That's the question.

You could never do the study on people because you could never create an ethical study where what you're asking is I'm going to see if I can cause pain

for you, because that can't be done. And so, first of all, you have to do an in vitro model, and so you search for an in vitro model that for the -- you know, for the purposes of discussion approximates the person as much as possible, and this sort of study is what science and medicine turns on every day. We take studies like this, we recognize that it's not people, we understand that it's a model, and based upon this we make clinical decisions all the time.

Q. In fact, if -- you read this article all the way through to the end? I'm pretty sure you did, Doctor.

A. I did.

Q. You're relying on it.

Can you turn now toward the last page? And while these -- this study suggests use of caution using certain benzodiazepines --

A. Yes.

Q. -- they also acknowledge that there's contrary findings, correct, Doctor?

A. Tell me what sentence.

Q. The end of the first paragraph. "Both triazolam and midazolam are generally listed as safe," and they're citing authors.

You see that?

A. I see that sentence. But the way that that's -- what they're referencing, of course, is -- is clinical experience or anecdotes. And we understand that anecdotes are the lowest level of certainty and a much lower level of certainty than -- and papers, I've written papers, and I understand that what happens here is that then one must look at one's method and say, well, what do I think are the strengths and what do I think are the weaknesses. And the standard in a scientific paper is different than the standard that we're talking about here, so I don't think it's -- can be necessarily, you know, directly compared head to head.

Q. Well, they were citing clinical studies, right, that use of midazolam and triazolam --

A. Well, they're --

Q. -- were generally considered safe? So they're --

A. Those are not necessarily studies. What they're citing are people saying, I did this case in this way and nothing bad happened as far as I could tell. That's not the same thing as a prospective study where the answer is not known.

Q. Did you look at those particular studies that were cited?

A. No. I've looked at other ones though. I can -- I know that there are cases where people write in and say, I did this this way and this is what happened. And it's a case report. It's not a study. It's a case report. It's different.

MR. BROWNE: Your Honor, may I approach the witness?

THE COURT: You may.

Q. So it'd be fair to say, Doctor, that there are conflicting authorities in your profession, and viewpoints, on whether or not you would use a benzodiazepine and how safe it would be with someone with porphyria?

A. Well, no one would use midazolam in any clinical setting in the dose that will be used in execution.

So what was striking about this paper is that the -- is that they used a low dosage of midazolam, and even in a low dosage they found this reaction to take place. And it's very possible that I could also conclude that even though midazolam -- and, in fact, if you -- there are certain repositories that have collected medications that they say, you know, safe, not safe, we don't know. Okay. There's a European repository, there's an American repository. There are

places that one can look where these drugs are accumulated. So, ultimately, it's an opinion.

But whether or not folks have porphyria with a small dose has not at all been proven that that does not occur. All that is known is that I did this and I don't think it occurred, okay, or I'm not sure that it occurred. And that might be publishable just by that claim alone.

But a person after, say, an abdominal operation could have abdominal pain very, very commonly, and we don't know if that's the pain from the operation or porphyria, because we haven't necessarily checked.

MR. BROWNE: Your Honor, I believe my question was there other sources of authority that believe that midazolam is safe for patients with porphyria, and I believe the answer to that was yes.

THE COURT: I would assume it was yes.

A. In -- in lone --

MR. BROWNE: Your Honor, may I approach the clerk?

Thank you, Doctor.

Q. In fact, Doctor, there are certain drugs that you certainly wouldn't use if you -- if someone had acute porphyria?

A. Yes.

Q. Right. In fact, barbiturates like sodium thiopental?

A. That's the one that's classically been shown to -- to be contraindicated in porphyria.

Q. Pentobarbital?

A. Right.

Q. Right. So most of those charts and warnings indicate midazolam, you can use it, but use with caution; would that be fair to say?

A. It's a very small dose, and it -- and it -- it's based upon a different level of evidence than what this paper is showing.

Q. So do you have any particular study that 500 milligrams of midazolam will immediately result in an outbreak of porphyria, an acute porphyria episode?

A. I think I have a study that says that a dose much less than that can result in -- in porphyria.

Q. In that chicken liver embryo study, don't they indicate that they were looking at the results 20 hours after administration of various drugs?

A. I understand.

Q. So you don't have -- you cannot cite this court a study that indicates acute porphyria will be initiated within minutes; do you?

A. Based upon my -- my professional opinion is

that the midazolam that will be given in this circumstance --

Q. That's not my question.

MR. KILEY: Judge, let him --

THE COURT: Sustained.

Answer the question. It's a clear question to you.

A. Ask it again then.

Q. You cannot cite a single study which indicates or suggests that an acute porphyria outbreak will be initiated within minutes of a large dose of a benzodiazepine or midazolam, can you?

A. I don't agree with that, no. I think I can cite that. I mean, I think that this paper shows that even in a low dosage and then based upon -- I'm not only relying on that paper alone -- based upon other things that I've written, what I've -- you know, what I've learned, that porphyria can occur acutely, and that's why we understand it to be of concern to us, because it can occur acutely and it can occur in the setting of -- of triggering agents.

Q. You're confusing me, Doctor.

Now, acute, you're well aware, are you not, that acute is a type of porphyria, right? You're using acute as a rapid onset.

A. Yes.
Q. Are you misusing those two terms?
A. I don't think I'm misusing it, no. I'm using it to mean acute, meaning a rapid onset.
Q. Within minutes?
A. Potentially.
Q. And you are telling us in court now that you can find me a study that says -- and maybe on break we'll go ahead and maybe we'll have five minutes for you to research that -- that you can find a study that says if you give a certain amount of midazolam, the outbreak will be within minutes, those symptoms will appear within minutes?
A. I don't think that such a study that would exactly mimic execution could ever be done. So if you're saying can I create for you a study where we take people and give them 500 milligrams of midazolam when they have porphyria and show that it will occur, you're right, that study will never be conducted.
Q. Now, are you familiar with the Porphyria Foundation?
A. Yes.
Q. And their work?
A. Yes.
Q. Are you aware that the Porphyria Foundation

lists midazolam as a drug that is generally considered safe for people with acute porphyria?

A. In a dose that would be a hundred to two hundred times smaller than the dose that -- that is going to be contemplated in this setting.

Q. Now -- excuse me, I'm having trouble reading my notes.

We're assuming -- we're making a number of assumptions here when you tell this court that -- and you -- obviously, Mr. Kiley was citing the language of the remand order, that it's sure very likely to cause these acute porphyria symptoms. But we're making a number of assumptions, one of which --

MR. BROWNE: And I'm not contesting this one Your Honor, for purposes of the question.

Q. -- one that he has porphyria, right, Doctor?

A. Yes.

Q. We're assuming that?

A. Yes.

Q. We're assuming that he has an acute type of porphyria, not just cutaneous?

A. Yes.

Q. Would that be fair to say?

A. Yes.

Q. We're also assuming that he'll have an acute

episode of porphyria before midazolam has its intended effect to render the defendant completely unconscious; that be fair to say?

A. I mean, it's entirely possible that the porphyria reaction will actually occur even before he is -- he's executed, because other things that can occur can start a porphyria reaction to take place, so one scenario is that things are already occurring, and the midazolam only further worsens what's already occurring.

Q. Do you have evidence of an acute porphyria outbreak on Mr. Davis that he's suffered over the past 20 years he's incarcerated?

A. I wasn't asked to comment or look into that, no.

Q. Would that be something that'd be relevant to your opinion here today?

A. I don't have an opinion about that. I mean, if you're asking me does he have porphyria, is that what you're asking me?

Q. Yeah. Has he had ever had an acute porphyria outbreak?

A. I don't know.

MR. KILEY: Objection, Your Honor.

THE COURT: Sustained. Move on.

MR. BROWNE: Your Honor, may I have one moment?

THE COURT: Certainly.

MR. BROWNE: Briefly, Your Honor. Thank you.

BY MR. BROWNE:

Q. Doctor, would it be fair to say that porphyrins need to accumulate before there is -- there is an active attack of acute porphyria?

A. Porphyrins need to accumulate, yes.

Q. Correct. And it takes some time to do that; would that be fair to say?

A. The issue, though -- I think what's important is the issue of dose.

THE COURT: Answer his question, please, then you can answer it.

A. Okay. So ask it to me again then. Does it take some time?

Q. It will take some time for the porphyrins to accumulate before this acute episode or attack?

A. Some time, yes.

MR. BROWNE: Thank you, Your Honor.

THE COURT: Redirect?

MR. KILEY: Yes, Your Honor.

REDIRECT EXAMINATION

BY MR. KILEY:

Q. Mr. Browne's last comment, take some time to accumulate, correct, sir?

A. Yes.
Q. That's what he just said?
A. Yes.
Q. How about if they were already accumulating before he is given the dose of midazolam?
A. I mean, the problem is whenever you look at dosages and even recommendations where it's been said that I use this in this way and it was, quote, safe, is, again, what's critically important here is dosage.

So the dosage that is felt to be, quote, safe is such a fraction of a dose that's going to be used here that it -- as to not be comparable. It would be the same thing to say that alcohol does not cause intoxication. It's a function of dosage. We understand if you have a sip of wine, you probably won't be intoxicated, but after the first bottle, you will be.

So the effect here is -- is fundamentally about dosage. And so all these claims about midazolam being safe are based on a dose that is tiny and minuscule compared to what is going to happen here. And so, yes, do porphyrins have to accumulate? Sure, they do. Can reactions happen in the body extremely rapidly? They absolutely can.

Q. Sir, Mr. Browne asked you at the beginning of his cross-examination if you wrote certain articles. Do

you remember the articles you wrote?

A. Yes.

Q. Why'd you write them?

A. Because as a physician, I have concerns about lethal injection. I don't think that lethal injection can occur where there cannot be the promise that they will not be needless cruelty in a setting of execution. That's my opinion.

Q. That's your opinion?

A. Yes.

Q. All right. Now, does the fact that Mr. Davis, we're assuming, has porphyria, does that heighten your concern?

A. Well, I think what's -- this is another example, I think, of the problems of the collision, if you will, of the practice of medicine and execution. These things are not intended to collide, and they're colliding here in complex ways, that lethal injection is not a medical act and can, therefore, not be held to the standards of a medical act.

This is another example of how confusing and complicated it is to try to lift up medicine and say, let's take some of this from medicine and now use it for -- for lethal injection. It just doesn't work like that. You know, it's not intended for that purpose, and

that's -- I think this is another example of that problem.

Q. Can you give us another example?

MR. BROWNE: Objection, relevance.

MR. KILEY: Well, Judge, he opened the door.

THE COURT: I'll give you some latitude.

A. It's just -- it's when -- there's a lot of problems here with language. So, for example, if I take something like midazolam, in my hand I use this as medicine to heal, and in that way I understand it. Now, when midazolam is taken from me and used for the purpose of execution, it is now turned into a chemical, a poison, with the intention of killing. And the problem is that these then, therefore, are not able to be compared in a simple sort of way, because all the things that I do, everything that I do is based upon two things. It's based upon being sure that what I'm doing is safe and being able to verify afterwards that it was safe. And in this circumstance, there's no verification of safety, not in the medical standard, and there's no way to verify afterwards whether it was, in fact, safe.

Q. So you can satisfy neither prong?

A. You -- it cannot be -- the question cannot be answered.

And so merely to say that it cannot be observed

in no way says to me that there's not needless cruelty that occurs here, as I understand the way that the chemicals are going to be contemplated to be used in the setting of a lethal injection.

Q. And, again, sir, will the introduction of such a massive dose of midazolam create a substantial risk that Davis will suffer pain?

A. My opinion is yes.

MR. KILEY: A moment, Your Honor.

Q. How could that occur?

A. Midazolam can create the rapid accumulation of porphyrin, and porphyrin is the compound that has been incriminated, if you will, as the cause of all of the problems that are porphyria.

Q. And what would cause him pain?

A. The porphyrin effects on nerves, which can result in pain, nausea, vomiting, some of the neurological problems, seizures potentially, all of these things -- the neuropathic pain, all of these things are aggravated by the presence of porphyrin.

Q. As opposed to someone who does not have porphyria?

A. Correct.

Q. This would not affect them to the extent it would affect Davis?

A. Correct.

MR. KILEY: I have no further questions, Your Honor.

THE COURT: I just have a couple of questions. Do you use midazolam in your practice?

THE WITNESS: I do.

THE COURT: And what is a typical dosage you would give to somebody to put them unconscious for surgery?

THE WITNESS: Midazolam is not used as a sole agent to produce unconsciousness on its own. The kind of dose that I would use as an adjunct would be on the order of maybe one milligram up to a maximum of five.

THE COURT: Have you ever used midazolam exclusively to cause unconscious for surgery?

THE WITNESS: Maybe once in 20 years.

THE COURT: And what was the dosage?

THE WITNESS: It's in the order of 40 to 50 milligrams.

THE COURT: And here you're dealing with a hundred times that?

THE WITNESS: Well, 500 milligrams, I guess.

THE COURT: How long does it take somebody to go into a state of unconsciousness after the -- is

it an injectable liquid of some sort or a drip or what?

THE WITNESS: It's -- yeah, it would be injected.

THE COURT: Okay. And how long until a person is given let's say the 50 milligrams of midazolam before they're unconscious?

THE WITNESS: Well, it's not used often. And I'll tell you two --

THE COURT: That's not my question. My question is how long would it take after the injection of 50 milliliters -- I'm sorry, 50 milligrams of midazolam for a person to be unconscious.

THE WITNESS: It wouldn't be injected rapidly, it would be injected slowly, so it could be a matter of a few minutes.

THE COURT: Okay. And would the increased dosage cause the onset of unconsciousness to come on quickly?

THE WITNESS: Well, I have to answer this question in this way, that these drugs, they work on what's called a receptor, okay, so that the effect between dosage and speed of onset is not, strictly speaking, linear, because the effect can peak, and

so once the receptors are saturated, you could give 500 times more and it would have no further effect. And what's not known always is whether, you know, the receptor population, how many receptors there are that need to be saturated.

So I think that the dosage of 50 milligrams generally has been used, again, to create anesthetic -- an anesthetic state, but it's never been used to -- to create death, and so I -- anesthetic state is not the same as death.

THE COURT: I appreciate that.

Okay. Since I asked questions, my policy is both of you can cross-examine on any question the court's asked, so if either of you have any cross-examination based on the court's questions, you're welcome to ask them.

MR. KILEY: I don't, Your Honor.

THE COURT: Okay.

MR. BROWNE: No, Your Honor. Thank you.

THE COURT: Thank you, sir.

THE WITNESS: Thank you.

THE COURT: You may step down.

(The witness stepped down from the witness stand.)

THE COURT: Mr. Kiley, further witnesses?

MR. KILEY: None for the defense, sir.

DEFENDANT RESTS

THE COURT: Thank you.

And who is handling for the State?

MR. FREELAND: I will be. Tim Freeland, Your Honor. Our next witness is going to be Dr. Evans, and perhaps we can take a break so --

THE COURT: Correct.

MR. FREELAND: He's going to be by telephone.

THE COURT: And you're Mr. Sabella?

MR. FREELAND: I am Freeland.

THE COURT: Freeland. I'm sorry. Forgot my notes. Okay. Freeland.

Okay. It's my understanding -- are we calling him at this point?

MR. FREELAND: We -- yes. Yes, Your Honor.

THE COURT: What we can do is go off the record for a moment.

(Discussion off the record.)

THE COURT: The other thing, if you just let him know, our phone system is such that if he's talking, he can't hear us. When they're talking on the other side, it closes our microphone, so if he gets off onto a -- you might just explain that to him in the brief discussion. Because, for example,

if you raise an objection, he can't hear us saying, "objection" by the nature of our phone. And just even heavy breathing on his side causes a disruption of our microphone on our side, so you might just tell him to take a pause every so often and not breathe heavily into the phone, if you will.

MR. KILEY: Your Honor --

MR. FREELAND: He's professor, so that may cause a few problems.

THE COURT: I know. But that's why --

MR. KILEY: Your Honor, can you give us a time certain so I could take care of some personal matters?

THE COURT: Yeah. I was going to say five -- it's going to take him five minutes to get him on the phone. Do you need any longer than that?

MR. KILEY: Well, I need enough time to get down through security, smoke a cigarette, and get back.

THE COURT: Why don't we tell him we'll start right at quarter of?

MR. KILEY: Very well, sir. Thank you.

MR. FREELAND: Thank you, Your Honor. Absolutely.

THE CLERK: Are we going off this record now?

THE COURT: Yeah, we'll go off the record.

(Recess from 2:25 p.m. until 2:38 p.m.)

THE BAILIFF: All rise please. Circuit court's again in session. Please be seated.

THE COURT: Are you all ready to proceed?

MR. FREELAND: Yes, Your Honor.

THE COURT: What's the number I need to call?

MR. FREELAND: I'm sorry.

THE COURT: This is the number?

THE WITNESS: Lee Evans.

THE COURT: Good afternoon, Doctor. This is Judge Jacobsen. I'm sitting here in my courtroom. We have you on a speakerphone. We have a court reporter sitting in front of me who will be taking down everything that's being said. We have Mr. Freeland standing near the phone, who will be doing some questioning in just a few moments, and then there will be cross-examination by, I assume, Mr. Kiley.

MR. KILEY: Mr. Shakoor, Your Honor.

THE COURT: Okay.

THE WITNESS: Okay.

THE COURT: And it's my understanding that you have a notary there present with you.

THE WITNESS: I do.

THE COURT: Would you please have the notary identify themselves for our court reporter?

THE WITNESS: Okay. Just a moment. I'm going to hand the phone to her.

THE COURT: Thank you.

MS. GANN: Hello?

THE COURT: Would you tell us your name, please?

MS. GANN: Yes. For the record, my name is Laurie Kenney Gann.

THE COURT: Could you spell the middle name and the last name?

MS. GANN: Kenney, K-e-n-n-e-y, last name's Gann, G-a-n-n.

THE COURT REPORTER: How is Laurie --

THE COURT: And, Laurie, how do you spell Laurie?

MS. GANN: It's Laurie, and it' L-a-u-r-i-e.

THE COURT: Thank you. And it's my understanding that you're a notary in the state of Alabama.

MS. GANN: Yes.

THE COURT: And would you please put the doctor under oath?

MS. GANN: Okay. I'm swearing in Roswell Lee

Evans, Jr., who's produced his driver's license for my inspection.

If you will raise your right hand. Do you solemnly swear and affirm that the testimony you're about to give will be the truth, the whole truth, and nothing but the truth, so help you God?

THE WITNESS: I do.

THE COURT: Thank you, ma'am.

MS. GANN: And I will turn it back over to Dr. Evans.

THE COURT: And just for purposes of our record, we are proceeding under Florida Rule of Judicial Administration 2.530(d) dealing with testimony by way of electronic, or in this case telephonic, means, and it's my understanding that the defense has agreed to the presentation and testimony by telephone after the oath has been provided.

Is that accurate.

MR. KILEY: That is accurate, sir.

THE COURT: Thank you.

Mr. Freeland, you may proceed.

MR. FREELAND: Yes, Your Honor. Thank you.

Initially I have these medical records, which I believe Dr. Evans has reviewed and used, which the

defense has no objection to being admitted. These are the defendant's medical records. These would be State's Exhibit Number 4.

THE COURT: Number 4.

Let me just for purpose of our record, during the earlier examination there was various items that were identified for the record, were not introduced into evidence. Are you moving to introduce those into evidence?

MR. FREELAND: Not at this time, Your Honor.

THE COURT: Okay. So this -- are you moving to introduce these medical records as evidence at this point?

MR. FREELAND: Yes, I am.

THE COURT: Any objection?

MR. KILEY: No objection, Your Honor.

THE COURT: Be received as State's Exhibit 4 for the purposes of this hearing.

(State's Exhibit No. 4 for identification was received in Evidence.)

MR. FREELAND: In addition, I have Dr. Evans' CV, which I have given a copy of to opposing counsel, and I believe they have no objection to it coming in as evidence. This would be State's Number 1.

THE COURT: Any objection?

MR. KILEY: No objection, Your Honor.

THE COURT: Be received as State's Exhibit Number 1, which is the CV for the doctor.

(State's Exhibit No. 1 for identification was received in Evidence.)

BOSWELL LEE EVANS, JR., PharmD, FASHP, FCCP, BCPP, called as a witness by the State, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. FREELAND:

Q. Dr. Evans, we're with you now.

A. Okay.

Q. Can you please state your name for the record?

A. My name is Roswell Lee Evans, Jr.

Q. What is your educational background, Doctor?

A. I hold a degree in pharmacy, bachelor's in pharmacy, a Doctor of Pharmacy degree, and postdoctoral residency.

Q. What is your present position?

A. I am a dean and professor of the Harrison School of Pharmacy at Auburn University.

Q. Can you tell us what a pharmacologist does?

A. Well, in my case, I'm involved in working with individuals and for various disorders, especially

psychiatric and mental disorders with -- regarding drug effects.

Q. Do you -- are you involved then in examining and researching the impact of various drugs on individuals to whom those drugs might be given?

A. Yes.

Q. Are you board certified?

A. I'm board certified as a psychiatric pharmacist.

Q. Do you have any consulting practice?

A. The only consulting practice that I have is the occasional legal question as we're -- like what we're doing today.

Q. Can you tell us something about your experience in evaluating the effect and impact of various drugs?

A. Well, I -- my clinical practice has been with active psychiatric patients in which I am to recommend and initiate appropriate drug therapy in collaboration with the rest of the psychiatric team. Today and the last few years, I also serve on a community practice experience with pharmacy nursing students in which these students are following patients out in the community, and I supervise those individuals.

Q. Do you -- have you had or do you now have experience as an instructor?

A. Yes, I've taught. Prior to coming to Auburn, I was at the University of Missouri-Kansas City. Primary employment was with the School of Pharmacy. I had an additional appointment in the Department of Psychiatry in the School of Medicine, and I taught pharmacy of medical students, nursing students, and anybody else who showed up in the patient care environment about drug therapy and -- and the effects on individuals that were receiving those drugs.

MR. FREELAND: Your Honor, at this point I would tender him as an expert in the field of pharmacology.

THE COURT: Do you wish to voir dire him?

MR. SHAKOOR: Yes, please, Your Honor.

THE COURT: Get close to the mic.

And this is Mr. Shakoor who's going to be questioning you, Doctor.

THE WITNESS: Thank you.

VOIR DIRE EXAMINATION

BY MR. SHAKOOR:

Q. Good afternoon, Doctor.

A. Hello.

Q. Doctor, are you a medical doctor?

A. I am not.

Q. Do you have a PhD, Doctor?

A. I have a Doctor of Pharmacy. It's not a PhD.
Q. And do you have any expertise in anesthesiology, and have you ever administered anesthesia?
A. No.
Q. Have you ever administered midazolam?
A. Not directly, no.
Q. And you said you specialize in psychiatric medication?
A. Yes.
Q. And you do not have any --
A. Well, let's -- let's correct that just a moment. I specialize in the treatment of psychiatric patients. Most of that is psychiatric meds, yes.
Q. So you specialize in the treatment of psychiatric patients?
A. Yes.
Q. So you don't specialize in the treatment of porphyria patients, do you?
A. No. I don't think there are too many people that do.
MR. SHAKOOR: Your Honor, I'd object to this witness being called as an expert. I'd like to cite, first of all, Florida Rules of Evidence 90.704, 90.702, particularly 97 -- 90 -- 90.702 when

we're talking about testimony of experts. If you go to subsection 3, the witness has applied the principles and methods reliable in the facts of this case.

Your Honor, this pharmacologist has no expertise in midazolam, has no expertise in porphyria, he has no expertise in anesthesia.

I'd also like to cite case Kelvin versus State 610 So.2d 1359, and that case is a 1st District Court of Appeals case where error was found in the admission of a technician regarding the flight of bullets when that witness had no expertise regarding either crime scene reconstruction or -- and ballistics.

Also like to cite Gilliam v. State. It's a Florida Supreme Court case, 514 So.2d 1098. Your Honor, in that case the court held that it was error to allow the expert -- the witness to testify with an expert opinion regarding shoe pattern evidence when that witness had no expertise regarding reliable scientific principles regarding shoe markings, and that was on reversible error in that case, Your Honor.

So I would ask, based on this witness's testimony so far, the fact he specializes in

psychiatrics and for all the other aforementioned reasons, I'd like to declare he's not an expert, and I would ask that this court not rely on this witness regarding expert opinion in the matters at hand. We have a very narrow focus based on what the Supreme Court has told us to focus on.

THE COURT: Mr. Freeland?

MR. FREELAND: May I question the witness further, Your Honor?

THE COURT: You may.

CONTINUED DIRECT EXAMINATION

BY MR. FREELAND:

Q. Doctor, can you tell us again, what is your board certification?

A. I'm a board certed -- board-certified psychiatric pharmacy -- board psychiatric neurologic pharmacist.

Q. Have you been qualified as an expert in any other courtroom?

A. Yes, sir.

Q. How many times have you been qualified as an expert in pharmacology?

A. I have never been disqualified.

MR. SHAKOOR: Your Honor, I'd object to relevance regarding that question.

THE COURT: Overruled.

Q. How many times have you have been qualified as an expert and in what fields?

A. It's hard to say. I would say at least 30 times dealing with the effects of drugs on individuals in question.

Q. Have you previously testified in a court of law regarding the effects of midazolam?

A. I have.

Q. Are you familiar with the effects of midazolam?

A. Very much so.

MR. FREELAND: I would tender him as an expert in this field, Your Honor.

THE COURT: Any further voir dire?

VOIR DIRE EXAMINATION

BY MR. SHAKOOR:

Q. Doctor, do you have any expertise regarding the administering of midazolam on someone with porphyria, any experience?

A. My -- my expertise there is gained from literature review. I have no personal experience with treating porphyria patients. Those patients are relatively rare.

Q. And these other cases where you testified for the State here in the state of Florida --

A. Yes.
Q. -- would one be State v. Henry, State v. Chavez?
A. Yes.
Q. Are those two of those -- are those two cases that you can remember testifying in? And in those cases, no objection was ever raised, was there, regarding your qualifications?
MR. FREELAND: Objection, Your Honor, that's not relevant.
THE COURT: Sustained.
MR. SHAKOOR: I object, Your Honor. I think the record shows that he's not an expert in the narrow focus of what we're focusing on today in court.
THE COURT: Overrule the objection.
You may proceed.
MR. FREELAND: Thank you, Your Honor. Is the court going to deem him an expert in this field?
THE COURT: It's not appropriate for the court to deem anybody an expert according to Ehrhardt --
MR. FREELAND: Thank you, Your Honor.
THE COURT: -- in some cases that he cites, and I can pull that if you like.
MR. FREELAND: That's quite all right,

Your Honor.

CONTINUED DIRECT EXAMINATION

BY MR. FREELAND:

Q. Doctor, you -- you have had an opportunity -- have you had an opportunity to review Dr. Zivot's affidavit in this case?

A. I have.

Q. Can you tell us, what is -- based upon your knowledge and expertise with regard to midazolam, what would be the effect on a human being of administering 500 milligrams of midazolam?

A. Well, the effect is pretty profound. It is a toxic dose of drug. It would cause eventually -- well, initially a comatose state, respiratory arrest, followed by cardiac arrest if left alone without any sort of treatment.

Q. Can you tell us how -- what time frame we're talking about for a person to be rendered unconscious by that amount?

A. Well, the unconscious component takes a very short amount of time. Literally by the time a person was asked to count to 10, they would never make it back from 10 to one. They would be unconscious at that point, and that level of consciousness would -- a lack of consciousness would continue to deepen the longer we

left the person untreated for that -- for that overdose.

Q. What is a typical therapeutic dose for midazolam?

A. Well, it's -- typically, it's about anywhere from one to two and a half milligrams of dose up to five milligrams, and that's an initial dose that one might get, and that is something that's used in doses that's use in the preanesthesia type of approach use of the drug.

Q. Is there any literature that you're aware of on deaths being caused by midazolam?

A. Yes. Actually, there are at least case reports of -- of as little as five milligrams of the drug causing -- causing death, and typically doses are a little higher than that that have caused death, but as you get into the doses of five to more milligrams, you increase the risk of causing serious complications.

Q. Are you aware of cases of midazolam abuse causing death?

A. There is a national trend for the drug to be abused intravenously and there's been a very large number of deaths reported as a result, and it's especially happening in South America as we -- as we know right now.

Q. Can you advise the court or give us any

information as to the amount of midazolam involved in the abuse cases which resulted in death?

A. It's -- it's very unclear how much a dose -- how much of a midazolam dose that has typically caused death. In abuse situations, it's very hard to know, and the ones we do know, we're talking about doses that approach 40 milligrams, but that's pretty scarce information.

Q. Doctor, in this case, Mr. Davis was weighed in June, June 2nd of this year, and at that time his weight, according to the medical records, was 223 pounds. Can you calculate for us what amount of midazolam would be required to render him unconscious?

A. Well, as a general rule, the amount that is necessary is like 1 point -- .15 milligram per kilogram is a -- is a typical dose, and you -- with a 223-pound individual, that's about a hundred kilograms, and so you're talking 10 milligrams, five to 10 milligrams. You would never start with more than five milligrams because the response of individuals is -- is very dependent on a number of factors -- and it's not a black and white science. So you would start low and begin to titrate upwards to get a clinical effect that you're after.

Q. Doctor, how long would unconsciousness last

with a dose of 500 milligrams?

A. Well, if the person were to survive that dose, it would be somewhere in the neighborhood of six to six plus hours, because we don't really know that -- that you know, in a normal dose, four to six hours is what you would count on to recover from a midazolam injection or administration, so with that large a dose, it would be prolonged, it would be longer than that, again, if the individual survived the dose.

Q. Am I correct that there are no cases that you're aware of, of someone surviving a dosage of 500 milligrams?

A. I'm not aware of anything like that, no.

Q. Would a dosage of 500 milligrams render an individual insensate to pain?

A. Very quickly the person is in a very deep coma. He would not respond to pain.

Q. And that would be how quickly? Within a space of, say, 10 seconds or longer?

A. Longer than that. But in the space of a few minutes, we have achieved a very deep level of unconsciousness heading to a very deep coma.

Q. Can you tell us what are the pain receptors in the brain; what are they called, and how do they function?

A. The pain receptors are typically receptors that are mu receptors. They are pretty well distributed throughout the central nervous system. Analgesic drugs like narcotics act on those receptors.

THE COURT REPORTER: I'm sorry. What was the name? Was it new receptors?

MR. FREELAND: Mu, m-u.

Q. Is that correct, Doctor?

A. Yes.

Q. How does midazolam affect one's ability to feel pain?

A. Well, it, as a drug, has no direct impact on those kind of receptors. This drug is primarily a GABA, an agonist -- antagonist. But when you are able to shut off the reticular activating system and create the kind of comatose state we're talking about, the person does -- that part of the brain which is sensitive to pain proprioception is essentially blocked.

Q. And that's -- is that because -- does midazolam operate on the GABA receptors then?

A. Yes, it does, which are pretty well distributed throughout the body, but a very, very high concentration of GABA receptors of multiple types are in the central nervous system.

Q. And which organ would you say is affected most

quickly by the midazolam when it's injected?

A. Brain. High -- the higher centers of the brain starting with the reticular activating system and upwards, but primarily the reticular activating system.

Q. Can you say within a reasonable degree of pharmacological certainty whether the defendant -- or that the defendant would be unable to feel pain if he is given a 500 milligram dose of midazolam within a few minutes?

A. It's my opinion that he would not.

Q. Have you done any research in the area of porphyria?

A. Yes. I have done an extensive amount of reading once I had been contacted. It had been years since I had looked at porphyria. Again, it's something you don't see very frequently. But yes, I have done a fair amount of reading.

Q. Can you tell us some of the sources you used; did you use, for example, the -- did you consult with the national porphyria institute?

A. Well, a number of articles and the primary of literature as well as consulting texts like Internal Medicine textbook, Harrison's, a number of resources that are available to us in summary form, electronic resources that are available through a drug information

system, that's the kind of thing that we've been able to get to.

We've done -- I've taken a look at the American Porphyria Foundation data, the National Digestive Diseases Information Clearinghouse, the Merck Manual for healthcare professionals, which is an -- updated most recently in June of 2014. Some of the -- those are the kind of things we've looked at. We've also looked at some review articles that have occurred in the British Journal of Anesthesiology as well as a few others.

Q. Based upon your research, have you been able -- have you developed an opinion as to whether midazolam would render someone with porphyria unconscious?

A. Render them unconscious?

Q. Yes.

A. Midazolam -- porphyria is -- is not at all -- would -- not at all implicated in not causing the effects of midazolam. So just because you have porphyria doesn't mean that midazolam doesn't work like it does in other individuals, so you wouldn't cause a problem with -- with the kind of action that we're asking it to do in this -- in this case.

Q. Can you describe briefly your understanding the mechanism of a porphyria attack?

A. Okay. Porphyria is a disease that is caused by

a enzyme deficiency that prevents the production of porphyrin, and porphyrin is a substance that's necessary in combination with heme to create hemoglobin, which basically is responsible for oxygen transport in our body along with a number of other things. When these enzymes are in lower concentration, more porphyrin is produced than can be combined with heme. That's where we begin to get into problems with porphyria.

Q. If we assume, as the court has, that the defendant has porphyria, what are the likely effects of midazolam on him; I mean, will it interfere with his ability to be placed unconscious and rendered insensate within a few moments, within a few minutes?

A. No, it will not.

Q. Will it specifically interfere with his -- with this drug's rendering him insensate to pain within a few minutes?

A. No.

Q. Are there any studies of which you're aware that show that a person with porphyria would experience a porphyric attack when given midazolam within the space of -- before he is rendered unconscious by the midazolam?

A. No, I've not been able to find anything that would suggest that.

Q. Is the process of a porphyric attack a progressive one?

A. Well, it's a delayed one; so regardless of what drug is inducing the increased production of porphyrin, it's not an immediate response. So what you begin to get out of the literature is the fact that the concern is post surgical anesthesia with some drugs that might be porphyrinogenic, so it's not an immediate thing, and in this case we would expect that the intent of the use of midazolam would be successful prior to any particular effects from porphyrin.

Q. Can you say based upon your -- your -- is it your opinion whether there is a substantial -- whether a substantial risk exists that Mr. Davis will suffer from extreme or excruciating pain as a result of his porphyria?

A. I think it's highly unlikely.

MR. FREELAND: If I may have a moment, Your Honor?

THE COURT: You may.

Q. Doctor, as a pharmacologist, is it one of your responsibilities to evaluate the implications of a particular drug for people who have certain medical conditions such as porphyria?

A. Yes.

Q. Is --

A. In fact, psychiatric patients would -- could show up and present with porphyria. That would be my responsibility to look at that.

Q. Is there any literature that discusses midazolam as being an accepted drug for people with porphyria?

A. Well, there is, and it would -- it has been suggested that it is a preferred choice in comparison to other drugs. There is some literature that would suggest otherwise, and when you review that, it seems like those conclusions are being drawn from animal studies, not human studies, and of the most human stuff would be observational in nature, so that -- that makes it difficult to study this.

Q. And most of those studies are -- don't they involve situations where a person is undergoing anesthesia and we're expecting them to recover?

A. Yes.

MR. FREELAND: I don't have any further questions, Your Honor.

THE COURT: Thank you.

Mr. Shakoor, cross-exam?

MR. SHAKOOR: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. SHAKOOR:

Q. Now, Dr. Evans?

A. Yes, sir.

Q. Specifically due to the fact that you concentrate in psychiatric medication, now, you don't -- you don't have the authority to prescribe any medication, do you?

A. Only in collaboration.

Q. Only in collaboration.

And you don't treat patients with porphyria, do you?

A. Not specifically, no.

Q. In your career, how many patients with porphyria have you treated or dealt with?

A. In my -- in my career, I do not remember. I may have seen one, but I may not -- I don't remember ever seeing a porphyria patient.

Q. So you really have no expertise at all regarding porphyria as a disease itself?

A. No clinical experience at a personal level, no.

Q. Okay. Now, you talked about unconscious and being conscious, in a coma. Can you tell me the difference between the three, conscious, unconscious, and a coma -- coma-like state?

A. Coma-like state, person is unresponsive to stimuli.

Q. What about unconscious?

A. Unconscious depends on the level. Early on, you may be responsive to stimuli.

Q. But you're either conscious or you're not conscious, right?

A. Yes.

Q. There's no -- there's no different levels of consciousness?

A. Different levels of consciousness leaning to the level of coma --

Q. And when you talk --

A. -- would be the most profound.

Q. And when you talked about these studies where people with porphyria were administered midazolam, can you cite any specific study, whether or not -- or how safe it may or may not be for somebody to be injected with midazolam while suffering from porphyria?

A. Let me -- let me back up just a moment and tell you that are there are no specific studies looking at any of these drugs' effects on porphyria. Most of the information that has been collected and assigned any kind of scientific manner is being collected from animal type studies. Most of -- all of the reports of

increased porphyria as a result of drugs clinically are case reports, so that doesn't constitute a study. So all of these case reports have been summarized in tertiary journals and textbooks and reports in journals -- from reports in journals. And a number of review articles have been written, and, essentially, even at the worst, people are saying it's equivocal whether -- whether they do or don't.

That class of compound, the benzodiazepines, the more classic benzos like Valium may actually be a bigger culprit to causing a problem than the very short-acting drugs like midazolam and triazolam. But, again, you know, you're talking about when do these effects actually occur, how long does it take for them to create enough of a problem that you see clinical presentation.

Q. So you raise a good point. There are no case studies regarding giving somebody with porphyria midazolam, so you're relying on literature, right?

A. Relying on literature and -- and review.

Q. Can you cite with specificity which piece of literature you're referencing when you state that it's safe to inject somebody that's suffering from acute porphyrias with midazolam?

A. Well, just off the top of my head, the most

recent issue Harrison's Internal Medicine textbook has a beautiful table, talks about unsafe and safe, and it does not -- it does not include the midazolam as an unsafe drug.

Q. Regarding somebody suffering from acute porphyria?

A. Porphyria, right.

Q. And --

A. Further --

Q. Go ahead. I'm sorry. Did I -- did I interrupt you, Doctor?

A. No. Just go ahead. I was going to give you another citation.

Q. Okay. What's that other citation?

A. British medical -- British Journal of Anesthesiology. This is a 2000 article. Again, has a table of recommendation of drugs that can or cannot be used in -- in porphyric patients, and midazolam is specifically listed as a better choice.

Q. Five hundred milligrams worth, Doctor?

A. I'm sorry?

Q. Five hundred milligrams?

A. Milligrams, no, there's no dose specific here.

Q. But doesn't dosage matter?

A. Dosage does matter, but I think we're talking

about normal doses of drug that are used as preanesthetic type of uses.

Q. But none of the literature that you're citing, I mean, you can go -- you can list two or you can list a thousand, none of them can state that 500 milligrams of midazolam would be safe for somebody with the medical condition of Eddie Wayne Davis, could you?

A. Well, nonetheless, regardless of how much you give, this enzymatic process that we're talking about takes a while to take effect, to have an impact on the reduction and the blockade of porphyrin production. It doesn't happen immediately.

Q. It could happen in minutes, though, right, Doctor?

A. I don't think so. I think you're talking about hours and maybe days. You're talking about post anesthesia in most cases where there's any evidence at all.

Q. And you're saying this with your opinion as a pharmacist; you never -- you know, as you've testified, you've never actually treated somebody in a medical setting?

A. I have never treated someone as a -- as an anesthesiologist, no.

Q. And, Doctor, these studies -- or these aren't

studies, these pieces of literature you're talking about, they're talking about midazolam in a medical type setting, right?

A. Yes.

Q. And in a medical setting, you would, you know, presumably have medical staff there, doctors and/or nurses, right?

A. Absolutely.

Q. And in a medical type setting, obviously their main objective would be to make sure that the patient is safe, so to speak, not feeling any discomfort; is that safe to say?

A. That's true.

Q. And Mr. Davis, he's set for execution on July 10th. That's not really a medical setting, is it?

A. No, it's not.

Q. So the literature that you're relying on is not something that supposes what Mr. Davis is looking at on July 10th, correct?

A. No. I think it would be very difficult to get people to volunteer for that study.

Q. And Mr. Davis and -- and, sorry, and these pieces of literature you're talking about, if these people have medical personnel by their side, they're able to come up with a hypothesis and test the patient

and the patient survives, and they're able to interview the patient and talk about how the patient is doing, right?

A. Yes. And if they had information about the level of the various enzymes that are responsible for blocking porphyrin production or levels of porphyrin itself, they would probably be very, very cautious, and we have -- we don't have that either in this case, nor do we have a bona fide diagnosis apparently that this patient has a porphyria.

Q. All right. Since you're referencing medical procedures and medical doctors and literature based on things that happened in a clinic type situation with patients, do you know what type of medical personnel Mr. Davis will be seeing if this execution goes forward July 10th, what type of medical personnel is going to there?

A. I am familiar with the protocol --

MR. FREELAND: Judge, I object.

A. -- and to my knowledge --

MR. FREELAND: It's beyond the scope --

A. -- there are no medical --

MR. FREELAND: -- and it's not relevant.

THE COURT: Overruled.

A. -- personnel, physicians, nurses, so forth

present during the execution.

Q. You said there are no nurses, doctors, medical personnel during the execution?

A. Right.

Q. So the literature that you're talking about is in a different situation, just to hammer it home, where there's actual doctors, nurses, and medical personnel present?

A. Yes.

Q. Okay. And you've also testified in other capital cases here in the state of Florida, right?

A. Yes.

Q. You know about how many?

A. I think this may be the fourth or fifth.

Q. How many times did you testify for the defense?

A. In -- in Florida?

Q. Yes, sir.

A. Once in my -- to my knowledge, to my recollection.

Q. Was that a capital case?

A. Capital case, yes.

Q. In the last couple years, have you testified more for the State or for the defense?

A. In Florida, more for the prosecution.

Q. More for the prosecution.

And you get paid, don't you, Doctor?

A. I do.

Q. Now, does this money go right to your university where you're a dean?

A. No. This is considered for me as a consult -- a consult practice, so the money comes to me.

Q. Okay. So you personally privately benefit, right?

A. I'm sorry. Say it again.

Q. So you personally and privately benefit from this?

A. Yes, I do.

Q. Okay. Now, if a doctor were to testify or if a doctor testified that there's a substantial risk that Mr. Davis could suffer extreme excruciating pain as a result of -- abdominal pain, tachycardia, hypertension, nausea, and vomiting, you couldn't rebut that as being untrue, could you?

A. No. But I think you would have to put it in a time frame. When would he occur -- when would this occur? And to my knowledge, there's nothing that would suggest that it would occur within -- within a very -- anywhere near a short period of time.

Q. And that's your knowledge based on your level of experience and the literature that you relied on with

the medical personnel, right?

A. Yes.

Q. So you can't state with any type of degree of certainty that Mr. Davis won't suffer during those minutes between the midazolam being administered and his ultimate death, can you?

A. No, but I think it's highly unlikely.

Q. And one of the drugs given to Mr. Davis is a paralytic, right?

A. Yes.

Q. And what good does a paralytic do Mr. Davis?

A. What good does it do?

MR. FREELAND: Objection. That's beyond the scope, Your Honor.

THE COURT: Sustained.

THE WITNESS: I'm sorry?

THE COURT: I sustained the objection. You don't need to answer.

THE WITNESS: Something -- something else in the background.

BY MR. SHAKOOR:

Q. This drug midazolam, do you know -- do you know of other states using this particular drug?

A. Do I know about other states that are using this drug?

Q. During this lethal injection procedure.

MR. FREELAND: Judge, I object. It's --

THE COURT: Sustained.

MR. FREELAND: -- not relevant.

MR. SHAKOOR: One brief second, please, Your Honor?

THE COURT: You may.

BY MR. SHAKOOR:

Q. All right. Lastly, Doctor, I gave you the opinion of a medical doctor regarding Mr. Davis's likelihood of experiencing or suffering from extreme excruciating pain as a result of abdominal pain, tachycardia, hypertension, nausea, and vomiting?

A. Right.

Q. Now, you -- you speculate that that might not happen, right?

A. Well, correct.

Q. But it's just speculation; the opposite could be true, right?

A. Could.

MR. SHAKOOR: Nothing further at this time, Your Honor.

THE COURT: Thank you.

Redirect?

REDIRECT EXAMINATION

BY MR. FREELAND:

Q. Dr. Evans, how likely is it that Mr. Davis will experience all those symptoms before the onset of midazolam?

A. I think it's highly unlikely.

Q. That's your professional opinion that it's highly unlikely?

A. Yes.

Q. Tell me, do pharmacologists author any of these studies that we've been referring to? I mean, generally, do pharmacologists author studies dealing with the -- the efficacy of drugs?

A. Yes. Clinical -- clinical pharmacologists do, indeed, do some of these kinds of studies.

Q. And in your -- you are not currently -- you don't write prescriptions?

A. Currently, I do not, no.

Q. However, you do teach?

A. I do. I do teach.

Q. You teach medical doctors?

A. I -- in my past practice, I have written prescriptions under protocol.

MR. FREELAND: Okay. Thank you.

That's all I have, Your Honor.

THE COURT: Thank you.

I just have a couple questions myself, Doctor. This is Judge Jacobsen. First of all, what is the purpose of midazolam in just the normal sense of its use?

THE WITNESS: Oh, in the normal sense of its use, it's used to induce a preanesthetic effect and reduce apprehension. If you've ever had a dental procedure that required like an extraction, midazolam is used. If you've ever had an upper GI -- upper colonoscopy, midazolam is used. In very low doses, it basically, you know, decreases memory of events, you know. So that's -- that's essentially its primary purpose. It can be used to induce anesthesia, but it's typically used in combination with other agents.

THE COURT: You indicated earlier that a five to 10 milligram dosage would be a typical dosage to render a person unconscious?

THE WITNESS: Very much so. And if you got above five milligrams, you'd frankly need to have someone available to support respiration.

THE COURT: Okay. And you also indicated that -- you used the concept of the person being unconscious within their attempt to count to 10 and

then in reverse?

THE WITNESS: Right.

THE COURT: When you say, "unconscious," would a person within that time frame of trying to count to 10 and then reverse down to one, would they, for all intents and purposes, be unconscious at that point?

THE WITNESS: Yes, they would be.

THE COURT: And you indicated also that there was a -- a person would eventually go into a coma?

THE WITNESS: Right.

THE COURT: Which sounds to me beyond unconsciousness. Is that accurate?

THE WITNESS: Far beyond unconsciousness, yes.

THE COURT: And with a initiation of a injection leading up to 500 milligrams, which I would assume would be over a period of time, do you have an opinion as to how long it would take for a person to be actually in a coma?

THE WITNESS: Well, it would definitely be five to 10 minutes until they reached that level of unconsciousness, but it's -- it's hard -- it's hard to be very specific. It means that the individual has to be monitored and tested to see if they are responsive to any kind of stimuli, any kind of

painful stimuli. But the longer that individual is -- is on -- has -- after they have -- the longer time elapses after the administration of that level of midazolam, the more likely that they are in a very deep, deep coma.

THE COURT: And as far if a person is unconscious, do they experience pain at that point?

THE WITNESS: Well, if somebody is -- has received one and a half milligrams of midazolam and you decided to stick a really sharp instrument on their foot, they might respond.

THE COURT: That's response to stimuli though.

THE WITNESS: Yes.

THE COURT: Would a person experience pain after -- you indicated them going unconscious within the count of 10 and reversing it. Would they be in a position to experience pain at that -- at that time?

THE WITNESS: Yes.

THE COURT: Okay. When -- can you give an opinion as to when within that length of time that they would not be experiencing any pain?

THE WITNESS: With a -- with a regular dose?

THE COURT: Well, let's start with the regular dose five to 10 milligrams.

THE WITNESS: With a regular dose, they would probably be able -- well, not probably, they would be able to experience pain at a regular dose in terms of that kind of noxious stimuli.

When we start talking about a dose that is perhaps as much as a hundred or more times that dose, given, you know, three, four, five minutes, it's very doubtful that they're going to be able to experience anything.

THE COURT: Okay.

THE WITNESS: The fact is, you know, in all likelihood, their vital functions are going to begin to cease. The respiratory arrest will begin. They will begin to have cardiac symptoms, and, eventually, left alone, they would expire from a cardiac arrest.

THE COURT: Thank you.

Any additional questions based on mine? Again, my policy is anytime the court's asked questions, you're entitled to cross-examine my questions.

MR. SHAKOOR: No thank you, Judge.

THE COURT: Okay.

MR. FREELAND: No, Your Honor.

THE COURT: Thank you. Any further need for the doctor?

MR. FREELAND: No. Thank you. He's released.

MR. SHAKOOR: He's released.

THE COURT: Doctor, thank you. We're going to go ahead and hang up form you.

THE WITNESS: You're welcome. Thank you.

MR. BROWNE: Your Honor, we'd like to call Dr. Zivot.

THE COURT: I don't know if they're done with their case.

Are there any further witnesses that the State wishes to call?

MR. FREELAND: No, Your Honor, we don't have any others.

STATE RESTS

THE COURT: Any rebuttal?

MR. KILEY: Yes, Your Honor. We call Dr. Zivot for rebuttal.

THE COURT: Doctor, please remember you're still under oath.

JOEL B. ZIVOT, MD, called as a witness by the Defense, previously sworn, testified as follows:

REBUTTAL DIRECT EXAMINATION

BY MR. KILEY:

Q. Dr. Zivot, you heard Dr. Evans testify that a 10 milligram dose will render a 223-pound man

unconscious. Is that an accurate statement, sir?

A. No.

Q. Why not, sir? Have you ever given someone -- have you ever done this; have you ever --

A. I've given many people that amount of midazolam over my career, and someone of that weight and under even, you know, moderate health, but perhaps of a certain age, that amount of midazolam will not render a person unconscious, no.

Q. Now, we're talking about Dr. Evans testified that there's no evidence that midazolam is unsafe. Did you hear him testify to that, sir?

A. Yes.

Q. Well, is it -- is there any evidence that there -- that it's safe?

A. No.

Q. And Dr. Evans was talking about a normal dosage of midazolam will not affect the infusion, if you will, of porphyrins. Did you hear him testify to that?

A. Yes.

Q. Would you consider 500 milligrams of midazolam a normal dosage?

A. No.

Q. Doctor, to distinguish, midazolam, that is an analgesic, correct, sir?

A. Midazolam is not an analgesic, no, not at any dose.

Q. Well, how does an analgesic work?

A. Well, analgesics are drugs that specifically work to prevent the experience of pain.

And so I think it's a fundamental question as to whether or not a person who is responsive or less responsive can experience pain. And I will tell you that to render someone unresponsive or less responsive after midazolam would be -- would have -- one of the things that would require a dosage adjustment would be how much pain a person was having. So let's say that a person had a fracture and they were going to -- and they were given midazolam and you were trying to get them to be unresponsive, it would -- it would be very difficult to do that, to get them to be unresponsive if they're experiencing pain, because pain kind of works against the effects of midazolam in terms of its capacity to render somebody unresponsive. It would be difficult to do that.

Q. Now, Doctor, what would be an example of an analgesic?

A. An example of an analgesic would be drugs of a narcotic class like morphine.

Q. Like opium --

A. Yeah.
Q. -- an opium derivate --
A. Opioids.
Q. -- derivative?
A. Yes. Yes, that's an example.
Q. So in other words, if you give him midazolam, how do you know he's not going to feel pain?
A. Not only do you not know that he's going to feel pain, but I would assume in certain -- certain circumstance that he could feel pain.
Q. And, sir, is it your contention or your opinion that a massive dose, 500 milligrams, of midazolam would trigger an incident of pure -- of acute porphyria?
A. Yes.

And I just want to add, too, that with respect to the question about pain, I think the question is how long does the pain have to be experienced for. If the pain -- say the pain lasts 10 seconds, say it's 10 seconds of excruciating pain before a person dies, I guess my -- you know, my concern is that I don't know how many seconds of pain we're allowing to have here.

I think that what we're saying is that there can be no pain at all, none. So if there is pain, if there's acute and serious pain, and even -- even if one could imagine would occur for a period of seconds, I

would suggest that most people couldn't imagine or stand, if you will, serious pain even for a moment. The pain of any duration is entirely, you know, undesirable. No one would wish that upon themselves.

So I think that this idea of trying to say that how much pain or how long could the pain be there, the fact remains that there is a real possibility that pain will be experienced before death, and that, I think, is what's at issue.

Q. Well, sir, it's also the issue mandated by the Florida Supreme Court is whether this midazolam is safe for people with porphyria.

A. I don't know how possibly it could be asserted that it's safe. I don't know how that could be claimed.

Q. Why do you contend it is not safe for people with porphyria?

A. Because there's no -- there's not a shred of evidence that says it is safe in the way that it's going to be used. And in science, we assume that things are not safe, and the onus becomes proving that they are. You can't start by saying something is safe. You have to assume that it's not safe and prove that it is. And I see no evidence it's proven that this is safe at all. This is just speculation and conjecture.

MR. KILEY: A moment, Your Honor.

Q. So, sir, basically it's speculation and conjecture that Mr. Davis will not suffer pain?

A. Yes.

MR. KILEY: I have no further questions, Your Honor.

THE COURT: Cross-exam?

MR. BROWNE: Briefly, Your Honor.

REBUTTAL CROSS-EXAMINATION

BY MR. BROWNE:

Q. Doctor, you've already answered this question, both in response to the judge and, I believe, on cross-examination earlier, that you can calculate how much midazolam is needed to render someone unconscious.

A. Not with certainty. Only on -- in the aggregate is what I said, I believe.

Q. Okay. But more than likely, for most patients, 50 milligrams is going to be more than sufficient; would that be a fair statement?

A. To render them unconscious?

Q. Correct.

A. In the setting of an anesthetic?

Q. Yes.

A. Fifty milligrams would likely render people unresponsive. I think that -- and only not -- and I would never at that point then say go ahead and cut

them. I would never allow a surgeon to cut a person with a knife after having any quantity of midazolam alone.

Q. Okay. And then, again, I think we've covered this. You've, again, testified before in the state of Florida that one of the reasons you might have an opiate as part of your protocol is to ease the recovery process for a patient --

A. Well, to --

Q. -- as they're coming out of a surgical procedure?

A. Well, it's -- not exactly. It's to treat pain, the part of it that's painful. Opioids are a part of -- are necessary to treat pain.

Q. Right.

A. One adjunct to treat pain, yes.

Q. Again, and you wouldn't want somebody waking up after a painful procedure in pain; you'd want to ease that process --

A. Correct.

Q. -- correct, Doctor?

A. Yes.

Q. Now, you mentioned your one article that you relied upon, and now --

A. Well, there are many. I mean, I wouldn't --

lest you think that I look -- read only one thing, I think if that's what your impression was, that that's not correct.

Q. Well, the only article you cited to us in court was with the one using the chicken embryo.

A. That's all you asked me about, so you didn't ask me if I looked at other articles. But I -- because, you know, I reviewed -- in the same way that Dr. Evans today, I did a review of -- from other sources too.

Q. Okay. And including the porphyria website that indicates that midazolam is generally considered safe?

A. But not in the setting of what we're talking about here.

Q. And the setting we're talking about here is administering a massive dose of midazolam?

A. Correct.

Q. In other words, you, as an anesthesiologist, are never going to administer 250 milligrams of midazolam much less 500?

A. That's correct.

Q. In fact, you would agree with Dr. Evans that that massive overdose amount would likely lead to death?

A. It would likely lead to death.

MR. BROWNE: Your Honor, may I approach and have this marked as the next exhibit? Copy to

opposing counsel.

THE CLERK: The next is 5.

(State's Exhibit No. 5 was marked for identification.)

MR. BROWNE: Thank you. May I approach the witness, Your Honor?

Q. What's been marked as State's Exhibit 5 for identification, Doctor, can you take a quick look at that first page in the Third Edition Anaesthesia Databook, by Rosemary Mason, consultant anesthesias?

A. Yes, I see that.

Q. And that says the third edition?

A. Yes.

Q. Doctor, they have a chapter on porphyria, and that would be -- begins at page 407. Do you see that?

A. I see something porphyria. I don't think I see a page number. Oh, I see it, yes.

Q. It's to the side. It's --

A. I've got it. Yes, I see it. Yes.

Q. And that appears to be a textbook on anesthesiology; is that correct?

A. Well, in the pieces of paper you've given me. I'm not familiar with this particular book. I know I see it's from the UK, so --

Q. Correct. But other countries have experience

with midazolam and porphyria, would you agree, Doctor?

A. I would agree.

Q. And under the section Porphyria on page 411, can you turn to that? You see number two, Anesthetic Drugs, paragraph B, Intravenous Agents. You want to read that paragraph quick -- Your Honor -- Doctor, excuse me, and look up when you're finished?

A. Sorry. Starting B, Intravenous Agents?

Q. Correct.

A. Clinical and experimental --

Q. You don't have to --

THE COURT: Read it to yourself.

Q. Can you read that to yourself, Doctor, please?

A. Oh, I thought it was a test.

Okay.

Q. And in this textbook, granted it's from the UK, does it not indicate that midazolam appeared to be safe in the experimental model and in clinical reports?

A. Well, this is from -- first of all, I don't know what -- maybe this is 1995 or 1992, it's not clear to me, so it's a long time ago. And it really doesn't -- it's only just a claim. It doesn't reference anything, so I don't know why they're saying that.

And I can tell you right off the bat that I know that Ketamine is not considered to be something

that's safe these days, so the fact that they say Ketamine is safe here, I think that, you know, that this is an evolving science.

Q. Well, does this also indicate that certain drugs like barbiturates are known to be contradicted, which you have acknowledged?

A. In this article here, does it say that?

Q. Yes, in this textbook.

A. I don't know. Where does it -- maybe you can direct me.

Q. The previous page, 410.

THE COURT: Let me just interject. Since he has not acknowledged this is a learned treatise on anything that he's familiar, it's improper to cross-examine from it. It's all hearsay.

You can frame a question concerning whether or not he agrees with it or not, but the proper use of a treatise is to establish first whether or not he recognizes it --

MR. BROWNE: Correct.

THE COURT: -- and can rely upon it. He does not say -- he says he does not recognize it and does not rely upon it; therefore, it's hearsay you're trying to elicit through him.

MR. BROWNE: Well, Your Honor, I -- I agree,

and I certainly could not use it on direct examination, but whether or not the doctor recognizes it as an authoritative treatise, I'm allowed, my opinion -- your opinion counts in this courtroom, I will move on.

THE COURT: Please move on.

MR. BROWNE: Thank you, Your Honor.

BY MR. BROWNE:

Q. Doctor, if that reference material indicates, as you would agree, that barbiturates are contradicted, that would be in accordance with your knowledge?

A. Yes.

Q. So the fact that this material also recognizes midazolam is generally considered safe is something that you're not familiar with or you do not agree with?

A. I don't know. I can't comment on that claim in this state of this particular -- you know, where they derived that. I can't say, because my reading concludes the opposite.

Q. Doctor, have you authored any articles on porphyria?

A. No.

Q. Have you authored any textbooks on porphyria?

A. No.

Q. And, again, I believe you have acknowledged

that there are sources of information which you yourself have reviewed that suggests that midazolam is safe for people with porphyria?

A. Anecdotes in low dosages, not in 500 milligram dosages that we're talking about here.

Q. And agree -- Doctor, would you agree that there are no references or studies of what 500 milligrams of midazolam will do on anyone?

A. Well, so I think that what we're agreeing that we can't prove that this is safe is what you're saying, I believe, which we agree, we don't know that this is safe.

Q. We will agree that Florida uses a massive amount of midazolam which is not for a medical purpose.

A. We can agree on that.

MR. BROWNE: Your Honor, may I have one moment?

THE COURT: You may.

MR. BROWNE: Thank you, Your Honor.

MR. KILEY: May I re --

THE COURT: Redirect?

REBUTTAL REDIRECT EXAMINATION

BY MR. KILEY:

Q. Doctor, you were read this pamphlet obtained off the Internet?

A. Are we talking about --

MR. BROWNE: Your Honor, I object.

A. Sorry.

MR. BROWNE: This is from a textbook.

THE COURT: Sustained. You know, the editorial comment about its -- where they got it from is irrelevant.

Q. Midazolam appeared to be -- be on 411 -- midazolam appears to be safe in the experimental model and in the clinical reports.

Did you see that, sir? You said you did before?

A. Yes, yes.

Q. All right. Is it safe to say, sir, this is not an experiment, is it, sir?

A. I don't have -- I can't speak to the details of how this sentence is constructed, what's --

Q. And -- and Mr. Davis is not facing a clinical report; this is not a clinical situation, right?

A. Yes.

Q. And Mr. Davis will not be monitored by any medical professional?

A. Correct.

Q. Not a doctor, not a nurse, no one?

A. Yes, correct.

Q. So we would say -- would you or would you not

say that these studies indicating the low dosages of midazolam is not applicable to Mr. Davis's case?

A. I agree they're not applicable.

Q. And the introduction of midazolam will trigger porphyria?

A. That's my opinion.

Q. And no one can say when it will be triggered?

A. True.

Q. And no one can say if Mr. Davis has previously had porphyrin in his body, more midazolam will equal more porphyria?

A. I think that's likely to occur.

Q. And you can say -- can you say, sir, that also his symptoms will be more pronounced and painful?

A. I'd say yes.

MR. KILEY: I have no further questions for Dr. Zivot.

THE COURT: One last question, which is a follow-up to my earlier.

Would the injection of even the dosage that you would use, 50 milli -- milligrams?

THE WITNESS: Sorry. Fifty where it's used as induction, you mean?

THE COURT: Correct.

THE WITNESS: Yes.

THE COURT: And how long till a patient would be rendered unconscious?

THE WITNESS: Again, a matter of a few minutes maybe.

THE COURT: Okay. Could it be less than that; it wouldn't be up to a few minutes?

THE WITNESS: I think that it's done so uncommonly that, you know, I -- I can only speculate.

THE COURT: Okay. Any further questions based on mine?

MR. BROWNE: None from the State, Your Honor.

MR. KILEY: None from the defense.

THE COURT: Thank you. You may step down, sir.

(The witness stepped down from the witness stand.)

THE COURT: Further rebuttal?

MR. KILEY: No further rebuttal, sir.

DEFENDANT RESTS

THE COURT: Thank you. Argument? Do you wish to provide argument?

CLOSING ARGUMENT

BY MR. SHAKOOR:

MR. SHAKOOR: Your Honor, very brief argument. There were two witnesses today. One witness is

highly credentialed, he's an expert in his field, he's an anesthesiologist. He's relied on clinical studies done on in vitro because you can't do clinical studies on people with porphyria with the drug midazolam in this type of dosage, because they wouldn't be alive.

Your Honor, I'd also like to remind the court that the articles and literature relied on the State are cases where medical personnel are present. This is execution set for July 10th, and it's not a medical procedure. It's an execution. And this highly-credentialed witness has testified that it's a substantial risk that he'll suffer extreme pain and suffering, nausea, tachycardia, vomiting, and as the doctor testified, whether it's seconds or a few minutes, that's extreme pain and suffering. And Mr. Davis is going to be experiencing a paralytic; he's not going to be able to cry out, he's not going to be able to move.

And, Your Honor, if the court were to rely on the Henry case, that's the most recent case where Mr. Evans testified and -- I'm sorry, Dr. Evans testified and Dr. Zivot testified, the State ruled in favor of -- I'm sorry, the court ruled in favor the State, but the State also had another witness by

the name of Dershowitz, and Dershowitz was also an anesthesiologist, highly credentialed, and if you look at the findings of fact in the court order on the Henry case, Dershowitz is referenced a lot more than Mr. Evans is. Dr. Dershowitz was not here today. He's not -- he didn't testify. Our expert is more highly credentialed. He's more experienced in these matters.

We're asking this court to stay the execution until a safe and effective manner of execution can be -- can be obtained for Mr. Davis, and, if not, we'd ask you to commute him into a life sentence. But he's set for execution in less than a -- a little more than a week, and these expedited matters and based on the testimony that Your Honor heard today in court, I think it's necessary and proper to issue a stay of execution.

Thank you for your time.

THE COURT: Thank you.

State?

CLOSING ARGUMENT

BY MR. AKE:

MR. AKE: Yes, Your Honor, we were sent back to this proceeding for the very limited purpose by the Florida Supreme Court, and that was to determine

whether the defendant's alleged porphyria would create -- that it would be sure or very likely to create serious illness or needless suffering and sufficiently imminent danger.

And what we've heard here today from the experts is that given the large dosage of midazolam that Florida gives an inmate, he is going to be rendered unconscious within a matter of minutes. I don't think that's up for debate.

Counsel -- or their expert speculates that various porphyrins will accumulate over time, but he cannot give any indication as to what that time frame is. The one study they rely on deals with a 20-hour interval.

And I would submit to this court that both the testimony from Dr. Evans and the Florida Supreme Court case law on both Henry and in Howe establish that after given this midazolam, the defendant is going to be rendered unconscious and insensate within a matter of minutes. Then Florida's protocol provides that various consciousness checks will be administered to the defendant to verify that he is, indeed, unconscious. I believe there's a number of them, including a noxious stimuli test that -- a pinch on the muscle, trapezoid muscle, I believe it

is. All those are done before the administration of the following drugs to make sure that he is unconscious and not feeling any pain.

Their testimony from their expert is speculative in nature as to what would happen, assuming the defendant has porphyria, which we don't agree has been established. I know this court's taken that under as if it were, but we would submit that he will be rendered unconscious within a couple minutes from the midazolam and that he will not suffer any threat of immediate danger as a result of that.

THE COURT: Thank you.

Any rebuttal?

REBUTTAL CLOSING ARGUMENT

BY MR. SHAKOOR:

MR. SHAKOOR: Very briefly, Your Honor.

Mr. Henry did not have porphyria. We're going under -- under the premise that Mr. Davis does, and our expert testified how Mr. Davis's condition of having porphyria will cause him the aforementioned pain and suffering, vomiting, tachycardia. So this is different than the -- than the Henry case, not to mention the fact that Dr. Dershowitz testified in that case, and in this case Dr. Dershowitz did not

testify.

Thank you.

THE COURT: Thank you.

I am taking this under advisement. I'll get an order out tomorrow as I am obligated to do under the mandate from the Supreme Court. As soon as I get that done, I will make sure it's e-mailed or faxed or whatever, electronically provided to everyone.

MR. KILEY: Your Honor, I would also ask that along with the order, if the court could order that the transcript of today's proceedings be transmitted to us as soon as possible, because both sides are going to be preparing an appeal in one form or another.

THE COURT: And it appears that the mandate requires the court reporter to forward this to the Supreme Court in electronic manner of some sort and the court reporter is well aware of that have, and I'm sure that she'll use her best efforts to expedite this. Okay.

MR. BROWNE: Your Honor, may I retrieve our exhibit?

THE COURT: You may anything else gentlemen.

MR. BROWNE: And I will hand that back to the clerk.

THE COURT: Anything else, gentlemen?

MR. KILEY: No, sir, not from the defense.

THE COURT: We will be in recess.

THEREUPON, the proceedings were concluded at 4:00 p.m.

CERTIFICATE OF REPORTER

STATE OF FLORIDA

COUNTY OF POLK

I, Linda S. Blackburn, Registered Professional Reporter, Certified Realtime Reporter, and Certified CART Provider, do hereby certify that I was authorized to and did report the foregoing proceedings, and that the transcript, pages 1 through 139, is a true and correct record of my stenographic notes.

Dated this 1st day of July, 2014, at Lakeland, Polk County, Florida.

LINDA S. BLACKBURN, RPR, CRR, CCP

Supreme Court of Florida

No. SC14-398

ROBERT L. HENRY,
Appellant,

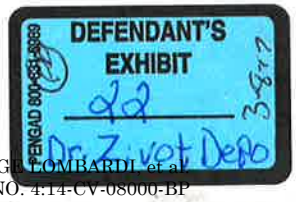
vs.

STATE OF FLORIDA,
Appellee.

[March 14, 2014]

PER CURIAM.

Robert Henry is a prisoner under sentences of death for whom a death warrant has been signed and execution set for March 20, 2014. In 1988, Henry was convicted of the first-degree murders of Phyllis Harris and Janet Thermidor, armed robbery with a deadly weapon, and arson. Henry now appeals the denial of his second successive motion for postconviction relief, filed under Florida Rule of Criminal Procedure 3.851; the denial of his motion to declare section 922.052, Florida Statutes (2013), unconstitutional; and his motion to dismiss his death warrant. For the reasons explained below, we affirm the postconviction court's



denial of relief. In addition, we deny Henry's motion for a stay of execution, filed March 12, 2014.

I. BACKGROUND

On November 1, 1987, Henry tied up his coworkers Harris and Thermidor, hit each of them on the head with a hammer, and set them on fire. Harris was found dead, but Thermidor survived until the next day and identified Henry as the perpetrator. When interviewed by law enforcement officers, Henry initially claimed that he was forced to attack his coworkers by unknown robbers but later confessed that he acted alone. Henry v. State, 613 So. 2d 429, 430-31 (Fla. 1992).

The jury recommended a death sentence for the murder of Harris by a vote of eight to four and for the murder of Thermidor by a vote of nine to three. The trial court imposed a life sentence for the armed robbery, a life sentence for the arson, and a death sentence for each murder. In imposing death sentences for both murders, the trial court concluded that five aggravating factors were applicable to each murder: (1) the murder was committed during the commission of a robbery and arson; (2) the murder was committed to avoid arrest; (3) the murder was committed for pecuniary gain; (4) the murder was especially heinous, atrocious, or cruel (HAC); and (5) the murder was committed in a cold, calculated, and premeditated manner (CCP). Despite Henry's decision to waive the presentation of mitigating evidence, the trial court also found two mitigating factors: (1) Henry

had no significant prior criminal history; and (2) Henry served in the United States Marine Corps. State v. Henry, No. 88-18628 CF 10 (Fla. 17th Jud. Cir. Ct. order filed Nov. 9, 1988).

On direct appeal, Henry argued that: (1) the trial court erred in partially denying Henry's motion to suppress his statements; (2) the trial court erred in denying Henry's motion to suppress Thermidor's statement; (3) the trial court erred by failing to give an instruction on duress; (4) a discovery violation occurred; (5) the prosecutor made improper comments; (6) Florida's rule requiring a defendant to forego presenting witnesses to preserve first and last arguments is unconstitutional; (7) the presentation of victim impact evidence was improper; (8) the trial court erred by admitting irrelevant and cumulative photographs; (9) the State presented false testimony; (10) the trial court erred by allowing the State to argue alternative theories of premeditated and felony murder; (11) the trial court applied the wrong standard of proof to the mitigating factors and erred by allowing Henry to waive the presentation of mitigating evidence; (12) the trial court gave improper penalty phase instructions; (13) the aggravating factors were not established beyond a reasonable doubt or were unconstitutional, and the trial court considered nonstatutory aggravating factors; (14) Florida's death penalty scheme is unconstitutional; (15) Henry's right to be present during all stages of the trial was violated; (16) the presentence investigation report violated Henry's rights under the

Confrontation Clause of the United States Constitution; and (17) the trial court erred by departing from the sentencing guidelines when sentencing Henry on the arson and robbery convictions.

In Henry v. State, 586 So. 2d 1033, 1034-35 (Fla. 1991), this Court concluded that each of Henry's claims was without merit or unpreserved and affirmed the convictions and sentences. That decision was vacated, however, by the United States Supreme Court in Henry v. Florida, 505 U.S. 1216 (1992). The Supreme Court remanded Henry's case to this Court for further consideration in light of Espinosa v. Florida, 505 U.S. 1079 (1992) (concluding that the standard jury instruction given on the HAC aggravating factor was unconstitutionally vague), and Sochor v. Florida, 504 U.S. 527 (1992) (concluding that the defendant failed to preserve for appeal his argument that the standard jury instruction given on the HAC aggravating factor was unconstitutional). On remand, this Court issued a revised opinion and again affirmed Henry's convictions and sentences. This Court explained that although Florida's former standard jury instruction on the HAC aggravating factor had been determined to be unconstitutional, in Henry's case, the trial court gave an expanded instruction that was not unconstitutionally vague. Henry, 613 So. 2d at 434.

In 1998, Henry filed an amended initial motion for postconviction relief, raising fifty-one claims, which was denied by the postconviction court. Henry

appealed and filed a petition for a writ of habeas corpus. This Court affirmed the denial of Henry's postconviction motion; determined that the postconviction court did not commit reversible error by limiting the evidentiary hearing to the deficiency prong of Strickland v. Washington, 466 U.S. 668 (1984); and concluded that "only the postconviction claims that were considered at the evidentiary hearing merit discussion." Henry v. State, 937 So. 2d 563, 568 (Fla. 2006). Those claims were: (1) trial counsel was ineffective for failing to develop a mitigation strategy that emphasized Henry's drug addiction; (2) trial counsel was ineffective for failing to follow Henry's initial psychological screening with a full mental health mitigation evaluation; and (3) Henry's waiver of the presentation of mitigating evidence was not knowingly and intelligently made due to trial counsel's inadequate penalty phase investigation. Id. at 571-75. This Court also denied Henry's habeas petition, which alleged that: (1) appellate counsel failed to raise numerous meritorious issues due to the page number limitation imposed on appellate briefs; (2) appellate counsel failed to raise claims on direct appeal concerning the record being incomplete and the need for a change of venue; and (3) the constitutionality of the indictment must be revisited in light of Ring v. Arizona, 536 U.S. 584 (2002), and Apprendi v. New Jersey, 530 U.S. 466 (2000).

In 2003, Henry filed a motion for postconviction DNA testing under Florida Rule of Criminal Procedure 3.853. That motion was denied in October 2007, and

Henry failed to file a timely appeal. In 2008, Henry filed a motion for belated appeal, which was treated as a petition for a writ of habeas corpus. This Court relinquished jurisdiction to the circuit court to determine if a belated appeal was warranted. The circuit court concluded that Henry was not entitled to a belated appeal, and in 2010, this Court denied Henry's petition. Henry v. State, 43 So. 3d 690 (Fla. 2010) (Table).

In 2007, Henry filed a petition for a writ of habeas corpus in the United States District Court for the Southern District of Florida. Henry raised six claims: (1) the trial court erred by admitting Henry's statements; (2) trial counsel was ineffective for failing to attach the search warrant used to obtain incriminating evidence; (3) the trial court erred by admitting victim Thermidor's statement; (4) the trial court erred by failing to allow DNA testing of a beer can found at the crime scene; (5) appellate counsel was ineffective; and (6) Henry's death sentences are excessive. While his habeas petition was pending, Henry filed a motion to hold his habeas petition in abeyance in order to litigate some of his claims in state court, a pro se supplemental motion to hold his petition in abeyance, and a motion to stay. On March 19, 2009, the federal court issued an order denying Henry's motions. The federal court concluded that several of Henry's claims had not been exhausted in the state courts and that Henry failed to establish the requirements for a stay and abeyance to finish litigating those claims. The federal court thus ruled that unless

Henry withdrew his unexhausted claims by April 1, 2009, his habeas petition would be dismissed. Henry v. McDonough, No. 07-61281-CIV-HUCK, 2009 WL 762219 (S.D. Fla. Mar. 19, 2009).

In 2012, Henry filed a pro se successive motion for postconviction relief, alleging that newly discovered evidence will show that his chronic drug addiction is now scientifically recognized as a brain disease. The postconviction court summarily denied the motion, and this Court affirmed the denial. Henry v. State, 125 So. 3d 745, 752 (Fla. 2013).

Most recently, following the signing of his death warrant on February 13, 2014, Henry filed a second successive postconviction motion. Henry alleged that Florida's lethal injection protocol is unconstitutional because: (1) midazolam hydrochloride (midazolam) should not be used as the first drug of the protocol; (2) due to Henry's specific health concerns, the use of midazolam creates a substantial risk of harm to him; (3) the consciousness check in the protocol is inadequate; (4) the execution team is inadequately trained and might not follow the protocol; (5) a one-drug protocol does not pose the same risk of causing pain as the current three-drug protocol. Henry later amended his motion to add more detail regarding his as-applied challenge to Florida's lethal injection protocol and to add a claim that Henry's death sentences violate the Eighth Amendment of the United States Constitution because the jury recommendations were nonunanimous. In addition,

Henry filed: (1) a motion arguing that section 922.052—as amended by the Timely Justice Act (Act), ch. 2013-216, §§ 1-9, at 2596-2613, Laws of Fla.—is both facially unconstitutional and unconstitutional as applied to Henry; and (2) a motion to dismiss his death warrant, asserting that the warrant was fatally defective for not stating a time of execution. On February 26, 2014, the postconviction court denied Henry's amended motion for postconviction relief, his motion to declare section 922.052 unconstitutional, and his motion to dismiss the death warrant.

Regarding the first part of Henry's as-applied challenge, the postconviction court reasoned that Henry's claim that due to his mental health, the use of midazolam would create a substantial risk of serious harm was insufficiently pleaded. The postconviction court explained that Henry's motion did not allege what mental health disorder Henry suffers from or how, as a result of that disorder, Henry would react to an injection of midazolam.

The postconviction court also rejected the second part of Henry's as-applied challenge—his claim that due to his hypertension, high cholesterol level, and coronary artery disease, the use of midazolam creates a substantial risk of serious harm. The postconviction court reasoned that while Henry presented an affidavit and an amended affidavit by Dr. Zivot that supported Henry's allegations that the injection of midazolam may cause Henry to experience an acute coronary event, Henry did not proffer any evidence that he "will be conscious at the onset of the

acute coronary event" or "that midazolam will not have the intended effect of rendering Defendant unconscious and insensate, and cause him to experience an acute coronary event while conscious." State v. Henry, No. 87-018628CF10A at 10 (Fla. 17th Jud. Cir. Ct. order filed Feb. 26, 2014).

The postconviction court concluded that each of Henry's remaining challenges to Florida's lethal injection protocol should be denied because the claims have been rejected by this Court in Howell v. State, 39 Fla. L. Weekly S89 (Fla. Feb. 28, 2014), cert. denied, 2014 WL 727245 (2014), and Muhammad v. State, 38 Fla. L. Weekly S919 (Fla. Dec. 19, 2013), cert. denied, 134 S. Ct. 894 (2014). And citing Kimbrough v. State, 125 So. 3d 752 (Fla.), cert. denied, 134 S. Ct. 632 (2013), and Mann v. State, 112 So. 3d 1158 (Fla. 2013), the postconviction court denied Henry's claim that his death sentences are unconstitutional as a result of nonunanimous jury recommendations.

In a separate order, the postconviction court denied Henry's motion to declare section 922.052 unconstitutional. The postconviction court concluded that because the Office of Executive Clemency began Henry's clemency proceeding before the passage of the Act, Henry's motion should be denied under Muhammad, in which this Court declined to reach Muhammad's constitutional challenge to section 922.052. In a third order, the postconviction court denied without

discussion Henry's motion to dismiss his death warrant. State v. Henry, No. 87-018628CF10A (Fla. 17th Jud. Cir. Ct. order filed Feb. 26, 2014).

Henry appealed in this Court, raising three claims. Henry argued that the postconviction court erred by denying his motion to declare section 922.052 unconstitutional, denying his motion to dismiss his death warrant, and summarily denying his as-applied challenge to the lethal injection protocol.

After considering Henry's argument and the State's response, on March 6, 2014, this Court relinquished jurisdiction to the postconviction court in order to conduct an evidentiary hearing on Henry's as-applied challenge to Florida's lethal injection protocol. On March 10, 2014, the postconviction court held an evidentiary hearing, during which both Henry and the State called medical experts to testify about the likely effect on Henry of intravenous administration of 500 milligrams of midazolam. On March 11, 2014, the postconviction court again denied Henry's as-applied challenge.

In addition to his claims on appeal regarding his motion to declare section 922.052 unconstitutional and his motion to dismiss the death warrant, Henry now appeals the denial of his claim that Florida's lethal injection protocol is unconstitutional as applied to him and has filed a motion for stay of execution. For the reasons expressed below, we affirm the postconviction court's denial of relief and deny Henry's motion for a stay of execution.

II. ANALYSIS

A. Motion to Declare Section 922.052 Unconstitutional

In his first issue on appeal, Henry argues that section 922.052, as amended by the Act, violates the Separation of Powers Clause of the Florida Constitution, art. II, § 3, Fla. Const., by limiting the Governor's discretion to grant clemency and sign death warrants. The determination of a statute's constitutionality is a question of law subject to de novo review. See Graham v. Haridopolos, 108 So. 3d 597, 603 (Fla. 2013). In this case, the postconviction court did not err by relying on Muhammad—in which this Court declined to reach a similar constitutional challenge to section 922.052—to deny Henry's motion.

In his initial brief, Henry concedes that his clemency proceeding began in February 2012, whereas the Florida Legislature did not pass the Act until April 2013, and the Governor did not sign it into law until June 2013. As in Muhammad's case, after the passage of the Act, the Governor could have chosen to continue, rather than complete, Henry's clemency proceeding. Furthermore, after signing a death warrant, the Governor retains statutory authority to stay Henry's execution if he chooses to do so. See § 922.06(1), Fla. Stat. (2013) ("The execution of a death sentence may be stayed only by the Governor or incident to an appeal."). Based on the foregoing, as in Muhammad's case, this Court cannot conclude that Henry's "death warrant would not have been signed but for the Act."

Muhammad, 38 Fla. L. Weekly at S925. Thus, the postconviction court did not err in denying Henry's motion to declare section 922.052 unconstitutional.

B. Motion to Dismiss Death Warrant

In his second issue on appeal, Henry contends that the postconviction court erred by denying his motion to dismiss his death warrant. Henry asserts that the plain language of sections 922.052(2)(b) and 922.052(3) requires the time of execution to be "designated in the warrant" and that his execution cannot proceed because the warrant in his case does not designate a time of execution. A trial court's ruling on a motion to dismiss and the interpretation of a statute are both legal questions subject to de novo review. See Jackson v. Shakespeare Found., Inc., 108 So. 3d 587, 592 (Fla. 2013); Tasker v. State, 48 So. 3d 798, 804 (Fla. 2010). The postconviction court did not err in denying the motion to dismiss.

On February 13, 2014, Governor Scott signed Henry's death warrant. The Governor sent a document titled "Death Warrant" to Warden Palmer along with a cover letter. While the "Death Warrant" did not specify a time of execution, the cover letter stated: "I have designated the week beginning at 12:00 noon on Tuesday, March 18, 2014, through 12:00 noon on Tuesday, March 25, 2014, for the execution. I have been advised that you have set the date and time of execution for Thursday, March 20, 2014, at 6:00 p.m." This cover letter also was sent to Chief Justice Ricky Polston of the Florida Supreme Court, Chief Judge Peter

Weinstein of the Seventeenth Judicial Circuit, Secretary Michael Crews of the Florida Department of Corrections, Julia McCall of the Office of Executive Clemency, Assistant Deputy Attorney General Carolyn Snurkowski, Henry, and Henry's counsel. Despite the clear time designation in the cover letter, Henry contends that his execution cannot proceed because the time was not designated in the document actually titled "Death Warrant."

Henry's motion to dismiss his warrant was properly denied because section 922.052 does not grant death-sentenced inmates a right to challenge the Governor's exercise of discretion in issuing death warrants. In Jarvis v. Chapman, 159 So. 282, 284 (Fla. 1934), this Court examined an inmate's petition for a writ of habeas corpus alleging that executive branch officials failed to comply with a statute requiring that "the copy of the record" of the inmate's conviction and sentence be attached to the death warrant. This Court determined that the death-sentenced inmate was not entitled to challenge whether the warrant complied with the statute:

> We hold that he has no rights in regard to it. It is merely a ministerial function as to the carrying out of the sentence pronounced upon the petitioner. His legal rights are ended so far as that judgment is involved. He has no voice as to the day he is to be executed, nor when the executive warrant shall issue, nor whether the certified copy of the record supplied to the Governor contains matters or does not contain matters that do not relate to the record proper which is designed to show only that the court pronouncing the sentence had jurisdiction of the person and crime, that there was a trial, verdict, and

> judgment and sentence, and, in case of appellate proceeding, a copy of the mandate from the appellate court.

Id. at 289. Similarly, in Tompkins v. State, 994 So. 2d 1072 (Fla. 2008), this Court concluded that a death-sentenced inmate could not challenge the Governor's issuance of a warrant or the timing of his execution. Following the signing of his death warrant in 2008, Tompkins argued that because Governor Bush—who had signed a death warrant for Tompkins in 2001—"was required [by section 922.06(2)] to reschedule his execution within ten days of the lifting of the stay of execution," "Governor Crist lacked the authority to reset the execution in October 2008." Id. at 1084. This Court affirmed the summary denial of Tompkins' claim, reasoning that it was procedurally barred and, alternatively, that "there is no authority that supports a claim that section 922.06(2) either explicitly or implicitly provides criminal defendants with any enforceable rights and, specifically, a 'right' to a speedy execution." Id. Henry, like Jarvis and Tompkins, does not offer any authority to support his claim that his sentence should be delayed or commuted as a result of any noncompliance with a statute governing the issuance of a death warrant.

Moreover, when sections 922.052 and 922.06 are read as a whole, the Legislature clearly expresses an intent that a time designation in the warrant is not essential to carrying out the sentence. See State v. Fuchs, 769 So. 2d 1006, 1009

(Fla. 2000) ("[S]tatutes which relate to the same or closely related subjects should be read in pari materia.").

Section 922.052(2)(b) states: "Within 30 days after receiving the letter of certification from the clerk of the Florida Supreme Court, the Governor shall issue a warrant for execution if the executive clemency process has concluded, directing the warden to execute the sentence within 180 days, at a time designated in the warrant." (Emphasis added.) Similarly, section 922.052(3) provides: "The sentence shall not be executed until the Governor issues a warrant, attaches it to the copy of the record, and transmits it to the warden, directing the warden to execute the sentence at a time designated in the warrant." (Emphasis added.) Section 922.052(4), however, explains that "[i]f, for any reason, the sentence is not executed during the week designated, the warrant shall remain in full force and effect and the sentence shall be carried out as provided in s. 922.06." (Emphasis added.) Section 922.06(2), in turn, provides:

> (a) If execution of the death sentence is stayed by the Governor, and the Governor subsequently lifts or dissolves the stay, the Governor shall immediately notify the Attorney General that the stay has been lifted or dissolved. Within 10 days after such notification, the Governor must set the new date for execution of the death sentence.
>
> (b) If execution of the death sentence is stayed incident to an appeal, upon certification by the Attorney General that the stay has been lifted or dissolved, within 10 days after such certification, the Governor must set the new date for execution of the death sentence.
>
> When the new date for execution of the death sentence is set by the Governor under this subsection, the Attorney General shall notify

the inmate's counsel of record of the date and time of execution of the death sentence.

When read in pari materia, these statutes provide that an inmate's execution time and date can be changed without directing the Governor to revise the existing warrant or to issue a new warrant. Thus, contrary to Henry's argument, the plain language of chapter 922 does not evince an intent by the Legislature that an execution should be barred on the basis that the time of execution is not designated in the warrant.

C. As-Applied Challenge to Florida's Lethal Injection Protocol

In his third issue on appeal, Henry argues that the postconviction court erred in denying his claim that due to Henry's specific medical concerns, the use of midazolam as the first drug of the lethal injection process creates an unconstitutional risk of severe pain. "[M]ixed questions of law and fact that ultimately determine constitutional rights should be reviewed by appellate courts using a two-step approach, deferring to the trial court on questions of historical fact but conducting a de novo review of the constitutional issue." Connor v. State, 803 So. 2d 598, 605 (Fla. 2001). Again, the postconviction court did not err in denying Henry's claim.

Article I, section 17 of the Florida Constitution provides that "[a]ny method of execution shall be allowed, unless prohibited by the United States Constitution." Article I, section 17, further requires that its prohibition against excessive

punishment "shall be construed in conformity with decisions of the United States Supreme Court which interpret the prohibition against cruel and unusual punishment provided in the Eighth Amendment to the United States Constitution." We are therefore bound by the precedent of the United States Supreme Court regarding challenges to methods of execution.

The Supreme Court has held that to state a claim under the Eighth Amendment, a defendant must show that the state's lethal injection protocol is " 'sure or very likely to cause serious illness and needless suffering.' " Brewer v. Landrigan, 131 S. Ct. 445, 445 (2010) (quoting Baze v. Rees, 553 U.S. 35, 50 (2008) (plurality opinion)). "In other words, there must be a substantial risk of serious harm, an objectively intolerable risk of harm that prevents prison officials from pleading that they were subjectively blameless for purposes of the Eighth Amendment." Howell, 39 Fla. L. Weekly at S92 (internal quotation marks omitted). "This heavy burden is borne by the defendant—not the State." Id.

At the March 10, 2014, evidentiary hearing, Henry called Dr. Joel Zivot, an Assistant Professor of Anesthesiology in Surgery and the Medical Director of the Cardiothoracic Intensive Care Unit at Emory University Hospital and a practicing anesthesiologist. Based on Florida Department of Corrections' medical records provided by Henry's counsel and an in-person examination of Henry, Dr. Zivot opined that Henry has "coronary artery disease of a significant nature." Dr. Zivot

then explained that if a person injected with midazolam is—like Henry—taking a diuretic to treat high blood pressure, that person's blood pressure will fall more than would the blood pressure of a person with normal blood pressure and could fall "quite dramatically." Dr. Zivot also testified that in a person with coronary artery disease, like Henry, "once the blood pressure falls and the coronary blood flow is reduced . . . almost instantaneously there can be the beginning of damage to a heart muscle [that] is experienced as pain or tightness or shortness of breath or pressure." Finally, Dr. Zivot testified that there is a substantial risk that the fall in blood pressure in Henry's case would occur before a loss of complete consciousness and that the coronary event would be experienced as pain.

In response, the State called Dr. Mark Dershwitz, a member of the Department of Anesthesiology and the Department of Biochemical and Molecular Pharmacology at the University of Massachusetts Medical School and a clinician at UMass Memorial Health Care. Dr. Dershwitz opined, to a reasonable degree of medical certainty, that an inmate injected with a massive dose of midazolam would be unconscious before any "hypothetical drop in blood pressure" occurred.

Regarding whether an injection of midazolam would cause a drop in blood pressure, Dr. Dershwitz testified that at the "usual[] doses for inducing general anesthesia, thirty, thirty-five, or even fifty milligrams, the drop in blood pressure is very mild if at all." Dr. Dershwitz then explained that any drop in blood pressure

from an injection of midazolam would not occur until after the recipient of the drug had lost consciousness. First, Dr. Dershwitz testified that because a fifty milligram dose would render a person "in the state of general anesthesia" such that "they could not perceive or process any sort of noxious stimuli," the initial 250-milligram dose required by Florida's lethal injection protocol would certainly result in unconsciousness. Second, Dr. Dershwitz explained that this unconsciousness would occur quickly. He testified that when midazolam is given intravenously, "[c]onsciousness will be lost after around twenty-five or thirty or thirty-five milligrams will actually have been delivered," which "would actually go in within the first couple of seconds," and that the "onset of the effect of [m]idazolam is usually quoted as around one to two minutes." Third, Dr. Dershwitz explained that any impact on a recipient's blood pressure from a large dose of midazolam does not happen as quickly as unconsciousness because "the action of [m]idazolam to drop the blood pressure is going to happen at the level of the vasculature, not anywhere closer to the heart or the brain." Dr. Dershwitz explained the course of midazolam through the body:

> Because, first of all, after the blood is pumped from the heart to the circulation, the brain receives literally the first amount of the blood pumped from the heart because of its proximity.
>
> And so once the brain will have received approximately twenty-five milligrams[,] the inmate will be unconscious.
>
> Now, for the blood pressure to fall, not only does the [m]idazolam need to be pumped far more distantly, especially to the lower extremities, but once it reaches there[,] it then has to start a

> cascade of events to result in the relaxation of smooth muscle to cause the dilation of the blood vessels that would then result in a drop of blood pressure. And that does not happen instantly.
>
> And so there is no plausible way that I could imagine that even if the [m]idazolam caused a drop in blood pressure[,] it would occur prior to the inmate losing consciousness.

The State also called Dr. Roswell Lee Evans, a doctor of pharmacy, who is a professor and dean at the Harrison School of Pharmacy at Auburn University. Dr. Evans testified that while he does not know what effect a 250- or 500-milligram dose of midazolam will have on a recipient's blood pressure, the relevant pharmaceutical literature indicates that midazolam—at a therapeutic dose—at most could cause a "reduction in blood pressure of about twenty percent," which "should not be of any particular danger"—regardless of the person's coronary health. Furthermore, Dr. Evans testified that the first part of the body to be affected by midazolam is the brain. He explained that "[w]ithin one to two minutes you are going to get a very significant effect on the central nervous system" and that the recipient of 250 milligrams of midazolam would "almost immediately" lose consciousness and not be able to feel pain. Dr. Evans concluded that after the initial injection of 250 milligrams of midazolam, Henry will not be conscious to experience the pain of any acute coronary event that may occur as a result of any reduction of blood pressure caused by the midazolam.

After considering this testimony and argument from the parties, the postconviction court denied Henry's as-applied challenge. The postconviction

court determined that Henry "did not meet the burden of showing that given his hypertension diagnosis, elevated cholesterol, and coronary artery disease, the use of midazolam in his case is 'sure or very likely to cause serious illness and needless suffering.' " State v. Henry, No. 87-018628CF10A at 13 (Fla. 17th. Jud. Cir. Ct. order dated Mar. 11, 2014) (quoting Brewer, 131 S. Ct. at 445). The postconviction court concluded that Henry did not demonstrate a substantial risk of serious harm from the use of midazolam in Florida's lethal injection protocol because the evidence established that even if Henry were to suffer an acute coronary event as a result of an injection of midazolam, he would be unconscious and unable to process the pain associated with a heart attack. Id. at 12.

The postconviction court's conclusion is supported by competent, substantial evidence. At the evidentiary hearing, Dr. Dershwitz testified that any drop in blood pressure from an injection of midazolam would not occur until after the recipient of the drug had lost consciousness. Dr. Dershwitz explained that because the midazolam affects blood pressure by relaxing the smooth muscle tissue of the peripheral blood vessels, an intravenous injection of midazolam will affect the brain, leading to unconsciousness, more quickly than it will affect blood pressure. Dr. Dershwitz also testified that once rendered unconscious by midazolam, a person "could not perceive or process any sort of noxious stimuli."

Because Henry has not shown a "substantial risk of serious harm," Howell, 39 Fla. L. Weekly at S92, he has not demonstrated that Florida's lethal injection protocol—as applied to him—violates the Eighth Amendment of the United States Constitution. Accordingly, the postconviction court did not err in denying his second successive postconviction motion.

III. CONCLUSION

For the reasons stated above, we affirm the postconviction court's denial of Henry's second successive motion for postconviction relief, his motion to declare section 922.052 unconstitutional, and his motion to dismiss the death warrant. Additionally, we deny Henry's motion for a stay of execution. No motion for rehearing will be entertained by this Court. The mandate shall issue immediately.

It is so ordered.

POLSTON, C.J., and PARIENTE, LEWIS, QUINCE, CANADY, LABARGA, and PERRY, JJ., concur.

An Appeal from the Circuit Court in and for Broward County,
Andrew L. Siegel, Judge - Case No. 87-018628ACF10A

Melodee A. Smith, Offices of Melodee A. Smith, Fort Lauderdale, Florida; and Kevin James Kulik of Kevin J. Kulik, PA, Fort Lauderdale, Florida,

for Appellant

Pamela Jo Bondi, Attorney General, Tallahassee, Florida; and Consiglia Terenzio, West Palm Beach, Florida,

for Appellee

(2)

IN THE CIRCUIT COURT OF THE SEVENTEENTH JUDICIAL CIRCUIT,
IN AND FOR BROWARD COUNTY, FLORIDA

STATE OF FLORIDA,

Plaintiff,

v.

ROBERT LAVERN HENRY,

Defendant.

_____/

CASE No: 87-18628CF10A

JUDGE: SIEGEL

DEATH WARRANT SIGNED
EXECUTION SET FOR
MARCH 20, 2014

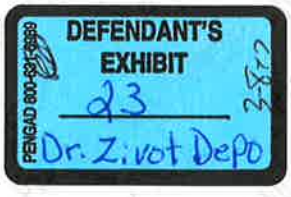
MOTION FOR LEAVE TO AMEND/CORRECT/SUPPLEMENT CLAIMS TO SUCCESSIVE MOTION TO VACATE JUDGMENTS OF CONVICTION AND SENTENCE AND REQUEST FOR EVIDENTIARY HEARING

ROBERT LAVERN HENRY, Defendant in the above-captioned action, through undersigned counsel, hereby files the instant Motion for Leave to File Amend/Correct/Supplement his Successive Motion to Vacate Judgments of Conviction and Sentence with Amended/Corrected/Supplemented Attachments and a Request for an Evidentiary Hearing and as grounds therefore would show as follows:

1. Mr. Henry filed his Successive Motion to Vacate Judgments of Conviction and Sentence on February 19, 2014. The State responded on February 20, 2014, and this Court conducted a case management conference on February 21, 2014. This Court found that an evidentiary hearing was not warranted, but has not yet denied Mr. Henry's Motion.

2. Fla. R. Crim. P. 3.851(f)(4) provides that a defendant may amend a post conviction motion up to 30 days before any evidentiary hearing upon motion and good cause shown. Mr. Henry submits that this motion is timely made.

3. Mr. Henry, it its current Successive Motion, attached a brief report authored by



Dr. Joel Zivot addressing Mr. Henry's "as applied" challenge to the State's current lethal injection protocol.

4. Mr. Henry's DOC Medical files, which had been provided This Motion, amending, correcting and supplementing the Attached Amendments is timely filed within the Rule allowing up to 30 days before any evidentiary hearing is scheduled.

5. Mr. Henry further submits that good cause continues to exist to permit him to amend/correct/supplement his Successive Motion to Vacate Judgments of Conviction and Sentence. Since undersigned counsel was tasked with representing Mr. Henry in this action precipitated by the signing of a death warrant, with due diligence and understanding the importance of Mr. Henry raising claims during this stage of the proceedings or forever be barred from claiming error, undersigned counsel has reviewed hundreds of pages of documents, including additional DOC Medical records just received on February 23, 2014, and an Affidavit authored by Dr. Zivot to assist in the investigation of potential claims.

6. Mr. Henry, as represented by undersigned counsel, verified in writing his Successive Motion for Post Conviction Relief on February 21, 2014. (Please see attached.)

7. Further, Dr. Zivot's initial report is supplemented with an Affidavit dated February 23, 2014. (Please see attached.)

8. Undersigned counsel requested that the DOC provide Dr. Zivot with an opportunity to conduct an evaluation of Mr. Henry, but the Warden's office initially denied the request until at least Thursday, February 27, 2014, because the State is intending to carry out an execution of another death row prisoner on February 26, 2014. On Friday, February 22, however, after the case management hearing was conducted, DOC notified undersigned that Dr. Zivot could conduct an evaluation of Mr. Henry on Monday, February 24, 2014 at 1:00 p.m.

Dr. Zivot will conduct this evaluation at the permitted time and provide an Amended Affidavit before 5:00 p.m. on February 24, 2014 - which needs to be supplemented to Mr. Henry's Motion as critical additional evidence for this Court to review before denying the Succesive Rule 3 Motion.

WHEREFORE, Mr. Henry respectfully requests that this Court Motion for Leave to File Amend/Correct/Supplement his Successive Motion to Vacate Judgments of Conviction and Sentence with Amended/Corrected/Supplemented attachments pursuant to Fla. R. Crim. P. 3.851 (f)(4) and Mr. Henry requests an Evidentiary Hearing.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing was furnished on this the 23rd day of February, 2014 to the following:

HONORABLE ANDREW SIEGEL
Judge, Circuit Court
Seventeenth Judicial Circuit
201 SE 6th Street
Ft. Lauderdale, FL 33301

CONSIGLIA TERCUZIO
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Respectfully submitted,

KEVIN J. KULIK, P.A.
Attorney for Petitioner

500 Southwest 3rd Avenue
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954/761-9411

BY: _____
Kevin J. Kulik
Florida Bar No: 475841

MELODEE A. SMITH
Attorney for the Petitioner
101 N.E. 3rd Avenue, Suite 1500
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954/522-9297

BY: _____
Melodee A. Smith
Florida Bar No: 33121

IN THE CIRCUIT COURT OF THE SEVENTEENTH JUDICIAL CIRCUIT
IN AND FOR BROWARD COUNTY, FLORIDA

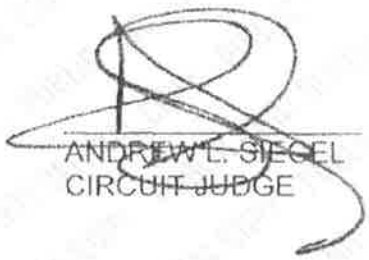
STATE OF FLORIDA, Plaintiff, v. ROBERT LAVERN HENRY, Defendant.	S.CT. CASE NO.: SC73433 L.T. CASE NO.: 87-018628CF10A JUDGE: SIEGEL CAPITAL CASE – ACTIVE WARRANT EXECUTION SET FOR 6:00 P.M. THURSDAY, MARCH 20, 20014

ORDER ON CASE MANAGEMENT CONFERENCE

THIS CAUSE came before this Court upon Defendant's Successive Motion for Postconviction Relief, brought pursuant to Florida Rule of Criminal Procedure 3.851(e)(2) and filed February 19, 2014. Having considered Defendant's instant successive motion, the State's response to Defendant's successive motion, filed February 20, 2014, the State's Notice of Filing, filed February 21, 2014, and the applicable law, having held a case management conference on February 21, 2014, having heard argument of counsel, and being otherwise fully advised in the premises, this Court finds as follows:

Defendant's as-applied challenge, that the use of midazolam as the first drug in the lethal injection protocol violates the Eighth Amendment's prohibition on cruel and unusual punishment, does not warrant an evidentiary hearing. This Court will issue a final order addressing the merits of Defendant's instant successive motion, within the time frame set forth in the Florida Supreme Court's Scheduling Order, dated February 14, 2014.

DONE AND ORDERED on this 21st day of February, in Chambers, Fort Lauderdale, Broward County, Florida.



ANDREW L. SIEGEL
CIRCUIT JUDGE

Copies furnished to:

John A. Tomasino, Clerk of the Florida Supreme Court

Celia Terenzio, Assistant Attorney General
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Carolyn McCann, Assistant State Attorney
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201 S.E. 6th Street, Room #660, Ft. Lauderdale, FL 33301

Joel Silvershein, Assistant State Attorney
Office of the State Attorney
201 S.E. 6th Street, Room #660, Ft. Lauderdale, FL 33301

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Law Offices of Melodee A. Smith
101 NE 3rd Ave. Ste. 1500
Fort Lauderdale, FL 33301

Kevin Kulik, Esq.
500 SW 3rd Ave
Fort Lauderdale, FL 33315

OATH

STATE OF FLORIDA

COUNTY OF Brad ford

Before me, the undersigned authority, this day personally appeared ROBERT LAVERN HENRY, who first being duly sworn, says that he is the defendant in the above-styled cause, that he has read or had read to him the foregoing SUCCESSIVE MOTION FOR POST CONVICTION RELIEF, that he understands the content of the motion and has personal knowledge of the facts and matters therein set forth and alleged and that each and all of these facts and matters are true and correct.

ROBERT LAVERN HENRY
Defendant

SWORN AND SUBSCRIBED TO before me this 21st day of February, 2014.

NOTARY PUBLIC

[Print name of Notary]

Personally known: X

Produced Identification: DL FD

ROSALIE C. BOLIN
Notary Public - State of Florida
My Comm. Expires Jun 12, 2018
Commission # EE 189338
Bonded Through National Notary Assn.

IN THE CIRCUIT COURT OF THE SEVENTEENTH JUDICIAL CIRCUIT,
IN AND FOR BROWARD COUNTY, FLORIDA

STATE OF FLORIDA,

Plaintiff,

v.

ROBERT LAVERN HENRY,

Defendant.

_____/

CASE No. 87-18628CF10A

JUDGE: SIEGEL

DEATH WARRANT SIGNED
EXECUTION SET FOR
MARCH 20, 2014

AMENDED SUCCESSIVE MOTION FOR POST-CONVICTION RELIEF
With Motion for Leave to Amend/Correct/Supplement Motion
and
AMENDED REQUEST FOR EVIDENTIARY HEARING

COMES NOW the Defendant, **ROBERT LAVERN HENRY**, by and through undersigned counsel, and pursuant to Florida Rule of Criminal Procedure 3.851(e)(2), moves this Court for post-conviction relief and as grounds in support therefore alleges the following:

The Judgment and Sentence dated November 9, 1988; Circuit Court of the Seventeenth Judicial Circuit in and for Broward County, Florida.

This Motion is timely because Henry is challenging, "as applied," the lethal injection procedure in existence at the time of his Death Warrant, which was promulgated on February 13, 2014.

This Court conducted a case management conference on February 21, 2014 and entered an Order stating that the Defendant's "as-applied" challenge that the use of midazolam as the first drug in the lethal injection protocol violates the Eighth Amendment's prohibition on cruel and unusual punishment does not warrant an evidentiary hearing. This Court did not deny the Defendant's Successive Motion, however, and Mr. Henry, through undersigned counsel is requesting leave to amend the Motion by providing the Court with evidence not yet available at the time of case management conference that supports a request for a second case management conference before the Court enters a final Order on the Defendant's Successive Motion and an Amended Request to conduct an Evidentiary Hearing.

NATURE OF THE RELIEF SOUGHT

ROBERT LAVERN HENRY is requesting a Stay of execution and/or Order declaring Florida's lethal injection protocol to be unconstitutional.

CLAIM FOR WHICH AN EVIDENTIARY HEARING IS SOUGHT

1. The Defendant is under sentence of death.
2. For purposes of preserving potential issues for appeal, all previous claims presented in Mr. Henry's Successive Motion for Post-Conviction Relief filed on February 19, 2014, are incorporated in this Amended Successive Motion.
3. The sole claim in this Amended/Corrected/Supplemental Motion is Mr. Henry's "as applied" challenge to Florida's use of Midazolam as the first drug in the lethal injection protocol based on evidence that, due to Mr.

Henry's medical history, the use of Midazolam will result in a substantial risk of serious harm to Mr. Henry. Dr. Joel Zivot, as evidenced in his attached Affidavit dated February 23, 2014, states that "[A] fall in blood pressure leading to an acute coronary event in an individual with a very high risk of coronary artery disease will result in an acute coronary event that will be experienced as severe chest pain and shortness of breath. Mr. Henry is such an individual. Midazolam, given in the dose described in the lethal injection procedure document, will lower the blood pressure precipitously in Mr. Henry in an exaggerated manner as a consequence of his long-standing hypertension."

4. "The design of the Florida lethal injection procedure will very likely cause serious illness and needless suffering to Mr. Henry as a consequence of the acute coronary event. This lethal injection procedure presents a substantial risk of serious harm and therefore does not immunize prison officials against subjective blame should they carry out lethal injection," according to Dr. Zivot's Affidavit.

5. The use of Midazolam creates a substantial risk of harm to Mr. Henry.

MEMORANDUM OF LAW

6. When Mr. Henry's Successive Motion for Post-Conviction Relief was filed on February 19, 2014, per this Court's Scheduling Order, the Florida Supreme Court had not yet published its slip Opinion in *Howell*, dated February 20, 2014. On February 21, 2014, the State noticed this Court that Howell provided this Court with specific language allegedly relevant to Mr. Henry's claims.[1]

[1] The State inadvertently cites "Powell" as the case decided by the FSC, but its intended notice is clear.

7 Mr. Henry points out additional language from *Howell* not provided by the State: "A review of Howell's claim shows that Howell is attempting to satisfy his heavy burden by pointing to two alleged weaknesses in the State's experts' testimony." The *Howell* Opinion further stated that Howell was "flipping the burden on its head, imposing the burden on the State to show that an Eighth Amendment violation has not occurred." *Howell v. State*, SC14-167, Slip Op. (Fla. February 20, 2014).

8. In this case, however, the State has not provided any evidence or expert testimony that refutes Mr. Henry's claim of his "as applied" challenge, and Mr. Henry has met his burden of proof.

9. Dr. Zivot's experience and qualifications are unassailable, and he has demonstrated both knowledge about Midazolam and Mr. Henry's medical history.

10 Mr. Henry intends to present evidence that he will experience an exaggerated reaction to Midazolam and that he will fail the graded noxious stimuli test that DOC employees undertake to ensure unconsciousness.

11. Dr. Zivot was initially denied an opportunity to conduct a medical evaluation of Mr. Henry by DOC due to scheduling issues associated with the scheduled execution of Mr. Howell on February 26, 2014, but late on Friday, the Warden at FSP consented to Dr. Zivot's evaluation on February 24, 2014, at 1:00 p.m. As soon as possible, thereafter, Dr. Zivot will provide

undersigned counsel with an Amended Affidavit for this Court's review and consideration.

12. Mr. Henry is requesting that this Court conduct a full and fair evidentiary hearing, which is not conclusively disputed by the State, to determine whether the use of Midazolam, in conjunction with his medical history and mental conditions, will subject him to a "substantial risk of serious harm." *Base v. Rees*, 553 U.S. 35, 50 (2008) (plurality opinion).

13. *Howell* does not address Mr. Henry's "as applied" challenge.

14. *Howell* does not bar Mr. Henry's right to challenge Florida's use of Midazolam as the first drug in the lethal injection protocol based on evidence that due to Mr. Henry's medical history, Mr. Henry will suffer substantial harm.

15. Further, as newly discovered evidence not time barred, Mr. Henry's as applied challenge has not been rejected by the Florida Supreme Court, and Mr. Henry is not barred from attempting to amend his claim in this Court.

16. An evidentiary hearing is required on this claim.

WHEREFORE, **ROBERT LAVERN HENRY,** requests that the court conduct an evidentiary hearing, enter a Stay of execution Orderand/or enter an Order declaring Florida's lethal injection protocol to be unconstitutional.

CERTIFICATE OF SERVICE

I **HEREBY CERTIFY** that a copy of the foregoing was furnished on this the 23rd day of February, 2014 to the following:

HONORABLE ANDREW SIEGEL
Judge, Circuit Court
Seventeenth Judicial Circuit
201 SE 6th Street
Ft. Lauderdale. FL 33301

CONSIGLIA TERCUZIO
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Respectfully submitted,

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954/761-9411

BY: /s/ Kevin J. Kulik
Kevin J. Kulik
Florida Bar No: 475841

MELODEE A. SMITH
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Fort Lauderdale, FL 33301
954/522-9297

BY: /s/ Melodee A. Smith
Melodee A. Smith
Florida Bar No. 33121

I, Joel Zivot, first being duly sworn, state as follows.

1. I am an assistant professor of Anesthesiology and Surgery at the Emory University School of Medicine in Atlanta, Georgia. I am the medical director of the Cardiothoracic and Vascular Intensive care Unit and the academic director of the critical care medicine fellowship for the Department of Anesthesiology.

2. In addition to my present position, I have served in similar leadership positions in academic medical centers in Washington, DC, Winnipeg, Canada, Cleveland, Ohio, and Ann Arbor, Michigan. I am board certified in Anesthesiology from the Royal College of Physicians of Canada and the American Board of Anesthesiology. I am board certified in Critical Care Medicine from the American Board of Anesthesiology. I have an unrestricted medical license for the State of Georgia, Ohio, and The District of Columbia. I hold a license for the Drug Enforcement Agency (DEA), granting me prescriptive authority for controlled drugs.

3. I am in graduate school at Emory University in the field of Bioethics. I have lectured and published on many topics related to Anesthesiology, Critical Care Medicine, and Biocthics, including a publication in a peer reviewed journal on physicians and the death penalty in the United States. I serve on the ethics committees of the largest professional Anesthesiology society and the largest professional Critical Care Medicine Society in the world.

4. My comments concern a request by the legal team of Mr. Henry in relation to his medical health and how that would be impacted in the circumstance of his execution by lethal injection according to the document from the Florida Department of Corrections, dated 9/9/13, and signed by Secretary Michael D. Crews, that describes the lethal injection procedure.

5. I have reviewed the medical records of Mr. Henry that record his blood pressure at various times between 1987 and 2014. These records show both systolic and diastolic hypertension on many occasions. It is note worthy that Mr. Henry's hypertension was present prior to the age of 35 and persists to the present.

6. I have reviewed blood work between 2012 and 2014 that demonstrates a marginal HDL in relation to total Cholesterol ratio. This relationship is referred to as dyslipidemia.

7. Hypertension is quantitatively the most important risk factor in premature cardiovascular disease and is strongly associated with dyslipidemia. Dyslipidemia is an independent risk factor of coronary artery disease. The odds ratio of 2 risk factors for

coronary artery disease, that is, hypertension and dyslipidemia is 4.2. Hypertension alone accounts for 18% of the population-attributable risk for the first myocardial infarction. Over 90% of coronary heart disease events occur in individuals with at least one risk factor for coronary artery disease. Mr. Henry has 2 risk factors for coronary artery disease.

8. Coronary blood flow is necessary for myocardial protection and in the setting of coronary artery disease; any drop in blood pressure will result in a compromise of myocardial blood flow and an acute coronary event or a heart attack.

9. Pharmacological agents that result in a fall in endogenous catecholamines and a relaxing of vascular tone will result in a corresponding drop in blood pressure. Individuals with long standing hypertension are at a significant risk for precipitous falls in blood pressure as described above.

10. A fall in blood pressure leading to an acute coronary event in an individual with a very high risk of coronary artery disease will result in an acute coronary event that will be experienced as severe chest pain and shortness of breath. Mr. Henry is such an individual.

11. Midazolam, given in the dose described in the lethal injection procedure document, will lower the blood pressure precipitously in Mr. Henry in an exaggerated manner as a consequence of his long-standing hypertension.

12. The Florida Department of Corrections document on lethal injection procedures does not provide the means to account for the presence of coronary artery disease and hypertension. Lethal injection is in no way a medical act and can never be regarded as such.

13. The design of the Florida lethal injection procedure will very likely cause serious illness and needless suffering to Mr. Henry as a consequence of the acute coronary event. This lethal injection procedure presents a substantial risk of serious harm and therefore does not immunize prison officials against subjective blame should they carry out lethal injection.

STATE OF Georgia

COUNTY OF Dekalb

Before me, the undersigned authority, this day personally appeared Dr. Joel Zivot, who first being duly sworn, says that he has personal knowledge of the facts and matters therein set forth and alleged and that each and all of these facts and matters are true and correct.

Dr. JOEL ZIVOT

Angela M. Claybrooks, Notary Public

Angela M. Claybrooks
NOTARY PUBLIC
Gwinnett County
State of Georgia
My Commission Expires April 9, 2017

State of Georgia, County of Dekalb

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Cerebral and Brainstem Electrophysiologic Activity During Euthanasia with Pentobarbital Sodium in Horses

M. Aleman, D.C. Williams, A. Guedes, and J.E. Madigan

Background: An overdose of pentobarbital sodium administered IV is the most commonly used method of euthanasia in veterinary medicine. Determining death after the infusion relies on the observation of physical variables. However, it is unknown when cortical electrical activity and brainstem function are lost in a sequence of events before death.

Hypothesis/Objectives: To examine changes in the electrical activity of the cerebral cortex and brainstem during an overdose of pentobarbital sodium solution for euthanasia. Our testing hypothesis is that isoelectric pattern of the brain in support of brain death occurs before absence of electrocardiogram (ECG) activity.

Animals: Fifteen horses requiring euthanasia.

Methods: Prospective observational study. Horses with neurologic, orthopedic, and cardiac illnesses were selected and instrumented for recording of electroencephalogram, electrooculogram, brainstem auditory evoked response (BAER), and ECG. Physical and neurologic (brainstem reflexes) variables were monitored.

Results: Loss of cortical electrical activity occurred during or within 52 seconds after the infusion of euthanasia solution. Cessation of brainstem function as evidenced by a lack of brainstem reflexes and disappearance of the BAER happened subsequently. Despite undetectable heart sounds, palpable arterial pulse, and mean arterial pressure, recordable ECG was the last variable to be lost after the infusion (5.5–16 minutes after end of the infusion).

Conclusions and Clinical Importance: Overdose of pentobarbital sodium solution administered IV is an effective, fast, and humane method of euthanasia. Brain death occurs within 73–261 seconds of the infusion. Although absence of ECG activity takes longer to occur, brain death has already occurred.

Key words: Brainstem auditory evoked response; Death; Electroencephalogram; Equine.

Euthanasia is a term used to describe ending of an animal's life in a painless and minimally distressful way.[1] The American Veterinary Medical Association has established recommendations to assist in the decision on when to consider euthanasia.[1] Several methods of euthanasia have been approved in veterinary medicine and might vary among species.[1] An overdose of barbiturates is one of the approved methods of euthanasia in horses and it is the most common method used by practicing veterinarians.[1] Determining death after the infusion of an overdose of a barbiturate solution relies on the observation of physical and neurologic variables such as undetectable heart sounds, loss of an arterial pulse, and the absence of brainstem reflexes (mainly corneal and palpebral reflexes).[1]

Determining brain death has been a subject of debate and controversy in human medicine and a consensus on what constitutes brain death varies from country to country.[2] Procedures used to confirm brain death in human medicine include computed tomography angiography, transcranial Doppler sonography, electroencephalography (EEG), somatosensory evoked potentials, and brainstem auditory evoked responses (BAER).[2] However, state of disease, drugs used, and personnel expertise in performing the tests used for the confirmation of brain death could influence accurate interpretation of such diagnostic aids.[2] Physiologic, behavioral, and EEG studies have been done in laboratory animals, poultry, piglets, rabbits, dogs, and frogs.[3–10] Brain activity during euthanasia with intravenous concentrated potassium chloride has been studied by monitoring cerebral blood flow, metabolic state, electrocorticogram, and extracellular ion concentrations in cats.[11] Electrodiagnostic studies such as electroencephalography and BAERs have not been performed in equine species to examine electrical activity of the brain in support of brain death because of euthanasia procedures. Therefore, the objective of the study was to evaluate the electrical activity of the cerebral cortex and brainstem during an intravenous overdose of pentobarbital sodium solution. Our testing hypothesis is that isoelectric pattern of the brain in support of brain death occurs before absence of electrocardiogram (ECG) activity. Therefore, suggesting that this method of euthanasia is an effective and humane procedure.

Abbreviations:

BAER	brainstem auditory evoked response
ECG	electrocardiogram
EEG	electroencephalogram
EOG	electrooculogram
MAP	mean arterial pressure

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Materials and Methods

Animals

This observational prospective study included 15 horses for which euthanasia was elected based on published guidelines during a study period from 2011 to 2014.[1] Reasons for euthanasia included poor quality of life, intractable pain, progressive and debilitating or incapacitating disease with a poor prognosis. Horses were sourced from a research herd and patients from the William R. Pritchard Veterinary Medical Teaching Hospital.

Sedation and anesthetic protocol

All horses had an intravenous catheter placed in the jugular vein for the administration of sedatives, injectable anesthetics, and euthanasia solution. Sedative and anesthetic protocols before euthanasia were elected according to the horses' condition or disease, temperament, apparent anxiety, clinician preference, and safety concerns for the horse, personnel, and equipment. Accordingly, 3 protocols were used: (1) intravenous sedation (IVS, n = 4 horses), (2) intravenous anesthesia (IVA, n = 4), or (3) inhalation anesthesia (IA, n = 7).

Intravenous sedation consisted of administration of xylazine hydrochloride at a dosage of 0.25 mg/kg to relieve anxiety and facilitate electrode placement. Four horses (#1–4) were included in this group (orthopedic = 2, neurologic = 1, cardiac disease = 1). BAER was not performed in these horses because of equipment safety concerns.

Intravenous anesthesia consisted of administration of xylazine hydrochloride at a dosage of 1 mg/kg IV followed 5 minutes later by administration of ketamine hydrochloride at 2.2 mg/kg IV. Four horses (#5–8) received IA (neurologic = 3, orthopedic disease = 1). The electrodes for the recording of the study were placed once the horses were anesthetized. A BAER was performed in 3 of 4 horses.

In the group of horses euthanized while under inhalation anesthesia, horses were first sedated with xylazine and induced with ketamine as in the IVA group. Seven horses (#9–15) received inhalation anesthesia (neurologic = 6, orthopedic disease = 1). Reasons for undergoing anesthesia included myelography, computed tomography, and magnetic resonance imaging. Inhalation anesthesia was maintained with isoflurane (except one horse [#13] that received desflurane) delivered in 100% oxygen via a large animal anesthesia machine and breathing circuit. In addition, this one horse (#13) received IV propofol at a dosage of 2 mg/kg. Before euthanasia, the anesthetic level was maintained such that the EEG recorded continuous activity (no burst suppression). BAER was performed in 5 of 7 horses because of equipment availability.

Physical and neurologic variables

Physical variables included audible heart rate (beats per minute [bpm]) and rhythm, and the presence and quality of the arterial pulse. The neurologic variables consisted of presence or absence of brainstem reflexes such as direct pupillary light, corneal, and palpebral reflexes. The subcortical dazzle reflex was also monitored. These variables were monitored as follows: before receiving any medication (sedation), after instrumentation (EEG, EOG, ECG, and BAER), within 1 minute immediately before euthanasia solution infusion, within 20 seconds after the initiation of the infusion, immediately after the end of the infusion, and every 30 seconds thereafter until these variables were undetectable. Monitoring at these specific time points were not always possible in horses from the sedation group because of safety concerns. However, once horses from this group collapsed, variables were recorded immediately after collapse and every 30 seconds thereafter. Personnel assistance was used for monitoring physical (1st assistant) and neurologic (2nd assistant) variables. Mean arterial blood pressure (MAP) was continuously recorded in the inhalation anesthesia group.

Electrophysiologic examination

The examination consisted of EEG, EOG, electrocardiography (ECG), and BAER as described elsewhere.[12,13] The equipment used for EEG, EOG, and ECG was a digital EEG system (stationary or wireless),[ab] with integrated video monitoring. Stationary or wireless (telemetry) digital EEG systems were used based upon equipment availability or safety concerns (eg, standing sedation versus anesthesia). Instrumentation for these procedures has been described elsewhere.[12] Needle electrodes were placed SC in the scalp of the horse for the recording of EEG.[12] Baseline recordings were performed before euthanasia in all horses. When possible, recordings were continuous throughout the procedure.

An evoked potential system[c] was used for the recording of BAER. However, BAER was not evaluated in nonanesthetized horses for equipment safety reasons. One set of baseline tracings (an average of 200 responses using both derivations [vertex to mastoid, and vertex to C2][13] run simultaneously) with a single duplicate recorded for each ear were done before euthanasia. Immediately after this recording, infusion of euthanasia began and recordings were made continuously. Each complete recording took 90 seconds total. These were repeated continuously until BAER was absent (no peaks could be detected). The noise applied to the ear under evaluation was 90 dB normal hearing level (nHL) with a masking noise for the contralateral ear of 60 dB nHL.[13] Identification of visible peaks were labeled from I to V; these were consistent with auditory function.[13]

Euthanasia protocol

Euthanasia consisted of intravenous injection of a combination of both pentobarbital sodium[d] (390 mg/mL) and phenytoin sodium (50 mg/mL) at a dosage of 77–109 mg/kg for a total volume of 100 mL for horses above 400 kg of body weight. This dosage protocol is routinely used by most practicing veterinarians. The study was approved by an institutional animal care and use committee and owner consent was obtained.

Statistical analysis

Mean, standard deviation (SD), median, and range values are presented. No attempts were made to compare the results from the 3 groups of horses because of the low numbers of horses with different disorders, different euthanasia protocols, and variation in euthanasia solution dosages.

Results

Fifteen horses of Thoroughbred (n = 5), Quarter horse (n = 4), Arabian (n = 2), Morgan (n = 2), Warmblood (n = 1), and Tennessee Walking horse (n = 1) breeds were included in the study. There were 8 males (castrated = 7, intact = 1), and 7 females. The mean age was 10.8 years (median 14, range 20 days to 17 years). Ten horses had neurologic disease as follows: cervical compressive myelopathy (n = 4), progressive multifocal spinal cord disease (n = 3: undetermined etiology, n = 2/3; scoliosis, n = 1/3), occipitoatlantoaxial malfor-

mation with compression of the cervical spinal cord (n = 1), equine protozoal myeloencephalitis (n = 1), and meningoencephalomyelitis because of *Halicephalobus gingivalis* (n = 1). Four horses had orthopedic disease: chronic multiple osteoarthritis (n = 2), bilateral femoral osteochondrosis (n = 1), and bilateral pelvic fracture (n = 1). One horse had atrial fibrillation with severe atrioventricular heart block.

The mean infusion time was 46.8 seconds (SD 23.1, median 38, range 28–115 seconds) in adult horses. Two foals received 20 and 30 mL of euthanasia solution infused over 21 and 32 seconds, respectively. The mean infusion time for all horses was 44.1 seconds (SD 22.7, median 37, range 21 to 115 seconds). Heart rate increased during and immediately after the administration of euthanasia solution (before infusion: mean 40.4 bpm, SD 15.4, median 32, range 30–80; immediately after the infusion: mean 54.3, SD 12, median 52, range 36–80 bpm). Visible and audible breaths were not evident by the end of the infusion. Within 1 minute after euthanasia, heart sounds (mean 43.2, SD 12.1, median 38, range 25–60 seconds) were not audible and arterial pulse was undetectable. The MAP decreased from a mean of 83 mmHg (SD 5.6, median 80, range 75–89 mmHg) before euthanasia to 56.7 mmHg (SD 9.9, median 60, range 58–66 mmHg) after the infusion. Mean arterial pressure (MAP) was undetectable at a mean time of 52.6 seconds (SD 9.3, median 59, range 40–60 seconds) after the end of the infusion. All horses had intact brainstem reflexes before euthanasia.

A 10-minute baseline EEG was recorded in all horses before euthanasia. Interpretable EEG was obtained in standing horses under sedation before infusion of euthanasia solution. However, interpretation was difficult during the infusion because of movement artifact. Based on unpublished isoflurane data from another EEG study in horses (DCW, MA), a minimal alveolar concentration of less than 1.2 was maintained to obtain continuous EEG activity without suppression. Burst suppression,[14] defined as an isoelectric pattern alternating with bursts of high voltage activity, was noted in 2 horses anesthetized with isoflurane after infusion of 20–40 mL of euthanasia solution (Fig 1). Lack of detection of EEG (a continuous isoelectric pattern) occurred at a mean time of 52.6 seconds (SD 26.6, median 41, range 25–111 seconds) from time 0 (defined as the start of the infusion). Undetectable EEG occurred before (Fig 2A) and after (Fig 2B) termination of the infusion in 4 and 9 horses, respectively. In 2 horses (#2 and 3) from the sedation group, electrodes were lost as the horses collapsed. A reduced number of electrodes (9 plus ground) were placed promptly (<15 seconds) after

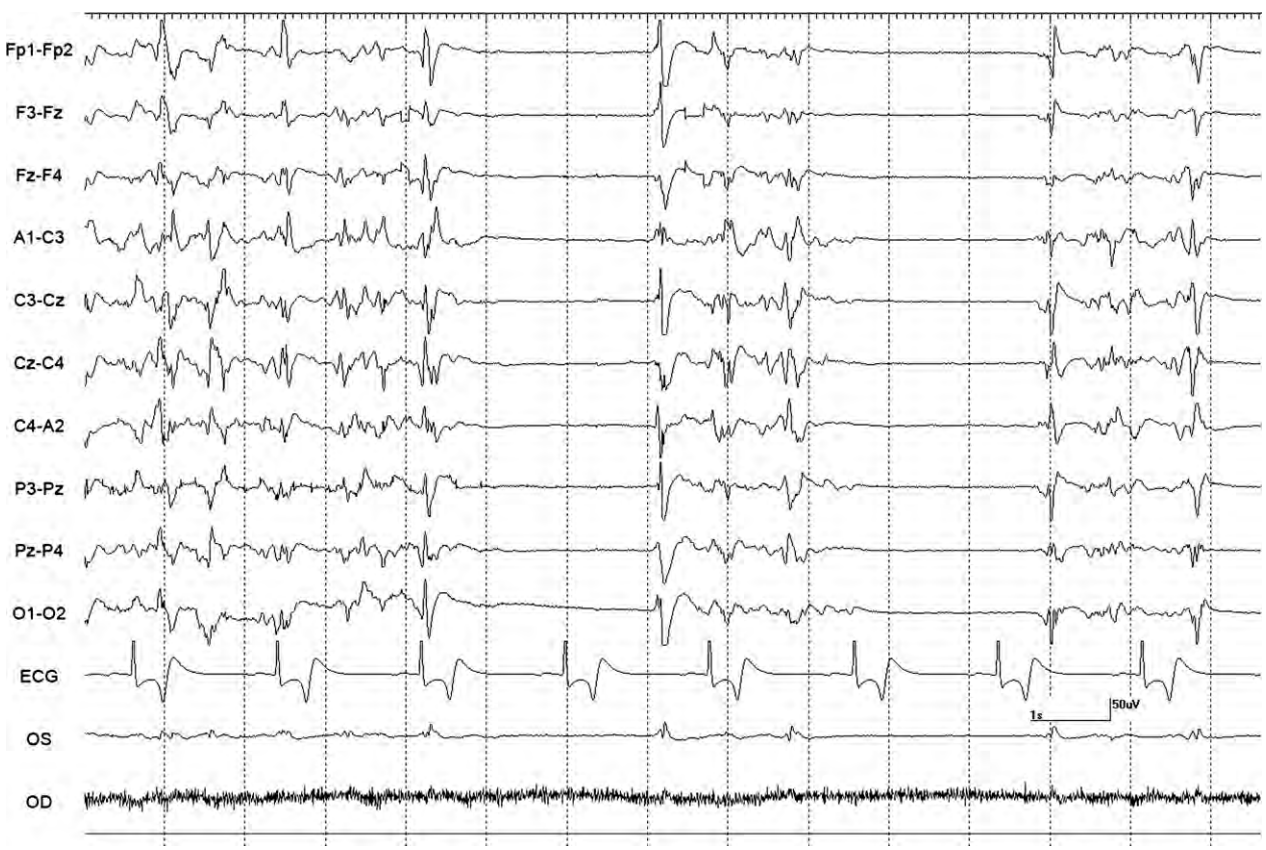

Fig 1. Burst suppression. This EEG is showing burst suppression activity in horse 13. Note the high voltage activity with intermittent electrical suppression. *Note:* Electroencephalogram: Even numbers = right side, odd numbers = left side, z = midline. Fp = frontopolar, F = frontal, C = central, P = parietal, O = occipital, A = aural, EOG: OD = right eye or OS = left eye, ECG. Calibration bar shown is for EEG and EOG = 1 second (second), 50 μV (microvolts). Calibration bar for ECG is not shown.

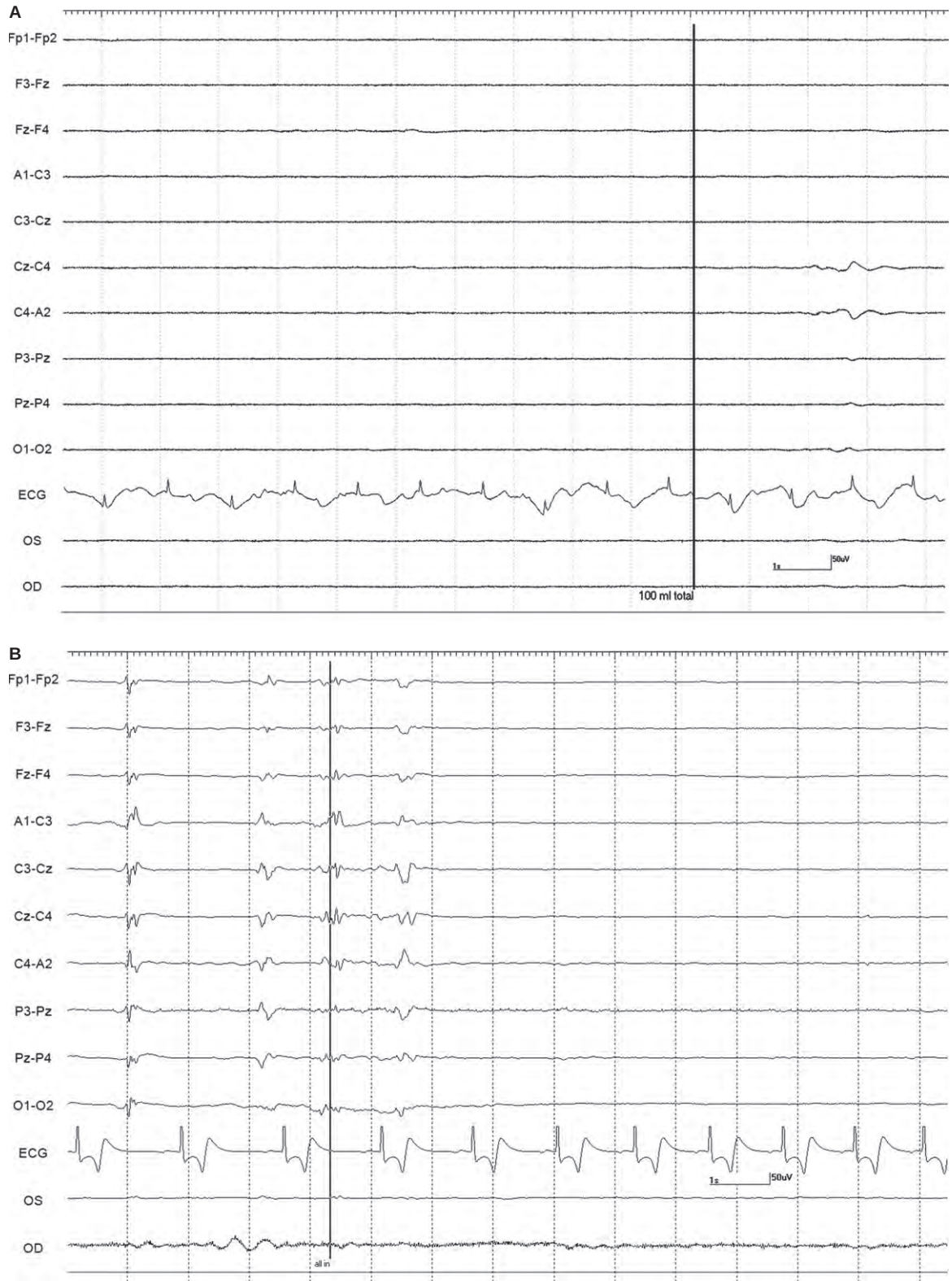

Fig 2. Isoelectric recording. (2A) This EEG is isoelectric in horse 10 before the end of the infusion marked with black vertical line and labeled 100 mL total (volume of pentobarbital sodium solution). (2B) This EEG is showing isoelectric pattern 1.5 seconds after the end of the infusion marked with a black vertical line (labeled: all in) in horse 13 (see Fig 1. for Electroencephalogram details).

collapse and an isoelectric pattern was noted; making it difficult to determine at what time point the EEG became isoelectric. In the group of 9 horses, loss of EEG activity occurred from 2 to 52 seconds (mean 23.7, SD 21.3, median 18 seconds) after termination of the infusion. The horse with the longest time to loss of EEG activity had atrial fibrillation and the longest time of infusion (Fig 3). This horse collapsed 17 second after the termination of the infusion, and lost EEG activity 29 seconds later. A different horse from the sedation group collapsed 5 seconds after the termination of the infusion and lost EEG activity 13 seconds later. Lack of brainstem reflexes occurred at a mean time of 81.1 seconds (SD 39, median 80, range 36–169 seconds) after the end of the infusion. A breath-like movement (perceived as an agonal breath) concurrent with undetectable brainstem reflexes was observed in 3 horses (Fig 4). A baseline BAER was recorded in 8 of 8 horses before euthanasia (Fig 5A). Decreased amplitudes of all waves were noted seconds after the termination of the infusion (Figs 5B,C). Loss of detectable BAER was seen at a mean time of 122.6 seconds (SD 69.6, median 88, range 73–261 seconds) after completion of the infusion (Fig 5D). In one horse, a second breath-like movement was observed and recorded on EEG at approximate 8 seconds after BAER became absent (not shown).

Despite undetectable heart sounds and the absence of a palpable arterial pulse, ECG monitoring showed ongoing ECG activity until a mean time of 559.1 seconds (SD 217.9, median 501, range 330–979 seconds) from termination of the infusion in all horses of all groups. During this time, brainstem reflexes and brain electrical activity did not return, and MAP was not recordable. In the horse with atrial fibrillation (Fig 3A), the heart rhythm became regular based on ECG (Fig 3B) after euthanasia solution administration. Before the occurrence of undetectable ECG in all horses, the ECG waves became irregular in shape, size, and rhythm (Fig 6).

Discussion

This study showed that euthanasia with an overdose of pentobarbital sodium administered IV is an effective, fast, and humane method to terminate life in horses. Absence of detectable cortical electrical activity can occur during the administration of an overdose of pentobarbital (4 horses) or within 52 seconds after completion of the infusion (9 horses). The exact time at what 2 horses lost cortical electrical activity was not determined, but thought to be either during or shortly after (<15 seconds) the end of the infusion. This lack of EEG activity appeared to be irreversible based on continuous recording for several minutes with no recovery of EEG activity. Brainstem function was lost second based on absent brainstem reflexes and BAER. Brainstem reflexes were undetectable before loss of the BAER. Agonal breaths were observed concurrently with the loss of brainstem reflexes. Although heart sounds and a palpable arterial pulse were undetectable, ECG activity was the last variable to be lost. Absence and lack of recovery of any detectable brain electrical activity, based on EEG and BAER, supported the diagnosis of brain death in these horses.

Electroencephalography has been used for decades to aid in the determination of brain death in human medicine.[15] Electroencephalography reflects cerebral cortical activity modulated by diencephalic and brainstem influences. An isoelectric pattern on EEG supports the absence of cerebral electrical activity. However, barbiturate administration and hypothermia can preclude proper diagnosis of brain death.[16] Barbiturates can cause burst suppression and even an isoelectric pattern.[17] Therefore, determining brain death in patients treated with barbiturates can be challenging. Halogenated inhalation anesthetics, such as isoflurane, can also cause burst suppression and isoelectric patterns.[17] Propofol can also cause burst suppression in humans; however, the single horse that received propofol did not demonstrate this pattern.[17] In the present study, only 2 horses displayed burst suppression and both horses were anesthetized with isoflurane. However, burst suppression was not observed until the infusion of pentobarbital sodium. The sedative (xylazine hydrochloride) administered to the horses in this study is not associated with burst suppression or isoelectric patterns.[12] Ketamine hydrochloride, the induction agent, does not induce these EEG patterns.

Brainstem evoked response is used to assess the auditory pathway which includes the cochlear nerve, caudal, and cranial brainstem.[18] Therefore, BAER could be used as a diagnostic aid to evaluate the presence or absence of brainstem function.[18] However, BAER is considered to have a moderate prognostic value and low to moderate validity to confirm brain death depending upon the disease process (eg, severe brainstem injury).[2,19] To fulfill the criteria of brain death in people with sufficient brainstem damage, BAER waves are absent after wave I or occasionally after wave II.[19] Complete absence of BAER could indicate deafness because of peripheral auditory dysfunction and not brain death exclusively.[19] To avoid misinterpretation of BAER in our study, a baseline BAER was recorded in 8 horses. All BAER waves were present in these 8 horses and considered to be within published reference ranges.[20,21] The amplitude of all waves decreased and interpeak intervals increased within seconds after termination of pentobarbital infusion. Loss of waves II to V (brainstem, Fig 5C) occurred first, and wave I was the last wave to become undetectable (Fig 5D). Complete absence of BAER is in support of brain death in the absence of severe brainstem disease in these horses (n = 8 of 8). BAER can persist despite high doses of barbiturates in people and animals.[22–25]

Factors that influence EEG and BAER recordings and interpretation such as disease and artifacts were considered. In this study, 3 horses had diseases that could have altered EEG and BAER findings. Two horses had multifocal brain disease with brainstem involvement (altered state of consciousness [stupor], multiple cranial nerve abnormalities). BAER was not performed in these 2 horses. The horse with atrial

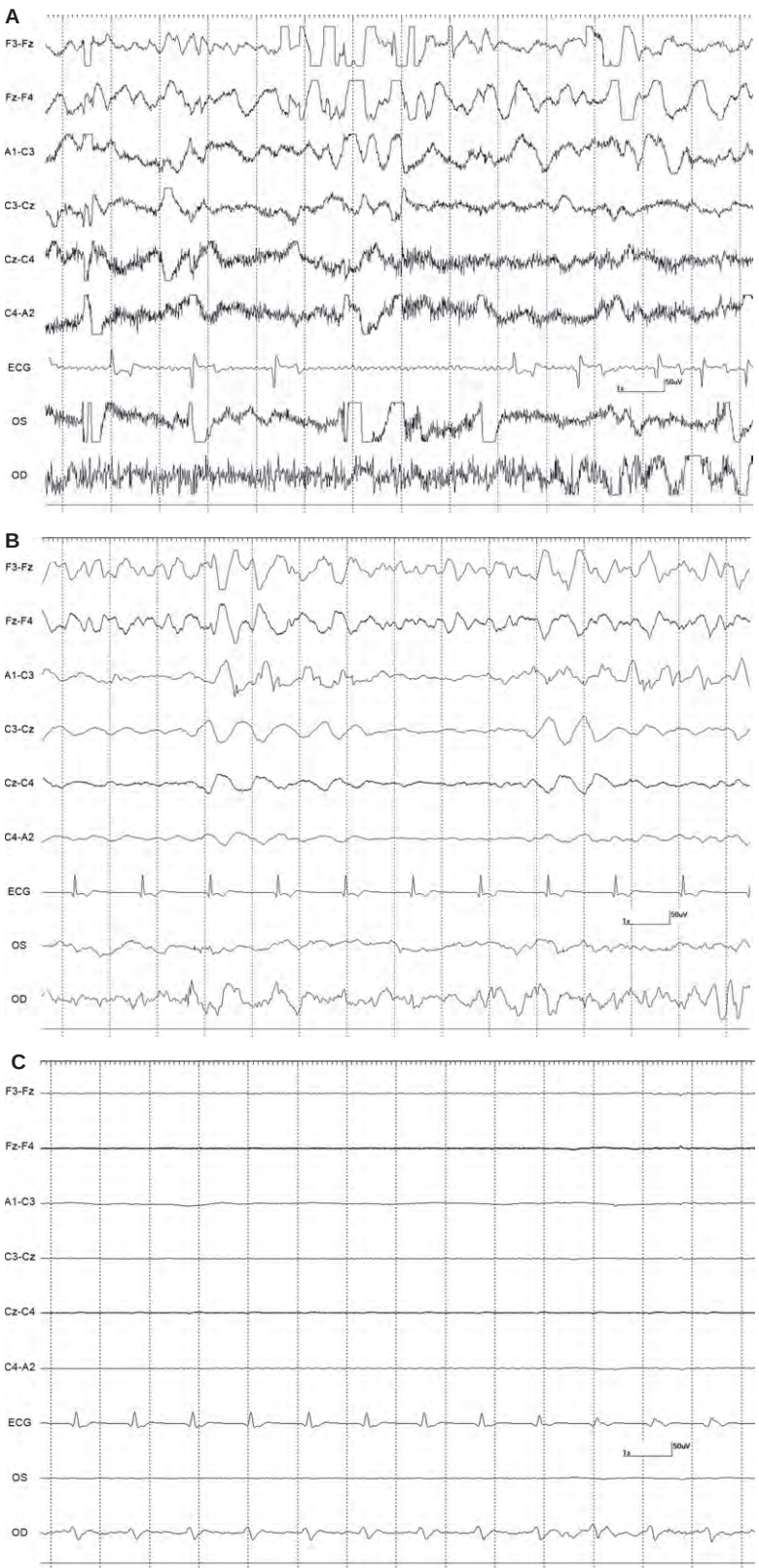

Fig 3. Electroencephalogram, electrooculogram, and electrocardiogram from horse 4. (3A) Baseline EEG and ECG. Movement artifact (large potentials often exceeding amplifier range [as evidenced by flattening of signal]) and muscle artifact (fast activity prominent in lower channels) obscure the EEG and EOG. Montage modified (fewer channels) than those of previous figures. Note atrial fibrillation. (3B) Decreased artifact in EEG. The ECG became regular after the infusion of euthanasia solution. (3C) ECG remained regular as EEG activity became undetectable. OD electrodes are picking ECG activity in this figure (see Fig 1. for Electroencephalogram details).

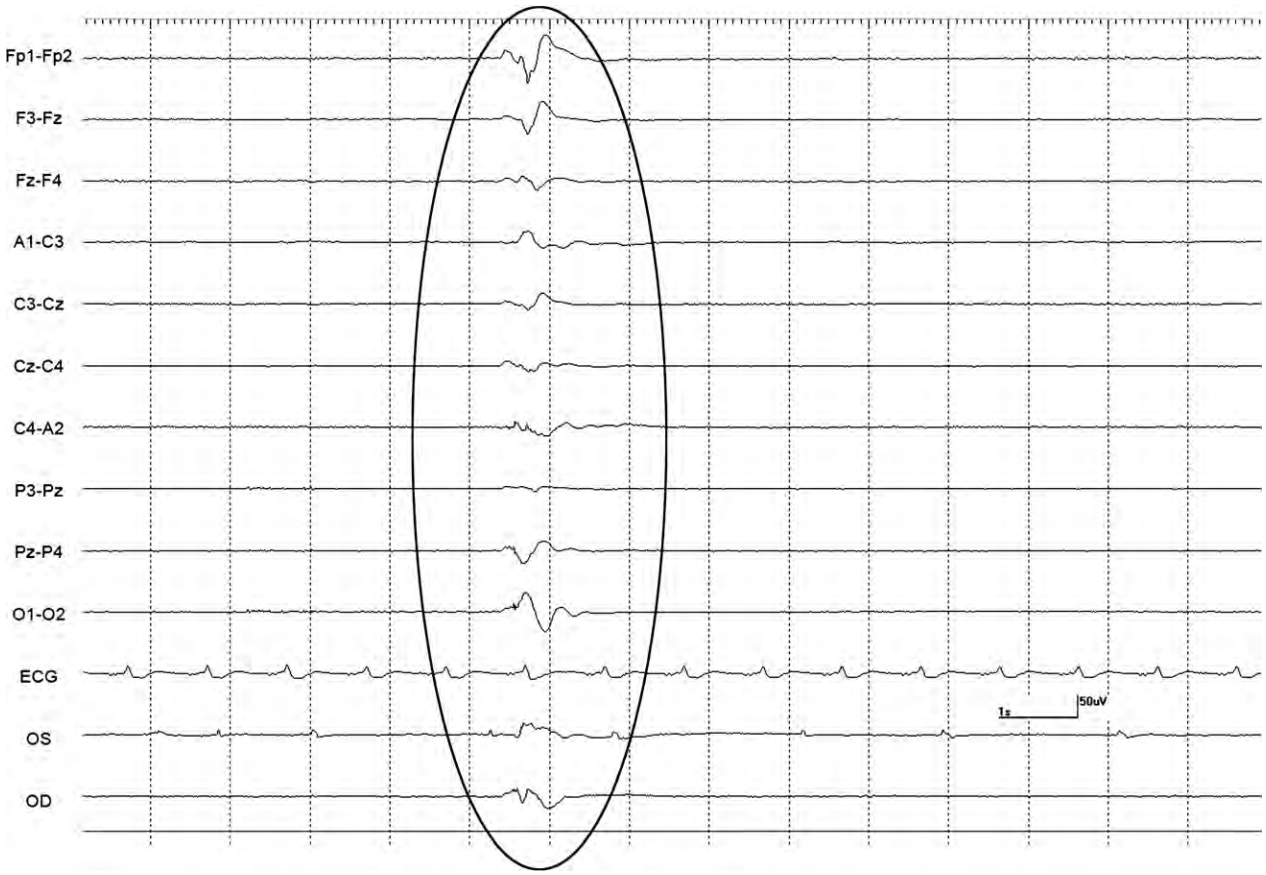

Fig 4. Agonal breath. This movement artifact (not cerebral electrical activity) was because of agonal breath (oval) at the time of absent brainstem reflexes in horse 3. Note isoelectric pattern and ongoing ECG (see Fig 1. for Electroencephalogram details).

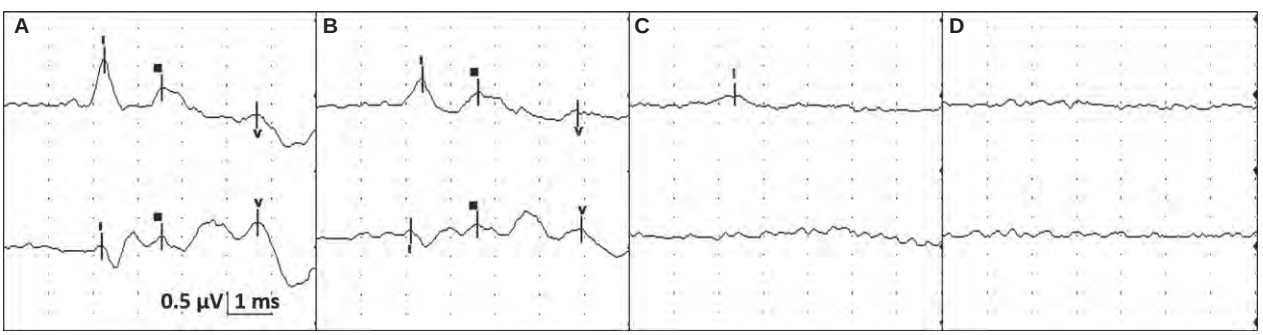

Fig 5. BAER. For all figures: Top tracing is vertex to mastoid (V-M) and bottom tracing is vertex to C2 (V-C2) recorded simultaneously. This figure represents stimulation of the right ear only. Calibration indicated for all figures (0.5 µV = microvolts, 1 ms = 1 millisecond per division). (5A) Baseline BAER in horse 15 (before euthanasia solution infusion). (5B) BAER done at the time of absent brainstem reflexes in horse 15. (5C) BAER done just before becoming absent. No clearly identifiable peaks, with the exception of wave I on V-M. (5D) Absent BAER.

fibrillation took longer to lose ECG activity but its baseline EEG did not show obvious abnormalities. Artifacts such as those generated by movement, electrical interference, or hospital equipment (eg, ventilator) could interfere with proper EEG interpretation and determination of brain death. Movement artifacts were observed in standing horses resulting in difficulty in interpreting EEG as euthanasia solution was administered. Body temperature should be noted when using BAER as an aid to determine brain death because hypothermia can alter BAER (increased interpeak latencies) in people.[26] This finding has not been investigated in horses. Body temperature in these horses did not decrease below 36.7°C (98°F), and BAER baseline was within reference ranges at this temperature.

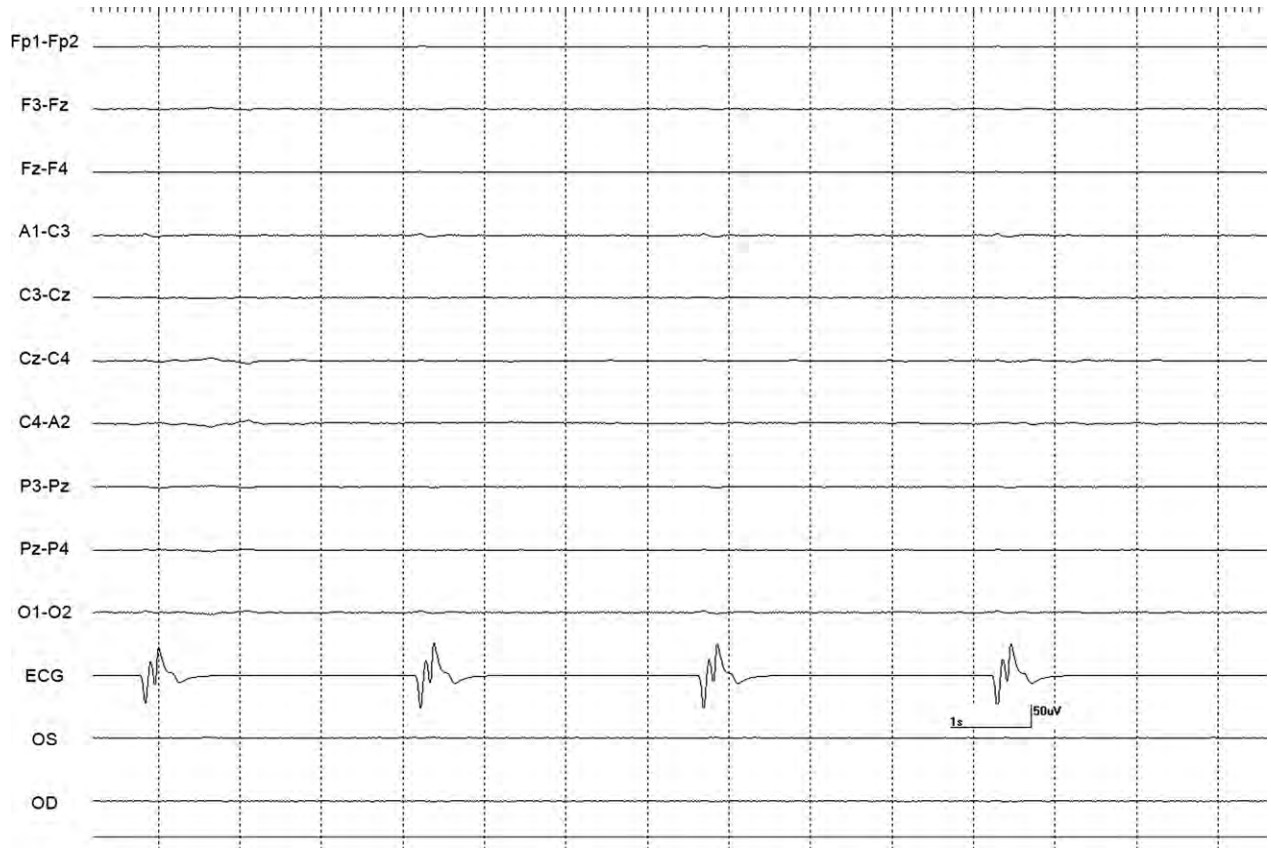

Fig 6. Electrocardiogram. Note the abnormal morphology of the ECG with isoelectric EEG recorded 10 seconds before undetectable ECG in horse 10 (see Fig 1. for Electroencephalogram details).

The 2 horses with the longest infusion times (65 and 115 seconds) were the ones who took the longest to lose all ECG activity (962 and 979 seconds) after end of the infusion. The infusion of a smaller volume per time likely prolonged the time for full effect of pentobarbital solution. However, one of these horses had atrial fibrillation with periods of no ventricular activity (based on recorded ECG) for over 8–9 seconds, which likely impacted the distribution time and effects of euthanasia solution. The mean infusion time of pentobarbital solution for the remaining 13 horses was 37.1 seconds, and the mean time to absent ECG activity was 495.8 seconds postinfusion. As this variable (loss of ECG) is frequently used to determine time of death, administration of an overdose of pentobarbital sodium should be performed quickly. The distribution of an overdose of pentobarbital might be delayed with prolonged infusion, therefore possibly prolonging the effect on the brain (perception). In another euthanasia study using different premedication protocols (detomidine versus no detomidine administration) and variable dosages of pentobarbital sodium (high versus low), the mean time to asystole varied according to the protocol used.[27] In that study, asystole occurred almost 4 minutes earlier in horses that received sedation compared to unsedated horses.[27] Although sedated horses took approximately 8 seconds longer to collapse than unsedated horses, the documentation that asystole occurred earlier, led the authors to conclude that the combination of sedation with high doses of pentobarbital resulted in faster cardiac death.[27] The overall mean infusion time in that study was 17 seconds (range 6–45 seconds).[27]

Pain, anxiety, and distress by a conscious horse could be minimized by administering IV sedation before euthanasia. In horses with standing sedation, 2 horses had isoelectric EEG patterns at the time of electrode replacement (<15 seconds after collapse) and 2 other horses took 18 and 46 seconds postinfusion to reach cerebral silence. The horse that took the longest time had atrial fibrillation, which likely played a role in the prolongation to effect. A larger number of horses are needed to validate these findings. However, the results of this study are encouraging because an isoelectric pattern on EEG supports a lack of conscious perception of pain and distress as euthanasia is occurring and while brain death and eventually asystole take place. A study by Chalifoux and Dallaire demonstrated that EEG was lost 4 minutes after euthanasia with carbon monoxide in dogs and that cessation of ECG occurred at 19 minutes.[7] The study by Buhl[27] showed that asystole in horses occurred up to 15 minutes later which is similar to our study (up to 16 minutes later in the 2 horses with the longest

infusion times which one had atrial fibrillation). Removing these 2 horses, absence of ECG activity occurred up to 12 minutes (mean time 8.3 minutes) postinfusion of euthanasia solution. Respiratory arrest was noted earlier with no observable or auscultable breaths by the end of the infusion. A few breath-like movements occurred at a time where EEG activity and brainstem reflexes were absent; and therefore considered reflexive (agonal breath: not a true breath).

In conclusion, an intravenous overdose of pentobarbital sodium solution is an effective, fast, and humane method of euthanasia. Rapid administration of an intravenous overdose of pentobarbital sodium solution might decrease the time to asystole after the infusion. Respiratory arrest occurs during or around the end of the infusion. Further, cerebral cortical activity becomes undetectable before the end or shortly after (less than 1 minute) the end of the infusion. This might support lack of conscious perception while brain death is happening. Brainstem function is absent next as evidenced by lack of brainstem reflexes and BAER. Lastly, absence of ECG activity occurs at a time on which brain death has already occurred and there is no cardiac output as evidenced by undetectable heart sounds, arterial pulse, and MAP. It is possible that cardiac death occurs earlier and that the ongoing ECG activity represents ineffective contraction with no cardiac output (electrical mechanical dissociation) as the remaining cardiac muscle ATP is being utilized. Future studies should be directed at assessing brain and cardiac death in horses with severe illnesses on which cardiovascular or metabolic derangements, hypovolemia, and hypotension might compromise and extend the distribution time of euthanasia solution to reach the brain and heart.

Footnotes

[a] Neurofax 9100, Nihon Kohden America, Inc., Foothill Ranch, CA

[b] Neurofax Wireless Input 1000A, Nihon Kohden America Inc., Foothill Ranch, CA

[c] VikingQuest, Nicolet Biomedical Inc., Madison, WI

[d] Euthasol®, Virbac AH, Inc., Fort Worth, TX

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Off-label Antimicrobial Declaration: Authors declare no off-label use of antimicrobials.

References

1. AVMA Guidelines for the euthanasia of animals: 2013 Edition. J Am Vet Med Assoc 2013;1–102.

2. Welschehold S, Boor S, Reuland K, et al. Technical aids in the diagnosis of brain death. Dtsch Arztebl Int 2012;109:624–630.

3. McKeegan DEF, Reimert HGM, Hindle VA, et al. Physiological and behavioral responses of poultry exposed to gas-filled high expansion foam. Poult Sci 2013;92:1145–1154.

4. Kongara K, Mcllhone AE, Kells NJ, et al. Electroencephalographic evaluation of decapitation of the anesthetized rat. Lab Anim 2014;48:15–19.

5. Baumans V, Meijer JC, Haberham ZL, et al. Euthanasia of piglets: gas or injection? Tijdschr Diergeneeskd 1998;123:738–742.

6. Hellebrekers LJ, Baumans V, Bertens APMG, et al. On the use of T61 for euthanasia of domestic and laboratory animals; an ethical evaluation. Lab Anim 1990;24:200–204.

7. Chalifoux A, Dallaire A. Physiologic and behavioral evaluation of CO euthanasia of adult dogs. Am J Vet Res 1983;44:2412–2417.

8. Lalonde-Robert V, Desgent S, Duss S, et al. Electroencephalographic and physiologic changes after tricaine methanesulfonate immersion of African clawed frogs. J Am Assoc Lab Anim Sci 2012;51:622–627.

9. Mikeska JA, Klemm WR. EEG evaluation of humaneness of asphyxia and decapitation euthanasia of the laboratory rat. Lab Anim Sci 1975;25:175–179.

10. Holson RR. Euthanasia by decapitation: evidence that this technique produces prompt painless unconsciousness in laboratory rodents. Neurotoxicol Teratol 1992;14:253–257.

11. Mayevsky A, Barbiro-Michaely E, Ligeti L, et al. Effects of euthanasia on brain physiological activities monitored in real-time. Neurol Res 2002;24:647–651.

12. Williams DC, Aleman M, Holliday TA, et al. Quantitative and qualitative characteristics of the electroencephalogram in normal horses following sedative administration. J Vet Intern Med 2012;26:645–653.

13. Aleman M, Puchalski SM, Williams DC, et al. Brainstem auditory evoked responses in horses with temporohyoid osteoarthropathy. J Vet Intern Med 2008;22:1196–1202.

14. Short TG, Leslie K. 'Known unknows and unknown unknows': electroencephalographic burst suppression and mortality. Br J Anaesth 2014;113:897–899.

15. Yingying S, Qinglin Y, Gang L, et al. Diagnosis of brain death: confirmatory tests after clinical test. Chin Med 2014;127:1272–1277.

16. Monteiro LM, Bollen CW, van Huffelen AC, et al. Transcranial doppler ultrasonography to confirm brain death: a meta-analysis. Intensive Care Med 2006;32:1937–1944.

17. Sloan TB. Anesthetic effects on electrophysiologic recordings. J Clin Neurophysiol 1998;15:217–226.

18. Spehlmann R. The normal BAEP. In: Spehlmann R, ed. Evoked Potential Primer. Stoneham, MA: Butterworth Publishers; 1985:204–216.

19. Spehlmann R. Coma. In: Spehlmann R, ed. Evoked Potential Primer. Stoneham, MA: Butterworth Publishers, 1985; 217–235.

20. Aleman M, Holliday TA, Nieto JE, et al. Brainstem auditory evoked responses in an equine patient population. Part I: adult horses. J Vet Intern Med 2014;28:1310–1317.

21. Aleman M, Madigan JE, Williams DC, et al. Brainstem auditory evoked responses in an equine patient population. Part II: Foals. J Vet Inter Med 2014;28:1318–1324.

22. Stockard JJ, Stockard JE, Sharbrough FW. Nonpathological factors influencing brainstem auditory evoked potentials. Am J EEG Technol 1978;18:177.

23. Bobbin RP, May JG, Lemoine RL. Effects of pentobarbital and ketamine on brain stem auditory potentials: latency and

amplitude intensity functions after intraperitoneal administration. Arch Otolaryngol 1979;105:467–470.

24. Sutton LN, Frewen T, Marsh R, et al. The effects of deep barbiturate coma on multimodality evoked potentials. J Neurosurg 1982;57:178–185.

25. Marsh RR, Frewen TC, Sutton LN, et al. Resistane of the auditory brain stem response to high barbiturate levels. Otolaryngol Head Neck Surg 1984;92:685–688.

26. Stockard JJ, Sharbrough FW, Tinker JA. Effects of hypothermia on the human brainstem auditory response. Ann Neurol 1978;3:368–370.

27. Buhl R, Andersen LO, Karlshoj M, et al. Evaluation of clinical and electrocardiographic changes during the euthanasia of horses. Vet J 2013;196:483–491.

IN THE UNITED STATES DISTRICT COURT FOR THE
WESTERN DISTRICT OF MISSOURI

RUSSELL BUCKLEW,)
)
Plaintiff,)
)
vs.) No. 14-08000-CV-W-BP
)
GEORGE A. LOMBARDI, DAVID)
DORMIRE, and TROY STEELE,)
)
Defendants.)
)

Deposition of DR. JOSEPH F. ANTOGNINI, taken on behalf of Plaintiff, at 555 West 5th Street, Suite 4000, Los Angeles, California, beginning at 9:04 A.M. and ending at 3:27 P.M. on Monday, February 27, 2017, before Amanda J. Kallas, Certified Shorthand Reporter No. 13901.

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QUESTIONS INSTRUCTED NOT TO ANSWER

EXHIBITS

Monday, February 27, 2017; Los Angeles, California
9:04 A.M.
-- o0o --

DR. JOSEPH F. ANTOGNINI,
the witness, having been administered an oath in accordance with CCP Section 2094, testified as follows:

EXAMINATION

BY MR. FOGEL:

Q Good morning.

A Good morning.

Q Dr. Antognini, my name's Larry Fogel, I think you met my colleague, Suzy Notton; we work for the law firm, Sidley Austin, and represent the plaintiff, Rusty Bucklew, in this matter.

You okay if I call you Dr. Antognini --

A That's fine.

Q -- throughout the course of the deposition today?

A That's fine, yes.

Q Excellent. And let's do a little housekeeping matter right off the top, here: You've submitted two reports in this matter; is that right?

A Yes. That's correct.

MR. FOGEL: Go ahead and mark this first report.

(Whereupon Exhibit 1
was marked for identification
by the court reporter and
is attached hereto.)

MR. FOGEL: And I'll show you both documents.

(Whereupon Exhibit 2
was marked for identification
by the court reporter and
is attached hereto.)

BY MR. FOGEL:

Q Have you had a chance to look at both documents, Doctor?

A I did. Yeah, they appear to be the documents I submitted, the two reports that I submitted.

Q All right. And the first one, I believe it's marked Exhibit 1.

A Correct.

Q That is your initial declaration for November 2016 that you submitted --

A That's --

Q -- in connection with this case?

A That's correct.

Q And does it appear to be a true and correct copy of your report including the exhibits thereto?

A It does appear to be, yes. And not having read

through the whole thing --

Q Sure.

A -- but it appears to be.

Q Absolutely. And you also submitted a supplemental report, and you submitted that in February of 2016. Is what's been marked as Exhibit 2 appear to be a true and correct copy of that report?

A Yes.

THE REPORTER: And if you could just wait until he's done.

THE WITNESS: Oh, I'm sorry.

THE REPORTER: It's all right.

MR. FOGEL: That's actually a good reminder.

THE WITNESS: Yeah.

MR. FOGEL: So we'll just go over a few basic ground rules.

BY MR. FOGEL:

Q Have you sat for a deposition before, Doctor?

A Yes.

Q So I assume you're generally familiar with the rules, but as the court reporter just reminded us, I ask that you wait until I finish asking my question before you respond --

A Sure.

Q -- and I'll, of course, extend to you the same

courtesy when you're answering the question. Inevitably, I will probably ask a question that doesn't make much sense, so please feel free to ask me to repeat it, if it's at all confusing to you --

A Inevitably, I'll probably give you an answer that -- no, hopefully I'll be very clear, but...

Q So at least we're in agreement on that.

And then also feel free to take a break, if you'd like, at any point today. I'd just ask that you ask or complete a question that's pending --

A Sure.

Q -- before you leave to take a break.

A Sure.

Q Before we get going, any other questions you might have?

A No. I do tend to -- as my wife is so apt to point out, I do tend to interrupt people mid-sentence, so I will try to refrain from doing that.

Q I appreciate that. And that's why we have the court reporter here, to help keep us in line.

A Yeah.

Q So going back to your reports, can you describe your process in preparing them?

A I looked at the material that I was provided to me, and I -- off the top of my head, I cannot remember all

the material that was provided to me by the attorney general's office, but it included -- may I refer to my document here to see?

Q Sure.

A Yeah, I cannot remember exactly what was provided to me, they were some of the declarations by Dr. Zivot, and then the medical records for Russel Bucklew, and then some letters from some other physicians, including Franz Wippold, and then Larry Sasich, and Dr. Gregory Jamroz. And then a lot of the Court documents that are numbered.

I don't remember specifically what they refer to, I'd have to look at them again. And then there were some judgments from various courts including the Eighth Circuit Court and the Supreme Court and so forth, and then the Missouri -- the injection protocol, the witness statements for 19 executions in Missouri.

So I took all those into consideration and reviewed those in preparation of my report --

Q And just to be clear for the record --

A And -- excuse me.

Q Go ahead.

A I apologize, I --

Q Go ahead.

A And -- and -- and also, of course, during my research, I referred to some articles that I cited in my

report.

Q Thank you.

And just to be clear for the record, when you were listing those various sources that you consulted, you were reviewing an exhibit to your November 2016 report --

A Correct.

Q -- as Exhibit B, your materials reviewed; is that -- does that sound correct?

A Yes.

Q Okay. You also reviewed some additional materials that you notated in connection with your supplemental report; is that right?

A That's correct. And do you want me to...

Q If you flip to the last page of your report, at the header it says, "Exhibit A, materials reviewed"?

A Yes.

Q Is that the right page?

A Correct.

Q And just to make sure I'm clear on this: Are the materials that you reviewed in connection with your supplemental report the items that are listed --

A Yes.

Q -- on this page?

There's no other list of materials that you reviewed?

A No. No. That refers to what was below, which was the reference as cited, and then the studies that I cited there -- or papers and then the package insert, and then my interview and examination of the -- of Bucklew, and then the medical records of -- through February 3rd of 2017, which includes the most recent imaging studies that were performed.

Q The MRI report for --

A Correct.

Q -- for 2016?

A Correct.

(Whereupon the reporter requested clarification.)

MR. FOGEL: 2016.

BY MR. FOGEL:

Q And we'll go into more detail on those materials later on. So you consulted these materials and what else did you to -- in preparing your reports?

A Well, I thought about the process by which a -- as I understand the lethal injection protocol is implemented. To make a determination whether the -- this particular inmate, based on the information that I've been provided in terms of his medical findings, whether this inmate would suffer pain, choking sensations, et cetera, as described by Dr. Zivot.

And I applied my understanding of the materials

that I reviewed in my scientific and medical background to his condition to make my assessment. Which, as you know, I do not believe that his medical condition is -- would materially affect the -- the action of the drug, or that it would cause him to have any additional -- or any suffering or pain, excruciating pain, as described by Dr. Zivot.

I'm not sure if that answers your question, and you kind of asked the question in a very general way, but for --

Q Yeah, it was intentionally general --

A Yeah.

Q -- in order to allow you sufficient space to describe everything that you did.

A Okay.

Q And prior statement, when you were talking about any suffering or pain, you were referring to one of the opinions you rendered in this case; is that right?

A That's correct.

Q Okay. And we'll go into a little bit more detail, but I want to make sure I understood what you said. Is it your opinion that Mr. Bucklew will suffer no pain and suffering?

A No. Can you elaborate about -- you mean, no pain and suffering during the lethal injection? Or during the

execution process?
Q I just want to make sure I fully captured what you said.
MR. FOGEL: Do you mind going back to when the doctor was testifying about pain and suffering, and repeat what he said?
(Whereupon the record was read.)
BY MR. FOGEL:
Q So that last part is what my question was referring to: So your opinion is that he would not suffer any additional pain and suffering?
A That is correct. I mean, obviously, I think any -- I think we all have an understanding, hopefully, that most modes of death do involve pain and suffering in some way. And my understanding of the lethal injection process is, that you have to start an intervenous line, that can be painful. Usually, not too painful, we do it all the time, patients having surgeries, but beyond that, the actual process, of where the drug is injected and so forth, would not cause any pain or suffering to somebody.
So there's always going to be a minimal amount of pain with a lethal injection process as I understand it, because you have to start an intravenous line, but beyond that, I don't see that this inmate would suffer any more than that.

Q Okay. Who did you work with in connection with the preparation of your reports?
A Mr. Spillane.
Q Anybody else?
A No.
Q Do you have any assistants that you work with?
A No.
Q No graduate assistants?
A No.
Q When were you first contacted regarding this matter?
A I'm going to say it was August -- I -- I can tell you the specific date, because I believe I have the letter somewhere, but I got a letter, by Fedex, from Mr. Spillane. I think it was dated August 27th or somewhere around there, I'm not sure exactly when it was, but it might have been before that, a little bit before that. It was some time in August -- or mid-to-late August --
Q Was that --
A -- of 2016.
Q Was that your first involvement in this case?
A Yes.
Q Had you -- have you worked with the Missouri State Attorney General's office before?

A No.
Q Have you worked with Mr. Spillane before?
A No.
Q What did Mr. Spillane ask you to do?
A He asked me to provide my expert opinion about this particular inmate and whether his -- well, may I -- just pause for a moment. I cannot specifically -- I mean, I'm going to give you my general understanding of what he asked me to do, but there may be some written documentation, where he has some specific questions that I could refer to, but I don't -- what would you --
Q To make it easier, and not make this a memory test: How about I direct you to paragraph 3 of Exhibit 1, which is your November 2016 report?
A Okay.
Q And you see paragraph 3 --
A Yes.
Q -- inner scope of engagement?
A Yes.
Q Does that help?
A Oh, thank you, yeah.
So I was asked to render my expert opinion, specifically, in general medicine and anesthesiology in regards to the actions and the efficacy of Pentobarbital, especially related to Missouri's lethal injection

protocol. And also, the efficacy of Pentobarbital in this particular inmate, Bucklew, who has this cavernous hemangioma.
(Whereupon the reporter requested clarification.)
THE WITNESS: Has a cavernous hemangioma.
BY MR. FOGEL:
Q Doctor --
A Yes.
Q -- let me ask you, does paragraph 3, Scope of Engagement, accurately summarize everything that you were asked to do in this matter?
A Yeah. I think it does. I mean, there might be -- again, not -- not making this a memory test, I believe that captures everything, I mean, there might be something I missed that I provided opinion in, but I think that captures pretty much everything.
Q What is anesthesiology?
A That's a field of medicine that describes -- I should -- that is involved with the administration of anesthetic to patients who are having surgeries or painful procedures. So we're physicians who specialize and go to residency for that, and render patients unconscious and, in a sense, during surgical procedures. That's part of what we do, but some people are also involved in critical care medicine, pain medicine, sort of, some of the

branches off of anesthesiology.
Q Is Pentobarbital a type of anesthetic?
A Yes.
Q Have you worked with Pentobarbital before?
A Yes.
Q What is your experience with Pentobarbital?
A I've used it in settings where patients would require Pentobarbital for induced coma, or to induce -- to decrease activity in the brain.
Q So could you help me out here, because I'm not a doctor --
A Yeah.
Q -- and no prior education in the area --
A Sure.
Q -- of anesthetics, how does Pentobarbital induce whatever you were just --
A Yes.
Q -- describing?
A Okay. Well, the -- the short answer is, we don't know. We don't know how anesthetics work, how they truly work. We know the Pentobarbital, like other anesthetics, work with what's called a GABA receptor -- G-A-B-A -- G-A-B-A, GABA receptor.
The GABA receptor is something that we all have. And when the Gaba receptor's active, it allows chloride

ions to enter into the cell, and causes the cell to become what we call hyperpolarized, and makes it less likely to fire. And when it's a neuron, like a neuron in the brain, then it's less likely to fire, and that produces the anesthetic effect, it produces unconsciousness, and the other things, immobility and so forth.
But we don't truly know how the work -- we know how they work at a receptor and cellular level, but how they end up resulting in a system -- what we call a system effect. That is, how they produce the actual unconsciousness, we really don't know. I mean, nobody knows for sure, that's the simple answer. We have a lot of pieces of the puzzle, but we don't know for sure for any of the anesthetics.
Q Do all anesthetics render a patient unconscious?
A Local anesthetics, obviously, by definition of anesthetics that leaves the term, local anesthetics, that's something we use for when you get a dental procedure done, that numbs up the nerve, so that does not cause unconsciousness in a dose as it's administered, but an anesthetic, when you use the term, anesthetic in the sense of sort of general anesthesia, then yes, they all produce unconsciousness. Because that is the -- that is one of the three essential endpoints of -- of anesthesia, which is unconsciousness.

Q What are the other two endpoints?
A Amnesia, and then immobility. So patients don't want to remember their surgery, patients don't want to be awake during the surgery, and physicians, specifically surgeons, do not want a moving patient during surgery. So the three special endpoints, as I described them -- now some people would also argue that analgesia is an important endpoint. But analgesia is, in my mind, and I may be a minority in this, but, in my mind, analgesia is not a required endpoint of anesthesia.
Q What is analgesia?
A So analgesia basically means something that -- that -- or an analgesic, for example, would be a drug or something that -- that lessens pain. So, for example, if you were out playing soccer or whatever and you hurt yourself, you might take Ibuprofen or you might take Tylenol, or maybe, if you'd had surgery on your -- dental surgery, you might take Tylenol with Codeine, those medications decrease pain, they provide some -- they have analgesic properties, they provide that.
But in order to be, again, this sort of gets into the semantics side more than anything else, in order for you to, in my mind, classify a drug as analgesic, the patient has to be awake. The patient has to say, "Oh, yes. I took this drug. My pain is less." But

anesthetics, by definition, if given a sufficient dose, makes someone unconscious, so they're not awake to be able to perceive pain. So analgesia is not really important in that setting, from that particular aspect.
Now, some people -- oh, I should say, so when you're having surgery and the surgeon makes an incision, your heart rate will go up, your blood pressure will go up. Even though you're unconscious and you may not move and you're not going to remember, but you're going to have these, you know, physiological responses to that. Now, you are a relatively young man --
Q Thank you.
A -- and you look in very good health.
Q Thank you.
A And if I were to anesthetize you, and your heart rate and blood pressure were to go up, it's probably not that critical to me or to you that I treat that. I probably would give you something for that, but I -- it wouldn't be necessary during the surgery, but most people would anyway.
If your grandmother was having surgery, let's say she's in her 80s, if her heart rate and blood pressure goes up, I'd be more concerned about that because that might be more harmful to her, so I'm more concerned about providing analgesia -- or analgesic-type of drug during

surgery for her. But it's not -- it's a long answer to your question, but it's, in my mind, analgesia is not a critical component or a necessary component of an anesthetic.

Q So let me ask a few follow-up questions based on what you just explained.

A Sure.

Q Which is very helpful, thank you for that.

Is the pain irrelevant when someone is unconscious?

A Is pain irrelevant?

Q Irrelevant when someone is unconscious.

A I want to make sure that we have an understanding of the terms: So pain is the conscious awareness of a noxious stimulus.

Q Excuse me, you said of a noxious?

A Noxious stimulus.

Q What's --

A Noxious. So something that causes tissue damage. So if I took a sharp instrument and poked you in the hand with it, that would be noxious, it would be painful to you.

Q But what about choking? Is choking, would you consider that painful?

A Choking, I wouldn't consider it painful, I mean,

it certainly is distressing.

Q Well, let's get away from the word "pain."

A Yeah.

Q Self- -- is it a type of suffering?

A Yes. Absolutely, yes. Choking would be a suffering, you know, you would have what I would describe as suffering sensation from that.

Q And is choking, or that type of suffering, irrelevant if someone is unconscious?

A In my opinion, yes. They're not going to be conscious and -- and aware of that sensation. If they're unconscious from a -- from a drug and choking or the lack of breathing, in my opinion, they would not be -- they're not aware, so they can't have the suffering component that we think about.

Suffering is a word or term describing sort of the emotional component of all this; right? So -- so suffering is an emotional part, and you can't have emotions when you're unconscious. I mean, you don't...

Q Doctor, you're -- your practice is as an anesthesiologist for some time; is that right?

A Yes. That's correct.

Q And you've administered an anesthetic for a patient who was unconscious during a procedure?

A Yes.

Q If that patient started choking during the procedure, would you say that it was irrelevant, it didn't matter, because they were unaware of the choking?

A Well, that is not -- it's not -- make sure we understand each other in terms of the question and the answer.

So if somebody was choking during surgery, and I'll use that term because that's the term you're using, but someone who has an airway obstruction during the surgery, that's an emergency; right? One of the things that we have to do as an anesthesiologist, of course, is to maintain breathing during surgery, and that requires an unobstructed airway. And that's a medical emergency. I'm not worried that the patient is suffering, but I am worried that the patient may die because they have an obstructed airway. Those are two different things.

Q I appreciate that. And certainly, we want to be very concerned of whether the patient lives or dies, but why are you not concerned whether the patient is suffering or not?

A Because suffering is not -- again, it's a -- it's a term describing someone's emotional -- what's the word I want to use? -- basically emotional response to that particular situation. And it requires someone to be awake. So let's, just to -- maybe, so I can clarify my

answer to this.

Q Well, I -- sorry, do you mind if I just have a quick question on this?

A Yeah.

Q But if you want to finish your answer, go ahead.

A Well, let me just finish this to clarify this: So, getting back to you having surgery, if your blood pressure increases and your heart rate increases, I'm not concerned that you're suffering in the sense that if -- if you -- if we were doing surgery on you, with you awake, we would all agree, I think, you'd be -- you'd have suffering. Because you're awake and you have a surgical incision and so forth; you're experiencing pain. I'm not concerned about that -- that part of it, when you're unconscious, because you're unconscious. You don't -- you don't have that emotional reaction that you would have when you're awake.

Now, you could have -- certainly, you could have the physiological responses to that stimulation. That is, your blood pressure would go up, your heart rate would go up, and I would be concerned -- potentially concerned about that. But I'm not concerned about the emotional part of it, because you're not having those emotional reactions.

Now, I will be honest with you, there is some

indication in the field now, that there may be some imprinting on the brain, so to speak, where people might -- even during a normal anesthetic, there might be some -- oh, how should I say this? -- that there might be some lasting effect of -- of the surgery, and potentially that -- I'll just leave it at that: That there might be some lasting effect.

Q Are you referring to anesthetic awareness? Or is that something different?

A That's something different in a sense that that is something that, you know, where, in general, there's a lighter level of anesthetic and so people are awake during their surgery, that's basically where there's insufficient anesthetic. And I'm talking more about even deeper levels of anesthesia. But we've been doing this for over 150 years and people come out of surgery just fine, so I think if anything is going on in terms of anything else, you know, aside from the physiological responses, it's -- it's going to be minimal.

And -- and -- and it happens every day, you know, people having surgery and anesthetic every day, so I don't think that there's anything going on there in terms of any long-lasting effects of what you're getting at as a potentially suffering. I just don't think suffering has occurred in the sense that you're -- we think about

suffering.

Q Well, let's make sure we're talking about suffering in the same way, because I've heard you use the term "emotional response." What do you mean when you say emotional response?

A So I'll give you an example of -- of this in the literature. So there is a part of your brain called the amygdala, which is near the hippocampus. The hippocampus is important to memory formation. The amygdala is important for the emotional component of memory.

So as an example, I remember where I ate dinner last night, and there's nothing particularly emotional about that. But if I had been mugged after dinner, it'd be a lot of emotions attached to that, you know, the threat and so forth, you would go through a lot of emotions, so there would be an emotional component to that. And that emotional component is -- is determined, in some regard, in some -- some degree, with the amygdala, so there's two separate -- at least two separate parts of our brain -- there's more than that, but when I'm talking about the hippocampus and the amygdala -- the amygdala's more about the emotional aspect and the hippocampus more is about the factual parts.

So if my amygdala had been destroyed somehow before last night and I had been mugged, I would be able

to provide to you the details of the mugging, but it wouldn't trigger any particular emotional response in me. So there is a emotional response, that -- that sort of gut terrible feeling that we get when something bad happens to us. And then there's just sort of the factual part; I remember what I had for dinner last night, it wasn't particularly --

Q So --

A -- you know, emotional.

Q Can -- can I interrupt you, because I don't -- I think I follow your analogy, and what you're explaining here, but I want to get to the more specific point: Is it your opinion that if someone cannot experience an emotional response, that they are not experiencing suffering?

A Yes. I think that -- that summarizes, for the most part, what I'm saying, yeah. Suffering is a -- a -- I mean, to me, suffering and pain are in the same category; you have to be awake to experience it.

Q So during the procedure, if somebody starts choking, which I think we discussed earlier would be a type of suffering, because they cannot experience an emotional response while they're unconscious, you would not consider that suffering?

A That's correct. So if I could elaborate, though,

on that, you might be able to determine some physiological responses to the choking, you know, maybe their heart rate would change and so forth. Just like you could do that with pain -- I mean, sorry, with a noxious stimulus during surgery, but you're not forming -- having the same type of formation of emotional -- the emotional response or the emotional aspect of all that when you're unconscious.

Q Why -- why are you focused on the emotional response?

A I'm not. You're -- you're -- you're asking a question about suffering, and I'm trying to put it in words that you can understand, that suffering is a -- a term that I believe is used, maybe in this context is used incorrectly, because you seem to think that suffering is something that can happen when you're unconscious, and I'm saying that it can't.

Because suffering is a -- the -- the -- the -- suffering has an emotional part to it, and you don't have that emotional part, and also, you have to be awake for it, to suffer. I mean, how could you -- I mean, maybe I should ask you, can you explain to me how you -- how you would have suffering in somebody who is unconscious? I don't -- I don't see how that can happen based on my understanding of how -- how all this works.

Q Well, fortunately the way today works, I'm the

one who asks the questions --
A I know.
Q -- and you're the one who gives the answers.
A I understand that.
Q You're the expert here. And I'm not opining or offering any of my own opinions --
A Sure.
Q -- we're here for your opinions and --
A Got you. I know, I know. I think I've answered as best as I can.
Q And I appreciate that.
Now, we -- you talked about an individual's weight, their blood pressure, does that affect the quantity of the anesthetic or the chemical that you administer?
A If it's a drug like Pentobarbital, then the weight does -- it does matter.
Q Why does the weight matter?
A Well, I mean, if you're giving -- usually, we dose a drug on a per-kilogram basis, per-weight basis. So you take a 3-kilogram baby, and you give an intravenous drug, you would give a lot less to a baby than you would 100-kilogram man, because 3 kilograms versus 100 kilograms. So for an injectable drug, you would give a small amount. So...

Q And does the amount you administer affect how quickly or how long it takes for someone to succumb to the effects of the anesthetic?
A Yes.
Q Meaning how long it takes for them to become unconscious?
A Yes.
Q So what other characteristics, besides someone's weight, would you take into consideration when determining the quantity of the anesthetic to administer?
A Again, we're talking about an injectable drug like Pentobarbital?
Q Sure.
A So besides the weight, you would be concerned about several factors: Actually, one would be their age, one would be other medications that they're receiving, one would be their other conditions, medical conditions.
Q Well, I'll let you complete your list and then we can go back.
A Those are the three that come to the top of my head. I'm probably missing some others, but those are some of the important ones I think.
Q Why is it important to take into consideration the medications that the individual may be taking?
A Well, because there -- you can have drug

interactions with --
(Whereupon the reporter requested clarification.)
THE WITNESS: You can have drug interactions.
BY MR. FOGEL:
Q C-A-N.
A Yes. C-A-N.
In -- in a clinical setting, some of the drugs that we give can interact or maybe either in a positive way or a negative way. So if somebody's on a -- an opiate of some sort, they could be tolerant of that. Or if they're acutely intoxicated from something, then that has to be taken into consideration. So there are a variety of different drug interactions that can occur.
Q And what is the import of the drug interaction? Could it prolong the effect of the anesthetic? Could it diminish the effect of the anesthetic? What are the potential consequences of the drug interaction?
A Could prolong it, could shorten it, potentially.
Q It depends on the type of medication, how frequently --
A Yes.
Q -- the individual's been taking it, and those are all things that the person applying the anesthetic would need to take into consideration?
A Yes. That's correct.

Q You also mentioned medical conditions?
A (Inaudible response.)
Q Why is that important?
A Well, if somebody has a serious medical condition, such as they're -- have renal disease, that can affect how much drug you give, usually, you're going to give less of it. Especially if they've just had hemodialysis, that's just one example, if somebody has heart problems, congestive heart failure, that could affect the -- how much drug that you give. So those are just examples of some of the considerations that you'd take into -- you want to think about.
Q And I believe, as you mentioned, it could affect how long it takes before the drug takes effect?
A Some of these -- yes -- conditions could do that.
Q So it's unique to the individual?
A Yes.
Q Would you have used -- when you -- let me make sure I have this right first: I -- I believe you said you have used Pentobarbital --
A Yes.
Q -- in a clinical setting in the past?
A Yes.
Q What quantity of Pentobarbital have you used in those settings?

A I do not remember, and this is a long time ago, I have not used it very -- I haven't used it at all, probably, in the last 15 to 20 years. So it was a long time ago, when Pentobarbital was more in vogue in terms of producing a coma. I don't think it's used as much anymore these days. So the doses were probably in the range of several milligrams per kilogram, as my recollection, and usually was given as an infusion after that. So clearly a lot less than the dose that is used in lethal injection. I don't think anybody -- well.

Q No. No. Go ahead.

A I was just going to say, I don't think anybody has an experience with that dose, except for the people that use it for lethal injection. It's not used clinically, of course, in that dose.

Q When you used Pentobarbital, I believe you said, 15 to 20 years ago approximately --

A Yeah.

Q -- had you used it several times in the period -- period that you used it?

A I would say probably not more than two or three times, is my recollection, so very limited use.

Q Is Pentobarbital generally infrequently used as an anesthetic today?

A It is. I know you're thinking frequent is --

right, I think it would have to be rare, if, at all. I don't think anybody's using it or I don't think anybody should be using it as an anesthetic in humans.

Q How --

A Because we have such -- much better drugs now.

Q How did you familiarize yourself with Pentobarbital and its effects as an anesthetic in order to render an opinion in this case?

A So Pentobarbital --

Q Well, let me ask a -- a first question: Did you think it was necessary to familiarize yourself with Pentobarbital in preparation for your reports in this case?

A Yes. In some of these -- some of the -- the issues that came up, absolutely. And --

Q And so how did you go about doing that?

A I looked at the -- I compared, primarily, the effects of Thiopental to Pentobarbital, because Thiopental's a drug that many people in my age and background have used. Because when I was first learning anesthesiology and training, and then after that, we used Thiopental for induction. This is before Propofol came out, so I used Thiopental many, many times. And Pentobarbital is very similar to Thiopental. It's not obviously the exact same thing, they have some structural

differences, but I was mostly concerned about the onset of action of Pentobarbital relative to Thiopental. In terms of determining my report.

And then looked at basically the -- yeah, I was primarily concerned with the onset, and then also blood levels of the Pentobarbital relative to its clinical effects. In terms of coma, and lethal amounts, and things like that. So that was sort of the -- the -- the main area that I focused on. In terms of trying to -- to look at what are the effects of Pentobarbital.

And I felt that was important because, obviously, from my report and the reports that we have -- reports that we have from Dr. Zivot, there is a disagreement about the onset of action and how deeply someone achieves coma or go into coma after the injection. And I -- it's my opinion that based on kinetics of the drug, and the way the drug happens, is unconscious will happen within 20 to 30 seconds and I think that the data that's published out there supports that.

Q What sources, specifically, did you rely upon to conclude that Pentobarbital would render somebody unconsciousness in 20 to 30 seconds?

In the quant- -- and I assume your opinion is limited to the quantities that are administered pursuant to the Missouri execution protocol.

A That is correct. Although -- and I'll elaborate on this, I think even a much lower dose of Pentobarbital will achieve coma, but they use 5,000 milligrams. So I relied on two --

Q When you say "coma," are you meaning unconscious? Are you using those terms interchangeably?

(Whereupon the reporter requested clarification.)

BY MR. FOGEL:

Q Are you using those terms interchangeably?

A I probably shouldn't use them interchangeably. I think for the purposes of our discussion here, we could do that, but coma and unconscious are not the same thing. So basically, if you think of a -- of -- of a VIN diagram, so a VIN diagram, this would be unconsciousness and coma would be a part of that, so you can be unconscious, but not necessarily in a coma. So if I were to be more precise, I should not use those terms interchangeably. So maybe I -- in the future, I will not do that.

Q Sure. So let's focus on your specific opinion in this case, then.

It's your opinion that the quantity of Pentobarbital administered pursuant to Missouri's execution protocol would render the subject unconscious in 20 to 30 seconds; is that right?

A That is correct. That's my assessment.

Q And my question is, what sources did you rely upon in forming that conclusion?
A I looked at the package insert for Pentobarbital, and then I also relied on a paper that was published by Ehrnebo -- spelled E-H-R-N-E-B-O -- that I referenced in my supplemental report that looks at the pharmacokinetics and distribution of Pentobarbital in humans.
Q Did --
A So the way I did it --
Q Sorry, did you rely upon any other information or sources?
A For this particular report that I have submitted, those are the two that I -- I looked at. Now, as I've mentioned to Mr. Spillane, subsequent to writing this report, I did find another study, which I think runs credence to my opinion, but it's not contained in the report, here. And I can provide that report to you or -- or...
Q Are you relying -- relying upon that report in forming your conclusion that it would last -- excuse me, that unconscious would set in within 20 to 30 seconds?
A I would say I -- probably, the answer is yes, in the sense -- I mean, I feel more confident in my answer -- I was very confident in my answer before I saw that report, I'm even more confident now in my answer.

Q Then, yes, we'd -- we'd like to be provided with at least the name and title --
A Yes. I can give it to you now --
Q -- of that report.
A -- if you want?
Or do you want to wait?
Q You can give it to us during the break.
A Okay.
Q So those three sources are the only source- -- are the sources --
A Those --
Q -- in the entire universe that you relied upon to conclude that 20 to 30 seconds is what --
A I'm sorry, not --
Q -- it would take for unconsciousness?
A -- not everything. And then, of course, I looked at the witness executions -- I'm sorry, the -- yeah, the execution witnesses, the 19 reports that were provided to me, where people that talked about -- you know, who had observed prior executions, and said that, you know, the inmates seem to be unconscious very quickly and so forth, so that, I also relied upon.
And then, I -- I relied upon my -- again, my understanding of how these barbiturates work -- Thiopental, Pentobarbital -- especially when you think

about the massive doses that are given to form my opinion.
Q Have you ever participated in any sort of setting, whether it be a clinical or academic setting, where you've administered Pentobarbital in this quantity to some subject?
A No.
Q So you've never observed the effects of Pentobarbital on somebody when it was administered in this quantity?
A No.
Q Did any of the treatises or sources that you previously mentioned specifically state that Pentobarbital would render the subject unconscious in 20 to 30 seconds?
A Let's see here. The third report that I described to you, that -- that I will provide to you, has a paragraph in the discussion -- so the -- the third report that I mentioned is a dog study, but in the discussion section, they talk about the effects of Pentobarbital in man, where they're looking at the electroencephalogram, and my recollection is that they said within I think it was 15 to 30 seconds, I can't remember the exact number of seconds, that they observed the clinical -- the changes in the EEG in man.
Now, obviously, in the dose that was used in that study had to be a very small dose relative to what's used

in -- in Missouri, because you wouldn't be given any lethal dose of Pentobarbital to man to study the effects. But again, that sort of added more, I think weight to my argument, that this drug is going to act very quickly, in the 20 to 30 seconds, and make somebody unconscious. I hope that answers your question.
Q I --
A Sometimes my answer's so long, I forget what the question was about.
Q To make sure I'm clear: That report did not state that it takes 20 to 30 seconds in order for a patient to be rendered unconscious?
A It did not. It stated that the changes in the EEG occurred -- started to occur within I think 20 to 30 seconds or whatever that -- I think it might have been 15 to 30 seconds. So the drug --
Q This -- this was the study regarding dogs; is that right?
A Well, yes. But in the discussion section of the paper, they sort of threw in this paragraph, where they said almost, "By the way, we also have given this Pentobarbital to humans," comparing it to Thiopental. And the onset of action of the Thiopental and the Pentobarbital on the EEG was about -- it was the same. There was a small delay with the Pentobarbital, in terms

of the full effect, so basically, after a minute or -- minute, they had the full effect for -- for Pentobarbital. They don't really describe what that full effect is. And they don't say what -- what the dose was either. But to me, when they talk about the effect on the EEG began the electroencephalogram, is what the EEG is, when Thiopental and Pentobarbital had the same onset, again, it -- it makes me believe that, in this -- with this dose of Pentobarbital, you're going to have an onset of 20 to 30 seconds; it's going to be like Thiopental.

I think -- I want to make sure we're clear about some of the kinetic issues, here. When you're comparing Thiopental to Pentobarbital if I may...

Q Well, let me stop you because I don't want to go too far down. Because we haven't had a chance to review that report.

A Sure. That's fine.

Q So it might be a little premature to probe that.

You did not render an opinion -- the opinion I'm referring to, that Mr. Bucklew would be unconscious, as well as any subject would be unconscious, within 20 to 30 seconds after the administration of this quantity of Pentobarbital. Did you render that opinion in your opening report?

A I did not. I said -- I used the term rapid onset

of unconsciousness followed by death is the term that I used. I did not say instantaneous.

Q I understand. And we're not here to do that. I'm talking specifically about your opinion --

A Yeah.

Q -- that it would render him unconsciousness in 20 to 30 seconds.

A That was in my second report, as I remember. Where I got more specific about the timing.

Q And let's -- so -- so let's turn to your second report.

A Sure.

Q And that's Exhibit 2 before you.

A Yeah.

Q And if you could turn to paragraph 5, which is on page 3.

A Uh-huh.

Yes, I have it here.

Q And it's a paragraph that begins, "the intravenous administration of 5 grams of Pentobarbital --

A Yes.

Q -- would result in rapid unconscious."

And then the next sentence starts, (reading):

"I clarify that opinion, that the rapid onset of unconscious would

occur within 20 to 30 seconds after the administration of the large dose of Pentobarbital. To reiterate and expand on my earlier statements"

And then you --

A Uh-huh.

Q -- go on to expand further.

Why did you think it was necessary to expand upon your earlier statements, to specify that unconsciousness would take effect in 20 to 30 seconds?

A Well, it was primarily because Dr. Zivot took issue with my use of the term "rapid onset of unconscious followed by death." And he basically said, "Well, there's a period between the -- when the drug is administered and when death occurs," and that's the period during which the inmate will, in his opinion, have such sensations of choking, gasping, and so forth. And suffering.

So he seemed to indicate that there -- there would be this period, during which the inmate is lingering and languishing in this sort of semiconscious zone, and, again, experiencing these sensations. And this was my way of basically refuting that argument, by providing more detail about what I think is occurring. In terms of the onset of unconscious and then what would be occurring after that.

I mean, I think we all surely must agree that 5,000 milligrams or 5 grams of Pentobarbital is a lethal dose. It's been demonstrated in other lethal injections. There's no doubt -- or should be no doubt in anyone's mind that it causes death.

Q Without --

A So --

Q Without any equivocation, it causes death? 100 percent?

A Pro- -- with -- with -- unless there's issues with administration, which we all also agree, that there has to be a proper functioning IV and all that, you know, 19 executions have, to my knowledge, and the information that I was provided, it caused death within around 8 to 9, 10 minutes, so --

Q Are --

A Are --

Q -- you done?

A No, I'm not.

Q Okay. Go ahead.

A So we have to sort of figure out, okay; well, how -- how does a drug kill somebody? What are the -- what is the physiological and pharmacological ways in which that drug would kill somebody at that dose? And that's why I laid out this -- and this is not a complete

sort of diagram or -- or -- or way of looking at it, but this is sort of my understanding of how this drug probably is killing somebody, is producing rapid, deep unconscious, respiratory depression, followed by loss of -- or -- or complete absence of respiration, decreased oxygen levels, slowing of the heart rate, and then the heart stopping. And then during all of this, we also have cardiovascular collapse because the blood pressure is plummeting.

So that is the mechanism by which the physiological steps, so to speak, by which this drug causes death. And I just wanted to sort of lay it out for people to understand what I think is occurring with this. That's why I went into that detail.

Q Are you relying on any information that someone from the attorney general's office told you regarding the length of time until unconscious sets in?

A No. No, I have not been provided. I mean, I have the witness statements.

Q But no other information was provided to you to support -- from the State -- to support your opinion, that Mr. Bucklew or someone else would be rendered unconscious in 20 to 30 seconds?

A No. Uh-uh. Not to my knowledge, no. I -- I -- I -- it was my -- it's my opinion, and was then and is now, based on the -- the action of that drug,

especially when -- when comparing it to Thiopental. Remember, I've never given 5,000 milligrams of Pentobarbital to anyone. And neither has your expert witness, I presume. Or anyone else in --

Q So you have no personal experience to draw upon, in order to support your conclusion that Mr. Bucklew would be unconscious in 20 to 30 seconds?

A I do not have any personal experience with the use of that drug at that dose, no. Which is why I make the comparison between Thiopental and Pentobarbital. I know how Thiopental -- quickly Thiopental works.

Q Is Thiopental -- say the word one more time, please.

A Thiopental.

Q Thiopental.

It's another type of anesthetic?

A Barbiturate.

Q Barbiturate.

A In fact, the only difference between Thiopental and Pentobarbital is one atom.

Q Is it used on humans?

A Thiopental?

Q Uh-huh.

A Yes. It's not used very often anymore, and it's probably not used -- it's not used in the United States

anymore, but it's probably used in other parts of the world. And it was used very commonly for a long time.

Q The Thiopental, that was the chemical that was referenced in the study concerning its effect on dogs; is that right?

A That was one of the drugs that was used. There's actually multiple barbiturates that were used.

Q But that's the study that you referenced?

A Yeah.

Q Could it be longer than 20 to 30 seconds?

A At this -- at -- at the dose of 5,000 milligrams, I don't think so, no.

Q So you can say, with 100 percent certainty, that anybody who was administered that quantity of Pentobarbital would be rendered unconscious in 20 to 30 seconds?

A One of the things I learned in medical school is never say always and never say never. So I -- 100 percent certainty, more like 99.99 percent certainty. I mean, I cannot -- there may be some very peculiar thing occurring that would prevent someone from being unconscious within 20 to 30 seconds, I can't think of what that might be, I mean, of course we've already talked about making sure the administration is appropriate, they have a well-functioning IV, that certainly would have affected

things. If you had a very slow circulation time, very slow circulation time -- and that term, I use, is somebody who has a very low blood flow in their body because their heart's not working properly, let's say, or their -- their fluid levels is very, very low, so their -- there's not much blood circulating. We call that slow circulation time -- that can affect the onset of these drugs. But Mr. Bucklew --

Q What -- what about somebody's weight? We -- we talked earlier about somebody's weight --

A Yeah.

Q -- their medications, their medical condition, those are all things that could affect the onsets of the drug as well; correct?

A Yes. But you have to make sure we're understanding something, here, which is that some of these effects we're discussing may be clinically relevant in the sense of the -- a clinical dose, but not with the dose of 5,000 milligrams. Even those conditions are not going to materially affect, save, perhaps the issue of a slow -- slow circulation time. That potentially could affect the onset of Pentobarbital even in 5,000 milligrams.

Q The other two reports that you said you relied upon, could you remind me which ones those are in your report?

A It was a study by Ehrnebo -- Ehrnebo -- Ehrnebo, I'm not sure how it's pronounced, but it's --
Q The pharmacokinetics study?
A And distribution properties of Pentobarbital in humans following oral and intravenous administration. And that was published in the Journal of Pharmaceutical Sciences, I think. I just have it as pharm sciences.
Q I see where you're referring to.
And what was the other one?
A It's the package insert.
Q The package insert.
A Of Pentobarbital, yes.
Q Does the package insert specify how long it takes to render someone unconscious?
A It just says immediate. As I recall. May I -- if I may refer to it, I think that's the term that is -- the word that is used. I have it here, if you want to -- unless you have it. I have it here (indicating.)
Although, you're probably going to enter it as an exhibit, so this copy's going to be mine.
Q Here we go.
A Maybe I cannot -- I'm not sure --
MR. FOGEL: Let's -- let's go ahead and just put this in as an exhibit.
(Whereupon Exhibit 3

was marked for identification
by the court reporter and
is attached hereto.)
THE WITNESS: So I -- may I continue?
BY MR. FOGEL:
Q Well, just make sure you -- you've just been handed an exhibit that's been marked --
A Yes.
Q -- or a document that's been marked as Exhibit 3. Is this, from your review, a true and correct copy of the package insert that you were just referring to?
A Yes. It looks like it is, yes. Yup.
Q Okay. Just wanted to establish that. Go ahead.
A Yup. So I said earlier, just a moment ago, immediate, I --
Q Uh-huh.
A That's my recollection. But there's lot of stuff here, and I'm not sure that's exactly what it says, so I don't want to commit myself to that word until I've found it and then -- see if I can...
Q Well, you did not point to this in your report. I understand that you reference this report, but you did not point to this specifically for that assertion that --
A No, I did not.
Q -- would be rendered in the --

A I don't think so. I mean, I thought I had something like that, but I didn't -- I used this primarily because of the table they have there, in which they describe the barbiturate levels relative to the different C-N-S depression.
Q So we can put that to the side --
A Yeah. Okay.
Q -- for now.
And then the pharmacokinetics report that you reference, did that specifically state that an individual be rendered unconscious in 20 to 30 seconds?
A No, it did not.
Q And then the other source you relied upon were the witness statements?
A Correct.
Q And is it your recollection that those witness statements asserted that the individual was rendered unconscious in 20 to 30 seconds?
A They did not specify -- in some cases, they specified within half a minute to a minute. In other cases, they specified longer. Sometimes they didn't specify at all, just that they were quickly rendered -- you know, they seem to be unconscious or whatever term that they used. Obviously, the witness statements, they're not medical professionals, they may not know what

they're looking for, so you can't take it -- you have to take that with a grain of salt, which I admit to. But the witness statements are consistent with my impression or my opinion that the drug is going to act within 20 to 30 seconds to -- that that's the dose to make somebody unconscious.
Q So I want to make sure we're very precise, here: I believe you said it would act within 20 to 30 seconds to make somebody unconscious. Is the individual unconscious at the end of the 30-second period? Or are you saying that the drug starts to take effect in 20 to 30 seconds, but they might not be unconscious?
A Well, let's see, how do I want to answer that. I'd say that the -- they are unconscious after -- 20 to 30 seconds after the drug has been administered. Does that answer your question?
Q And in part.
You're -- are you defining administered from the moment the Pentobarbital starts to enter into the individual's circulatory system, via the IV line?
A Yes. It starts -- it may and -- you know, I -- one thing -- one piece of information that I do not have, and I -- and that's how -- how fast the drug's injected, that is not something that's -- either it's not known or it's not provided to me. I don't know how quickly it's

injected, but I -- I -- my guess would be that it's probably injected -- we're talking about 100 CCs, 100 MLs of the drug --

Q Are you --

A -- is my understanding, so it takes some time to inject it.

Q Do you understand that there are two syringes of 50 CCs?

A Yes. And I believe they use -- they use both of them. They're both hooked up, one syringe has 2- -- 2.5 grams, the other syringe has 2.5 grams. That's my recollection.

Q Is it your understanding that they're injected simultaneously?

A No. They're -- I believe they're injected one after the other.

Q Do you know how long it takes to inject the respective 100 CCs?

A I have not provided -- been provided with that information, so I don't know.

Q And when you say -- as I just parroted you, the -- how quickly the -- it -- it's injected, what -- what do you mean when you say that?

A Well, usually, when you talk about an injection rate, you say 1 -- 1 CC or 1 ML per minute -- I mean, for

a second. So every second, a milliliter of a solution goes in. So if you have to inject 100 milliliters, it could take 100 seconds to inject. I don't know whether these are both hooked up to the IV line or they have to take one off and put the other one on, I don't know how that part works.

Q So if there's one syringe of 100 milliliters, and that could take 100 seconds to be fully injected, and then another syringe of 100 milliliters, which would take another 100 seconds, that's approximately three minutes if -- and that's assuming it's 1 millimeter per second before the Pentobarbital's fully in the individual's system; is that right?

A I believe you might have that a little bit off. I believe that there are two syringes --

Q You're right.

A -- of 50 --

Q Of 50 milliliters.

A -- each. So it would be 50 and then another 50.

Q Okay.

A So if it was one MLs -- one ML per second, then it would take 100 seconds for all the drug to get in. Which would be almost -- close to two minutes. Now, if we could certainly talk about while based on my analysis of that study, what blood level do you achieve after just 100

CCs of the drug? I believe that you achieve the sufficient drug level to make somebody unconscious. So, again, that's why I'm thinking about, it's not going to take very long for that first part of the Pentobarbital to get in, to make somebody unconscious. You don't need 5 grams of Pentobarbital to make somebody unconscious; you only need probably -- make to use volumes, part of it.

You don't need 100 MLs of that Pentobarbital to make somebody unconscious; you probably only need 10 MLs to make somebody unconscious.

Q Do you -- do you -- you don't know how quickly the Pentobarbital is injected into the individual, do you?

A No.

Q Was that information provided to you?

A No.

Q If it takes -- could -- would that affect your opinion in terms of how long it would take for the individual to be rendered unconscious?

A At the extreme, yes. I mean, if somebody was injecting that at 1 ML per hour, then that would affect the onset. I mean, that's sort of the -- that's sort of an extreme example, almost an absurd example of that. You know, absolutely, the speed of injection could affect it. But based on my understanding of how quickly these inmates die after the beginning of the process, again, it sounds

like, based on the witness statements and so forth, that death occurs within 8 to 10 -- to 10 minutes, after the injection is started or the execution process starts.

I mean, it has to -- the -- the injection can't -- you know, it has to be probably one or two minutes at most, I would imagine. I don't know for sure, but that's just sort of my -- my -- my -- my guess. I -- but I have to guess, I think anybody does, because that information has not been provided to me, at least.

Q So you can't say for certain -- you don't know for sure how long it could take for the individual to be rendered unconscious?

A I still feel very confident in how long it takes. Because I don't think that the injection -- the -- the -- the length of the time of the injection, how long it takes, it would only be materially important if it was a very, very slow injection. So, again, we're talking about 1 ML, maybe, 30 -- per 30 seconds or whatever, I -- you know, I -- I would have to do the numbers, I guess, to -- to -- to see what it would be, but...

Q If a witness -- you relied, at least, in part, on the witness statements; is that right?

A Yes.

Q If a witness had reported that it took several minutes for the drug to take effect, would that change

your opinion at all in terms of how long it takes for someone to be rendered unconscious?

A No. Because -- and -- and, again, I'm looking at this -- I'm -- I'm interpreting these witness statements, which I know they're not medical people, and I'm interpreting, maybe with my own bias, with my own lens, I'm interpreting some of these comments as ones in which they may be seeing something that they believe is the signs of a conscious individual, which, in fact, it's probably not.

So as an example, gasping, the best example that I could think of would be -- and many of us have probably experienced this -- when you have an animal that you've had to put to sleep. And you give them the euthanasia drug, and sometimes the animal goes to sleep and then maybe a minute later, they have an agonal breath, they go, huhuhuhuh (phonetic.)

Q Have you spoken to any of the witnesses?

A No.

Q So the entire universe of information you're relying upon is contained within the four corners of the witness statements?

A Yes. I have not spoken to any witnesses about this, no. Absolutely not.

Q Right. And are these statements or observations

made by -- you mentioned, they're not medical personnel?

A I'm assuming they are. I mean, based on the -- the -- the titles that they're -- that they were provided to me of these individuals, you know, some of them are journalists, some of them are -- they -- they're called like staff witness I think, things like that. So it's possible some of them -- maybe I've been wrong about my assumption, but it's possible that some of them have had medical background, I don't know.

(Whereupon Exhibit 4
was marked for identification
by the court reporter and
is attached hereto.)

THE WITNESS: So -- but I -- my assumption is that none of them did, maybe I'm wrong about that.

MR. FOGEL: So I'm handing the court reporter a document and asking if she can mark this as Exhibit 4.

BY MR. FOGEL:

Q Doctor, take a moment just to familiarize yourself with the document.

A Yes. Uh-huh.

Q Does this appear to be a true and accurate copy of the witness statements that you reviewed?

A Yes.

Q And were these documents that were provided to

you by the State Attorney General's office?

A Yes, they were.

Q And is it your understanding that these are documents that were prepared by the State Attorney General's Office?

A Yes.

Q Did you take that into consideration at all when rendering your opinion?

A Well, of course. You -- obviously, you look at that and say, "Well, these were interviews performed by an investigator for the -- for the Attorney General's Office, and, you know, I -- I -- I have to take them at face-value, I mean, is there a potential bias in how they were collected? I have no idea to know that, one way or the other.

Q Well, do you see many of the names -- look at the first page, for example, you see "state witness" next to many of the names?

A Yes. Uh-huh.

Q What is your understanding of state witness?

A My guess is that, if I understand it correctly, that these were witnesses that if -- the State has asked to be present for the execution, and, of course, some of these are labeled as being members of the press.

Q How -- how did you form that understanding?

A Well, I'd say, for example, the first page, Jessica Machetta, state witness, then it says "press" next to it.

Q So aside from reading that, do you have any other independent knowledge? Or were you otherwise provided with further information to form that understanding?

A No.

Q You see later on, there's some names that have the title "staff witness" next to that name?

A Yes. Uh-huh.

Q Do you -- do you have an understanding what staff witness refers to?

A My guess is that, it is somebody who works for the Department of Corrections, but I don't know if that -- could be somebody who works for the Attorney General's Office or somebody that's a member of the staff of some state agency for Missouri, is what I -- my best guess would be that it's from the Department of Corrections.

Q Did you ask the Attorney General's Office to provide any information or further clarification of who these individuals were?

A I don't think so. I -- I don't think I would have asked. If -- if -- if anything, I would have asked the question, "Do any of these people have a medical background?" And I don't think I asked that question. I

don't think I asked that question of anybody. Except asking myself.

Q Would that be important to forming your opinion, whether or not any of these individuals have a medical background?

A Yes. If some of them had a medical background and knew what they were looking for, then I would probably -- that would be more -- would lead -- give it more credence, what they're observing and saying.

Q What if it was determined that most or none of them had a medical background?

A Then, again, I would say that their -- some of -- some of which they're observing -- some of the things they observed may not be accurate, one way or the other. I mean, some of them describe the onset of the drug as being within 15 seconds or so, or whatever, and sometimes, you know, longer period of time. So, again, I -- you have to look at this and say, "It's not -- I -- I don't want to hang my hat on just the witness statements," but I did rely upon them.

Q So if somebody said it took 15 seconds from their naked-eye observation for the drug to take effect, that might not be accurate?

A That's correct. That might not be accurate. Nor maybe, if someone said it was two minutes. Maybe it took

only 30 seconds, but they thought it was two minutes, so it could go either way in my opinion.

Q Are you aware that some witnesses have opined that it took over five minutes for the drug to take effect?

A I believe that in some of -- in some of these -- somewhere in here, I do believe someone said it took five min- -- it was a long time, I mean, I don't know whether it was five minutes or not, and you'd have to point that out to me if it was -- if -- but I do remember seeing something in here, that it did take that long, you know...

Q Did that affect your opinion at all?

A Not particularly, no. Because I -- again, I asked myself the question -- based on my understanding of how the -- how this drug works, and in terms of its kinetics and -- and its effects on the brain, is it possible that it could take five minutes for the drug to take effect?

Again, the only possibility that comes to mind -- or possibilities that come to mind would be if the IV's not working properly. Or if there's a slow circulation time, which would occur in somebody who has, again, you know, really bad congestive heart failure, let's say, where their heart's not functioning properly. Those are the main reasons why I think that you would have -- have

that effect.

But, again, you sort of look at what -- well -- well, when this individual said it took five minutes for the drug to take effect. What is the endpoint that they're looking for? So -- so for example, you might be -- again, from a non- -- nonmedical perspective, you might say that the inmate appeared to be unconscious after 20 to 30 seconds, but at five -- at minute five, he took a breath, that's -- and then there was no breath after that, so it took five minutes to have its full effect.

Well, that's maybe a different definition than somebody else, who just basically says, "Well, they appeared to be unconscious within 20 to 30 seconds, and -- and the rest of it was just these agonal breaths." So I'm not sure what endpoints each of these individuals are using.

And that's part of the -- the confusion, let's say, or the lack of clarity around some of these statements. So I certainly do concede that the witness statements do not provide crystal clear guidance to us about how quickly the drug acts. But it does lend support to my contention, that it acts pretty quickly within 20 to 30 seconds.

Q What -- what I don't understand is, why you're willing to discount some witness's observations, that it

might take several minutes, but you seem to be putting credence in witness statements who say it happened in a matter of seconds.

MR. SPILLANE: I'm going to object to the form of the question. If there's a witness in here that said it took five minutes, I haven't found them; I've found less than five minutes. I was wondering if you could point to one and ask the doctor to explain it.

MR. FOGEL: Well, that's a different question from the question that I asked. Because I said minutes and the doctor acknowledged that there are statements in here that say minutes. And I ham happy to point the doctor to a statement, but first, I would like him to answer my question:

BY MR. FOGEL:

Q Why, based on his recollection that there are statements in here that do discuss minutes, why he is willing to discount those statements, yet attach credence and significance to those that say seconds?

A Well, there are probably over 150 individual statements in here, from 19 executions. I'm not, you know, I'm not sure how many there are in total, but there -- there probably -- it's probably more than 150; it might be 200. And if you look at some of these statements about the minute part, you know, it says -- so to get to

the issue about the five minutes, there is a -- on page 6 of 56, Patrick Martin.

Q Uh-huh.

A (Reading):

"Martin said it was hard to tell, but appeared to take more than five minutes, but less than ten minutes for the drug to take -- to fully take effect."

So let's take a look at all these statements, here. And -- and one of my faults is, I'm a very quantitative person, one of my strengths is, I'm a very quantitative person; you could take it either way, but let's look at this particular execution, here. There are probably -- let's count them: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, (inaudible) -- there are 29 statements here -- well, there's not 29, because some of these people couldn't be reached.

Priddy, first one, "Seemed to happen quickly."

Powell --

Then the next person basically said wasn't -- didn't -- didn't return his answers.

Powell said, "He took two deep breaths, and that was it."

Hufford said, "It was over very quickly."

Jones said, "Appeared to take a deep breath, and that was it."

Taylor, "Less than two minutes."

Martin, "More than five, but less than ten."

The next person, "Less than two."

Next person, "Less than one."

A lot of these say less than one; one says less than five. So, you know, I have over 20 witness statements, a small minority said five to ten, five or so. But most of them said less than one, so I have to ask myself, "Is that one person that said it was five to ten --

BY MR. FOGEL:

Q Well, I don't think that's a fair characterization, Doctor, I mean, because we -- you just read a few that said minutes, there are a few -- several more you did not get to that said three to four minutes, there's one that took less than five minutes. I don't want to do number counting with you right now, but my question is, you do acknowledge that there are other witnesses who said it took minutes as opposed to seconds.

A That is true.

Q Yeah.

A There are -- there are witnesses -- and they have statements saying that it took three, four -- five minutes

to take...

Q And my question for you is, does that affect your opinion in terms of how long it might take to render somebody unconscious?

A No, it does not. If the vast majority of the witnesses said that the inmate -- you know, not just in this execution, but in other executions, you know, took five/ten minutes, you know, that they -- they -- and they specifically said, "The inmate was still breathing, the inmate was still moving, it took five minutes," then I'd say, "Wow. Maybe this drug is not acting as quickly as I think it is."

But the overwhelming -- in my mind, the overwhelming evidence here is, that the drug -- these witness statements support my contention that the drug acts very quickly, within 20 to 30 seconds. So...

And that's just the ones -- by the way, the one execution where you can pull out those -- I believe, there may be one or two others, I don't know, that you could pull out those kind of numbers, but most of these will say in these executions, it's one, less than one minute. Maybe less than two minutes.

Q Well, let me ask you a question, because you're -- now you're talking about that specific execution. It could vary by execution?

A Yes. I would say --

Q Why -- why could it vary by execution?

A There may be issues with how fast they can inject the drug. So I don't know what those -- what those specific issues are in these cases. Obviously, I wasn't present and that information has not been provided to me, if that information is even known. But for whatever reason, maybe they didn't inject the drug as quickly as they wanted to. Or maybe some of these inmates did have -- I don't know their medical history, you know, how much they weigh, but, you know, some of those issues could have an impact in the time that it takes, as we previously discussed, for the drug to act.

Q And therefore, render the individual unconscious?

A Correct.

Q It's possible that it could affect it?

A Yes.

Q You can put the witness statements aside for the moment.

Have you ever witnessed an execution in the State of Missouri?

A No.

Q Have you ever witnessed an execution period?

A No.

Q Going back to your scope of engagement, which is

on paragraph -- excuse me, in your November 2016 report, at paragraph 3.

A Yes. Yes. Uh-huh.

Q You said, (Reading):

> "I've been asked to render expert opinions in the fields of general medicine and anesthesiology. Especially regarding the use, actions, and efficacy of Pentobarbital."

And then the next sentence -- that sentence continues on --

A Right, the --

Q The next sentence that I will focus on, it starts, (Reading continued):

> "I have also been asked to render opinions regarding the efficacy of Pentobarbital in the case of Rusty Bucklew."

What do you mean by efficacy?

A Efficacy is used in its, you know, defined term, which is basically the -- the ability of the drug to produce the intended effect essentially.

Q The intended effect, here, being...

A Death.

Q Death.

A Yeah.

Q Do you understand plaintiff to be challenging whether or not he would die from the administration of Pentobarbital in this quantity?

A Could you ask that again.

Q Sure. Do you understand plaintiff to be asserting or to be challenging whether or not he would die from the administration of Pentobarbital in the quantity set forth in Missouri's execution protocol?

A I don't think -- I mean, I -- that's news me. I think he was challenging the efficacy of the drug in terms of its ability to -- well, let me -- let me rephrase that.

My understanding, he's sort of challenging the issue around this method would cause undue suffering, pain, et cetera. I did not think that he was challenging the fact that -- that it would cause -- it would not cause death.

Q Right. It's a question of whether he would die in violation of --

A Right.

Q -- his 8th Amendment rights?

A Correct. I mean, I don't think he's saying, somehow, that the drug, as it would be administered, would not cause his death. I don't think -- I don't think I read that anywhere.

Q Do you know what cavernous hemangioma is?

A Yes.

Q What is cavernous hemangioma?

A It's a condition -- usually, it's congenital, but it's a condition where you have an abnormal growth of blood vessels that produce what's essentially on -- if you were to look at the tissue under a microscope, there are these pools of blood or caverns of blood that are part of that hemangioma. And that's where that term cavernous comes from. So basically, the hemangioma has this blood that will enter it slowly and pool there in these caverns, and then that causes the growth of the hemangioma, as, you know, if it's congenital as the child gets older, this -- this can sometimes grow larger. And so its definition -- or its term is based on, primarily, its finding under microscopy.

Q And how did you form that understanding of cavernous hemangioma?

A I reviewed some of the literature. I -- I had a general understanding of that term before this case, but had certainly gained more specific knowledge about the pathology, so to speak, of -- of -- after reviewing some of the medical literature on it.

Q And did you form that general understanding prior to this case in connection with your treatment of

patients? Or otherwise?

A No, not -- I don't know, off the top of my head, if I've ever had a patient with a cavernous hemangioma that I've had to anesthetize, I don't know. I mean, and I don't -- my -- my recollection, I don't recall actually learning that about a cavernous hemangioma during medical school, but my recollection, at the time, when I saw this is, I -- when I saw this, I said, "Oh, yes. Okay. I know what that is." And in a very general sense.

Q But you've never treated a patient who had cavernous hemangioma?

A I --

Q Or -- sorry, go ahead.

A I don't think so. If I did, I do not recall.

Q The paragraph we were just looking at --

A Yes.

Q -- the sentence continues (reading):

> "Rusty Bucklew, a condemned prisoner who has a congenital cavernous hemangioma, and whether that hemangioma would affect the efficacy of Pentobarbital or otherwise inflict the substantial risk of severe pain as a result of Missouri's lethal injection procedure."

Do you see where I was reading?
A Yes. Uh-huh.
Q What -- what do you mean by whether that hemangioma would affect the efficacy of Pentobarbital?
A One of the claims that your expert witness made -- well, actually, not just Dr. Zivot, but I think it was -- was always Dr. Wippold and Jamroz, I believe was the other one, they made claim that the hemangioma would cause a abnormal distribution of the Pentobarbital, and thereby affect -- affect its efficacy, you know, how the drug acts.
And so that's why that statement is in there, so that I can, you know, I wanted to render opinion as to what the effect of the cavernous hemangioma would have on the distribution of Pentobarbital.
Q Sure. And the sentence continues, (reading):
"Or otherwise inflict a substantial risk of severe pain as a result of Missouri's lethal injection procedure."
A Uh-huh.
Q Do you think that there is some risk, due to Mr. Bucklew's condition, that he would suffer severe pain as a result of -- let me strike that.
Do you think that there is some risk that Mr. Bucklew would suffer some pain as a result of

Missouri's lethal injection procedure?
A As I said earlier, inserting an intravenous line can be painful. Beyond that, if -- if the IV was not functioning properly, and the IV infiltrated, then there would be some pain associated with that. When drugs infiltrate, then that could be painful. So especially with something like Pentobarbital.
Q Well, let's pause on that.
Why would it be painful?
A Well, some of the drugs that we use have a the -- the PH, which is the acid level basically --
Q Uh-huh.
A -- can either be high or low. And because of that, when it gets into the tissue, it can be painful. It's been described with many drugs, especially drugs we use in anesthesiology, such as Thiopental is a classic example. And I've never said otherwise, about you have to have a properly functioning IV for these -- for any drug, really, that you give. Whether it's in this protocol or whether it's for a clinical reason, to work properly. So there is that risk.
Q And what could happen if you don't have a properly functioning IV?
A Well, the drug won't work as quickly as we want it to. Whether it's in a clinical setting or -- I'm not

putting myself in that weed when it's --
Q Sure.
A -- used in the lethal injection process, but from a clinical perspective, the -- the drug will not work fast. In fact, it may not work at all. Because it's -- it's very slow -- once it gets out, in the tissue, it's going to be very, very slowly absorbed, and it won't have its intended effect.
Q And what are some of the factors that affect whether you have a properly functioning IV line?
A Primarily, it's going to be the patency and size of the vein that you put the intravenous -- the catheter in. That would be the -- not the -- that's the main reason from a -- from a -- sort of a clinical perspective.
Q What does patency mean?
A Whether it's open or not.
Q Yeah.
A Yeah, so...
Q And -- and that varies by person?
A That is correct.
Q Did you make any observations -- well, you previously did examine Rusty Bucklew, didn't you?
A I did.
Q Did you make any observations regarding IV access points?

A I did.
Q And what were your observations?
A So his IV access is -- is what I would consider to be limited. So his left hand in particular, and arm, there are very few -- there are just a few small veins that I could find. There are some more on his right arm. Sufficient that I -- that I believe I, with my expertise -- or somebody with the expertise of starting an intravenous line would be about to get an intravenous line in his right hand, but the veins are small.
Q And what happens when the veins are small? What does that mean?
A Well, that gets to the issue of, if you inject -- you have to watch how quickly you inject a drug. And you could cause infiltration in the -- the vein could -- you could -- we call blow the IV. Basically, where the -- you rupture the vein, so now you're going to get to that drug going out into the tissue instead of into the vein, so...
Q And that could be particularly problematic when you have a drug with a PH level like Pentobarbital?
A Correct.
Q Okay. And what happens when a drug like Pentobarbital gets into the tissue?
A Well, it can be painful.
Q Uh-huh.

A And it can destroy the tissue. You can actually get ischemic and gangrenous tissue, where the tissue dies. Almost like a chemical burn in a sense, so...

Q Right. When somebody has a small IV line -- sorry. Does quantity of the chemical that you're injecting affect the success of the IV line?

A It's more the speed than the quantity. I mean, it's -- it's -- yeah, it's more the speed. I mean, if you injected -- you could inject a lot if you did it slowly.

Q Right.

A It's really more about the speed of the injection than the actual quantity.

Q And why does the speed matter?

A Well, because the -- the vein -- let's see, so imagine that you're -- if you had -- I'll use an example, if you had a mouthful of water and you're trying to spit it out through a straw. If you spit it out through a large straw, a large diameter straw, you're going to be able to get a lot more water out of that straw, in a certain amount of time, than if it were a small diameter straw. And a straw -- I know we're thinking about a typical straw that is made of plastic and can stand high pressure, but if that straw was made of a very thin material, if you really applied a lot of pressure to that, it would blow. And that's essentially what's happening

when you're injecting too quickly.

Q So correct me if I don't have this right, but the smaller the IV or the smaller the vein, the slower you want to inject the chemical.

Is that fair to say?

A That would be an accurate assessment, yeah. Because you'd have to be -- if you're concerned about blowing the vein, you'd have to be worried about the speed of injection, yes.

Now, I will -- if I can elaborate on that.

Q Go ahead. Go ahead. If you have something further to say in response to my question.

A I mean, certainly in the clinical setting, we may have to start IVs in places that we normally wouldn't want to start IVs because of that. So we might start a central line. I mean, and that's certainly happened in my practice many times, and I'm sure Dr. Zivot -- and any anesthesiologist is going to say the same thing, where you have to -- you have to put in a central line when you have very poor IV access.

Q What is a central line?

A So that's a term that we use for the central circulation. So usually, it's going to be a catheter that we put into a neck vein, it could be in a subclavian vein, or it could be in the femoral vein. I mean, you -- you --

you're able to access -- those veins are very big.

Q Uh-huh.

A And you can put catheters in that. So in a clinical setting, if we were worried about injecting drugs or other substances, then we would put in a central line. Generally speaking -- yeah, that's -- that's the way that we would manage that many times.

Q That's in a clinical setting. Do you know how that would be handled in the execution setting?

A I have been told that, I believe, that -- that they have inserted central lines in some of the inmates -- I don't know whether that's been in Missouri or not, I'm really -- I'm not positive about that. So --

Q You've -- you've been told it could be done?

A I -- that there have been central lines that have been placed in some inmates.

Q You -- you just don't know if that's -- who -- who told you that?

A I'm not sure if that's something that I've read in the newspapers, I'm not sure. Yeah.

And then maybe -- maybe, it was something that Mr. Spillane and I discussed. I'm not -- I'm not even sure -- maybe it was in the -- I'm not sure if the Missouri protocol has it in there, I forget. Maybe we can refer to that, I don't know.

Q Would it be helpful to look at the --

A Sure.

Q -- open protocol?

(Whereupon Exhibit 5 was marked for identification by the court reporter and is attached hereto.)

THE WITNESS: Oh, yeah. It does say, in C, it says, (reading):

"Medical personnel may insert the primary IV line as a peripheral line or as a central venous line."

And then it lists femoral, jugular, subclavian. So that refers to the femoral, which is in the groin area; and the jugular, which is in the neck area; and the subclavian, which is below the clavicle or the collarbone.

BY MR. FOGEL:

Q Right. And do you see the end of that sentence it says, "Provided, they have appropriate training, education, and experience for that procedure"?

A Yes.

Q Does inserting an IV line in -- as a central venous line, require additional training or expertise?

A Yes.

Q Why is that?

A Additional -- well, for example, a nurse may have a lot of experience in inserting a peripheral IV, but there are very, very few nurses that probably have experience in inserting a central line. The only -- there might be some nurse practitioners that have that experience -- in the clinical setting, there might be -- certainly CRNAs or nurse anesthetists would have that experience. But usually you have to have additional experience, and that's going to be somebody who has, you know, maybe a physician that has experience.

Q All right. So do you know if the medical personnel, that are present as part of the execution team, have that training and experience?

A I believe that there is a anesthesiologist involved in the Missouri process.

Q Right. But this condition, here, when it says, "provided, they have appropriate training, education, and experience for that procedure," are you assuming that somebody present would have that expertise?

A They would have to have that expertise in order to safely place that -- those -- those types of lines, yes.

Q Right. And you're assuming that somebody with that expertise would be present --

A Yes.

Q -- in order to do this?

A That's my assumption.

Q Okay. And what would be all the alternatives if you could not insert it through a central venous line?

A If you did not have adequate -- what you considered an adequate peripheral IV, and you did not have central access --

Q And sorry, what is a peripheral IV?

A So that would be like a IV --

Q Through the hand?

A -- in the hand, or in the arm. This is considered basically the periphery (indicating), it could be in the foot.

Q Uh-huh.

A We often have placed IVs in the feet in a clinical setting. But a central line, so it's usually considered to be peripheral -- peripheral versus central. Central line would be something where the catheter's actually in what we call the central circulation. Usually we're talking about a large vein such as a jugular or the subclavian or the femoral, and pretty much everything else is -- is -- is peripheral.

Q Sorry, I -- I think you were answering a question before I interrupted you.

A I -- I -- I think I --

Q Do you want me to repeat the question?

A Sure.

(Whereupon the record was read.)

THE WITNESS: You wouldn't be able to administer the drug. I mean, you do not have -- you do not have a properly functioning peripheral line, you do not have a properly functioning central line, you cannot inject the drug because there's no vein to inject it in.

I mean, I've never said otherwise. You have to have a properly functioning IV somewhere to be able to safely administer any intravenous drug. Just to make that clear.

BY MR. FOGEL:

Q Now, in your report, your supplemental report, Doctor, you state there had were small superficial veins in his hands?

A Yes.

Q And that -- and that is referring to what you said earlier, that he has small veins --

A Yes.

Q -- in his hands, which would make it difficult to administer an IV through the hands; is that correct?

A I don't think difficult would be the right word. I mean, it made it more challenging.

Q More challenging. Sure.

A Yeah.

Q And --

A And by way of an example -- I know you can't put this in the report, but look at my veins (indicating.) Right? People look at that and they just salivate of over those veins; they're huge.

Q But Rusty does not have those types of veins?

A No, he does not.

Q He's not as lucky as you to have those veins?

A Right.

Q So --

A Just -- just as an aside, and I'm sorry I got to throw this in there: Anesthesiologists, when we're out in the world, we look at veins and we look at the airway of everybody. So I guess it's just what we do, so...

Q You -- you also stated in your report that there are limited sites for IV access in upper extremities --

A Yes.

Q -- is that right?

And when you say "upper extremities," what are you referring to?

A The arms. I didn't examine his feet.

Q Okay. When we talk about peripheral IV access --

A Uh-huh.

Q -- are you generally talking -- is that what

you're referring to when you say the upper extremities in the hands, that's --
A Yes, that's the --
Q -- the peripheral IV access.
A -- that's the peripheral IV access that I'm talking about, yes.
Q So you did not examine whether -- where the potential of a central venous line --
A No, I did not.
(Whereupon the reporter requested clarification.)
BY MR. FOGEL:
Q Is that -- is that accurate?
A I did not. I did not examine him.
Q What -- what type of -- in the clinical setting, what equipment, if any, would you use to identify the central venous line?
A Well, if you are using a -- if you're going to insert a catheter in the jugular vein, the standard of care now is to use an ultrasound machine, where you identify the -- the jugular vein. If you are inserting a femoral line, you don't need any -- I mean, people can use an ultrasound machine, but it's not necessary. It's not -- you wouldn't have to use that.
And likewise, with a subclavian vein, you wouldn't have to use an ultrasound machine. I think

people do do that, but it's not absolutely necessary. But I think for the purposes of the jugular vein, you'd want to use a ultrasound machine, but for the others, I wouldn't say it's absolutely necessary.
Q Do you know if an ultrasound machine -- are there any other pieces of equipment that you would use in order to identify an central venous line?
A No. I mean, ultrasound would be the -- the one that I would use.
Q Do you know if an ultrasound machine is available in the execution setting?
A I do not know.
Q For somebody with veins as poor as Rusty's as you've described them, is there anything to increase the likelihood of the vein to blow once the fluid begins flowing through it? Through the needle.
A Yes. There is -- with poor IV access or limited IV access, small veins, then the risk of an infiltration is higher. I can't give you any numbers, I'm not even sure those people have ever studied that, quite frankly. But just based on my clinical experience and I think, based on general teaching and clinical experience of others, yes, there's an increased risk of a vein blowing when provided with limited IV access. Which he did have.
Q Right.

MR. FOGEL: Why don't we take a -- a break.
(Whereupon there was a break in the proceedings.)
MR. FOGEL: We're ready to resume?
BY MR. FOGEL:
Q Doctor, I want to pick up on something we were discussing shortly before we took a break. And that was the -- accessing the central venous line.
Now, do any of the veins that you discussed have arteries -- well, first of all, what is the difference between a vein and an artery?
A An artery is the term that we use that describes blood that takes a tube, essentially, that takes blood away from the heart. And usually, that's to the systemic circulation. So for example, the left ventricle will have the aorta coming out of it and that will have branches, and those are arteries. Like the carotid artery and so forth.
And then veins we describe as structures that bring blood to the heart. And that's sort of the -- that's the basic structure. And usually, for the most part, arteries have oxygenated blood in it, and veins have deo- -- what we call deoxygenated blood it in.
But there are the two main exceptions to that is, that when the blood comes back from the lungs back into the heart, those are called pulmonary veins because they

are veins that are bringing blood back into the heart but actually it's oxygenated blood. And likewise, the pulmonary artery takes blood from the heart to the lungs, it's called an artery, but it's got deoxygenated blood.
But in terms of the systemic circulation, which is the typical term we use to describe blood flow through the -- through the body. Arteries carry blood from the heart to the various organs and then veins bring that blood back from the periphery or from those organs back into the heart.
Q Can you use an artery instead of a vein --
A For?
Q -- for purposes of an IV line?
A You cannot.
Q Why -- why not?
A Well, let me just clarify that.
You can use an artery -- in fact, that -- people do use arteries for an- -- what's called angiography, where they are -- they are looking at the structure of an artery, and -- and the -- the blood flow through that artery, so they will inject a contrast through that artery. But for the purposes of giving a drug for, you know, having a systemic effect, you would not use an artery. In fact, you would want to avoid using an artery.
Q Okay.

A Because these drugs can damage arteries. You know, many drugs can damage arteries.
Q Do any of these veins that you would use, as you described as a central line, do any of them have neighboring arteries?
A Yes, they do. And I guess, for purposes of -- of making a complete statement about the artery, there is one exception to the -- the -- what I said about arteries. The pulmonary artery, sometimes will have a catheter, it's called, interestingly enough, a pulmonary artery catheter. And it goes through the heart, into the pulmonary artery. And you can't inject drugs into that, because that's -- in that sense, it's like a vein.
Q Yeah.
A But it's -- anyway, back to your question:
Do these structures, where the -- the central line being placed in a femoral artery, you know, the --
Q And the jugular?
A -- jugular and stuff like that.
Q Yes.
A Yes. There are arteries very close to the veins.
Q So the important -- based on what you described and why you would use the vein as opposed to an artery -- to be very careful that you don't insert the IV into the artery, and not into the vein?

A Correct.
Q So what do doctors use in a clinical setting to make sure they don't put it into the artery instead of the vein?
A Well, we already brought up the issue or the technology of an ultrasound machine.
Q Right.
A And that's one way of more accurately diagnosing where your catheter is. The other things that you do, I mean, there are a variety of different techniques. So for example, I mean, I'm going to go into some detail because I think maybe that's what you want, but...
Q Well, do you need an ultrasound in order to --
A No.
Q -- access --
A You don't need an ultrasound to --
Q -- the central venous line to make sure you do not --
A You do not --
Q -- put the IV into the artery?
A You do not need an ultrasound to -- we used to do that all the time, for many years.
Q What is preferred practice today?
A For the placement of the central line in the jugular vein, it's going to be the ultrasound. I'm not so

sure that it's preferred practice or a standard of care for the other veins. It may be in some settings and some institutions, where they say you should do that, but...
Q If you were to insert an IV into the central line, would your practice be to use an ultrasound?
A I think you want to rephrase that question. You said to put my IV in a central line, you mean in a --
Q Central vein.
A -- central vein.
I would use it for a jugular -- I'm not sure that I would need to use it for the femoral vein or the subclavian. The subclavian vein is a little bit more difficult for the ultrasound to be useful, I think, but I think people can use it.
But it's really primarily for the jugular vein because the concern there, is that, when you puncture the artery, the carotid artery, that's the blood flow to the brain, there's risk of stroke and things like that. There's obviously risks involved in terms of puncturing the other arteries, but not nearly cat- -- potentially catastrophic as with the somehow puncturing or having a problem with the carotid artery.
Q Are you familiar with a cutdown procedure?
A Yes.
Q What is it?

A So a cutdown procedure is where you actually have to make an incision into the skin to gain access to a -- the structure that you're trying you -- and usually, it's going to be a vein that you're trying to cannulate. So we use the term percutaneous -- you got that?
THE REPORTER: (Inaudible response.)
THE WITNESS: Okay.
Percutaneous means through the skin, basically. And that's essentially where you use a needle to gain access, like a intravenous line. A cutdown is where you would actually use a scalpel to make an incision in the skin and then you do a dissection to actually -- to find the vein.
BY MR. FOGEL:
Q What -- when would a doctor use -- or some medical professional, use the cutdown procedure?
A If they had difficulty gaining access to the venous system, but the usual methods of, you know, they can't access it peripherally, they can't get a central venous line placed. Most cutdowns are usually done on -- I shouldn't say most -- most cutdowns, in my experience, in the -- in the clinical practice that I was in, most cutdowns were done on the saphenous vein, which is a vein in the ankle. It's usually patients in the -- who's been in trauma. So they come into the emergency room and they

get a cutdown on the saphenous vein, and they -- or they find the saphenous vein and they insert a large bore of tubing or a catheter into that vein.

Q When -- have you ever used the cutdown procedure on somebody before?

A I have.

Q What position was the individual lying in when you applied the cutdown procedure?

A Supine.

Q Which means?

A Flat.

Q Lying flat?

A Lying flat, yes.

Q And why were they lying flat?

A Because they are -- were trauma patients, and they have injuries, and they were -- they had -- they'd be lying flat -- all -- all trauma patients -- I shouldn't say all, like I said earlier, never say never, never say always, but vast majority of the trauma patients are going to be lying flat, so that's why. And that's the best position to be able to get access to the ankle and to do the -- to do the other things that need to be done in a trauma patient.

Q Would you agree that for somebody where it is difficult to locate a IV site through the skin, that it's

more likely that they need to have a cutdown procedure?

A Yes. More likely, I mean, that wouldn't be the next step, the next step would be the central line. But failing that, and a cutdown would be needed, I mean, for the most part. I mean, those are sort of the ways in which you could access the venous circulation.

Q Do you have any understanding of whether the cutdown procedure was used under Missouri's execution protocol?

A Say that again.

Q Sorry. Do you have any understanding of whether the cutdown procedure is an option under the Missouri execution protocol?

A I -- I don't know if it's in there or not. I don't remember seeing that.

Q Do you know if it's used at all?

A In --

Q The Missouri -- in Missouri executions?

A I don't know.

Q Or is it an option?

A I don't know.

Q You mentioned the -- was it the saphenous vein?

A Yes.

Q Do I have that right?

A Yes.

Q And it run -- starts in the ankle.

Does it run all the way up, into the groin?

A Yes. It's -- well, it's not called the saphenous vein, once it gets up to that level. But yes, that's the way the pathway goes up, into the femoral vein.

Q So it's different from the femoral vein?

A Yes. So you could think of the femoral -- so there's several veins -- there are a lot of veins, let's say -- let's take the leg, there are a lot of veins in the -- in your leg. Some of them have names, because they're commonly -- you know, they have a common location. The others don't. So they all sort of come together -- not all of them -- but many will come together -- not all of them, but many of them will come together to form the femoral vein? So...

Q And where do you access the femoral vein?

A In the groin.

Q In the groin.

And you mentioned that as an option if you were to do a central venous line; correct?

A Yes.

Q If you were to access the femoral vein, would you need to cover it with a sheet, if you were trying to shield someone -- if there was somebody observing --

A Yes.

Q -- the person who was having the IV inserted, would you recommend them covering it with a sheet because the groin would be otherwise exposed?

A Kind of depends on the clinical setting. So for example -- so normally, what we could do the -- for the femoral vein, you would use a -- a central line kit, basically, and most of these -- you know, some of these kits could be used for almost any central line location, whether it's a saph- -- I mean, a subclavian or a jugular or a femoral.

And you prep the area, you disinfect it, basically, and then you take a -- a large sheet that's sterile, and it has a hole in it, and that's where you put -- that's where you're going to be doing your work. So it's -- you do cover a large part of the, you know, the lower-torso part, there, including the genitalia. But the actual area where you're working is going to have a hole in that sheet, that you're going to -- that's where you're going to be doing your work.

Q Uh-huh.

A I don't know if that's what you were --

Q Well, I suppose it's -- it might be a little bit of an unfair question, because you don't know if the cutdown procedure is allowed or used under Missouri execution protocol; is that right?

A I don't know that.
Q And you don't know -- and therefore, you wouldn't know how it is employed?
A Yeah. Well, you're talking about central line placement. I thought. A femoral line.
Q Well, I was talking about femoral line, but also the cutdown procedure.
Would you use the cutdown procedure on the femoral line?
A I don't know whether people do that. I've never done that. I've never done a cutdown on a femoral vein because in my experience, the femoral vein is -- is easily accessed. Well, I shouldn't -- you know, it's -- it's easily accessed.
I mean everybody, for the most part, I mean, I should, again, never say never and never say always, but almost everybody has a femoral vein. And the anatomic location is very consistent from one person to the next.
Q Uh-huh.
A So you wouldn't need to do a cutdown in somebody for a femoral vein in the groin. I mean, I don't -- I suppose it has happened somewhere, but I've never seen it and I've never done it.
Q Right.
A For the purposes of gaining access.

Q Have you ever had a conversation with any of the execution medical team on --
A Never.
Q -- the access of the femoral vein?
A Nope. I've never spoken to anybody for, you know, execution team, not at all. No contact whatsoever.
Q I think you used the word "challenging" when talking about accessing Rusty's IV line. What -- what are the consequences, for somebody like Rusty, if the medical team is having challenges accessing an IV line?
A So I will answer that in sort of the setting of what has happened in my clinical experience.
Q Uh-huh.
A You may end up having several attempts, more than several attempts. I've probably seen patients that have had more than, probably, ten attempts to try to get IV access. And sometimes, depending on how the patient's tolerating, you might end up saying, "You know what, we're going to go over to try a central line, you know, we're not going to do -- do this anymore."
So that's -- that's where, if there was a challenge, you know, I say challenge, if there was a problem, then, after so many attempts -- and I don't know what that number would be, it's going to vary from individual to individual. But they would --

Q But for somebody with Rusty's veins, as you've described them, you've acknowledged it could be challenging to access the IV lines. Is that something that you would -- is it likely to induce stress on somebody like Rusty?
A It would induce stress on almost anybody. Because you're sticking them with sharp needles, yeah.
Q Would it increase the likelihood of heavy breathing?
A It -- yes, it could increase the likelihood of that, because, you know, it's stressful, you're going to be breathing more rapidly potentially.
Q Could it increase the likelihood that Rusty's hemangiomas would start bleeding?
A I'm not so sure about that. I don't know, I'm not sure that I -- I know that the -- Dr. Zivot and others, and, you know, the other experts have said -- talked about changes in the blood pressure, I'm not sure that the, you know, increase in blood pressure would cause -- make it more likely to rupture, I'm not so sure that that's well documented based on the pathology, essentially, of -- of these types of hemangiomas. I -- I don't think I buy that, that an increase in blood pressure is more likely to do that.
Q To cause the hemangioma to start bleeding?

A Correct. I don't think it's going to be more likely, yeah.
Q What causes Rusty's hemangiomas to bleed in your opinion?
A Well, the histology in the -- my, you know, or the basic structure of these hemangiomas is that No. 1, for him, they're superficial. Part of it's superficial, I mean, obviously some of it's gone up, on the inside of his neck, but in -- in -- into his -- into his head. But part of it is actually, you can see it in -- in his mouth. And you can see that -- and you can always see, of course, some of it on his nose and on his face. And that tissue, if you were to -- in terms of Zivot -- Dr. Zivot uses his friable.
(Whereupon the reporter requested clarification.)
THE WITNESS: Friable.
I don't know if that's the best term to use, but I do agree that that hemangioma, and that, if you were to traumatize it in some way, that it would be more likely to bleed compared to, if I provided the same type of, quote, "trauma" to you.
And when I use the term, I'm -- for example, I'm thinking about if I had to intubate him, put a tube into him, you know, let's say the -- the inmate needed to have surgery, then there's -- you would normally put a tube

into the windpipe to breathe for them. And use a -- what I call when I talk to patients, a metal tongue blade basically, it's called a laryngoscope, and when you insert that into the mouth, even a normal individual, could you, you, or you, or any of us, when we do that, sometimes you get bleeding. Rusty or Mr. Bucklew's going to have increased risk for that because of his tissue. If you were -- if you were to manipulate his airway in that way.

BY MR. FOGEL:

Q Through the insertion of the tube?

A Correct.

Q Right. So what -- under what other conditions would cause -- because Mr. -- as you know, and I think you observed Mr. Bucklew has some periodic experience of bleeding from his hemangiomas.

A Yes.

Q Obviously, without the insertion of a tube. To your understanding, what causes those hemangiomas to bleed in those circumstances?

A Well, there're probably parts of that hemangioma that are -- again, we have used the term "friable," that are very, very, very thin, and just the normal, you know, maybe when he's eating something and just the act of swallowing can irritate or scrape, basically, the back of -- the back of his throat or the pallet, and cause the

bleeding. He reported to me that he gets -- when he wakes up in the morning, he sometimes has blood on his -- on his sheets. So maybe there's some type of spontaneous bleeding, I don't know. Maybe -- I don't know what -- why that is happening, but he does report that.

Q Any other understanding of why or how his hemangiomas would start bleeding?

A If his airway -- if he is -- so for example, if he's snoring, on, you know, there's no doubt, of course, that, you know, the hemangioma involves his airway, he's more -- he's going to be more prone to snoring, having some sort of the tongue fall back into the back of his throat. Maybe somehow that vibration causes him to have some bleeding potentially. That could be another cause of it.

Q So we're -- we're -- you're talking about some of your observations from your examination of Rusty; is that right?

A Some of these, yes.

Q And -- and you did, in fact, Rust- -- examine Rusty --

A Yes, I did.

Q -- in person. And you documented that in your supplemental report; is that right?

A Correct.

Q So let's take a look at that.

And I'm specifically looking at paragraph 3 of your supplemental report.

A Uh-huh.

Q And it continues on -- it starts on page 2 and continues on to page 3, ending with No. 4, limited sites for IV access in upper extremities?

A Yes.

Q Do you see that?

A Yes.

Q And so does that -- is that the entirety of your observations from your examination of Mr. Bucklew?

A I think so. I mean, I -- doctors never write everything down that they observe. I mean, I'll be honest with you.

Q I -- that's fine. I just want to make sure I'm looking at --

A Right.

Q -- at everything that's relevant.

A Yeah. I'll -- but that's -- I put as much down there as I thought. I mean, you know, if -- there may be some other things that I saw that I didn't put down there, but that's the vast majority of what I observed.

Q Great. Just want to make sure that we're looking at --

A Yeah. Okay.

Q -- all the information.

Why -- why did you examine Mr. Bucklew?

A Well, two -- I guess, two basic reasons: One was credibility; right? I mean, if -- if -- how can I make a medical or make an assessment of this guy if I haven't examined him, and Dr. Zivot pointed that out.

And then No. 2, I do want to have a sort of independent -- be -- be -- being able to make an independent judgment of what he looks like and what the airway -- what his hemangioma looks like.

So I felt that was likewise important, so... that was the -- that was the main reason why I wanted to do that.

Q So like Dr. Zivot, you found that Rusty has a hemangioma on the right side of his face; is that right?

A Correct.

Q And -- and he has multiple hemangiomas, but you specifically focused on the one on the right side of his face; is that right?

A Well, I think that the hemangiomas, I don't know that they're anatomically completely separate, I don't know that for sure. I'm sort of thinking to call it -- call it an all -- so there's an -- obviously a hemangioma that the -- hemangioma's involving his -- the outside of

his -- the exterior, external part of his right face, but of course, it's also internal.

Q Uh-huh.

A And so this hemangioma seems to be all in- -- interconnected, so you can call it one hemangioma or several. But...

Q Understood.

But you also agree with Dr. Zivot, that this hemangioma or hemangiomas, plural, affect Rusty's airway?

A Yes.

Q And how does it affect his airway?

A So he had a -- or he has a hemangioma -- the hemangioma involves his pallet --

Q Uh-huh.

A -- his uvula, his -- basically, his cheek, both in the mucosal side or the internal -- oral side, and the external. And it extends -- seems to extend down, into his tonsil region a little bit.

Q And the pallet, is that -- what does that mean? The roof of the mouth?

A Yeah, the roof of the mouth.

Q Right.

A So we talked about the hard pallet and the soft pallet. So the hard pallet is where it's hard and the soft pallet is further back where the uvula is, you know,

that thing that hangs there, and is attached to the soft pallet.

Q So how -- I mean, now that you've described kind of the presence of the hemangioma, how does that affect his airway?

A Well, it causes him to have some of the symptoms that he describes, he, being Rusty Bucklew, some of the symptoms that he describes of, you know, sometimes he feels like he can't, you know, he's choking a little bit, or he has the bleeding problem, he has to -- he says that sometimes he has to sleep on his side or be in a particular position. And then, those are the primary things that he described to me. And --

Q Go ahead.

A No. No.

Q Do you have any more?

A No. No.

Q Do you know what a Mallampati is?

A Yes.

Q What is a Mallampati?

A It's a scoring system that's used in our specialty to describe a airway for the purposes of how easy it will be to intubate somebody, to manage their airway. And Mallampati is actually the name of the person who described it. It's usually, going to be a score of

one to four. One, being an airway that's primarily going to be high- -- higher likelihood that it's going to be an easy airway, and a four, being a higher likelihood that it's going to be a difficult airway. But it's not absolute. For example, you can have somebody --

THE REPORTER: Can you slow down a bit.

THE WITNESS: -- with a Mallampati score of 1, who has a difficult airway. And then you can somebody who has a 4, that has an easier airway. But in general, it's going to be easier for a 1 and a -- a more difficult airway for a 4.

BY MR. FOGEL:

Q Does Rusty have a Mallampati 4?

A Yes.

Q And so that means that Rusty has the most difficult airway to manage?

A Higher risk for that.

Q Higher risk.

A Yeah. Higher risk is probably the way that I would say that.

Q Have you ever anesthestized somebody with a Mallampati 4 airway?

A I have.

Q How many times?

A A lot. I, you know, it's not uncommon in the

population, especially, with people that are obese. Obesity increases your risk for -- because you get a lot of redunentation in the back of the -- you know, the mouth and you get, you know, a thick neck and that kind of thing, so...

Q When you, quote, "manage the airway," what are you doing as a doctor?

A So, in -- in our specialty, you -- you have to obviously breathe for the patient. You give these drugs that stop breathing, and you have to breathe for the patient. And most of the time, you're going to do that using some type of air -- airway device. So might -- might be a mask, you know, we put a mask on you, and when -- when you're anesthetized, we can hold that mask on your face and we have a infuser machine with a circuit and with a bag, and we can actually manually inflate your lungs through that mechanism.

Q So the purpose of that is -- I'm sorry.

A If I could continue...

Q Yeah, go ahead.

A So sometimes, we put in another airway device, several airway -- there's an oral airway device that we use to help lift the tongue up, off the back of the throat and back of the mouth. We use something called an L-M-A to put in the back of the throat and then we use an

endotracheal tube to go back into the back of the mouth and back, into the windpipe.

So we use all these different tools to be able to breathe for the patient, and that's called managing the airway, basically, and we use those types of techniques to make sure that we can breathe -- breathe for the patient.

Q Because they, otherwise, would not be breathing or would have difficulty breathing?

A Correct.

Q And somebody who has a Mallampati 4, is at the highest risk of having difficulty breathing?

A During that induction process of anesthetic, where you're starting to take over their breathing, yes. In a clinical setting, where the patient's going to be, hopefully, alive at the end of the procedure.

Q Do you consider Rusty's airway irrelevant in the context of your opinions in this matter?

A Yes, I do. I think that it's not -- I mean, I -- irrelevant, I mean, I do -- I do understand the concept that is being proposed here around bleeding in the airway. I don't think that's important in a sense that -- could -- could he, the inmate, bleed before, you know, during the process when he is getting the IV placed and all that? Well, he's already bleeding now. We know that. So could he bleed at that point? Yes. Is it going to be more than

what he bleeds now? I -- I have no idea.

But, actually bleeding during -- after the injection of the drug, and, you know, these choking, you know, again, choking sensations, he'll be unconscious, so his airway's irrelevant in that sense. Because we're not interested in -- I'm sorry -- the State of Missouri is not interested in -- if I may use that term, I'm sort of putting maybe words in their mouth -- but they're not interested in -- in this airway issue because the intended outcome is death; it's not to keep someone alive. So airway management is really not that important at all. That's sort of my perspective on that.

Q So you -- airway management is, I understand you would say that State of Missouri doesn't think it's relevant because he's going to die, but is airway management not relevant only after he's rendered unconsciousness? Is that your opinion?

A Repeat the question.

(Whereupon the record was read.)

THE WITNESS: I'm hesitating here, I'm thinking why -- why would it be relevant before he is unconscious? I -- I -- I have thought about scenarios. Would -- would there be something that would stop -- stop the execution? Well, I suppose. I mean, not to -- not to put too silly of a point out there, but I'm reminded of what happened

last night at the Oscars, where the wrong envelope was presented to Warren Beatty? You know, what if the governor said, "Go ahead and -- and in this execution. And oops, I made a mistake and I meant stop," and they've already started, I mean, I'm not -- I suppose you could think of scenarios like that, where you -- or the, you know, Missouri has to, now, resuscitate an inmate, you know, of course, in that -- in that particular case, Rusty Bucklew, with his airway and all that, is going to be more of an issue.

But beyond that, I'm grasping at, you know, reasons why the airway would be an issue beforehand. I mean, it just -- I -- I -- my opinion about what -- what the case is being made, here, about Dr. Zivot is, that he -- and -- and others, perhaps, are applying clinical or they're taking a clinical perspective on this execution when I don't think that applies.

BY MR. FOGEL:

Q Aren't you drawing upon your clinical knowledge and expertise in order to render an opinion here?

A Well, I'm not -- I -- I -- I'm not -- maybe I didn't make that clear.

He is -- he is basically saying -- if I understand what he's written, he's basically saying, you know, this inmate has a -- an abnormal airway, and

therefore, he's at higher risk for problems during this execution. Well, I agree with him, that Bucklew has an abnormal airway, but it doesn't affect the intended outcome. It doesn't impact the intended outcome.

If I were anesthetizing Bucklew for a clinical procedure, absolutely, I'd be concerned at his airway, both, before and after he was unconscious. But not for the lethal injection, so...

Q Let me make sure I'm following here: Because it doesn't affect the intended outcome, meaning, that he dies?

A Correct.

Q Correct. Do you not understand -- do you understand that Dr. Zivot was not addressing whether or not he would die, but whether he would die in violation of the 8th Amendment, meaning intolerably suffering during -- during a procedure?

A Well, that's, I think, what he was -- he was certainly trying to get at in some of his -- in his reports. But I think my interpretation of he was saying in some of his reports, might -- again, my interpretation is that he's misapplying -- he's sort of conflating, you know, the clinical picture of someone who's going to be, you know, the intention is that they be alive at the end of the procedure with what occurs in an execution. So...

Q Sure. But maybe we just need go back to the questions that we were talking about earlier, at the beginning of the deposition.

Do you think Rusty would suffer any pain and suffering as a result of his blocked airway during the course of the execution?

A The answer to that is, I don't think he will suffer or have any pain. Aside from, again, starting the IV, and, you know, could he have a massive bleeding prior to that? I suppose that's possible.

Q So you don't know if Rusty might -- his hemangiomas might start bleeding during the procedure?

A They probably -- my guess is that they -- you know, I don't know, we don't know. You won't know that until, you know, if -- if this -- this if the execution occurs, but...

Q Could Rusty choke on his blood?

A Well, he would -- so he could have bleeding after he's unconscious or before he's unconscious, and he could aspirate that blood. You know, I mean, that's entirely possible because that, you know, his -- his hemangioma, we don't know what the -- the course of that will be exactly. But, you know, that is a possibility, but that -- but it may never happen either. I mean, it's possible that it would never happen. While he was awake, he would have a

massive bleeding that would cause him to choke on his blood, so...

Q Do you think Rusty's at an increased risk of bleeding from his hemangiomas as a result of execution procedure?

A I'm trying to think of a scenario whereby the -- he -- he would be at increased risk.

So could an increase in blood pressure cause that? In my opinion, unless it was a massive increase in his blood pressure, I don't think that it would, you know, affect it. I mean, his blood pressure was 144 over 100 when I examined him and I think it was very similar to, if not identical, to when Dr. Zivot examined him. You know, I -- is it a increased risk, I -- I think that was your question, yes, it is increased, but I think a small relative increase in his risk during the execution protocol. Because, you know, he's going to be stressed, like anybody would be, if you're, you know, you have impending death. But I think that risk is -- is pretty small.

Q Do you think it's relevant whether Rusty suffers any pain and suffering, notwithstanding the fact that he was going to die at the conclusion -- that he would die at the conclusion of the execution process?

A Do I think it's --

Could you repeat that question, please.

(Whereupon the record was read.)

MR. SPILLANE: I'm going to object to the form of the question. Because the doctor probably needs to know relevant to what.

BY MR. FOGEL:

Q Well, it's a very -- I mean, we can start with that baseline question: Do you think it's relevant whether he suffers any pain and suffering?

A I think it is, from a -- and I'm going to get off into a legal/constitutional area that maybe I don't have the expertise to, but I -- any method of execution, for the most part, is going to involve some type of pain and suffering. So, you know, is it -- is it relevant? I think it's only relevant if -- if you think that it's going to -- it's going to be more than what would be legally permissible, I guess.

So I don't want to say it's not relevant at all. But in -- you know, in this particular case -- and that's, of course, why we're here -- I don't see the -- the type of suffering, as you say, that we're talking about here, I don't see that as being any more or any less than what, you know, the suffering that he already has. I mean, he already has symptoms; right? He already talks about, he -- he -- he has these gasping, choking, bleeding

episodes. So -- and none of us can do anything about that. I don't see that that's going to be -- marked the increase as a result of this execution process. So I'm not sure that answers your question, but -- so I don't want to say it's irr- -- you know, the suffering is irrelevant, but it's just -- you know, I -- I --

Q Well, you -- you used the term "legally permissible," do you have an understanding, an independent understanding of what is a legally permissible amount of pain and suffering?

A I mean, I have sort of a -- I guess, a layperson's understanding of it.

Q Right. And did you apply that in the context of your opinion here? Did you render an opinion on what would be a legally permissible amount of pain and suffering?

A No, I don't think so. I don't think I did that, I mean, I just looked at the amount of pain and suffering that I think that somebody would have in general with -- with -- with this protocol. Which, again, I mentioned, you know, you're starting an intravenous line, so that is painful or can be painful.

Within the setting of this particular individual, I just don't think that there is a -- would be a marked increase in his pain and suffering, you know, preceding

the injection of the drug. But does that -- I -- I don't know what the -- again, I have sort of a vague understanding of what would be sort of permissible, but I don't know -- I mean, it is a -- I guess a judgment call, in regards to, you know, what's permissible and what's not. But I didn't apply that in this particular case. I just sort of looked at the, you know, facts of the case, you know, my medical and scientific background, determine how the drug's going to work, and would the drug work in -- in the -- its intended way.

Q So let's focus more specifically on the actual opinion that you rendered.

A Okay.

Q And if you go to paragraph 26 of your November 2016 report, so this will be Exhibit 1.

A Uh-huh. Okay.

Q And the paragraph starts, (reading):

"It is my opinion, to a reasonable degree of medical and scientific certainty"

And then you list --

A Yes.

Q -- five different --

And first, as a threshold matter, are all the opinions that you're rendering captured here, in

paragraph 26?

A I wouldn't say all of them. I'm sure I have other opinions in this -- in my other report.

Q In your supplemental report?

A Yeah. But I probably -- I probably have opinions that are in here that I didn't put in my conclusion, I think these are the main ones that I put in there.

Q Okay. And No. 3 is, (reading continued):

"Injection of massive doses of barbiturates in this inmate would not inflict mild, moderate, or severe pain."

Did I read that right?

A Yes, I read that.

Q And let me ask you, what are the basis of this conclusion?

A For No. 3?

Q Uh-huh.

A Well, the injection process of actually injecting the drug, if done the way it should be done, which is with a well-functioning IV, that is not a painful process, to actually inject the drug into a well-functioning IV.

Q So you're assuming that there's a well-functioning IV?

A That's correct.

Q Does the fact that Rusty has a challenging or it

could be challenging to access Rusty's IVs, render it more or less likely that the IV would be well-functioning?

MR. SPILLANE: I'm going to object to the form of the question. I think he said it would be challenging to access his IVs, I think he means challenging to access his veins.

MR. FOGEL: Thank you for correcting me.

BY MR. FOGEL:

Q With that clarification, please go ahead.

A Repeat the question now that we've -- or maybe you just want to repeat it then.

Q Sure. Because based on your prior -- on your observations of Rusty, you concluded that it would be challenging to access his veins, does it make it more or less likely that you would have a well-functioning IV line?

A It would be less likely that you would have success of get having a well-functioning IV line.

Q Does that at all affect your opinion at No. 3?

A No.

Q Why not?

A Because my understanding of the protocol is, that the drugs would not be injected unless there was a well-functioning IV, either a peripheral or a central line. So maybe some clarification would -- was -- should

have been added to that, but my assumption there, based on what I read in the protocol, is that you have a well-functioning IV. And having a well-functioning IV, either a peripheral one or a central one, the actual injection of the -- of the drug would not inflict mild, moderate, or severe pain has I had written there.

Q Right. You're assuming, though, that there is a well-functioning IV line?

A I am assuming that, yup.

Q Now, at No. 5, you also say, (reading):

"Any pain and suffering that he risks during an execution using Pentobarbital is not a greater quality or magnitude than a risk of pain and suffering that he currently experiences and the risk would end up a rapid unconsciousness from the injection of Pentobarbital."

A Yes.

Q What were the bases for that opinion?

A Well, he is suffering or, you know, he's having these symptoms as it is. He's having episodes of bleeding, he -- he has episodes where he can't -- he -- he has -- I can't remember the exact term that he uses, but airway closure and he gasps, things like that. Choking

sensations. And that, you know, those are going to -- those will continue, you know, up to his death, probably. Whether it's by natural causes or by execution, I mean, this is a -- that's nature of the hemangioma, I mean, his symptoms are not going to get any better. So he carries that risk all the way up to his death, whether it's natural or by execution.

And basically, the only way that he will -- that suffering and pain and, you know, symptoms that he has will stop, will be when he, you know, during times when he's asleep; right? He's not going to experience those because, by -- by definition he's asleep. Or when he's -- achieves or when he's given the Pentobarbital or, you know, if he was -- had to have surgery for something else and he was given, you know, those -- those episodes, where he'd be unconscious, where he wouldn't have those symptoms. That's essentially what I'm writing there -- or what I've written there.

Q Okay. Any other basis you relied upon in order to form that opinion?

A Not that I can recall.

Q And here, at paragraph 26, you also mentioned that you rendered some other opinions that would be set forth in your supplemental report?

A Uh-huh.

Q Is that right?

Can you direct me to where I can find those opinions in your supplemental report?

A Well, opinions about what? Just all -- any of my opinions?

Q What -- what are the opinions? You said you had rendered some additional opinions in your supplemental report.

A Well, I think all of the paragraph that I've wrote in any supplemental report are opinions. I guess, I'm not sure what, specifically, you're --

Q Are there any conclusions --

A Oh.

Q -- similar to how you phrased it --

A Oh, I see.

Q -- in your opening report?

A Well, as we've discussed, I gave my opinion and assessment of his -- my physical examination, my -- my history and physical examination, which are shown on pages 2 and 3.

Q Uh-huh.

A My opinion assessment of his airway -- or my assessment of his airway doesn't alter my opinion regarding the actions of the -- of the Pentobarbital, which is that you've got rapid unconsciousness and

respiratory rest.

I gave an opinion about my -- what I wrote regarding the Pentobarbital action in the prior supplement, and then I clarified -- or in the prior opinion, and I clarified that in terms of action, adding the timeframe, along with the physiological responses to the Pentobarbital. And then even if there was bleeding in his airway after the Pentobarbital, that the -- the inmate would be unconscious and deeply unconscious, and unable to sense that bleeding.

And then I go on to talk about the --

Q So you're essentially just flipping through your report right now?

A I am.

THE REPORTER: Hang on. One at a time.

BY MR. FOGEL:

Q So you're flipping through your report?

A Yes.

Q All I was asking was, for you to identify if there's another section in your supplemental report --

A I see.

Q -- that sets forth your conclusions similar to what you have done in your opening report.

A All right. I -- I -- I'm sorry, I just don't know how to answer your question. I mean, I'd have to go

word through word --

Q No. No, that's fine.

A Yeah.

Q You said you had rendered some additional opinions here --

A Oh, I'm sorry.

Q -- in your supplemental report, so I was just asking you to point out what you had meant or what you were referring to.

A Oh, I see.

Q And what you were saying.

A Yeah. I -- I talk about, for example, I clarified some issues around the action of the drug, how quickly I think it would work. You know, the physiological effects, why death occurs from the Pentobarbital. I -- obviously, I refute some of the things that Dr. Zivot states, so --

Q Sure.

A -- I'm not sure I actually --

Q Okay. Sure.

A I'm not sure I actually changed my conclusion --

Q I think we're on the same page.

A Yeah.

Q Okay. I think we're on the same page.

And I think that's probably a good point to --

you want to break for lunch at this point?
MR. SPILLANE: Okay.
THE WITNESS: Sure.
(At 11:55 p.m., the deposition adjourned for lunch.)

(At 12:34 p.m., the deposition of Joseph F. Antognini was reconvened.)
BY MR. FOGEL:
Q Dr. Antognini, right before our break, we were talking about the opinions you've offered in this case.
A Uh-huh.
Q Aside from the opinions that are set forth in your two reports, do you intend to offer an opinion on anything else?
A I guess, if I was asked. I'm intending to write another report. If I mean, do you mean in the context of offering something right now, more opinions? Or in...
Q At -- at any point, between when you last submitted your supplemental report --
A Uh-huh.
Q -- going forward to this moment, do you intend to offer any other opinions?
A There are some details that I think probably are worth explaining, relative to some of the drug-level issues that I talked about and I think are worthwhile understanding, that I don't think have been completely fully elucidated -- or not elucidated, but fully described.
Q Right.
A So yes, I guess there are opinions and things

that I want to say that I haven't said yet.
Q During the course of today's deposition?
A During the course of today's deposition.
Q But you're -- you do not intend to issue another formal opinion, be it, in a report?
A I don't have that intention --
Q Yeah.
A -- but sometimes, I don't know what I'm going to be asked to do.
Q That's fine. Just asking about your present intention.
A Yeah. Okay.
Q Are you offering any opinions on the feasibility of lethal gas as an alternative method of execution?
A Do I? Or have I? Or sorry, what was the question?
Q Have you or are you --
A Or have I.
Q -- offering any opinions on the feasibility of gas as an alternative of lethal injection?
A On my initial report, first one that is on -- the one dated November 8th, I did offer an opinion, that's summary 23 of that report where I -- so obviously, we're, not sure, aware of the some of the ethical issues around recommending one method of execution over another, I guess

that's an ethical issue for -- for me, not so much for anyone else. But I did talk about the use of lethal gas and basically, I don't offer an opinion about one being better than the other, because I just think that -- that my understanding of the use of a lethal gas, and obviously, there are many kinds of gases that can be lethal, that that would not affect the risk of an innate, in particular, this inmate, suffering one way or the other, you know, suffering more.
Q Right. Are you aware that the state has taken the position that lethal gas is not that viable alternative to lethal injection?
A I am aware that -- again, I'm sorry, I'm going to have to get into some legal terms that I've -- I've heard and I think I have an understanding of them, but basically, that it has to be readily available -- a readily available alternative, so what -- whether you say that it's -- I'm sorry, I'm -- I'm going off on a tangent.
Q I don't -- I don't intend to make this complicated.
I -- are you offering any opinions on the viability of lethal gas as an alternative method of execution? I understand you've rendered opinions in terms of whether it would be more or less painful in relation to lethal injection.

My question is, are you offering any opinions in terms of its viability --
A Oh, I see.
Q -- as an option?
A No, I'm not -- I have no knowledge, really, about whether lethal gas is readily available or viable in this area or -- or not, I have no idea what --
Q That's what I thought.
A Okay. Yeah.
Q Just wanted to be clear.
A Sorry, yeah.
Q No, that's fine.
Are you offering any legal opinions as to whether execution, in the manner as described, by lethal injection, would constitute a violation of Mr. Bucklew's 8th Amendment rights?
A Well, I don't really -- I can't -- I'm not in a position to offer a legal opinion, but I -- I will say that I was -- I did review some court cases, like Glossip, and they talk about -- and then Baez, they talk about the issue around, you know, substantial risk, so -- I mean, I do have that understanding, but I don't think I'm really offering an opinion, one way or the other, on that.
Q Okay. Are you aware of any errors in your reports?

A Any errors?
Q Either, in the original or the supplement?
A Am I aware of any errors in my report?
Q If you're not aware of any --
A I'm not.
Q -- right now, I'm not asking you to look.
A Yeah.
Q Just, is there anything that you want to correct?
A Maybe I should have thought about that question being asked, I wasn't -- there are probably things that I would have said differently, I guess, to make it clear, but I don't think I have any errors, so to speak, in this report that I'm --
Q Just -- just giving you an opportunity --
A Yeah.
Q -- if there was something that you already identified that you wanted to correct.
A Okay. Well, I appreciate that.
Q And if the answer's "no," it's no.
Have you been asked by counsel to undertake any additional or supplemental analyses since you've drafted these reports?
A No, I did not. I was not asked of that, but I did -- I did do it, I mean, on my own. I -- for example, I found that article that I, again, will provide to you,

but I wasn't asked by Mr. Spillane or anyone else to --
Q Have you done any other -- besides identifying that article, any other supplemental work or additional work beyond your supplemental report?
A Let's see, so I looked at that -- let's see, I -- I did review -- I did look at some news articles on some, you know, art or executions that occurred in Missouri, and some of which were actually written by some of the witnesses, and that's not mentioned in my report. So that -- now that I think about that, I did look at that.
Q Uh-huh.
A So let's see, other analyses that I -- no, I don't think so. I mean, there -- my -- my approach I'll be, you know, of course, I'm going to -- I'm going to be upfront about any approach, I mean, there are certainly articles -- for example, articles that -- scientific articles, that I've looked at in my search for some information on this, that I didn't include in my report.
Q Uh-huh.
A And I don't think those articles influenced my -- my opinion, because they weren't -- they turned out not to be something that I could use or I thought was relevant to what -- to what I was looking at. So I looked at those.
Q Right.

A I mean, I don't have a list of those because I never used them, you know.
Q That's fine.
A Okay.
Q That's fine.
Did you have to make any assumptions in forming your opinions in this case?
A Yes.
Q We've talked a little bit about some of them already.
A Such as the speed of injection.
Q The speed of injection.
And what did you assume the speed of injection to be?
A My assessment -- or my assumption is probably going to be around 1 ML per second, that's my -- that's my assumption.
Q And that was based on --
A Just how quickly I inject drugs -- or would inject drugs in a -- in a human. In fact, quite frankly, I probably inject -- if I were to -- I inject drugs more quickly than that.
Q Okay.
A I mean, quite frankly, I do inject drugs more quickly than that, but that was sort of on the slow side,

I just made an assumption that it be on the slow side.
Q We also talked about having a -- I think you called it a functional IV line?
A Yes.
Q A well-functioning IV line?
A That's --
Q You made an assumption that would be true?
A Yes, that's true. I -- I assume that an IV has to be functioning, well-functioning.
Q Any other assumptions?
A Well, on -- we assume that the individuals that do this are trained --
Q Uh-huh.
A -- and that they've, you know, they've done this before. Or -- or obviously, may be the first time for somebody, it's got to be the first time for somebody, at some point in their life. But in general, these individuals are going to be trained in the various techniques that need to be used, so make that -- I had to make that assumption.
Q For example, when we saw on the open protocol that it referenced --
A Yes.
Q -- you know, provided there are, you know, sufficient expertise or trained individuals.

A Yes. That's what I'm referring to.
Q Okay. Anything else -- well, let me --
A Well, and the drug has to be effective; right? It has to be Pentobarbital. I mean, you assume it's going to be Pentobarbital, so you have to -- I mean, those types of assumptions, you have to make.
Q Uh-huh.
A I mean, there might -- I'm probably sure there are others, I just, off the top of my head, those are the ones that come to mind.
Q Have you met the execution medical team?
A No.
Q Are you familiar with --
A I mean, I don't know -- I mean, I have not. I mean, to my knowledge. I mean, right? I was in Missouri --
Q Yeah.
A -- for -- for one reason or another, a couple times recently. Once, to examine the -- the -- the inmate, and then to -- for other business. I could have met them, but I wouldn't have known it.
Q Are you familiar with their training?
A I understand that one of them is an anesthesiologist, and I believe there's a nurse involved, and there might be a -- maybe a paramedic or something,

I'm not sure. I'm not sure about the exact competition of the execution team. Except, I think one's an anesthesiologist, and one's a nurse -- and I'm not even sure they're actually involved in the -- I mean, I guess you have a question, what does "involved" mean? But I think they are a part of the team.
Q And you assume they had sufficient medical training and experience?
A Yes.
Q As we've discussed?
A Yes.
Q Okay. Are you also assuming that the execution team, including the medical staff as you described, would be familiar with Mr. Bucklew's medical condition being cavernous hemangioma?
A Yes. I -- I -- I assumed that. And my understanding, I believe Missouri does a pre-check of the inmate beforehand, so they -- they review the -- the clinical history. I -- I think. I may be wrong about that, I don't -- that's my recollection. So they certainly would know about it, but that's my assumption as well.
Q When you say "they," you're referring to the execution team? Or the medical members of the execution team?

A I don't know who is reviewing what. But my understanding is, that there was a review of that process.
Q Right.
A But --
Q But you don't know what information is actually provided --
A No.
Q -- to the medical team?
A I do not know that, no.
Q So you're assuming that they're given a sufficient level of knowledge needed?
A Yes.
Q Let me ask you: In your personal experience, what information do you deem important regarding a patient before you administer an anesthetic?
A So we do a thorough history and physical, and we look at -- I mean, it's focussed in the sense that we do look at particular organ systems, and -- and -- and review of -- of -- of systems. So for example, I'd be interested in knowing their exercise tolerance, what medications they're on, I'd be interested in knowing what their prior experience with an anesthetic is.
During the -- the physical examination, I'd be looking at their vital signs, their weight, I'd be looking at their airway, listening to their heart and lungs. So

those are the things that I would be focusing on, I mean, that's not everything, but that would be a lot of what I would be focusing on.

Q You, personally as the --

A As --

Q -- as the individual administering the anesthetic; correct?

A Correct.

Q And why would it be important for you to become familiar or knowledgeable with that information?

A Well, it impacts what type of anesthetic we use, what the risk would be to the patient. You know, managing the airway, it's just good practice to -- to -- to do that, because I -- you know, another example -- or another thing we look for is, a drug allergy; right? You might be allergic to some of the drugs that I want to use, so I have to get that information as well.

Q Are you assuming that all the information that you just described would be available to the medical execution team?

A Yes. I -- based on my understanding, I assume they -- they would -- they would have that information. Or somebody on the team would have that information.

Q Somebody present for the --

A Present, yeah.

Q -- execution?

A That's why, in my assumption. I'm not sure that it makes a big difference, though, but that's my assumption in terms of how the execution is carried out.

Q Do you know what a gurney is?

A Yes.

Q What is a gurney?

A It is a -- basically, a -- a bed with wheels -- a small bed with wheels, with a mattress on it, that a -- a patient would lay on. If they're waiting to have a procedure done, they're waiting in the preop area before surgery, things like that, yeah. And it has wheels on it so you can wheel them around.

Q What is your understanding of the use of a gurney in the context of Missouri's execution protocol?

A I don't know what they use, if they have a gurney, if they have an OR table. I've -- I've seen a picture of it from the internet, I think. I don't know whether -- I don't think it's a gurney, but I'm not -- I'm not sure. I thought it might be an OR table, but I'm not positive, or a procedural table, I don't really know, I don't recall.

Q Whatever device or sorry, not device --

A Yeah.

Q -- whatever structure, whether it be an OR table

or a gurney --

A Yeah.

Q -- that an inmate would be lying on during the course of the execution, did you make any assumptions regarding whether that gurney or OR table is adjustable?

A I did assume that it could be adjusted so that someone could use it in the sitting position or semi-recumbent, semisitting position. Again, based on my understanding of and experience with gurneys, I mean, almost all gurneys are going to have the ability to sit somebody up, and all OR tables, likewise, have that. So I did assume that would be the case in -- in -- in Missouri.

Q You -- you don't know for sure?

A But I don't know for sure.

Q You don't know for sure; right?

A I don't know for sure.

Q If you found out the gurney was not adjustable, would that affect the opinions that you've rendered in this case?

A No, I don't think so. You wouldn't have to have an adjustable table. I mean, if you needed to sit somebody up, you could do it in other ways besides having a gurney that didn't sit up. You could use a lot of pillows or you -- you could use other devices like that. For that matter, you could use a chair, quite

frankly. I didn't see any reason why a chair wouldn't, you know... if you wanted to anesthetize somebody, you could do it in -- in a chair. I mean, we wouldn't do that clinically. Again, I'm not sort of rendering an opinion about what Missouri should do, but, you know, certainly, in the clinical setting, you could anesthetize people in a sitting position.

Q Is somebody in a clinical setting, when they're anesthetized in a sitting position, are they strapped into the chair?

A Well, we wouldn't use -- I -- I said chair, and you could do that, but you never would do that clinically. Except, I guess, in -- if it's in a dentist chair. I mean, that's not really a chair like I'm sitting in right now, but you could anesthetize somebody in a chair like that. And I apologize, I'm not sure I -- what was the question?

Q Do you have an understanding -- let me ask a different question: Do you have an understanding of whether the inmate is to be strapped down during the course of the execution?

A I believe -- or I assume that they are strapped down, because I've seen straps on these things, on these gurneys or tables or whatever they are, based on the pictures I've seen, and there are straps. So my guess is,

that they are strapped down for the, I guess, obvious reason that, they would pull the IV out if they, I mean, almost anybody would that if they knew they were going to get a lethal injection.

Q If it was determined or if you determined that the individual was required to be in a supine position, so a flat position, would that affect your opinion that you rendered in this matter?

A If -- if the -- Bucklew was required to be in the supine position, and he does state he has worsening symptoms -- his symptoms are worse when he's lying supine, you know, than when he's awake, then if -- and he says that his symptoms are worse when he's awake, when he's lying supine, then, yeah, laying supine would be potentially a problem for him.

Now, having said that, he was able to tolerate an MRI, he was supine for more than an hour, he said. So he is able to -- to lie supine.

Q Who said that he was able to tolerate lying in a supine position for the MRI?

A He did, when I examined him. I didn't say that in my report I don't think, but there it is, he did say that. I'm not sure if I said that or not. I think it's somewhere in --

Q So we talked earlier and now we're looking, to

state for the record, we're looking at Exhibit 2, your supplemental report. And this contains your summary of your examination of Mr. Bucklew, can you point to me where --

A Yes.

Q -- in your summary he told you --

A So --

Q -- that he was lying --

A -- in paragraph 7, it says -- I -- I quote Dr. Zivot in his publication, and I write, (reading):

> "Bucklew can, in fact, lie flat, according to the inmate, he did so for about one hour while undergoing his recent imaging studies. While he stated he was not comfortable, he was nonetheless able to be flat."

Q So when you say "the inmate," are you referring to Mr. Bucklew there?

A Yes.

Q Well, of course, when Mr. Bucklew was undergoing the MRI, he was conscious; correct?

A Yes.

Q Is that -- did you take that into consideration when considering whether Mr. Bucklew could make certain accommodations to handle lying in a flat position?

A Yes. I mean, obviously, if he needs to adjust -- and he said that, he needs -- he needs to be able to adjust his breathing pattern, when -- I -- that's my -- kind of my term that I use, I'm not sure exact words that he used, but to adjust his breathing pattern essentially to be able to tolerate that.

Q Adjust his breathing pattern, how so?

A Well, if -- if he felt as though he was -- maybe his uvula, which, of course, is involved with a hemangioma, was getting stuck in the back of his throat, he might be able to position that in some way that he would be able to minimize that. However, with the MRI that was performed on the -- the imaging studies that he -- that are performed, obviously, of his head, his head has to be pretty motionless, you know, he has to keep still, so it didn't require much -- I mean, he couldn't be moving a lot to be able to do that, because you wouldn't be able to get a good image study.

So I just don't see -- I mean, again, if he said, "I was able to -- to lie flat, and it wasn't comfortable, but I was able to do it," then I have to imagine, if -- if this -- if he was suffering -- had incredible amount of suffering from lying flat, he would not be able to -- to do it. And they would not have been able to do the MRI study or the other imaging studies as well.

Q You did not, personally, observe Rusty lie flat during the -- during the MRI; is that right?

A No, I did not.

Q Do you have any other basis for your conclusion aside from what Rusty -- you said Rusty told you during the examination?

A Yeah. I -- I thought Dr. Zivot said the same thing, but I'd have to refer to his report to see maybe I mis- -- maybe I don't know that. You know, but I thought he said essentially the same thing.

If we have Dr. Zivot's report somewhere, I could --

Q We do.

A -- look at that.

MR. FOGEL: We're at 6.

(Whereupon Exhibit 6 was marked for identification by the court reporter and is attached hereto.)

THE WITNESS: And this would be his supplemental report.

BY MR. FOGEL:

Q Is that right?

A Right. I could be wrong about that, but I thought I might have seen --

Q That's why we gave you the report.
A Yeah. Too bad we didn't have this as a -- I know we have it as a PDF, you could search for the word, it would be a lot faster. Okay. So -- all right. Let me go back this way.
Q And doctor?
A Yes.
Q Is your recollection or what you might be looking for, that Dr. Zivot said that he -- Rusty lied flat during the MRI, is that what you're saying?
A That he lied --
Q And --
A That -- that -- my -- my recollection was that he made a statement, similar to mine, which is that, yeah, he was able to lie flat, but he wasn't comfortable. He probably didn't use those words, but my recollection may be wrong, maybe he didn't say that at all. I mean, he just -- I'm trying to find the spot where he talks about the -- the MRI was -- showed that the mass was smaller.
Okay. He reported, (reading):
"Experiencing extreme discomfort during the procedure. In order to maintain the integrity of his airway while lying flat, Mr. Bucklew was forced to consciously alter his breathing

pattern and swallow repeatedly to keep his uvula from settling and completely obstructing his airway in order to avoid checking."
Bucklew did not report to me or say extreme discomfort. So --
Q That last sentence you just said, are you reading from Dr. Zivot's report? Or are you just --
A From -- sorry. So I read from No. 7, on page 8. Where -- where Dr. Zivot asked Bucklew to describe his experience during the MRI procedure. So --
Q Do you think Mr. Bucklew would be capable of doing, as he told -- excuse me, Dr. Zivot during the execution process? Meaning, consciously alter his breathing pattern and swallow repeatedly to keep his uvula from settling and completely obstructing his airway in order to avoid choking?
A He would be able to do that when he's awake. But once he's received Pentobarbital and he's unconscious, he's -- he's not capable of doing anything. But it wouldn't be necessary for him to be able to clear his airway because he's not going to sense any type of blockage.
Q Sure.
A Yeah.

Q And I understand that's another part of your opinion, which we'll get to later, but --
A Right.
Q -- just, there is a distinction, do you agree, between when Mr. Bucklew is conscious during an MRI procedure versus the execution protocol -- under the execution protocol, when he's administered Pentobarbital? In terms of his ability to manage his airway.
A There is a difference in a sense that, obviously, an individual who's about ready to die is probably going to be stressed. But I don't know what other difference there would be, I mean, I don't know how to address that issue about him having an MRI or having, you know, lying flat for -- for an execution in terms of, you know, the difference between his ability to maintain his airway.
Q Well, you were drawing a comparison. Because we were talking about whether the gurney --
A Right.
Q Assuming it's a gurney. Whether he's lying flat and what that might mean in terms of his ability to manage his airway, and what pain and suffering he might suffer or endure. And you said, drawing upon your examination, that because he was lying on an MRI table for an hour, you thought it would not be an issue?
A That is correct. That he -- so --

Q And -- and -- sorry.
A So the question that I'm thinking in my mind or to answer your -- your question about this is that, can Bucklew lie flat for an extended period of time? And in this case, we'll make it an hour, because that's apparently how long he had to lie flat for these exams. And, yes, he could do that. Was it comfortable for him? No, it wasn't.
He described it not being comfortable, but he was able to do it. So could he do that on an execution table, would he do it on an execution table? I don't know. I mean, my guess is that -- my opinion is that he could do it if he wanted to. On the execution table, he could maintain his airways, just like he did in the MRI scanner.
Now, the question is, would he want to? I don't know. I mean, his alternative is that he's going to choke while he's awake, but that's something he's going to be doing on his own. But clearly, he's able to -- to maintain his airway lying flat, because he did so on the MRI exam.
Q Under extreme discomfort, do you dispute that he experienced it under extreme discomfort?
A I dispute the term "extreme," that's not the way he described it to me. He, being Bucklew.
Q Do you agree that lying in that position causes

stress?
A For him, lying -- lying flat, yes. That would increase his stress level, because he has to focus on his airway management basically.
Q Does it make it more difficult for him to breathe, lying in the supine position?
A Compared to a semirecumbent or sitting position, yes.
Q Okay. Do you consider an execution a medical act?
A No.
Q How is a physician's practice applicable to the execution setting?
A A physician's -- say that? A physician's --
Q Well, we've -- you -- you've referenced the clinical setting --
A Yeah.
Q -- a handful of times today. How is that different than an execution setting?
A Well, obviously, many things that are done in an execution setting are things that we've done in a clinical setting, so start an intravenous line, if we have to start -- if they have to start a -- a central line, those are things that we do clinically. Clinically injecting the drugs.

But some of those things we would do in a clinical setting, you wouldn't do, I guess, based on my understanding, in the execution setting. So you wouldn't -- you'd give a much larger dose of the drug, you wouldn't resuscitate them and so forth. You wouldn't breathe for them, that kind of thing.
Q So there are some things that happen in the clinical setting that are not applicable to the execution setting and vice versa?
A Correct.
Q Can you look at Exhibit A to your November 2016 report? It's Exhibit 1.
A Uh-huh.
Yeah.
Q And is Exhibit 1 your curriculum vitae?
A It is.
Q Or your CV?
A Yes. Uh-huh.
Q Is this accurate? Are there any changes that need to be made?
A To my knowledge, it's all accurate. I am still, to my knowledge, a -- a voluntary clinical professor of anesthesiology at UC Davis. I haven't been told otherwise. I currently work part-time for the joint commission...

Q So you did not include a CV with your supplemental report?
A Yeah.
Q So this is --
A That's correct.
Q -- the true and correct version?
A Yes, that's correct. It has not changed since then, so...
Q Now, it says from September 16 -- excuse me, September 2016 through present, and I'm looking under professional positions --
A Yes.
Q -- on the first page of your CV, you're a physician's surveyor --
A Correct.
Q -- is that right?
A Yes.
Q What -- what is -- is that?
A So the joint commission -- what the joint commission does is, they survey hospitals. So they go to hospitals and they look at different processes, and there's usually a group of three to four to five people that do that, and usually it's a physician that's in -- at least one of the individuals is a physician. And they might look at certain things that would only apply to his

sort of physician-involved activities, and so that's what I -- I do. I might survey parts of a hospital that a nurse would survey, but there are some specific areas where only the physicians survey. So they hire physicians to do that.
Q And what exactly are you surveying?
A As a physician?
Q Yeah.
A So I might go in to the operating room and watch their processes of how they manage their instruments, how they -- there's something that's called a timeout, where you're supposed to take a time out and you identify the patient before the procedure, you know, the right -- is it the right patient having the right procedure, that kind of thing.
So you make observations of their practice, doing things like that. It's -- you make observation of how patients are taken care of in the intensive care unit, so you might look at some orders and say, "Well, the physician ordered such and such, did the nurses follow those orders?" So it's really more around looking at processes, some of these clinical and operational processes --
Q Sure. You, yourself, though, are not operating --

A No, I am not.
Q -- on a patient?
A No, I am not.
Q Got it.
A No.
Q Are you operating -- or currently --
A I am not.
Q -- practicing as an anesthesiologist in any capacity?
A I have not anesthetized anybody since December of 2015, so it's been over a year. So I'm not clinically active right now.
Q Are you retired?
A From the clinical practice of anesthesiology, I retired. I'm not doing it. Will I return to it? Never know, but right now, I'm not doing it.
Q Why did you retire?
A Mostly personal reasons. So we have a son that moved down to Escondido area, we wanted to be closer to him, there was a time in my life where I could do that, so I just -- financially, I can do it, so I just decided to stop practicing.
Q Is there a -- do you have a medical license?
A I do.
Q Is your license currently active?

A Yes.
Q Ever been suspended?
A No.
Q Are you currently a professor of anesthesiology?
A My title is voluntary clinical -- where is my CV here. Have to pull it up. I believe that's the accurate title: Clinical Professor of Anesthesiology and Pain Medicine. And it's a voluntary clinical faculty appointment.
To my knowledge, that's still active, I haven't been told otherwise by UC Davis. When I was there the last couple of years, that was the title -- the -- I had the clinical professor part, but the volunteer part was only made once I -- I retired and became a volunteer, basically. So I think that's an accurate statement. And the reason why I may be a little bit equivocated on that is, because, you know, if you were to call UC Davis and say, "What's Dr. Antognini's title?" Sometimes the -- it might be professor of clinical anesthesiology and pain medicine, not clinical professor. And some of these series are a little bit confusing about that, so I think I have that correct.
Q Are you compensated for --
A No.
Q -- for your position at UC Davis?

A I am not.
Q Are you compensated for your work as a physician's surveyor?
A Yes.
Q Aside from that, do you receive any other -- what are your other current sources of income aside from, perhaps, passive investments?
A I have done work, obviously, for the State of Missouri. I've worked on other cases, which I described. Which, for example, the case in Ohio. And then I did some work for the State of Mississippi about a year ago. Similar -- lethal -- lethal injection issues, and then I also did some -- a -- legal work or expert witness work for the -- for a hospital in California that was being -- it wasn't being sued by a patient, but it was -- it was being basically fined by the State of California because of something that happened, and I represented -- I was the expert witness for the hospital in that -- in defending that.
Q Was that an administrative proceeding?
A Yes.
Q Before the N-L-R-B?
A No, I don't think it was that. I'm not sure, it was a State of California administrative hearing of some sort.

Q It was an administrate hearing?
A Yeah. It wasn't --
Q You said work you've done for the State of Missouri, have you have done work for the State of Missouri outside of this expert retainment?
A No, I don't -- no. No.
Q I just wanted to clarify what you said.
A No, I have not.
Q Okay. So let's talk about the work you've done in connection with the Ohio matter.
A Yeah. Uh-huh.
Q And did you serve as an expert witness --
A I did.
Q -- in that case?
A I did, yes.
Q And what opinions were you asked to -- or what opinions did you render in that case?
A Basically, the -- the -- there are a lot of opinions that I did render through the course of that work, but essentially, the -- the main opinion that I rendered was whether the dose of Midazolam that they were going to use, which is 500 milligrams, was sufficient to produce unconsciousness to the extent that the inmate would not experience or be -- be conscious of the other two drugs that are administered, which are a paralytic,

and then potassium chloride. That was basically what I was asked to -- to render an opinion on.

Q And what was your opinion?

A My opinion was that the -- that dose of Midazolam was sufficient to render an inmate unconscious, to the extent that they would not be aware and -- and have the sensations of the two drugs, that is the pain associated with potassium chloride, and then also, the paralytic drug.

Q You said the pain that's associated with potassium chloride?

A Yes.

Q That chemical can cause pain in an individual when it's administered via an IV line?

A That's correct.

Q And so your opinion was, because the patient is unconscious at that point, they would not experience any pain?

A Yes. The inmate. The inmate would be unconscious and would not experience any pain. Which, as I said earlier, pain is a conscious awareness of a noxious stimulus.

Q How long, in that context, would it take to render the patient unconscious from the administration of Midazolam?

A Midazolam?

Q Midazolam.

A M-I-D-A-Z-O-L-A-M.

Q How long did it take to render the patient unconscious after the administration of Midazolam?

A We did not -- I do not recall if I made any opinion about how long that took, quite frankly. I -- I'm not sure I rendered an opinion on that. I'd have to review my testimony and all that.

Q You just rendered an opinion of whether or not they would be unconscious?

A I did. I could have said also, how quickly it would happen, but I don't -- I'm not sure that I actually asked -- made a statement in regards to how long it -- it would take. I'd have to review my testimony and my -- my report there.

Q Is Midazolam a barbiturate?

A No, it is not.

Q Are there any similar characteristics between Midazolam and Pentobarbital?

A They both work with the GABA receptor; although, their actions at the GABA receptor, they work at different sites of the GABA receptor, based on my understanding. So even though they both work at the GABA receptor, doesn't mean they both function in the same way. In fact, they do

have -- they are dissimilar in terms of the effects that they do produce, because of that. What was -- there's more -- I'm going to answer more, but I want to make sure that I've got the question. What was the question?

Q I was asking if there were any similarities between the two drugs. And I think you probably have gotten to that question.

A So yeah, there -- so there's that similarity. I -- as I said earlier, I believe they can both produce unconsciousness. Now, can you get deeper levels with Pentobarbital than you can with Midazolam? The answer is, yes. But I -- my opinion is that the level that you achieve with Midazolam is sufficient for what its intended use in that setting.

Q So explain that to me.

Deeper levels, are you referring to deeper levels of unconsciousness?

A Yes.

Q So --

A And it's --

Q Are there various levels of unconsciousness?

A Yes.

Q What does that mean? Or tell me about these various levels.

A So you could think of consciousness as being on a

spectrum. So we're all awake right here; although, I can see some of you may be nodding off a little bit. But I'm not a charismatic and energetic kind of person, but anyway, that's why I'm an anesthesiologist; I put people to sleep.

But there's a spectrum. So we're all awake. And then you have basically on the other end of the spectrum, deep coma, where someone could be brain dead, basically. So there's different levels of consciousness across the spectrum. So what do I mean by that? So for example, someone may be fallen asleep, and you may say, "Larry, wake up." And you don't wake up, but then I nudge you and you wake up. As you get into deeper sleep, even a nudge may not wake you up, I have to really shake you; right?

With drug-induced unconsciousness, there's a spectrum and you get into levels where even shaking and noxious stimulation, you don't get any response. So you can assign consciousness according to that scale, and most people would define unconsciousness as occurring when they fail to be aroused from a non-noxious stimulus.

Now, that's arbitrary, which I think came out in the -- I'm not -- I think that's, you know, some people might say it's, you know, you have to -- if -- if they arouse with a noxious stimulus, that would be sort of the line between conscious and unconscious, so there's some

arbitrariness in that. But it's a spectrum, so when people throw this term around, of unconsciousness, it's not an all or none thing. It's not like you're conscious and you're unconscious, it's really a spectrum. And I think that's where a lot of the issues come up about how we apply these issues -- this type of knowledge to this setting of lethal injection.

Q Did you specify where, on this spectrum, Mr. Bucklew would be, when you state that he would experience rapid unconsciousness?

A I did not specify. I may have used the term coma somewhere in there, I don't remember if I did or not, but...

Q I -- after reviewing your report, I don't recall seeing the word coma?

A And you don't want me to go through it again.

Q Well, I guess the more fundamental question is, do you know where Mr. Bucklew would be on the spectrum of unconsciousness?

A He would be at the far end, basically brain dead. I mean, he wouldn't -- at that dose of -- of Pentobarbital, you would -- I -- I'm going to backtrack a little bit here, just to -- to clarify one thing:

So when you give a huge dose of Pentobarbital like this, again, based on my understanding of how it's

given and all that, and I've never done it myself, but one of the, you know, bar -- barbiturates do decrease the blood pressure, so you're going to have a huge decrease in the blood pressure in somebody. That's sort of separate in a way from the unconsciousness that occurs from a drug.

If you could maintain their blood pressure at this large dose, you still have deep coma, like a brain-death type of coma, where the brain is silent, neurons are not firing, the EEG has flat lined. So Pentobarbital at this dose would -- I mean, even at a fraction of the dose would cause that type of picture. So Pentobarbital, you'd be at the far end of the spectrum. No question about it. Where there would be deeply unconscious comatose brain-dead type of picture.

Q Do you know how much Pentobarbital would need to be administered in order reach that level of unconsciousness?

A Probably my guess -- so -- so -- I'm -- again, I am -- I have never used Pentobarbital as an induction agent. To my -- my recollection, I've never used it as an induction agent. When I use that term, I mean if I were to take you and you were going to have surgery, and I'm going to induce anesthesia, I -- I would not use Pentobarbital.

The closest I've ever come is Thiopental. But

Pentobarbital and Thiopental are very similar in terms of their doses for that purpose. So when I, you know, if I give 500 milligrams of Thiopental to somebody, you can achieve these -- at least transiently, you can achieve that deep level that I'm talking about. So I think with Pentobarbital, 500 milligrams, you can do that as well. But of course, they're -- they're giving 5,000 milligrams, so that's why I say a fraction of the drug would -- would get you to that endpoint.

Q Right. But you don't know when or how much or how long it would take?

A I don't know -- I don't have any firsthand knowledge, no. I have had to -- as I -- I said earlier, I've had to piece together some information that I pulled from the literature.

Q So you're -- these most recent questions have focused on, I suppose, the far-end of the spectrum, when we're talking about this deep level of unconsciousness. And it's your opinion that the individual does not experience any pain or suffering at that level of the spectrum because they cannot experience an emotional response.

Do I have that right?

A That's correct, yes.

Q And what about closer to the other end of the

spectrum? Can individuals still experience pain and suffering under your definition?

A Well, it depends on where you want to put them on that spectrum. So yes, it could be, you know, if you have awake on one end of the spectrum and a coma, deep, deep coma, brain death on the other end of the spectrum, somewhere -- somewhere along that continuum, people are going to be able to experience suffering and pain.

Q Yeah, sure.

A I don't know where that is exactly, and it kind of depends on your definition.

Q So if Mr. Bucklew was not in this deep level of unconsciousness, yet was somewhere else on the spectrum, it's possible he could still --

A Yes.

Q -- be experiencing some pain and suffering?

A Yes. But as I pointed -- yes, that's true.

But as I pointed out, he's not going to be on this end of the spectrum, he's going to be on the very far end. That's my opinion.

Q Understood.

A Yeah.

Q Now, on this -- closer to the awake end of the spectrum, would a person who -- appear unconscious to someone, even though they're not, in this deep level of

unconsciousness?
A They could appear to be unconscious, yes. Because unconsciousness, you know, you -- you look at consciousness -- if you're going to take a strict medical scientific approach to it, you just don't look at the person, you'd have to do other things to, you know -- you know, you might nudge them and that kind of thing and see if they wake up or not.
Q Right. So just the naked-eye observer wouldn't be able to determine whether the drug had taken full effect simply from just observing?
A Right.
Q Okay.
A So just an example: If you were to close your eyes right now, I have no idea whether you've closed your eyes and you're awake, or whether you've fallen asleep. I mean, I don't know.
Q Would you say the same is true for a nonmedical person, who is observing somebody during the execution process?
A Yes.
Q Okay. Have you ever witnessed an execution ever?
A No.
Q Have you ever worked for the Missouri Department of Corrections?

A No. I mean, I don't know what this relationship --
Q Outside of this current --
A Yeah. No, I have not.
Q -- working relationship?
A No.
Q Have you ever been consulted or ever worked for any states' department of corrections?
A No.
Q Ever consulted on the drafting of an execution protocol?
A No.
Q The use of chemicals for lethal injection?
A No.
Q Feasibility of an execution method?
A No.
Q Do you have any views on capital punishment that were germane to the opinions you rendered in this matter?
A I have ambivalence about it. So my ambivalence, there's three -- I think, I'm balanced; I'm against the capital punishment and it's primarily -- so I have three basic prongs of my approach to this: Two are religious and one is a sense of fairness.
So on a religious perspective, yeah, the Old Testament, which basically -- if I may paraphrase, an eye

for an eye, and a tooth for a tooth; and then you have the New Testament, where Jesus says, you know, "Be forgiving," so I -- I do struggle with that morally and as a Catholic.
And then, from a sense of fairness, I know that there probably have been individuals that have been -- that are on death row that may be innocent. So I think that's the most -- the strongest feeling I have about my feeling on capital punishment that -- I think that's the -- fundamentally, the most unfair thing that a government can do is, to take the life of an innocent person. So those are sort of my -- that's my perspective on capital punishment, but...
Q And it -- sorry, go ahead. I was going say, I don't intend to probe --
A Yeah.
Q -- the -- your personal --
A Okay.
Q -- perspectives here, but I'm just curious to the extent that they were germane to the opinions you rendered in this case.
A No, they weren't -- they weren't germane. I mean, I think that one of the main -- the main things that has driven me to, you know, to -- to testify in these cases is, that the -- basically that, you know, you're -- you're representing the -- the defendant, or, I guess, the

plaintiff in this case, and -- and I represent the -- am an expert witness for the defendant --
Q Huh-uh.
A -- which is the State of Missouri.
Q Yeah.
A So I -- out of a sense of fairness, I mean, if I were to ask the question of somebody, and I sort of played with this in my mind about, you know, do you believe that a defendant has the right to adequate counsel? And do you believe that a defendant has the right to expert witnesses? I think we'd all say yes.
Well, in this particular case, the defendant is the State of Missouri, so I feel that they need have some type of expert represent- -- representation to be able to make their case. So that's the other thing that drives me -- why I would -- I would do something like this.
Q Aside from the Ohio case and this present matter --
A Right.
Q -- you also mentioned the Mississippi case?
A Yes.
Q What opinion did you render in the Mississippi case?
A Basically, the same as I did in Ohio. It's essentially the same type of information -- or the same

type of questions. You know, does Midazolam render somebody unconscious to the extent that they would not be able to perceive the effects of the other two drugs. It's been a long -- it's been over a year since I was involved with that case, so I -- you know, I can't remember exactly everything I said, but that's the gist of it.

Q And what was your opinion?

A Well, that Midazolam would produce a level of unconsciousness that would render the inmate incapable of sensing the effects of the other two drugs, sensing in -- in the sense of --

Q Experiencing pain?

A -- experiencing pain and so forth, yeah.

Q So very similar to the opinion that you rendered in the Ohio matter.

Are there any other cases that you rendered an expert opinion on, that relate to capital punishment?

A I don't -- no, it's been Mississippi, it's been Ohio, and then now Missouri, so I don't -- no.

Q Have you ever rendered an opinion where you concluded that the inmate would not ex -- would experience pain?

A In -- in those three cases -- those three? Or any?

Q Either in those three cases or in some other

matter.

A Do you mean in a legal setting? Or just in general about discussions around capital punishment?

Q Let's start, first, with the legal setting.

A No. I've not been provided any opportunity -- I've never had -- you know, it's only been in those three cases about --

Q What about outside of the legal setting?

A Well, I guess, you know, there's -- we -- I've had discussions in -- in various social settings about capital punishment, but I don't remember anything specific about that, and I didn't -- so...

Q Have you ever had your opinions challenged as being inadmissible under Daubert or a related doctrine?

A I'm -- I'm not familiar with that, so I don't know whether anything I've admitted or anything that I've said has been inadmissible. Do you want to --

Q Do you know what the Daubert motion is?

A No, I don't think -- I might, but I -- I can't tell you off the top of my head.

Q Are you familiar with the concept of challenging an expert's report as inadmissible?

A Yes. Yeah.

Q Are you aware of a report -- a judge ruling that any opinion that you've submitted in a matter was

inadmissible?

A My specific opinion in a case?

Q Uh-huh.

A No. I mean, I know that I -- certainly, with the Ohio case that I just testified at, there -- there was a challenge by -- well, I'm not sure -- I'm not sure challenge is the right word. But, you know, we went through the usual thing, where I was asked questions about my background, and -- and the attorney for the State of Ohio said, "I'd like to stipulate," or whatever word that was used, I forgot what words that you guys use, but admit Dr. Antognini as an expert witness, and there was no from -- from the other side. And then I gave my testimony.

And then when I was being -- under cross-examination, they brought up the issue about my CV, I'm retired, and, you know, walked through that issue about how they -- you know, obviously, they were getting at the issue of can I give expert testimony when I'm retired, which I think I can. But you'll have to decide for yourself, and the Court will have to decide that.

Q But are you telling me that no court has ever ruled --

A As far as I know.

Q -- your opinion as --

A As far as I know.

Q Okay. So going back to your materials reviewed and your November 2015 report, Exhibit B.

A Okay.

Q Let me know when you're there.

A Yes.

Q Who's -- who selected the documents for you to review?

A These were documents sent to me by Mr. Spillane.

Q Did you ask for anything beyond what's listed here as well as under your materials reviewed in your supplemental report?

A I -- I -- I don't know, I mean, I probably did ask for some things. But off the top of my head, I'm trying to think what -- what they might be. Well, for example, I mean, one thing that comes to mind, is that I was -- I was asked to -- I shouldn't say -- Dr. Zivot refers to a scan that was done in 2005 on this inmate, and I don't think that I was ever sent the results of that scan, but he apparently had access to it, and I was never about to find that -- the results of that scan.

And I asked Mr. Spillane about that and I don't think he's been able to find it either. Now, there are over 5,000 pages of medical records that were sent to me. So, again, I told you I was a numbers person, I'm

thinking, "My God. There's a lot of these," so I counted -- I mean, I didn't count them, but you do it in PDF, so there's over 5,000 pages of medical records, so I guess it could be in there, but I didn't see it and he couldn't find it. So that was one thing that I -- I --

Q Anything else?

A Let's see here, so I was interested in what happens during the execution, itself, is there any medical -- not medical. Is there any information about the execution, itself, that would provide guidance to -- to me, but I was not provided that information, you know, I don't know whether they -- what they do in terms of taking records.

I mean, sometimes I think my understanding is, that they -- I don't know what happens in Missouri. But I do remember, I think, seeing from the other cases they had or someone provided me with some notes on Florida executions, and I -- I -- I'm sorry, I don't remember if it's from Ohio, from Missouri, or where it was, but that made me think, you know, is that a type of information available, and I was not provided any information. So I, you know, maybe you don't take that information, I don't know.

Q You -- you did receive and review Missouri's open protocol; correct?

A Yes.

Q Are you aware that Missouri also has a closed protocol?

A Yes. I did not know until I think you used that term this morning, about open versus closed. I know that there's more to the protocol than what I was provided, but I've not been provided the protocol -- the -- the closed protocol.

Q Did you ask to review the closed protocol?

A No, I didn't actually. I did not ask for the closed protocol, as far as I -- I recall. And I think primarily because I had sufficient information with the open protocol to render my -- my opinion. Although, maybe the closed protocol has some information, like the rate of injection, that would have been useful to me. But anyway, I was not provided that information.

Q So is your awareness or understanding of the execution process that Missouri limited to what is in the open protocol?

A I'm trying to think, is there anything -- any other information that I received about the process. I think so, I mean, I'm thinking, maybe, there might have been something that Dr. Zivot would have put in his report that might have -- I suspect it would be the same thing. And, you know, he -- he would have gotten to the open

protocol. So I -- I guess, yes, it's limited to the open protocol. I can't think of where -- where else I would have gotten any other information about it.

Q Is your understanding of the execution process at all informed from conversations with the State Attorney General's Office?

A No. It's not, no. I mean, obviously Mr. Spillane and I have had discussions about, you know, a lot of these issues, but nothing that he said is -- has really informed me about -- it might -- doesn't make my opinions.

Q What did you confer with -- confer about with Mr. Spillane or somebody else from the Attorney General's Office that you relied on in forming your opinions?

MR. SPILLANE: I'm going to object to the form of the question, because I think he just said that I didn't tell him anything or anybody else told him anything that formed his opinions.

But you can answer.

MR. FOGEL: Perhaps, I misheard or misunderstand what the witness said, but if that's true, then you can state as much.

THE WITNESS: Well, nothing that Mr. Spillane said to me, helped me to form my -- my opinion. I mean, there's nothing that he said that I used to rely upon my

opinion. To form my opinion.

BY MR. FOGEL:

Q I'm thinking, in particular, about a statement you put in your materials reviewed. And you say, (reading):

> "I reviewed the pleadings in this case to gain a general familiarity with the matters at issue and a contentions of the parties. I have conferred with the attorneys for defendants."

So just to be clear, anything that you conferred about with the attorneys for defendants, is there anything that you took into consideration when forming your opinions?

A No. No. I'm -- I'm -- no.

Q We talked a little bit earlier about the Pentobarbital package insert.

A Yes.

Q Was that provided to you by the State?

A No. No.

Q Sorry?

A No. I got that off the internet.

Q Okay. Is it your understanding that -- well, does the package insert refer to a specific type of Pentobarbital? A commercially --

A It does.
Q -- manufactured?
A This particular -- this particular package insert refers to the Akorn brand. But that was just -- that was one that I grabbed off the internet.
Q Is it your understanding that it's the same type of Pentobarbital that would be used in Missouri's execution?
MR. SPILLANE: Well, I'm going to object to that question. That's -- that's state secret of what we use, whether it's compounded or manufactured, because it could lead to the identities of the suppliers. So I'm going to direct him not to answer anything that might lead to whether we use compounded or manufactured.
(Whereupon the witness was instructed not to answer.)
THE WITNESS: I don't know what they use.
BY MR. FOGEL:
Q Okay.
A I'm -- I'm told it's Pentobarbital. I just Googled Pentobarbital package insert, and this is the -- one of the first ones that comes up.
Q That's -- to answer my question, the purpose of the question is not to try to get at the origin of the type of Pentobarbital uses, but why Dr. Antognini used that information and how we relied upon it.

A Yeah.
MR. FOGEL: Okay.
THE WITNESS: That's basically, I guess, if you Google those two, I think that's one of the first things that comes up, so that's what I grabbed.
So -- and for the most part, I don't want to say 100 percent, but for the most part, package inserts are very similar, from one manufacturer to the other. I'm not sure how many people manufacture Pentobarbital, but for most drugs, it's going to be the same.
BY MR. FOGEL:
Q I'm looking at your supplemental report now.
A Uh-huh. Uh-huh.
Q At paragraph 6, it talks about large dose of Pentobarbital, such as the 5 grams, would cause respiratory arrest and cardiovascular collapse, leading to death. What was your basis for that understanding?
A So if you look -- if you go to that website, as I recall that's -- what I wrote there, in No. 6, is basically a summary, a synopsis, of what the effects of Pentobarbital are. So obviously, we know that people do not use that dose in a clinical setting.
So this particular website doesn't state that, you know, if you get 5 grams of Pentobarbital, this is what's going to happen. It basically states that if you

use Pentobarbital, these are the risks involved, basically respiratory arrest and cardiovascular collapse. And if you don't resuscitate somebody, you know, if you give somebody sort of a -- I don't want to say a clinical dose, but if you gave them a low dose in a clinical setting, these are the things that can occur. So obviously, if you gave a large dose in an execution setting, you're going to get the same thing.
Q So that understanding that you just explained, is that based on your review of the website article --
A That --
Q -- that you got off the internet?
A That particular statement is supported by that particular reference; although, you know, I've made claims like that in other parts of my reports and they may be supported in the same way, but from different sources, you know, this is not the only source that would support that particular statement. So for example, if you look at the package insert, basically, you would read the same thing.
Q Are you aware that the open protocol contemplates the use of Pentobarbital beyond the 5 grams -- the original 5 grams that are administered?
A Yes.
Q Why do you think it contemplates the use of additional Pentobarbital?

A So my guess is that it's out of abundance of caution; although, it may seem like a paradox when you're talking about the lethal injection process, but it's basically to ensure that, if there were any issues of with the delivery of the first dose of Pentobarbital, you know, you have a protocol that says you can give another dose. But 5 grams, if, again, properly administered through a functioning IV, would be sufficient. But the -- probably -- I don't know why they put that in there, you'd have to ask them, but my guess is, because you want to have that capability.
Q In the event that an inmate did not die from the original administration of 5 grams?
A That's correct. That's my assumption, sure. Yeah.
Q What did you do today to prepare -- or what did you do to prepare for today's deposition?
A I had a nice breakfast with Mr. Spillane, and then we spent a few minutes just going over some of the points that -- the major points that would probably be brought up in the deposition. In terms of the action of the drug, and its ability to produce unconsciousness, how fast it would work. You know, basically telling him this is -- this is -- if I were asked these questions, which I suspect I will be, this is how I would reply to them.

Q Did you review any documents?
A I looked at the reports. I looked Zivot's reports, and I looked at my own reports. I looked at the -- I have a copy of the -- that pharmacokinetics paper -- the one that I cited, not the other one that I did not cite, but I mentioned this morning. I think I looked at that.
Q Aside from that one article, and I think you said it was a dog study --
A Yes.
Q -- do I have that right?
A Yes, correct.
Q And by the way, did it study humans as well? Or just dogs?
A Well, as I said, there is a paragraph -- it's a penultimate paragraph in the paper, and a discussion that they said -- they basically gave Pentobarbital to humans, looking at the EEG and the onset of the -- the change of the EEG with Thiopental and Pentobarbital is about the same time. So I think it's 15 to 30 seconds. They don't state what the dose was in that -- in that paragraph. And then they say that the -- it took Pentobarbital a little bit longer to have -- I think they used the term "full effect." Not sure if that's what it was.
And then -- but within one or two minutes, it

said that it had it -- its full effect. And that was presumably at a dose of -- I don't know what the dose was, but my guess is, it's probably going to be similar to the dose they used for Thiopental, 500 milligrams, 400/300 milligrams, it's not clear because they don't state what that dose is.
Q Well, full effect, meaning death?
A No. Full effect, I think, in terms of consciousness. Now --
Q So it took a minute -- it said it --
A If you want --
Q -- took a --
A -- I can pull it up on my computer.
(Whereupon there was unreportable crosstalk.)
BY MR. FOGEL:
Q We can look at it later.
A All right.
Q I just wanted to make sure I understood what they were studying.
A Yeah, I cannot --
Q And what they were not studying.
A I cannot remember the specific language -- you know, the words that they used, but that's my recollection of, you know, the verbiage basically.
Q Got it. Aside from that one report or study --

A Yeah.
Q -- were there any other documents that you reviewed, in preparation for your deposition, that you did not review in connection with your reports?
A Well, I told you -- I mean, there -- like I said, there are some papers that I looked at, that I said these don't really apply, and I don't remember what they are, but there's nothing -- and there may have been some papers out there that I -- I -- I reviewed that basically -- so there might have been, let's say, three papers that I reviewed and supported a particular point that I wanted to make, but I only cited one of those papers, so there might be some papers like that out there that I -- that I looked at.
But I, you know, there's nothing out there that I -- that I reviewed that supports my opinion, basically, that -- that I didn't include in here. Again, I mean, I -- again, except for the situation, where there may be three papers, as an example, and I only cited one of them.
Q Has your review of any of these materials that you looked at informally/formally caused you to change your -- or modify your opinions in any way?
A No. No.
Q In your opening report, under your materials reviewed --

A Uh-huh.
Q -- is a document 263.
A Yes.
Q Do you know what that is?
A I'd have to -- I -- I don't remember what that is. These are all -- these -- these were documents that were sent to me, and they -- they were numbered, and that's how I put them in there. Is there not a Document 263?
Q Well, there -- there is at least some confusion on our end and perhaps --
MR. SPILLANE: If we could go off for a minute.
MR. FOGEL: Yeah. Okay.
(Whereupon there was a break in the proceedings.)
BY MR. FOGEL:
Q So I want to go back to the opinions we were talking about earlier, that you've rendered regarding whether Mr. Bucklew would experience any pain.
A Yes.
Q And again, I just want to make sure we have this established as the baseline: It's not your opinion that Mr. Bucklew would not ex- -- strike that.
Are you opining that Mr. Bucklew would experience no pain?
A During?

Q During the execution process.
A It is not -- I -- it is my opinion that he would not experience pain except for the insertion of the IV, which I said earlier, but that the injection of the Pentobarbital through a properly functioning IV, would not cause, in and of itself, pain to Mr. Bucklew.
Q So let's talk through the execution process, drawing, of course, upon your understanding of how it works.
And we've talked about Mr. Bucklew being in -- strapped to a gurney or an OR table, some sort of surface. Do you know how long Mr. Bucklew would be positioned in that -- let's call it a gurney for now?
A I do not know specifically. I can -- I have a guess in my mind, but I don't know specifically how long that would be.
Q Does it depend, in part, on how long it could take to find a strong -- a good IV line?
A Yes, it would.
Q And you mentioned that somebody -- I think you used the example, in your clinical practice, you've had patients where you've had to try ten different IV locations; is that right?
A Some patients have gotten that many, yes, maybe -- yeah. I mean, I -- I -- I use that number,

I -- I suspect that some patients that I've -- hopefully I -- not my personal patients, but others that I've seen have had that many IV sticks, so it could be up that high.
Q And that, of course, takes time.
A Correct.
Q Each attempt.
A Correct.
Q And we've established already, that when Mr. Bucklew was lying in a supine position, it's uncomfortable for him to lie in that position; is that correct?
A It is uncomfortable for him, that is -- that is what he reports, yes.
Q Is it your understanding that when Mr. Bucklew describes it as uncomfortable, he is experiencing pain when he's lying in a supine position?
A When -- he -- he states he's got pain all the time, no matter what position he is; and he's got pain in his face. And I -- maybe I didn't say that in my report, but he has pain in his face and in that area, so he's -- he has that as a baseline. So...
Q But I'm -- I'm talking specifically when he's lying in a supine position.
A No, I don't think he describes it as being painful, he just describes it as being uncomfortable. I

mean, the inability -- or having problems with -- with breathing, we've all experienced that for one reason or another, it's not really painful, but it's uncomfortable.
Q Sure. So let me substitute -- or remove pain, and say, when Mr. Bucklew was lying in a supine position for extended periods of time, it creates difficulty for him to breathe?
A Yes. He's going to have more difficulty, absolutely, than somebody else would.
Q Do you know how long it takes to strap him into the gurney? Again, assuming we're having -- using a gurney?
A Just strapping him in, I mean, if he's cooperative or if an inmate's cooperative, it shouldn't take more than -- again, it depends on how many people are doing it. But if they're -- let's say four individuals, I'm just picking four out of a hat because there are four extremities, shouldn't take more than 30 seconds, at most, to actually put those straps on. I -- I -- I think. I mean, based on what I see in terms of those straps that I've seen from the internet, so...
Q After Mr. Bucklew is strapped in, what is your understanding of what happens next?
A My understanding would be that they -- an attempt is made to start an intravenous line.

Q And that's what we were just discussing, looking for a good IV line?
A Correct.
Q Do you know if the State of Missouri uses one or two IV lines?
A I believe the protocol uses two. There's a primary and a secondary, I think is the wording that they use. I think they use two.
Q What is the purpose of using two IV lines to your understanding?
A It's basically to have a backup IV. Where if you have a problem with one IV, you can use the other IV.
Q So when there's two syringes -- I mean, we -- we recall, we've established that there are two syringes containing 50 milliliters of Pentobarbital. And then there's a third syringe of the saline solution; correct?
A That's my understanding, yes.
Q Right. Do all three of those -- and not simultaneously of course, but are all three of those syringes injected into the same IV line?
A I do not know. I -- I'm -- I'd have to review the protocol. I don't remember if they state it goes into the primary line, but I think the saline would go in -- I -- I -- I don't know for sure, but my guess is they all go in through the same line, because if you have the

Pentobarbital go in, and then next syringe of Pentobarbital, and then you have the saline -- you're using the saline to clear the line, so you'd probably be doing it all through -- all through the same IV, is my guess. But I don't know specifically what it states in the protocol and what they do.

Q Well, do you have the open protocol in front of you, which we previously marked as an exhibit?

A I have had it in front of me, and there it is.

Q So looking at section C, under intravenous lines, it says the second sentence, (reading):

"Both, a primary IV line and a secondary IV line shall be inserted, unless the prisoner's physical condition makes it unduly difficult to insert more than one IV."

Do you see where I was reading?

A Yes.

Q So would you agree that that indicates that it is preferable to have two IV lines?

A Well, I think as I interpret that whole section, there, they -- they say that, if there is difficulty, then you would have a central line. And in the secondary line, is the peripheral line. If you read further down.

So I think what they're saying here is, that, you

know, if there's difficulty placing the IV, and you get one IV in, a peripheral IV in, then the -- the other IV can be a central line. But the central line in that case becomes the primary IV line, because it says the secondary -- secondary IV line is the peripheral line.

So I think what they're essentially saying, here, is that, if we have a central line, that's the one we're going to use because that's going to be the most reliable one.

Q Well, all it says is medical -- you're looking at the next sentence. (Reading):

"Medical personnel may insert the primary IV line as a peripheral line or as a central venous line."

A Correct.

Q So one or the other.

And then the secondary IV line is a peripheral line?

A Correct.

Q That's the final sentence?

A Yes.

Q So it still contemplates two IV lines?

A Yes. That's correct, yes.

Q Right.

A I'm sorry.

Q So my question is, why would you want to have two IV lines?

A If there was a -- if there was a problem with one of the intravenous lines, then you could use -- and when I say "problem," if you started to make an injection, it could be -- let's see, hold on just a moment.

So under C2 it says, (reading):

"A sufficient quantity of saline solution shall be injected to confirm that the IV lines have been properly inserted and that the lines are not obstructed."

So, you know, if they had -- if they were concerned about the -- the flow of fluid through that, let's say, the peripheral -- through one of the lines on the peripheral lines, then, you know, obviously, they would use the central line in that case. I guess. I mean, that's -- I -- I -- I'm not trying to provide any -- any input to anybody about how to manage this, but I'm just trying to interpret what they -- what they wrote here, but...

Q Do you think it's more or less likely than Mr. Bucklew -- strike that.

Do you think taking into consideration the state of Mr. Bucklew's -- or the access to Mr. Bucklew's veins,

that it's less likely the state would be able to identify two IV lines?

A It'd be less likely, yes, to identify two peripheral IVs. Yes. I think that's true.

Q When you say "two peripheral IVs," you mean that the state would then need to identify a peripheral IV as well as the central IV line?

A That scenario would be more likely with someone like Mr. Bucklew, compared to an individual -- an individual who had no problems with their -- with their -- with their veins. Now, when I say more likely, I -- I can't really give you number on that.

So -- but I would say in my experience, yeah, you'd be more likely to have problems getting two IVs -- peripheral IVs in someone like him than, you know, someone else.

Q Once the IV lines are inserted into Mr. Bucklew's vein or veins, depending on how many IV lines the state is able to identify, do you know where the Pentobarbital is administered from?

A In -- in -- in -- in the tubing, itself.

Q Into the tubing, itself.

A No, I don't. I mean, there's most intravenous lines have what are called ports, and sometimes -- usually, there are several ports in the line, and one's

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going to be close -- usually, it's close to the IV insertion site and there's going to be another one farther up. I have no idea where they inject it.

Q So do you have any idea how long it would take for the Pentobarbital to run the length of the IV line into Rusty's vein?

A So those -- the volume of that tubing is probably, even at the most distal part, you know, maybe it's -- I don't know, could be 5 MLs, I'm not -- I -- actually, I should probably know that, but I can't remember off the top of my head, it depends upon the size of the IV tubing, but it's probably going to be a relatively small amount.

So I don't know the answer to your question of how much -- how much dead space, is what we call that, in the line because I don't know where the ports are.

Q Right. So you don't know the length of the tubing?

A Yeah. I do not know that.

Q Right. And we've always talked about, you've made an assumption in terms of the speed in which the Pentobarbital is run into Mr. Bucklew's vein; is that right?

A I did. But I do believe that it's important to point out that the, you know, when you give a drug,

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especially when you've given a large bolus of the drug, so you have this tubing going along and it goes into the arm, so all of a sudden you start to inject the drugs and you have sort of this bolus of the drug moving along, and so the injection has started, but it actually hasn't gone into the -- into the patient or, in this case, the inmate.

So it might take five seconds, let's say, for that Pentobarbital to start actually getting into the vein. So if you were to say to me, "Precisely, when did the Pentobarbital actually enter into the inmate?" If I started the injection at 12:00-noon and zero seconds, and maybe it actually didn't enter the inmate until 12:00-noon and five seconds, because it took five seconds for me to put sufficient volume in to get it into him. So -- but we're not talking about minutes. I mean, again, I don't know how fast the infusion --

Q That's all I'm asking.

A Yeah.

Q If you know, one way or the other.

A I don't, sorry.

Q Yeah. Okay.

Once the Pentobarbital starts running into Mr. Bucklew's veins, explain to me what happens.

A The drug will go through the -- the veins and -- and get into the larger veins -- let's say that he

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has peripheral IV -- enter the larger veins of his arm, and go in, through the subclavian vein, and then it would go into the superior vena cava and then it goes into the heart. And then it could go through the right side of the heart, through the lungs, and then back into the left side of the heart, and then it's ejected by the left side of the heart, the ventricle, and it is then distributed to the rest of the body, so it'd go to the brain and other organs. So that's basically how that drug would be --

Q Uh-huh.

A -- distributed.

Q At some point after the Pentobarbital is running through Mr. Bucklew's veins, it's your opinion that he's rendered unconscious?

A Yes. That's correct.

Q And it's your opinion that this would occur approximately 20 to 30 seconds from when?

A It would be about 20 to 30 seconds after the -- my guess would be, the first 10CCs of the drug actually entered into his venous system. So from when it actually gets injected into the -- into the vein, this's -- that's my estimate.

Q Do you have an estimate of how long it would take for Mr. Bucklew to die from the point that the Pentobarbital enters his veins?

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A My -- my estimate is -- is basically around 8, 9, or 10 minutes. Because as I said to you earlier, one of the things that I did look at, were some of the press reports of -- of some of these executions, and they almost always give the time, between the injection and when the inmate is declared dead.

Q And you said approximately eight to ten minutes?

A Yeah.

Q Okay.

A I think that's what most of the reports said. And my understanding is that's public information. I mean, obviously, it is now, because it's in these news reports. So I'm assuming that that's accurate.

Q We've talked a little bit about this already: But it's your opinion that, once Mr. Bucklew becomes or an inmate becomes unconscious, that inmate no longer experiences pain and suffering; is that correct?

A That is my opinion, yes.

Q Okay. And just to make sure I have a good understanding, what is your basis for that opinion?

A So Pentobarbital is an anesthetic that is capable of producing deep unconsciousness and coma, as we discussed before. And you can actually do surgery with Pentobarbital. And with -- just like with any -- any other anesthetic, patients do not report pain and

suffering during -- when they have a normal, properly administered anesthetic. They don't report pain and suffering after the operation -- that they experienced during the operation.

Obviously, they may have pain and suffering afterwards, because they have an incision, and they're painful from that. But during the operation, itself, they don't report anything like that because they're unconscious. So that is the important thing to consider about, would somebody be suffering during the effects of Pentobarbital? And I think that's the primary thing that I'm looking at.

The other thing to consider is that the Pentobarbital is being given in a very large dose, so you're going to achieve that endpoint more quickly. The third thing to remember is that, in addition to the anesthetic effect of the Pentobarbital, you're going to get essentially cardiovascular collapse. It's my -- I don't -- I don't, I mean, just based on the action of a drug and what we see with -- with Thiopental, for example, you're going to get a really low blood pressure. And then as I described in my report, hypoxia, and then the heart starts to slow. So, I don't see how you could -- how anybody could -- could have suffering and pain during that process.

I mean, once you become unconscious, the rest of it is downhill, I mean, I'm not trying to make light of it, but that's basically everything's going down hill. The blood pressure's going down, the neurofunction is going down, and it's irretrievable or just irreversible, I should say.

Q What is your --

A It's irreversible. You couldn't -- I just don't think it'd be possible to resuscitate somebody out of that -- out of 5 grams of Pentobarbital.

Q Understood. But isn't that a separate question from whether they're experiencing pain before they enter -- declared dead?

A Yeah. Maybe you're right, maybe I went off a little bit more information than was needed to answer the question, but I'm kind of looking at the overall process. And I think, maybe, part of that is -- is -- is -- is informed by Dr. Zivot's opinion, which I think -- again, I'm sort of paraphrasing, but -- or interpreting what he's saying is that, somehow Mr. Bucklew is going to be in this sort of zone where he's semi-awake and semiconscious. And he talks about -- he, being Zivot -- that, this could be anywhere from, you know, sev- -- it could be anywhere from several minutes, because Missouri has it in their protocol that they're going to have five -- they're going to give

another 5 grams in their protocol if they need to, but my question really about that is, how -- how -- well, how can you explain or support that statement? How -- how is Pentobarbital and the doses given going to keep an innate in this sort of semi-awake zone for several minutes?

It just -- if you look at the action of the drug, if you look at the kinetics of the drug, if you look at how it affects the brain and its -- and the cardiovascular system, I just don't see how you can make that statement.

I mean, this -- this drug will cause a rapid onset of unconsciousness, 20 to 30 seconds is my opinion, could it be a minute? Maybe. And then it's going to -- it's going to -- just going to be a deepening and deepening unconsciousness, to the point of coma and brain -- or electrical silence. Cardiovascular collapse.

I don't see how he, Dr. Zivot, can put together this picture, where it's going to be this prolonged period, where the inmate is going to be in this state of semiconsciousness and -- and experiencing these symptoms of pain, and suffering, and choking. I just cannot piece it together with the information that I've been provided and the information that I pulled from these articles and so forth.

Q Is there any medical equipment that could be used to determine whether or not the individual is experiencing

pain?

A Not in the current clinical use. There have been attempts in the past to try to determine whether people are experience -- if anesthetized individuals are responding to a noxious stimulus in the way that would indicate to you -- to the inclination that they are -- well, they're not -- not really, they're experiencing pain, but they are -- but that the body is responding physiologically to the -- to that stimulus.

We don't have that right now, I think there is some companies working on it, but we don't currently have that. As far as I know.

Q Could Mr. Bucklew experience feelings of suffocation and choking after the administration of Pentobarbital?

A Only during the period, where he's still conscious. But after he becomes unconscious, no. I mean, he, you know, once that injection starts, as -- as I've already said and you've asked about, it does take some time for the patient -- for the inmate to become unconscious, and I'm seeing it's 20 to 30 seconds after that first, say, dose of 500 milligrams or so, thereabouts, gets into the -- into the inmate. But after that, no, he's -- he's not going to experience any sensation of suffocation or choking. It's my opinion.

Q From the point of unconsciousness? Therefore --
A Correct. Once he becomes unconscious.
Q What if Mr. Bucklew started bleeding from his hemangioma?
A He -- he would not -- if he's unconscious, he would not experience suffering from pain from that bleeding, no.
Q Could he start bleeding from the mouth, where the hemangioma's located?
A He could. But if he was unconscious, he wouldn't -- in my opinion, he wouldn't be suffering or be feeling it.
Q How do you know that he would not be suffering or experiencing it?
A Because he's unconscious, so you don't -- as I -- as I mentioned earlier, you -- in -- in my opinion, suffering is a something that you have as a conscious experience. You don't have suffering and pain as a unconscious experience.
But I've also been very clear that you can certainly have physiological responses to various stimulation -- various stimuli of when you're unconscious. So as an example, brain-dead humans, if you do -- obviously, brain-dead humans are -- are organ donors. And by definition, you wouldn't necessarily need to give an

anesthetic because they're brain-dead. But in fact, you do need to give some anesthesias and some drugs because they have physiological responses to the noxious stimulation to the surgery, their blood pressure goes up, their heart rate goes up, that's a -- a reflex that they -- that the brain-dead humans retain.
So yes, you can have these physiological responses to these different types of stimulation, but that doesn't mean that they're suffering or have pain. I mean, obviously, example of the brain-dead, but by definition, they can't because they're brain-dead.
Q So what -- what information are you relying upon?
A For what?
Q To -- to say what you just asserted.
A I -- based on my clinical experience, because I have provided care for brain-dead humans, who are organ donors. And then also, based on my review of literature and some of the research that I have done over the years. Some of my research is related to where the anesthetics work in the body, so that was part of my -- my review of that area.
Q Are you familiar with anesthesia awareness?
A Yes.
Q What is it?
A That's a term that usually is used to describe

somebody who is aware, awake, conscious during a surgical procedure, usually because of insufficient anesthesia that was provided, that -- sometimes it's because it's -- it's an error or an oversight, sometimes it's because we just can't give enough anesthetic to a person, so if it's a patient that's been in trauma and they've lost a lot of blood, then you can't, you know, you can't provide anesthesia to them -- or as much anesthesia to them. And in my own practice, although, as I've mentioned to you, I don't practice clinically anymore, but in some trauma patients, there have been times where I've whispered in their ears during surgery, and I've said to them, "Mr. Jones, I know that you might be awake, and I know that you might be experiencing this, but I cannot give you much anesthesia because you are so sick right now. And I'm going to do the best that I can."
And I did that and I taught residents to do that, because when you -- when you review the literature on this, patients who have suffered anesthesia awareness said -- a lot of them just said, "I wish they knew that I was awake," and this is one way -- you don't know for sure that they're awake, and we have monitors now that -- not entirely accurate, but, you don't know whether they're awake or not. So you can do it to everybody and -- and hopefully they are not awake, but that was my practice at

least. So yes, I'm very familiar with anesthesia awareness.
Q Is it possible that Mr. Bucklew could experience anesthesia awareness? Taking into consideration, of course, that he would not be alive at the end of the experience to recount it?
A I don't think that's a possibility. If something wrong happened with the administration of the drug, and as we already discussed, I do not, especially with the dose that is used, I do not think that he would experience anesthesia awareness, no.
Q You talked about, I think there was three end goals in the context of anesthesia?
A Yes.
Q One of them was amnesia?
A Yes.
Q Do I have that right?
And you -- there was an amnesia agent. What is the purpose of the amnesia agent?
A The purpose is to block memory. And an anesthetic, by definition -- and when I say "an anesthetic," I mean, one drug that produces the state of general anesthesia. So that drug has to have -- has to be capable of producing those three end points to be called a general anesthetic, and that's my medical and scientific

opinion based on many years of thinking about this and doing research on that. As opposed to a drug that may cause amnesia, but it wouldn't produce necessarily the other end points of --

Q I -- I -- I understand.

A Okay.

Q But why do you want there to be an amnesia component to the anesthetic?

A Because patients don't want to remember their surgery.

Q Why do they not want to remember their surgery?

A Because it would be an unpleasant experience.

Q Because there would be some sort of suffering or some sort of painful --

A That's -- that's true.

Q -- component to it?

A Yeah.

Q So how do you -- so if you want to suppress that by making it so they can't remember, so doesn't that suggest that there is, in fact, some pain and suffering while the patient is under an anesthetic?

A No, it doesn't. You're -- you're trying -- there -- there would be pain and suffering if they were awake. But you're giving them a drug that makes them not awake and -- and removes that --

Q But also a drug that helps them forget it.

A That is -- that is -- that is true. Yes, it does because -- because the -- let's see -- so not, you know, we wish you could do this 100 percent of the time, but some patients, of course, we have difficulty with. And the trauma patient, I'm going to, again, give the example. You know, we have some choices, I guess, and I'm not saying necessarily in a clinical sense, but just in terms of how these drugs work and why they're chosen, but, you know, I guess -- I guess the -- the -- the first goal would be: I don't want the patients to -- to remember this. I mean, there may be patients that are, quote, "awake," but I don't want them to remember that --

Q Okay.

A -- part.

Q Why do you not want the patient to remember it?

A Because that's -- who would want to remember their surgery? Or their -- that -- that experience. I mean, that's -- that's the first --

Q And my follow-up question to that was, is it because there's a pain and -- component to the procedure?

A Yes. Absolutely.

Q Okay.

A Absolutely.

Q So why -- how do you reconcile that with your

opinion that somebody who is unconscious does not experience any pain and suffering?

A Because as -- yeah, we're not -- we're sort of going in circles, here, on this. I can tell.

As you give an anesthetic, one of the first -- so of the three components that I described, blocking memory formation is one of the first ones to occur. And then very soon after, you -- patients become unconscious. Very soon after. But they're very close.

And then farther, higher doses, you finally block the movement response. So if -- if -- if I am saying to myself, well, all I want to do is, I -- I just want to block the memory, well, unfortunately, our drugs are not -- the drugs that we use do not provide me much wiggle room in that regard. So that is, if I provide just enough to block memory, then may not be enough to -- to produce unconsciousness. And I want to get past that. So I have to give a larger dose.

I'm not sure I have answered your question, but pain, I -- I -- I don't deny the fact, and I admit it freely, that pain and suffering can occur in awake individuals. No doubt about it. And that could be pain and suffering from surgery, it could be pain and suffering from other experiences. Whatever.

But in -- on my -- in my sort of opinion, as I'm

a scientist and a physician, pain and suffering are words that we use to describe experiences that awake individuals have relative to these different types of situations or stimuli. So once somebody becomes unconscious, I don't consider them to be in the situation where they are -- or a state where they can have pain and suffering because you have to be awake in order to have that. I can't -- I'm not sure I can make it any more clear to you.

Q So once -- you're -- you're assuming entirely that a patient -- or, in this context, the inmate is unconscious?

A (Inaudible response.)

Q So when we're asking specifically regarding any pain and suffering that an inmate may experience during the execution process, as soon as the patient becomes unconscious, the period thereafter is irrelevant.

Is that your opinion?

A That is my opinion, yes.

Q So the length of the execution process, the endpoint being when the inmate is declared dead, is a moot question -- or moot point for you; is that right?

A As long as you're maintaining the unconscious in a continuous basis, which, they are, based on my understanding of, again, how the drug works and how, you know, the timing and all that, yes.

Q So if Mr. Bucklew's hemangiomas continue to bleed when he was lying in the supine or whatever position he may be in -- as long as he's -- and blood is coming out of his mouth, as long as he is unconscious, he's not experiencing any pain or suffering in your opinion?

A That is correct.

Q And is it your opinion that as a medical fact, he would not be choking or he could not suffocate -- experience suffocation because he is unconscious at that point?

A That is correct.

Q And is this all based on the assumption that Mr. Bucklew is, in fact, what you're define- -- on what you're defining the far end of the unconsciousness spectrum?

A That is correct. And again, I base this opinion on -- I mean, we're -- I -- I realize, we're kind of focusing on -- and as we should -- on this particular inmate and the issues around choking and sensation. But remember, Pentobarbital is an anesthetic. And what kind of procedures can we do on patients with an anesthetic? I'll use myself on the example: I had heart surgery. They split my chest open, spread my chest, replaced my heart valve. Okay? Patients have had abdominal surgery where their incision, from stem to stern, for trauma

patients, from here to here. In orthopedic surgeries. These types of procedures that go on for hours, are infinitely -- maybe that's little bit of a hyperbole -- but are much more capable of inducing suffering and pain than, you know, the choking and gasping and so forth sensations that we are discussing here.

And why are we able to do those types of procedures? Because this drug, like many of the other general anesthetic drugs, they're anesthetics. So if we're capable of doing those types of procedures on individuals, and I think that -- that the consensus is that those individuals are not suffering or having pain during those procedures, in the sense that we're talking about, which is that they're awake, then yeah, I think that you're -- once this Pentobarbital begins to occur, choking or the blood in the airway, that kind of thing, it's not that -- I mean, it's stimulating, we all have experienced stuff in our airway, but it's not stimulating to the extent that these other procedures are. And, again, large dose of an anesthetic, I just -- it's -- I don't see it happening.

Q Do you agree that any length of any time in which an individual is choking is painful?

A If they're awake, would -- yes. They would be in pain or -- or suffering. I'm not sure, again, we've

already talked about this, I'm not sure pain is the right word, but they would be suffering.

Q Do you agree Mr. Bucklew, as a result of his condition being cavernous hemangioma, the difficulty or the challenge in accessing his IV lines, the uncomfort -- or discomfort he experiences when lying in a supine position, again, assuming he would be in the supine position, do you agree that Mr. Bucklew is more likely to experience a more compacted airway during the execution process?

A More likely compared to what? Just his normal state? Or just a normal individual?

Q Either one. Certainly his --

A Yeah.

Q His --

A It's more likely -- I think it's more likely that he would have those symptoms compared to a normal individual, because he already has those symptoms. And lying flat is more of problem for him, and -- and he says that and I don't disagree with that. Now, can he tolerate -- as I said earlier, can he tolerate that? Yes, he has been able to do that.

Q But lying in a supine position for an extended period of time would introduce additional stress or difficulty in his ability to breathe. Do you agree with

that?

A Yes. That would be increasing his risk for that or -- or that possibility, yes.

Q And the challenge in finding an IV line, would introduce -- has a potential to introduce additional stress into Mr. Bucklew as well?

A Yes. I would agree with that.

Q And that additional stress has the potential to make it even more difficult for Mr. Bucklew to breathe?

A Yes. That could happen. Yes, I agree with that.

Q And as a result of these factors that we've discussed, it's possible Mr. Bucklew could experience a sensation of choking or suffocation?

A While he was awake, yes, that would be -- that would be possible.

Q So there's an increased risk of pain and suffering that you acknowledge exists up until the point of unconsciousness. Is that your opinion?

A I would agree with that. So -- and you -- you're probably not going to be willing to -- to -- to assign a numerical value to that, but -- because you're just saying increased risk, and so increased risk would be -- mean, going from 1 in 1,000 to 1 in 100 chance. I don't know what the number would be, but just because it's increased, doesn't mean it's substantial or likely.

Q Well, Mr. Bucklew has an increased risk of this, certainly in comparison to other individuals who do not suffer from cavernous hemangioma?

A That is true, yes. He has increased risk compared to a normal individuals.

Q And increased risk compared to individuals who don't have a Mallampati 4 airway?

A Yes. That's true.

Q If you were to able to determine that it takes significantly longer than 20 to 30 seconds for Mr. Bucklew to become unconscious from the administration of Pentobarbital, would that affect the opinions you've rendered in this case?

A I don't think so. I would say however, that -- so if -- if it took longer, than 20 to 30 seconds, it would certainly increase the amount of time that he -- there is a potential for him to -- to have, you know, the sensations of choking and so forth that he described.

But I have to leave it to the Court to decide whether that's a substantial -- substantial risk or not, or an increase in the risk, I just don't know. I don't have any -- I can't really give you an opinion about that, because I don't know what that -- from I guess a legal perspective, and I know that's a term that's used, I don't -- I'm not sure if that's substantial or not. I

really don't.

Q A substantial amount...

A Of risk. That it would be a substantial increase in the risk for him or a substantial risk for him, compared to, you know, if it went -- if, instead of it taking 20 to 30 seconds, it took two minutes, is that a substantial risk or an increase? I don't know. Because a substantial is a -- is a term that -- that's open to interpretation.

Q Right. And -- and -- and maybe I should rephrase the question, so we can move away from the substantial risk. But if it appeared, in fact, was two minutes as opposed to 20 to 30 seconds, then that period of time in which Mr. Bucklew would be experiencing suffocation and/or choking?

A Well, that risk would be there. But you're -- I think you're assuming that he -- he will have, you know, if he does have choking sensations as the drug is being administered, and it takes two minutes for the drug to work, then yeah, I mean, it's going to be two minutes instead of the 20 to 30 seconds that I described.

Q Uh-huh. Right. And I'm not asking you to make a legal determination --

A Uh-huh.

Q -- of 20 to 30 seconds versus two minutes --

A Yeah.

Q -- in terms of what is an acceptable level of risk?

A Right.

Q My question is more focused on your medical assessment. In terms of his -- during that additional minute-and-a-half or two minutes, would Mr. Bucklew be experiencing or there be an increased likelihood that Mr. Bucklew would be experiencing suffocation or choking?

A There would be an increased likelihood because of the reasons that I've already provided to you: Because he already has those symptoms, and, you know, we're going to -- if you're going to make it longer then there's an increased risk just because of the length.

Q I believe you stated in your report that if Mr. Bucklew started bleeding from his hemangioma, he would not notice; is that right?

A If he was unconscious.

Q Right.

A Yes.

Q So again, we're assuming he's unconscious.

A Yes. Right.

Q Is it possible that he could bleed to an extent that it would be coming out of his orifices?

A Yes, that is possible.

Q Are you aware that Mr. Bucklew takes certain nervous system depressants?

A I -- in review -- yes, in review of his records, I -- I saw that he is taking several different types of CNS drugs. Although, quite frankly, off the top of my head, I know that they've changed over time so I don't know specifically what he's taking right now, as of today.

Q What were the drugs, as of the time -- or what drugs are you familiar with that he's take in the past?

A I have to look at the medical records, I don't recall specifically off the top of my head.

Q Does Clonazepam sound familiar to you?

A That sounds like one of them, yes.

Q What about Tramadol?

A I think he took that, but I -- again, I --

Q Right. Sorry. I'm not trying --

A I know.

Q -- give you a memory test.

A I just don't remember exactly what drugs he's been on in the past, and that's now off of, and what he's on now, so...

Q Is it your opinion that -- again, assuming Mr. Bucklew is taking these depressants, that any interaction between these depressants and the Pentobarbital would be inconsequential?

A Yes. And that's based on my -- you know, the dose that's used, it's just going to be overwhelming. The, you know, the dose is overwhelming compared to any effects that they might have between the -- those drugs and the Pentobarbital.

Q What effects could the drugs have at a lower dosage of Pentobarbital?

A So basically, you could have what are called additive or synergistic effects where the two drug act together to produce more of an effect than the drugs acting separately.

Q Uh-huh.

A Or they could just be additive, where they just add -- you know, work together in the same amount, so they produce more unconsciousness or whatever effect that you're looking at. Those -- those are some of the interactions that you would have.

I know that -- well, that -- that's just, you know, that's the main -- I think the main effect. Which, again, when I -- in my report, I said basically, it's -- it's essentially going to be an additive effect anyway. I mean, you're using such a large dose that it's not -- it's not important. It's irrelevant more or less.

Q Can you turn to Paragraph 14 of your supplemental report.

A Uh-huh.

Q And I believe you state here that Pentobarbital is an anesthetic?

A Yes.

Q And by definition, anesthetics prevent awakening from stimuli including airway obstruction?

A Yes.

Q So by medical definition, Mr. Bucklew, if he was starting to choke, would -- that would not inhibit him from succumbing to the effects of the Pentobarbital?

A No. Not in -- not in this -- not in the dose of -- that's being used. So if -- if you could give a dose of Pentobarbital or whatever anesthetic you're using, and you could get into that fine, fine line, that level where, you know, somebody would respond to a type of stimulus, such as airway obstruction, then, yes, that -- that type of stimulus could wake somebody up. If you're at that very, very narrow window of -- of concentrations.

But that's a very low concentration of the drug, and -- and, of course, the Pentobarbital, in this setting, is at a much higher level. So they're not in that period for more than probably a second or two is my guess.

Q Could -- if a patient --

A Or a couple -- you know, maybe more than that, maybe ten seconds.

Q If an inmate is experiencing suffocation and/or choking, could it affect the distribution of the Pentobarbital?

A No. No. No. No. No. No. It wouldn't.

Q What if the suffocation or the choking was to such an extent that the inmate started convulsing?

A Convulsions, I don't know why you want to use that term, because you're not going to get convulsions in this type of setting because Pentobarbital is one of the drugs that you would use to prevent convulsions and so maybe you can clarify about why you think obstruction would cause convulsions.

Q Well, if the patient -- excuse me. If the inmate is experiencing some sort of a choking reaction or a gasping for air before the Pentobarbital has presumably taken full effect, as you've defined it, could that lead into some physical reaction or physical movement of the body?

A It could, but that's not what convulsion is. We don't use that term for that type of movement.

Q Maybe I was using that imprecisely.

A That's why I got thrown off base by your --

Q Well, that's why you're the expert, to keep me in line. I appreciate that.

So could the physical reaction, through the

experience of choking, affect the distribution of the Pentobarbital?

A Well, I guess if the inmate was moving to sufficiently where it interfered with the flow of the IV, right? So, you know, I don't know where these straps are located, and it's obviously relative to where the IV is located, but I suppose if the individual was moving around or -- or -- or basically pushing up against the -- the strap where an IV was placed, then you could obstruct the flow of the fluid going through that. So that would be -- that would affect the distribution of the drug.

Q Is it possible that it could dislodge the IV?

A Yeah. I mean, if somebody's moving around, absolutely. If it's -- especially if it's a tenuous IV, so...

Q And then, of course, if the IV is dislodged --

(Whereupon there was a telephonic interruption.)

MR. FOGEL: Pardon me. If I'm not -- sorry.

THE WITNESS: It's okay.

BY MR. FOGEL:

Q If the IV is dislodged, that would necessarily impact the distribution of the Pentobarbital?

A That is correct.

Q Is an anesthetic the same thing as an -- and I'm probably going to mispronounce this -- anesthesia?

A No.
Q What is anesthesia?
A So anesthesia is a term that would be used to describe the -- the -- the state or condition that is produced by an anesthetic. So for example, Pentobarbital is an anesthetic, it produces anesthesia. And what is anesthesia? Again, going back to my three end points, it's immobility, it's unconsciousness, it's amnesia. The ability to -- to -- to do surgery procedures and have those end points, that's sort of what anesthesia would be.
Q Are you familiar with analgesics?
A Analgesics.
Q Analgesics, thank you.
And those are designed to prevent pain, I think we talked about earlier?
A That is correct.
Q And we've also talked about that anesthesia is also designed to cause amnesia.
Do I have that right?
A That is correct.
Q And it's your opinion that Pentobarbital would achieve all of these results? Unconsciousness, lack of pain reception, and amnesia?
A And immobility.
Q And immobility.

A Yes.
Q And how do you know this?
A The Pentobarbital would do that?
Q Uh-huh.
A Because Pentobarbital is an anesthetic, and you can give it in sufficient doses to produce that type of picture or that -- that state. Pentobarbital's used -- I don't think it's used -- as I said earlier, it's not used at all, clinically, for that particular, you know, in that setting. It could be used in animal studies or animal experiments or animal surgery; although, even now, veterinarians don't do it because it's such a long-action drug. At the dose that you need to give, it would last too long.
Q Understood.
A Yeah.
Q Understood.
So to what extent did you rely upon Mr. Bucklew's medical -- excuse me, the records from his prior surgeries from 2000 and 2003?
A I relied -- I think it was an important part of my analysis because one of the issues that came up initially, and maybe it's still -- it will be a factor, I don't know, but it has to do with distribution of the drug. That -- that there is a contention that this

hemangioma would affect the distribution of the Pentobarbital. And so my -- the process that I went through to refute that is that well, he had that hemangioma back in 2000 and 2003, and it was a low-flow hemangioma, and he reacted normally to the anesthetics. And that is -- the that the documentation was that he was unconscious, he did surgery, he reacted normally. So I think that was an important piece of information to show that he doesn't rea- -- he would not react abnormally to anesthetics.
Q Did you take into consideration the fact that those procedures were 13 and 17 years, respectively -- 17 -- 13 and 17 years ago, respectively?
A I did and I thought about, well, how -- how much larger has the hemangioma gotten, has it changed its characteristics? And it has not, based on my review of his medical records. So, for example, the hemangioma was slightly smaller when comparing 2010 to 20- -- 17 -- '16, slightly smaller. The -- he had an angiogram done in -- I'd have to review the records, I forget exactly when the angiogram was done, but it was done at some point, and it showed that it was a low-flow hemangioma, so it showed there wasn't much blood flow it to.
The image study that he had done in 2016 used a -- what's called CTA or computer -- computer demographic

angiography, I think I got that right, I may have it a little bit off, but CFT for short. They can use that technique to look at the blood flow of the hemangioma, there was low blood flow to the hemangioma. So the characteristics of that hemangioma, in that regard, have not changed over the years, so I don't see how it could have...
Q But aren't those procedures different because they were affirmatively trying to control for Mr. Bucklew's blocked airway? I -- I -- I can't recall, perhaps, if there was a kaleidoscope or some sort of tool that was used to control for his breathing?
A During?
Q The 2000 and 2003 procedures.
A No, I don't think so. I think they just used direct laryngoscopy.
Q Well, they used some sort of device to control for his blocked airway.
A But it's just the device that they normally use.
Q But that device would not be used in the context of an execution.
A There would be no reason to do so.
Q Right. So aren't there fundamental differences between how Mr. Bucklew reacted during those procedures in 2000 and 2003, as he would during an execution?

A No, I think you're -- you -- you, and perhaps, Dr. Zivot, are -- are -- are conflating and -- and putting together the issues around the airway management with his reaction to the anesthetic drugs, themselves.

Q And you're saying that he would react the same?

A Correct. Because as you well know, Dr. Zivot and -- and Dr. Wippold, and Jamroz, but primarily Dr. Zivot said, at least in some of the initial reports that I read, that there would be an abnormal distribution of the drug. And that's just not true. And it doesn't make any sense to me in terms of the anatomy or physiology of this hemangioma.

Based on my understanding of how these hemangiomas are -- their structure, and just to prove my point, the inmate had surgeries in 2000 and 2003, when the hemangioma was quite large. I don't know what it was compared to what it is now, but it was large enough that he was having treatment for it, and in -- reacted normally. So that is separate from the airway issue.

Q Right. Okay. And so that's the distinction, I think we're -- we're just talking past each other. His procedures in 2000 and 2003 do not tell you anything in terms of how he may or may not have experienced feelings of suffocation or be choking during an execution process?

A I wouldn't say they don't tell me anything,

because he did have a large hemangioma then. Unfortunately, I don't know how large compared to what size it is now. But it was described in the records as being, again, large. I mean, that's sort of one of the terms that was used.

Q Right. But they controlled for his airway --

A That's correct.

Q -- during the course of the procedures, which, of course, they would not do during the course of the execution?

A That is -- that is correct. But it's -- but it's controlling -- they were controlling for his airway when he was unconscious, and, again, it just doesn't matter to me what's happening because he's unconscious in terms of the lethal injection process.

Q One of your conclusions --

THE REPORTER: Are you moving on to a new subject? I need a break.

MR. FOGEL: Okay.

(Whereupon there was a break in the proceedings.)

BY MR. FOGEL:

Q Dr. Antognini, we were talking about the fact that choking may have under the distribution of the Pentobarbital. What about the bleeding from Mr. Bucklew's hemangiomas? Could that have an effect?

A No, I don't think so.

Q Even if the blood with was coming out of his orifices?

A No. It wouldn't affect the circulation of the drug. Well, so I'm -- I'm going to make sure, it has been -- it's getting -- been a long day, I may not be as focused as I should be. Can you repeat the question.

(Whereupon the record was read.)

THE WITNESS: Could the bleeding have an effect on the distribution of the drug, was the question --

BY MR. FOGEL:

Q Correct.

A -- I believe.

Okay. No. If -- I mean, if he had -- if somebody had massive bleeding from something, and by massive, I mean, we're talking about hundreds of MLs or thousands of MLs, that kind of setting, that of course affects the distribution of drugs. Because it's distributed by the bloodstream, so if you're bleeding -- but even bleeding from a hemangioma of this type, you know, wouldn't affect that because it's a low-flow hemangioma. The blood flow to it is low, relatively speaking. So you're not -- so there's not going to be a lot of blood actually going through that. Of course, it's in a sensitive area, I admit and agree with Dr. Zivot that

in the awake condition, Bucklew could have choking conditions from the bleeding, but it's not enough to affect distribution of the drug.

I'm trying to think of a scenario whether either the choking sensations or the bleeding, itself -- I mean, there is a -- and I'm, you know, I don't mind saying this, you know, you might think it's pertinent or not, I mean, it's not because, again, we're talking about a massive dose of drug. But if somebody is choking, it could affect the mechanics of blood flow through the -- through the thorax, basically. But that's, again, sort of small compared to the overwhelming effect of it in terms of the dose of the drug that's being given.

And the main thing that's going to affect distribution of this drug, in my opinion, is the rapid onset of hypo- -- severe hypotension. And that doesn't actually help in your case in any way whatsoever. Because when that blood pressure drops from that Pentobarbital, it -- the one thing that -- that keeps -- that brings the blood concentration down of a drug -- I shouldn't say the one thing -- but the main thing in this particular time period, the one thing that brings the concentration of the drug down, is that it gets redistributed to other organs, so the brain is what we call a high-flow organ, the heart is a high-flow organ, it gets a lot of blood flow.

So the drug starts to go there first, but then, you know, there's blood flow to other tissues, so the drug gets -- we call it redistributed to other tissues. But that's not going to happen in this setting, because that severe hypotension that happens, the circulation is essentially going down, close to zero, and you're not going to redistribute that drug. So the drug that's in the brain now, normally if it was a low dose, it would be sort of washed away, and it's not going to happen in this setting. So it goes into the brain, and it stays there.

Q So going back to my original question --

A Yeah.

Q -- which is just --

A Yes. Yes.

Q -- regarding the blood -- the bleeding from Mr. Bucklew's hemangioma, which you've acknowledged is a possibility that could happen as a result of the execution, the answer to my question is, you do not think it could affect distribution of the Pentobarbital?

A Right. Correct.

Q You've also rendered an opinion regarding lethal gas?

A I did say something about that, yes.

Q And it's -- I'll read it directly from your opening report. And it's at paragraph 26.

A Yes, I see it.

Q You said, (reading):

"The use of lethal gas would not significantly lessen any suffering or be any less painful than lethal injection in this inmate."

Why does lethal gas not hold any advantage compared to lethal injection?

A Well, essentially, because I think that the -- I use the term lethal gas but there are several -- several types of gases -- maybe more than several, there are a lot of types of gases that could be used for -- for -- to kill somebody, I guess. They're not necessarily ones that will be used or have been used in executions.

You know, the one that comes to mind is cyanide gas, and, you know, I -- I don't know if anyone's used nitrogen in an execution, I don't know the answer to that question. I -- I think somebody has, some state has done that, but I'm not positive about that. And those have effects that may not be pleasant either, but it would be short-lived, just like it is with the Pentobarbital.

So that's why -- I mean, I do -- I -- I, you know, drew a conclusion and I said I didn't think in my opinion that it would -- you know, using gas would not significantly lessen any suffering or be less painful.

Because, again, their onset of action is going to be relatively fast, just like Pentobarbital's onset -- onset of action. So that's why I -- I drew that conclusion.

Q That's it? Simply because it would happen quickly?

A Correct.

Q You think there would be no difference?

A That's --

Q Did you take into consideration what position the individual might be sitting or lying in?

A No. I did not, no.

Q Did you consider the fact that using lethal gas would not require the use of accessing an IV line?

A I did not. I mean, I -- obviously, I know that. But I don't think that the -- inserting an IV line is, as I said, significantly increasing the -- the -- the amount of pain.

Q Right. I mean, we've -- we've --

A Yeah.

Q -- talked plenty --

A Right.

Q -- about your opinions --

A Yeah.

Q -- and understandings regarding accessing Mr. Bucklew's IV lines.

But what -- what are you relying upon, in terms of how a lethal gas execution operates, to form this conclusion?

A Let's see. Again, I -- I referred to I believe examples of nitrogen and of cyanide. Because I know -- of course, we all know cyanide has been used in the past, that was used in California and elsewhere. I don't know whether other gases that have been used in executions --

Q Sure. Putting aside --

A Okay. I know --

Q Okay. Okay.

A I just -- I want you to know I'm trying to answer your question in giving you the background of why it formed my opinion.

So I thought in mind, okay, well, how does cyanide work and how quickly does that work and what kind of suffering may be occurring? And I'm, quite frankly, thinking about, you know, maybe -- as I look back in my review of this, at this -- at that point, I did probably look at reports of cyanide, you know, using cyanide as a lethal injection, and -- and I think that those could be -- to -- to use a rather -- not -- maybe not the best term, but it could be kind of messy. In the sense that, you know, inmates can be -- can have convulsions from the -- from the cyanide, and that might be true for the

nitrogen, so I'm -- I'm looking at, you know, the -- the pain and suffering that might occur from Pentobarbital compared to what my understanding of lethal gas would be and that's why I formed that opinion.

Q Right. And my -- my question is, what informed your understanding of a lethal gas?

A So for the cyanide one, I guess it'd have to be, I might have reviewed -- I -- I really don't remember. But I'm not trying to be evasive about this.

Q Is there anything in your materials reviewed that you could point to?

A No. I didn't put that in there. No, I did not. Now, as far the nitrogen part, just based on my -- my experience, my scientific experience -- not the right word. My scientific knowledge of -- of using nitrogen, when you go from, you know, air is 80 percent -- 79 percent nitrogen. When you go from 79 percent nitrogen, now to 100 percent nitrogen, you know, you quickly achieve hypoxia and somebody would be unconscious very quickly and, you know, it depends on how quickly the gas is introduced and all of that.

So I -- again, I'm just saying sort of based on what I know, that's why --

Q And how do you know how quickly a gas is introduced?

A Well, I don't know that. I mean, it could be introduced very slowly and cause a lot of suffering, I guess. You know, you get -- you can get suffering from hypoxia, you know, because somebody can be awake and realize that they're not getting enough oxygen. So depending on -- on how it's used, you might get more suffering from nitrogen gas than you would have Pentobarbital. Or you might get less suffering, you know, it depends on how you would use it, I guess. And I'm not making any recommendations to anyone about how --

Q Understood.

A Yeah.

Q I'm just still trying to get at my first question, which is, how you -- what you are basing your conclusion on, that lethal gas would cause significantly less -- excuse me, strike that.

What you're basing your conclusion on, that the use of lethal gas would not significantly lessen any suffering or be less painful than lethal injection?

A Well, I already said to you, I looked at -- my recollection is, I suspect I looked at some information on -- on the use of -- of cyanide as a lethal gas, and then I just looked at -- or had my -- my understanding of what happens with hypoxia based on over the years. I mean, obviously, as an anesthesiologist, we're very

concerned about hypoxia and we study hypoxia and all of that, and that's how I came to that conclusion. But it's not -- I -- I will admit that it's not perhaps as well founded as some of my other conclusions.

Q Are you relying upon any information that you were given by the Attorney General's Office --

A No.

Q -- in forming that conclusion?

A No.

Q Dr. Antognini, are you being compensated for your time today?

A Yes.

Q Are you being compensated for the time you spent in preparing your reports?

A I am.

Q How much are you being compensated an hour? Do you charge an hourly rate?

A I do. It's -- well, for the deposition, I think it's a -- it's a flat rate, I can't remember what it was, it's in my -- I think it's in my report. I believe, in the first one. I think it's $2,000 for a deposition appearance.

Q It's a flat rate?

A Yeah.

Q Okay.

MR. FOGEL: We don't have anything further at this time.

MR. SPILLANE: All right. I'll try and move quickly.

EXAMINATION

BY MR. SPILLANE:

Q You're a board-certified anesthesiologist; is that right, sir?

A Yes.

Q Do all board-certified anesthesiologists have expertise in setting central lines, such as subclavian or femoral vein lines?

A No. I wouldn't say that all of them do. I would say that -- that is part of their training, but if -- you know, just because they've trained -- been trained to do that, does not mean that they continue to do that in their particular practice, so I wouldn't say that all board-certified anesthesiologists would be experts in...

Q Well, I probably asked a bad question. I'll start out with this: Every board-certified anesthesiologist is trained how to do that or he wouldn't be a board-certified anesthesiologist?

A That's correct. That is part -- that's a part of training. But, you know, some people, their -- their

practice may be that they're doing outpatient surgery -- or anesthesia for outpatient surgery, so they may not place central lines ever.

Q What type of surgeries does one use a central line?

A It would be heart surgery. It could be somebody who's having a major abdominal surgery. It could be some type of orthopedic procedure, where there's going to be a lot of blood-loss, I guess. Or a spine surgery. And then somebody who's particularly sick, and you can't get -- you don't have good IV access, and you wanted to, you know -- if you're having problems with that, which we've already discussed, then -- then, you know, you would put a -- a central line in that kind of patient.

Q When you examined Mr. Bucklew, were you able to physically view his uvula?

A I did see his uvula, just the very top of -- of it. But I -- I did sort of waffle, whether it was a Mallampati 4 or 3, because I was able to see part of his uvula. And generally speaking, when you have a Mallampati 4, you don't see any of the uvula. But I still have nevertheless called it a 4, because the Mallampati score -- and maybe, I mean, I -- I think clinicians use that scoring system in maybe not the most consistent way. So for example, if I had somebody who's thin, but just has

an abnormal, maybe have a very small chin or whatever, they may have a -- I look at them and I say, "Oh, they have a Mallampati 3 because I can -- I can see just a part of their uvula," but if I have somebody like with this inmate, I mean, it's -- it's not just a question of being able to see, I mean, he has a large mass there, I would say maybe sort of maybe fib -- fib, I shouldn't say that in a deposition -- but I would move more toward saying a Mallampati 4, just so show people, "Hey. This is a potentially difficult airway." Which I don't deny, he's got a, you know, from a clinical perspective, it could be a challenging airway.

So to answer your question, I know it was more -- it was a "yes" or "no" question, but I wanted to provide some feedback, I did see part of his uvula.

Q Okay. And -- and as I understand it, and correct me if I'm wrong, if you see part of the uvula, it's generally not a 4; is that fair?

A That is -- that is correct.

Q Okay.

A But I did not say that in my report.

Q All right. That's what I --

A That was my recollection -- yeah, that was my recollection, that I did see part of his uvula.

Q Let me ask you about your conclusion of -- on

pain and suffering. Those are two different things; is that fair according to your testimony?

MR. FOGEL: Objection.

BY MR. SPILLANE:

Q If you understand my question, you may answer.

A Yeah.

Q And if I stated it wrong, tell me.

A Yeah. I would say that they are two different things. So basically, pain is a -- suffering can occur from a variety of different types of situations or -- or stimuli, and pain is part of that. Pain, generally speaking, will cause suffering. But you have suffering from some -- some -- from something else that's not painful. So, you know, with all suffering, we have emotional suffering from things that happen in our family and all of that, but that's different than the suffering that occurs from a painful stimulus.

Q As I understood your testimony on direct, you testified that there would be no pain 20 to 30 seconds after the chemical entered the bloodstream in the IV; is that accurate?

MR. FOGEL: Objection. Misstates the witness's testimony.

BY MR. SPILLANE:

Q You may answer, if I got it right. If not, tell

me.

A That is correct. That -- that 20 to 30 seconds after the injection started to enter into the -- actually into the bloodstream.

Q When you --

MR. FOGEL: Hold -- hold -- hold on. That's not even close to what you testified about. I mean, fine. I can redirect, but...

MR. SPILLANE: The record will reflect.

MR. FOGEL: Fine. That's fine.

THE WITNESS: Well, I don't remember what I said, I mean, we can read it back, I'm happy to -- I'm trying to be consistent, but that's --

MR. FOGEL: Understood.

THE WITNESS: Maybe I'm not using the right words.

MR. FOGEL: For 20 to 30 seconds from entering the bloodstream; right? We've been talking about unconscious the entire day, but it's different. But Mike, go ahead and ask your question.

BY MR. SPILLANE:

Q I asked about pain. You indicated, as I understood your direct testimony, that when the person is unconscious with this dose of Pentobarbital, they would not feel pain.

Did I get that correct?
A That is correct. That is my opinion.
Q So they would not feel pain 20 to 30 seconds after the chemical entered the bloodstream from the IV; is that accurate?
A That is my testimony, yes.
Q Let me ask you a little bit of how you got there. Did you think about blood concentrations when you made that conclusion?
A Yes.
Q Tell me what you thought.
A So I looked at -- as I said, I quoted that study in my supplemental report from Ehrnebo. And basically, what they -- what he did in that study is, he took humans and he gave 100 milligrams of Pentobarbital intravenously and then he measured the blood levels of that drug. And typically, what happens when you do that kind of study, you give the drug, and then you start taking blood samples and measuring the concentration of the Pentobarbital in the blood. And if you look at their -- his figure, which is figure 1, I think, it shows a typical high level and then it just starts to fall off and go down and decrease.
So one thing that you can do, as an approximation is, that you can look at those blood levels and say, "Well, if this is the concentration that you achieve with

100 milligrams of Pentobarbital, what concentration would you achieve with 5,000 milligrams?" Which is -- is 50 times 100.
Let me make sure I got that right. So as a first approximation, you could just say -- look at the peak level there, and say, "All right. Well, if they achieved -- or I should say, if you look at the blood levels, if they achieved in that study the average -- at six minutes after the injection, the average was about 2.9 micrograms per ML, you just multiply that by 50, and say, "Well, it would be about 145 micrograms per ML at six minutes."
Now, mind you, in that -- in that particular study, that was the first time that they had taken a blood sample. If they had taken a blood sample earlier on, it would have been higher because that's what happens with these drugs, their concentration falls off as the blood is redistributed.
Now, I will admit to that -- that analysis is an approximation and, in fact, he might -- you can go on and claim that there's an error there, that I'm wrong. But I'm not wrong in the direction that would aid you, as I mentioned earlier. Because when you get that incredibly fast -- well, I shouldn't say -- when you get that rapid onset of hypotension, sudden or severe hypotension, that

drug is not going to redistribute. So if you were to able -- if you were able to measure the blood levels on that setting instead of falling off like that study showed, it would -- it would be de-elevated. Because the blood pressure is so low that the drug is not being redistributed so the blood levels are staying very high.
Q How many micrograms per milliliter of Pentobarbital in the blood are necessary to achieve the high level of unconsciousness that you spoke about, near comatose?
MR. FOGEL: Object to form.
THE WITNESS: So I -- can I answer? Or...
BY MR. SPILLANE:
Q If you understand my question, you can.
A So I -- I relied on the package insert that has a table in it that I referred to in my report, and they have some drugs listed there. And the first drug listed is Pentobarbital, and there -- there're five degrees of depression listed there. And No. 3 says, "Comatose, difficult to arouse, significant depression and respiration." And then No. 4 is, "Compatible with death an aged or ill persons, and then -- or in the presence of obstructed airway." And then No. 5, "The usual lethal level."
So just taking No. 3 as an example of comatose,

No. 3 says you need 10 to 15 micrograms per ML; No. 4 is 12 to 25; and No. 5 is 15 to 40. Obviously, they -- they've given a range because it's going to be sort of individualized. And at six minutes, based on that study, just looking at the average, it would be about 145 I think is what I calculated. 50 times -- about 2.9. So that's ten times the amount that would be needed to achieve level 3.
Now, mind you, that was the concentration that -- that -- that calculation I just did, of 50 times 2.9, that was the using the concentration of Pentobarbital at six minutes. But the concentration of Pentobarbital in those individuals at, maybe, one or two minutes was probably, you know, I don't know for sure, I -- I did some calculations and I -- I can't remember off the top of my head, but it's higher. So if you, now, take that factor of 50 and multiply that, at that point in time, one or two minutes after the drug's been injected, now we're talking -- could be 200 or 250 micrograms per ML of the Pentobarbital. From this massive dose of the Pentobarbital.
All right. So we're at this very high level, and then, as I said, this sudden and/or this rapid severe hypotension and that drug is not going to get redistributed, so it's not going to fall off. So it

starts out very high, and it stays very high. That's why this drug is a lethal -- is a lethal agent administered in the way that it does.

Q Is that calculation you just told me about part of the reason you concluded that this person would be deeply unconscious and not feel pain at 20 to 30 seconds?

A That is part of the reason.

Q Tell me the other reasons.

A Well, the hypotension is going to make somebody unconscious. So if you take a normal individual and you make them hypotensive, I mean, they can main- -- people can maintain unconsciousness -- sorry. People can maintain consciousness when they're hypotense, you know, when nothing else is being given. But when you give an anesthetic like this and it causes the hypotension, and it's going to act synergistically, because you need blood flow to the brain to be able to maintain consciousness, and this drug -- and in addition to the effect it's having on the brain, it's decreasing blood pressure, so the blood flow to the brain is going to be decreased as well. So that's going to exacerbate the problem of maintaining consciousness.

And then finally, the inmate is going to stop breathing, their oxygen source is going to go down and they will become hypoxic, and then you can't maintain

consciousness when you're hypoxic, so those factors all combine to produce death, and, you know, unconsciousness and death. So that -- that's how I envisioned what was happening in this scenario.

Q I want to clarify something we talked about earlier.

As I understood the earlier testimony, there might be a period when the person had some level of unconsciousness, where he could still experience pain or some level of -- perhaps, I'm using the term wrong, semi-unconsciousness, did you reach an opinion of how long that would last?

A I have an opinion about it, I -- but it's -- it's more based on my -- my understanding of the -- the drug and the kinetics, and not so much about the, you know, having done a calculation. Because in order to be able to -- to answer that question, first, we have to decide, okay. Well, what -- what is the period during which --

MR. FOGEL: Objection. The question was, did you reach an opinion? I think it's --

MR. SPILLANE: I think he said "yes," and then kind of...

THE WITNESS: Okay. Yes, I did reach an -- I have reached an opinion.

//

BY MR. SPILLANE:

Q Okay. Let me ask you this: What -- what opinion did you reach?

A That it would occur rapidly. And by rapid, I'm -- I'm -- I'm going to estimate that it's probably going to be in the range of maybe ten seconds. I mean, that's just a -- a -- a -- I'm -- based on my working with these figures and how quickly this drug is getting in and so forth, that this period, as I think Dr. Zivot is describing, where, you know, the -- the inmate would be in this period where he would be able to maintain -- or sense that choking sensation, it's going to be ten seconds. But I think that's going to be within that 20 to 30 seconds that I described. It's not going to be in addition to the 20 to 30 seconds. It's a ten second, let's say, a ten second window within that 20 to 30 seconds.

Q So I'm going to ask you the question, just a different way:

During the 20 to 30 seconds you described earlier, is there a period of ten seconds where he might feel something; is that what you're saying?

A Sorry, within that 20 to 30 --

Q Yeah, is it before? Or is it within? I didn't --

A Within. It's within.

Q It's within.

So in the 20- to 30-second period, there might be ten seconds where he could feel something; is that what you're testifying to?

A That is correct. But just to clarify, I mean, he could also experience before that ten seconds -- I mean, obviously when he's awake, he can experience as I've testified.

Q Right. Thank you.

I don't have think I have any further questions, Doctor.

FURTHER EXAMINATION

BY MR. FOGEL:

Q Clarify quickly: On that last question, matter of clarification, states lawyer asked you if you had reached an opinion on how long this state of mild unconsciousness, somewhere else on the spectrum besides this total unconsciousness, whether you had reached an opinion; is that opinion set forth anywhere in any of your reports?

A No.

Q And you also -- also talked about there might be some ten seconds, where he would experience this level of mild unconsciousness, some level of unconsciousness,

somewhere away from the far end of the spectrum. Is this ten-second period identified anywhere in any of your reports?

A No. Not -- not a -- a actual quantitative number is not.

Q Okay.

MR. FOGEL: No further questions.

MR. SPILLANE: All right. That's all I have. Thank you.

(Whereupon the deposition of Joseph F. Antognini was concluded at 3:27 p.m.)

---oOo---

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss.

I, AMANDA KALLAS, C.S.R. No. 13901, in and for the State of California, do hereby certify:

That prior to being examined, the witness named in the foregoing deposition was by me duly sworn to testify to the truth, the whole truth, and nothing but the truth;

That said deposition was taken down by me in shorthand at the time and place therein named and thereafter reduced to typewriting under my direction, and the same is a true, correct, and complete transcript of said proceedings;

That if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript { } was { } was not required.

I further certify that I am not interested in the event of this action.

Witness my hand this 14th day of March, 2017.

AMANDA KALLAS, C.S.R. No. 13901

Veritext Legal Solutions
1 North Franklin Street - Suite 3000
Chicago, Illinois 60606
Phone: 312-442-9087

March 14, 2017

To: Michael Joseph Spillane

Case Name: Bucklew, Russell v. Lombardi, George A., et al.

Veritext Reference Number: 2551650

Witness: Dr. Joseph F. Antognini Deposition Date: 2/27/2017

Dear Sir/Madam:

Enclosed please find a deposition transcript. Please have the witness review the transcript and note any changes or corrections on the included errata sheet, indicating the page, line number, change, and the reason for the change. Have the witness' signature at the bottom of the sheet notarized and forward errata sheet back to us at the address shown above, or email to production-midwest@veritext.com.

If the errata is not returned within thirty days of your receipt of this letter, the reading and signing will be deemed waived.

NO NOTARY REQUIRED IN CALIFORNIA

Sincerely,

Production Department

DEPOSITION REVIEW
CERTIFICATION OF WITNESS

ASSIGNMENT NO: 2551650
CASE NAME: Bucklew, Russell v. Lombardi, George A., et al.
DATE OF DEPOSITION: 2/27/2017
WITNESS' NAME: Dr. Joseph F. Antognini

In accordance with the Rules of Civil Procedure, I have read the entire transcript of my testimony or it has been read to me.

I have made no changes to the testimony as transcribed by the court reporter.

_____ _____
Date Dr. Joseph F. Antognini

Sworn to and subscribed before me, a Notary Public in and for the State and County, the referenced witness did personally appear and acknowledge that:

They have read the transcript;
They signed the foregoing Sworn Statement; and
Their execution of this Statement is of their free act and deed.

I have affixed my name and official seal this _____ day of_____, 20____.

_____
Notary Public

_____
Commission Expiration Date

DEPOSITION REVIEW
CERTIFICATION OF WITNESS

ASSIGNMENT NO: 2551650
CASE NAME: Bucklew, Russell v. Lombardi, George A., et al.
DATE OF DEPOSITION: 2/27/2017
WITNESS' NAME: Dr. Joseph F. Antognini

In accordance with the Rules of Civil Procedure, I have read the entire transcript of my testimony or it has been read to me.

I have listed my changes on the attached Errata Sheet, listing page and line numbers as well as the reason(s) for the change(s).

I request that these changes be entered as part of the record of my testimony.

I have executed the Errata Sheet, as well as this Certificate, and request and authorize that both be appended to the transcript of my testimony and be incorporated therein.

_____ _____
Date Dr. Joseph F. Antognini

Sworn to and subscribed before me, a Notary Public in and for the State and County, the referenced witness did personally appear and acknowledge that:

They have read the transcript;
They have listed all of their corrections in the appended Errata Sheet;
They signed the foregoing Sworn Statement; and
Their execution of this Statement is of their free act and deed.

I have affixed my name and official seal this _____ day of_____, 20___.

_____
Notary Public

_____
Commission Expiration Date

ERRATA SHEET
VERITEXT LEGAL SOLUTIONS MIDWEST
ASSIGNMENT NO: 2551650
PAGE/LINE(S) / CHANGE /REASON

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_____ _____
Date Dr. Joseph F. Antognini

SUBSCRIBED AND SWORN TO BEFORE ME THIS _____
DAY OF _____, 20_____.

_____
Notary Public

_____
Commission Expiration Date

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m

v

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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Case No. 4:14-CV-08000-BP

United States District Court
Western District of Missouri

RUSSELL BUCKLEW,

Plaintiff,

v.

GEORGE LOMBARDI et al.,

Defendants.

LEGAL MEMORANDUM IN SUPPORT OF DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

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Resp. Ex. 6

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TABLE OF AUTHORITIES

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STATEMENT OF UNCONTROVERTED MATERIAL FACTS

1. The hemangioma will not interfere with the circulation of pentobarbital. Defendants' Exhibit 1, Exhibit 5 to Dr. Zivot's Deposition Supplemental Report of Dr. Antognini paragraphs 13, 14 and 26 (opining that the hemangioma will not interfere with the flow of pentobarbital). Defendants' Exhibit 1, Dr. Zivots' deposition at 65–66, (Dr. Zivot states he has no evidence to answer the question whether the hemangioma is a fast-flow system that would interfere with circulation).

2. Assuming the I.V. is properly set and utilized, Bucklew will be deeply unconscious in a matter of seconds. Defendants' Exhibit 1, Dr. Zivot Deposition Exhibit 4 Supplemental Report of Dr. Antognini at 3–4 (injection of five grams of pentobarbital will cause rapid and deep unconsciousness in 20-30 seconds followed by death). Defendants' Exhibit 3, Deposition of Dr. Antognini at 240–49 (Bucklew would achieve a state of deep unconsciousness in which he would be unable to sense pain in 20 to 30 seconds). Defendants' Exhibit 1, Dr. Zivot deposition at 85–89 (based on a study of horses given a similar dose of pentobarbital per kilogram, while brain activity was measured by EEG, all measurable brain activity will stop in 52 to 240 seconds, but Dr. Zivot has no way of knowing when complete cessation of pain will occur). Defendants' Exhibit 2, Study relied on by Dr. Zivot, (the study actually

indicates cortical electrical activity ceases *within* 52 seconds, and estimates brain death at 73 to 261 seconds).

3. Both experts agree that Bucklew has poor peripheral veins in his hands and arms. Defendant's Exhibit 1, Dr. Zivot Deposition at 69–70 (Bucklew has poor veins in both arms). Defendants' Exhibit 3, Dr. Antognini Deposition at 83–86 (Bucklew has challenging veins in his arms and hands).

4. The Missouri Execution protocol provides for a primary and a secondary I.V. line, and that a primary or secondary I.V. line may be set in either a central or peripheral vein. Defendants' Exhibit 1, Dr. Zivot Deposition Exhibit 1, Exhibit 1 to Deposition.

5. There is no reason to believe that there are any problems with any of Bucklew's veins except the peripheral veins in his hands and arms. Defendant's Exhibit 1, Dr. Zivot Deposition at 70 (Dr. Zivot only examined the peripheral veins in the arms), Dr. Zivot Deposition at 78 (Dr. Zivots' conclusion about there being a likelihood Bucklew could suffer from a blown vein during the execution was limited to the peripheral veins in the arms).

6. The femoral vein is easily accessed and the anatomic location is very consistent from one individual to another. Defendants' Exhibit 3, Dr. Antognini Deposition at 98.

7. Dr. Zivot described the femoral vein, in explaining why it was unlikely a blown vein could explain a botched Oklahoma execution, as "a

vessel of large caliber and should be able to, if—when properly placed take a fair amount of fluid when—as it is infused into the vein. And so for that vein to rupture from what was described seemed unlikely." Defendants' Exhibit 1, Dr. Zivot Deposition at 26.

8. It is not necessary for Bucklew to lie flat during an execution. Defendants' Exhibit 1, Dr. Zivot Deposition at 91–95 (conclusion that Bucklew must lie flat during an execution in Dr. Zivots' report based on a misreading of Missouri execution protocol and an execution he observed in Georgia where the offender was supine, as opposed to scientific necessity for the offender to be flat for the chemical to be effective). Defendants' Exhibit 5, Deposition of Director Dormire at 52 (the anesthesiologist has the freedom to adjust the angle of the gurney for an execution).

9. Bucklew was able to lie flat for an hour during medical imaging and was able to adjust his breathing pattern to compensate for the position, although he reports discomfort or extreme discomfort while doing this. Defendants' Exhibit 3, Deposition of Dr. Antognini 142–150, (Bucklew described being able to lie flat for an hour during medical imaging during medical imaging and described that to Dr. Antognini as being "uncomfortable"). Defendants' Exhibit 1, Dr. Zivot Deposition, Exhibit 1 to the Deposition Supplemental Report of Dr. Zivot at 8 while lying flat,

Bucklew consciously altered his breathing pattern and swallowed repeatedly to keep his airway clear and reportedly felt extreme discomfort).

10. Dr. Zivot opines that during an execution, if Bucklew is lying flat, there will be some period, the length of which he cannot determine, before death, when Bucklew, unlike during the MRI, will not be able to adjust his breathing due to the effects of pentobarbital, but will be capable of knowing he cannot make the adjustment and will experience this as choking and being very uncomfortable. Defendants' Exhibit 1, Dr. Zivot Deposition at 79–81. Dr. Antognini defined the time period when Bucklew is under effect of pentobarbital but will be able to sense pain as around 10 seconds. Defendants' Exhibit 3, Dr. Antognini Deposition at 247–49.

11. The interactions of Bucklew's psychiatric medication with pentobarbital would be additive or synergistic, but because the dose of pentobarbital is so large the effects are irrelevant. Defendants' Exhibit 3, Dr. Antognini Deposition at 217–18.

12. Missouri does not use methylene blue or any other dye during executions, does not plan to do so in the future, and does not possess dye for use in executions. Defendants' Exhibit 5, Director Dormire Deposition at 52.

13. There is no way to determine that execution by gas is a feasible and readily implemented alternative method of execution that will significantly reduce a substantial risk of severe pain for Bucklew.

Defendants' Exhibit 1, Dr. Zivot Deposition at 38–40 (commenting on an article in which he had commented that there is not and cannot be necessary research on nitrogen gas, Dr. Zivot opines there is no way to tell if execution by nitrogen gas would be cruel). Defendant's Exhibit 1, Exhibit 5, Report of Antognini paragraph 23 (Execution by gas does not hold any advantage with respect to pain and suffering as compared to lethal injection). Exhibit 3, Deposition of Dr. Antognini at 129. *Id*. at 231–36 (the use of gas would not affect the risk of this inmate suffering, there could be more or less suffering). Defendants' Exhibit 4, Deposition of Matthew Briesacher at 46–58 (Mr. Briesacher testified that he started to research the possibility of gas as a method of execution when he was General Counsel of the Department of Corrections but "hit a wall" due to the lack of research articles and lack of experts that could answer questions he believed must be answered for further research).

14. Dr. Zivot opines that Bucklew's cavernous hemangioma *will* strangle him to death, and cause him to bleed during the strangulation, if he is not executed, but it creates a *risk* of choking for an undetermined period before the pentobarbital takes full effect if he is not executed. Defendants' Exhibit 1, Dr. Zivot Deposition at 29–32 (Dr. Zivot opines, in agreement with views he published on the subject in an article, that if Bucklew is *not* executed the hemangioma will kill him by "self-strangulation" and that

hemorrhaging will accompany the death by self-strangulation). *Id.* at 90–91 (unless Bucklew is executed or dies by some intervening cause the hemangioma will strangle him to death, but if he is executed, there is a risk he will choke).

15. In June 2008, Bucklew filed a pleading in the United States Court of Appeals for the Eighth Circuit asking for $7,200 to hire Dr. Cohen to support a claim in a clemency application that claimed that because of his hemangioma, "execution by lethal injection may pose a substantial and intolerable risk of inflicting serious harm and excruciating pain." Defendants' Exhibit 11, Eighth Circuit pleading at 12. The pleading argued that the use of a general anesthetic in an execution may compromise the veins and the hemangioma risked complications by disrupting blood flow to the brain. *Id.* at 5. Bucklew argued that he needed a medical expert to demonstrate that Missouri's execution protocol as applied to him would constitute cruel and unusual punishment. *Id.* at 7.

16. Bucklew was a plaintiff in the litigation in *Zink v. Lombardi*, filed in this Court in August 2012, making a facial challenge to Missouri's death penalty procedures. Docket Sheet *Zink v. Lombardi* 12-0429. This Court dismissed the case on May 16, 2014. *Id.* Document 443.

17. On May 14, 2000, one week before his scheduled May 21, 2014 execution Bucklew filed his original complaint in this litigation. *Bucklew v.*

Lombardi, 14-8000, Document 1. Bucklew alleged that because of his hemangioma the execution chemical would not circulate properly, and because of the abnormal circulation he would bleed and suffer during the execution. *Id*. at 4–5.

18. The testimony of Dr. Evelynn Stephens, the treating psychiatrist, does not indicate Bucklew is particularly more likely to have an adverse psychiatric reaction to execution than other inmates, and because of his more robust medication program it is likely he will deal with his current scheduled execution better than he dealt with the last execution date. Defendants' Exhibit 10 at 73–79. Dr. Stephens has not diagnosed Bucklew with post-traumatic stress disorder and would do so if she thought he met the criteria. *Id*. at 81. Dr. Stephens believes Bucklew is anxious over his medical condition, which she views as a normal reaction. *Id*. at 31. Dr. Stephens indicated Bucklew has never brought up anxiety over his execution status to her, and avoids talking about his execution because he is uncomfortable because of shame over his crime and its repercussions, as opposed to fear of execution. *Id*. at 31–32. Dr. Stephens finds that such shame is normal but that it would be a good thing if he would talk about it more. *Id*. at 32.

STATEMENT OF EXHIBITS

1. Defendants' Exhibit 1 is the deposition of Dr. Joel Zivot and the attached exhibits.

2. Defendants' Exhibit 2 is an article relied on by Dr. Zivot, Aleman Williams, Guedes, and Madigan, "Cerebral Brainstem Electrophysiologic Activity During Euthanasia with Pentobarbital Sodium in Horses" 29 J. Vet. Med. 663–72 (2015).

3. Defendants' Exhibit 3 is the deposition of Dr. Joseph Antognini.

4. Defendants' Exhibit 4 is the redacted deposition of Mr. Matthew Briesacher, former General Counsel of Missouri Department of Corrections (MDOC).

5. Defendants' Exhibit 5 is the redacted deposition of former MDOC Division of Adult Institutions Director Dave Dormire.

6. Defendants' Exhibit 6 is the redacted deposition of former MDOC Director George Lombardi.

7. Defendants' Exhibit 7 is the redacted deposition of MDOC Director Anne Precythe.

8. Defendants' Exhibit 8 is the redacted deposition of Warden Troy Steele.

9. Defendants' Exhibit 9 is the deposition of Dr. Evelynn Stephens.

10. Defendants' Exhibit 10 is the deposition of Dr. William McKinney.

11. Defendants' Exhibit 11 contains pleadings and orders from Bucklew's litigation in 2008 and 2009.

STANDARD OF REVIEW

Summary judgment is not a disfavored procedural shortcut, but "is an integral part of the Federal Rules as a whole, which are designed to 'secure the just, speedy and inexpensive determination of every action.'" *Torgeson v. City of Rochester*, 643 F.3d 1031, 1043 (8th Cir. 2011) (en banc) *quoting Celotex Corp. v. Catrett*, 477 U.S. 317, 327 (1986). Summary judgment is proper if there is no genuine issue of material fact and the movant is entitled to judgment as a matter of law. *Id*. at 1042. The movant bears the burden of informing the district court of the basis for its motion and must identify the portions of the record that demonstrate the absence of a genuine issue of material fact. *Id*. The nonmovant must respond by submitting evidentiary materials that set out specific facts showing a genuine evidentiary issue for trial. *Id*.

In order to prevail on Eighth Amendment method of execution challenge Bucklew must prove that the execution procedure is "sure or very likely to cause serious illness and needless suffering." *Zink v. Lombardi*, 783 F.3d 1089, 1102 (8th Cir 2015) (en banc). And he must "prove that another

execution procedure exists that is feasible and readily implemented, and that alternative method will significantly reduce a substantial risk of severe pain." *Id*. at 1103.

Bucklew must establish an 1) injury in fact, 2) caused by the defendants, that 3) this Court can redress, in order to establish Article III jurisdiction over the case. *See Spencer v. Kemna*, 523 U.S. 1, 8 (1998) (at every stage of the litigation the plaintiff must have suffered or be threatened with an actual injury, traceable to the defendant, that is likely to be redressed by a favorable judicial decision).

ANALYSIS

I. The record refutes the claim that any method of lethal injection execution is sure or very likely to cause serious injury and needless suffering to Bucklew.

The thrust of Count I of the Fourth Amended Complaint is that Bucklew will suffer "a prolonged and excruciating execution because the lethal drug fails in its intended effect or fails to circulate properly in Bucklew' body." Document 53 at 51. Bucklew also alleges that his psychiatric condition will cause him stress, which will cause his blood pressure to rise, causing bleeding during an execution. *Id*. at 51–52. Bucklew alleges the use of the dye Methylene Blue causes a great risk of a dangerous drug interaction. *Id*. at 9. But the record refutes these claims.

Only two experts have examined Bucklew and reviewed the recent imaging of his hemangioma and addressed the effect of the hemangioma on circulation, *after doing so*, rather than speculating on the effects a hemangioma might have on circulation in affidavits to support Bucklew's complaint. Those two experts are Dr. Antognini, the defense expert, and Dr. Zivot, Bucklew's expert. Dr. Antognini determined that the hemangioma is not a fast flow system that would interfere with the circulation of an execution chemical, and Dr. Zivot testified at his deposition that he had no evidence that supported a conclusion that the hemangioma is a fast flow system that would interfere with the circulation of a lethal chemical. Statement of Uncontroverted Material Facts Paragraph 1. That testimony destroys the core of Bucklew's complaint, that because of the hemangioma, the execution chemical will not circulate properly, and not take effect in seconds, as it would in a normal person.

Both experts agree that, if properly infused, the pentobarbital will take effect in seconds. Dr. Antognini opines that Bucklew will be in a coma-like state unable to sense pain within 20 to 30 seconds, while Dr. Zivot indicates measurable electrical activity in the brain will cease in 52 to 240 seconds. Statement of Uncontroverted Facts Paragraph 2. Dr. Zivot testified he has no way of knowing when the complete cessation of pain will occur after the infusion of pentobarbital, while Dr. Antognini opined there may be a 10

second period, during the 20 to 30 second period leading to a coma-like state, when Bucklew may be able to sense pain, although under the effects of pentobarbital. *Id*. Therefore, absent some accident in infusing the pentobarbital, the record indicates it will be effective within seconds. So it is not sure or very likely Bucklew will suffer a prolonged tortuous execution.

Although both experts agree that Bucklew has poor peripheral veins in his hands and arms, the execution protocol permits the use of other veins as well, and nothing in the record indicates that any of Bucklew's veins, that would potentially be used for an I.V., except the peripheral veins in his hands and arms, are in anyway abnormal. Statement of Uncontroverted Facts, Paragraphs 3–7. It is not sure or very likely that the anesthesiologist, M3, will make multiple failed attempts to start an I.V. line in both arms despite the veins being visibly poor, and then make one or more failed attempts in other veins, despite no known abnormalities existing in other veins. It is speculation that the anesthesiologist will not be able to find and utilize one of Bucklew's normal veins, or that he would use an inadequate peripheral arm or hand vein causing it to blow. *See* Defendants' Exhibit 1 Dr. Zivot Deposition at 97–99 (speculating that the anesthesiologist would make multiple unsuccessful attempts to start an I.V. in both arms before starting one in the femoral vein). Dr. Zivot's own testimony indicates that his opinion about the possibility of a blown vein is limited to the peripheral veins in

Bucklew's hands and arms. *Id*. Finally, the Fourth Amended Complaint does not allege the peripheral veins in Bucklew's hands and arms would contribute to an execution being cruel and unusual punishment, Document 53. Defendants do not agree to have this issue adjudicated by consent of the parties. It was not properly pled, despite Bucklew having filed five complaints overall.

What Bucklew's expert is really arguing here is the possibility of an accident inserting the I.V. that could occur to any offender during an execution. But the United States Court of Appeals has held that such a possibility is not an Eighth Amendment violation. *See Zink*, 783 F.3d at 1099–1103 (alleging a risk that an accident may occur and cause pain is not the same as showing it is sure or very likely that serious illness or needless suffering will occur).

Both experts agree that Bucklew has stated that he has difficulty breathing when lying flat, but that while lying flat for an hour during imaging he was able to tolerate being supine by adjusting his breathing pattern and swallowing. Statement of Uncontroverted Facts Paragraph 9. There is no real reason Bucklew would have to lie flat during an execution. *Id*. at Paragraph 8. But if he did, while conscious, he could regulate his breathing as he did during the imaging studies. Dr. Zivot opines that if Bucklew was lying flat during an execution he would, *after the pentobarbital*

took effect, lose the ability to regulate his breathing and for some undetermined period experience extreme discomfort from sensing his inability to regulate his breathing. *Id.* at Paragraph 10. But Bucklew does not necessarily have to be flat during an execution, and if he lost the ability to regulate his breathing while lying flat during an execution as he does while awake and lying flat, because of the pentobarbital making him unconscious, the key is he would be unconscious. Even assuming Bucklew is in a semiconscious state for a matter of seconds before he becomes comatose, that does not make his execution cruel.

The record here refutes the claim that it is sure or very likely that Bucklew will suffer serious illness and unnecessary suffering from execution by lethal injection. The core of Bucklew's original allegation, that the hemangioma will interfere with circulation causing prolonged suffering, is now not supported by his own expert. Arguments that medical personnel might miss or blow a vein, although there is no evidence any vein except the peripheral veins in the hands and arms are abnormal, are speculative. And both experts agree that if properly infused, the lethal chemical will have an effect within seconds. Speculation about interactions with dye or medications is refuted the record. Statement of Uncontroverted Facts Paragraphs 11–12. Similarly, the record refutes speculation that it is sure or very likely that Bucklew's psychiatric condition will somehow cause a tortuous execution. *Id.*

Paragraph 18. The record refutes the first prong of the Eighth Amendment claim. And as discussed below, the record refutes any claim that gas would significantly reduce a substantial risk of severe pain. In fact, in light of the speed with which lethal injection would work, the record supports the conclusion that execution by gas *increases* the risk of pain and suffering.

II. The record refutes Bucklew's allegation that execution by gas is an alternative execution procedure that is feasible and readily implemented, and that alternative method will significantly reduce a substantial risk of severe pain.

In order to prove the second prong of an Eighth Amendment method of execution claim, Bucklew must "prove that another execution procedure exists that is feasible and readily implemented, and that alternative method will significantly reduce a substantial risk of severe pain." *Zink*, 783 F.3d at 1103. Bucklew cannot meet this burden because the record refutes this finding.

In his deposition, answering questions about an article in which he commented on the lack of, and impossibility of doing, research on execution by Nitrogen gas, Dr. Zivot opined that there is no way to know if execution by Nitrogen gas would be cruel. Statement of Uncontroverted Facts Paragraph 13. Dr. Antognini testified that execution by gas does not contain an advantage over execution by lethal injection on the issue of inmate pain and suffering. *Id*. And Mr. Briesacher testified that he "hit a wall" in trying to

research gas as an alternative method of execution because of the lack of research and experts on the subject, making it impossible to answer questions that would need to be answered. *Id.*

The testimony that the hemangioma will not delay the circulation of a lethal chemical and the pentobarbital will take effect in seconds also defeats an argument that gas will significantly reduce a substantial risk of severe pain. There is nothing in the record that shows that gas will work more quickly than pentobarbital and that any suffering during an execution by gas would not be as bad as, or worse than, an execution by lethal injection. Bucklew completely fails to prove the second prong of an Eighth Amendment claim. Certainly nothing shows that inhalation of a lethal gas or death by nitrogen hypoxia would be less irritating to Bucklew's throat than the injection of a fast-acting barbiturate into a vein.

III. The record refutes that this Court has Article III jurisdiction.

Bucklew must establish an 1) injury in fact, 2) caused by the defendants, that 3) this Court can redress, in order to establish Article III jurisdiction over the case. *See Spencer v. Kemna*, 523 U.S. 1, 8 (1998) (at every stage of the litigation the plaintiff must have suffered or be threatened with an actual injury, traceable to the defendant, that is likely to be redressed by a favorable judicial decision). But he cannot do that.

In denying Defendants' motion for judgment on the pleadings on this issue, this Court held that reading the complaint in its entirety, it could be read to allege that "Plaintiff suffers certain risks by virtue of his disease, but that administering a lethal injection will substantially increase those risks." Document 101 at 4. But the testimony of Dr. Zivot, Bucklew's expert, refutes any argument that execution *increases* the risk to Bucklew of a tortuous death. Dr. Zivot's testimony is that Bucklew *will* die from self-strangulation by the bleeding hemangioma, if he is not executed, unless some unforeseen event causes his death, but that he risks choking during an execution. Statement of Uncontroverted Facts Paragraph 14.

If Bucklew will die a tortuous death from self-strangulation by the hemangioma, if he is not executed, there is no injury in fact, caused by the Defendants that this Court can fix, from the alleged risk that Bucklew will sense his inability to breath for a matter of seconds before the pentobarbital renders him unable to sense pain or discomfort. There is no Article III jurisdiction here.

IV. Bucklew's Eighth Amendment Claim is barred by the statute of limitations and claim preclusion.

In analyzing the statute of limitations issue in the motion to dismiss this Court held that the "critical question is: when did Bucklew become aware that lethal injection in his then-present condition supported a claim that all

uses of lethal injection would violate his Eighth Amendment rights." Document 63 at 10. That answer is: *before* June 2008; nearly 6 years before he raised the claim in this Court.

In his June 2008 pleading to the United States Court of Appeals for the Eighth Circuit, Bucklew argued that execution by lethal injection risked being cruel and unusual punishment because it would cause bleeding of the hemangioma, and the hemangioma would interfere with circulation of the chemical. Statement of Uncontroverted Facts Paragraph 15; Defendants' Exhibit 11, Eighth Circuit pleading at 5–12. *See* Eighth Circuit Pleading at 5 saying the placement of the hemangioma in the head and face enhances risk and severity of complications by disrupting blood flow to the brain and there is a grave risk that general anesthesia drugs may compromise the veins); *Id*. at 12 ("execution by lethal injection may pose a substantial and objectively intolerable risk of inflicting serious harm and excruciating pain."). This pleading was supported with an affidavit from Dr. Cohen. Defendants' Exhibit 11.

We know Bucklew had the elements of his current claim at least as early as June 2008 because he set those elements out in a pleading to the Court of Appeals. There is no good reason he could not have filed the current suit at least as early as June 2008, and requested funding from this Court under the Criminal Justice Act for an expert in the pending suit. But he did

not. He waited until May 14, 2014, seven days before his scheduled execution to file his suit in this Court. That is a violation of the five-year statute of limitations.

The current suit is also barred by claim preclusion. See Document 63 at 13 discussing the four requirements of claim preclusion citing *Yankton Sioux Tribe v. United States Dep't of Health and Human Servs*., 533 F.3d 634, 639 (8th Cir. 2008). The four requirements of claim preclusion are (1) the first suit was resolved by final judgment on the merits, (2) there was proper jurisdiction for the first suit, (3) both suits involve the same parties or parties in privity with them, and (4) the same wrong was sought to be redressed in both actions. All the requirements are met here. We know now from Exhibit 11 that Bucklew knew of his current cause action before he filed the *Zink* litigation in May 2012 alleging his execution by lethal injection would violate the Eighth amendment. Therefore, this is a proper case for application of the doctrine of claim preclusion. *See Magee v. Hamline University*, 775 F.3d 1957, 1059 (8th Cir. 2015) (where claims in both suits sought to address the same wrong based on different theories, and the claim in the second suit arose before the first suit was filed, claim preclusion applied).

CONCLUSION

This Court should grant the motion for summary judgment.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on the 10th day of April, 2017, I electronically filed the pleading, and this Court's electronic filing system should serve counsel for Plaintiff.

/s/ Michael Spillane
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Case No. 4:14-CV-08000-BP

United States District Court for the Western District of Missouri

RUSSELL BUCKLEW,

Plaintiff,

v.

GEORGE LOMBARDI, et al.,

Defendants.

REPLY IN SUPPORT OF DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

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ANSWER TO BUCKLEW'S "STATEMENT OF UNDISPUTED FACTS"

1. Both parties agree that, given his unique medical condition, Mr. Bucklew will experience pain and suffering under Missouri's lethal injection protocol, however, they dispute: (1) the length of time he will suffer, and (2) how long is it acceptable for someone to suffer. Antognini Dep. Tr. 247:7-249:8; Zivot Dep. Tr. 84:22-85:11, 88:14-89:3; Zivot Suppl. Report at 11 (¶ VI.J.).

Answer: Defendants do not agree that Bucklew will endure pain and suffering during his execution. Despite the evidence to the contrary or the complete absence of supporting evidence, Bucklew speculates that he will choke and bleed during an execution because he will allegedly be lying flat, stressed, and his hemangioma will not allow the proper circulation of the lethal injection chemical. But his conjecture is refuted by the record. His own expert admits there is no evidence that Plaintiff's hemangioma will slow the circulation of pentobarbital (Dr. Zivot Deposition 65–66), and the other expert opines that it will not (Dr. Antognini Supplemental Report Paragraphs 13, 14, 26). Contrary to his assertions that he cannot lay supine for a period of time, Bucklew recently tolerated lying flat for an hour during medical imaging (Dr. Antognini Deposition 142–50, Dr. Zivot Supplemental Report 8), and the gurney would not necessarily be required to be flat during an execution but may be adjusted accordingly. (Director Dormire Deposition 52). Bucklew's expert attempts to distinguish Bucklew's proven ability to tolerate lying supine by explaining that Bucklew was awake during the

medical imaging but will not be awake during an execution once the pentobarbital takes effect (Dr. Zivot Deposition 79–81), although he will not say how long Bucklew could sense discomfort after the pentobarbital takes effect and he is no longer awake (Dr. Zivot Deposition 85–89). The defense expert opined that this period would be around ten seconds (Dr. Antognini Deposition 247–49). In short, there is no reason to believe that Bucklew will lose consciousness any slower than any of the multiple persons executed rapidly and painlessly by Missouri using pentobarbital (Witness Statements from earlier executions, which are Exhibit 4 to Dr. Antognini Deposition).

Bucklew also speculates that because he has poor peripheral veins in his hands and arms; therefore, the medical team member anesthesiologist will make multiple unsuccessful attempts to use those veins before using a central vein. That is speculative, not material, and outside the scope of the complaint.

In sum, Bucklew does not really present evidence that it is *sure or very likely* that he will suffer at all during his execution. And he does not present evidence that it is *sure or very likely* that if any discomfort at all occurs that it would not be limited to a matter of a few seconds. *See McGehee v. Hutchinson*, 854 F.3d 488 (8th Cir. 2017) (en banc) (per curiam) (Court holds that a petitioner must show that it is sure, or very likely, that the method of execution will cause serious illness or needless suffering, and that equivocal

evidence that inmate might have some level of consciousness and therefore, suffer pain, during the execution process, does not meet this standard).

2. The ability to insert an IV in difficult veins or to insert a central line depends on the skill of the medical team member performing the procedure. Antognini Dep. Tr. 81:18-82.25; Open Portion Protocol at 1 (*see* ¶ C).

Answer: This fact is not material based on the allegations raised in Bucklew's Fourth Amended Complaint. This Court summarized the Fourth Amended Complaint as alleging that execution by lethal injection will cause Bucklew's tumors to rupture because lethal injection relies on the circulatory system and (1) the chemicals will not travel through the body as intended, delaying unconsciousness, and (2) the ruptured tumors in Bucklew's throat can cause him to choke; and that lethal gas will significantly reduce the risk of rupture and needless suffering because gas does not rely on the circulatory system). Document 105 at 2. This Court further held that Bucklew specifically "disclaimed the possibility that any utilization of lethal injection will reduce the risk of pain and suffering." *Id.* at 6.

To the extent an answer is required, Defendants admit that the insertion of an intravenous line depends on the skill of the anesthesiologist, but note that Bucklew's own expert testified that all anesthesiologists become proficient in inserting intravenous lines as part of their training (Dr. Zivot Deposition 22–24).

3. Mr. Bucklew has poor peripheral veins, meaning they are small and difficult to find, which makes it more challenging to establish intravenous access and detrimentally impacts how quickly drugs can be injected in those veins. Antognini Dep. Tr. 77:3-10; 84:14-25; Zivot Dep. Tr. 69:25-70:6.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2. Bucklew did not actually plead that his poor peripheral veins were a reason his execution would violate the Eighth Amendment.

To the extent an answer is required, Defendants do not agree that Bucklew has poor peripheral veins in general, only that he has poor peripheral veins in his hands and arms. To evaluate this fact, one must assume that the anesthesiologist would choose to make multiple unsuccessful attempts at establishing a line in visibly poor peripheral veins in the hands and arms, rather than using a large central vein for the primary I.V. line.

4. In an individual like Mr. Bucklew with difficult-to-access peripheral veins, it is sometimes necessary to make several, even as many as ten, unsuccessful attempts to access a peripheral vein before attempting a central line. Antognini Dep. Tr. 99:14-20; Zivot Dep. Tr. 70:2-6, 74:6-25.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that it would be necessary to make as many as ten attempts to find a peripheral vein in Bucklew's hands or arms before deciding to use a central vein. This is

purely conjecture. Whether that has occurred in some clinical case or may occur in some hypothetical case is not material.

5. Repeated unsuccessful attempts to insert an IV in difficult veins will increase Mr. Bucklew's pain and discomfort. Antognini Dep. Tr. 100:1-12; Zivot Suppl. Report at 10 (¶ VI.G); Zivot Dep. Tr. 70:2-6, 74:12-25.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that repeated unsuccessful attempts to insert an I.V. "will" increase Bucklew's pain and discomfort. The premise of the assertion is that there will be multiple failed attempts to insert an I.V. line. That is speculation.

6. The stress of undergoing multiple attempts to set an IV will increase the likelihood of heavy, rapid breathing. Antognini Dep. Tr. 100:10-12; Zivot Suppl. Report at 10 (¶ VI.G.).

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that multiple attempts to set an I.V. "will" increase the likelihood of rapid and heavy breathing. The premise of the assertion is that there will be multiple failed attempts to establish an I.V. line. That is speculation.

7. Mr. Bucklew is at an increased risk of having a vein blow because he has poor peripheral veins. Antognini Dep. Tr. 87:13-24; Zivot Dep. Tr. 78:12-19.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that Bucklew is at increased risk of having a vein blow because he has poor peripheral veins. There is no evidence that Bucklew has any poor veins except the peripheral veins in his hands and arms, and it is pure conjecture that the anesthesiologist would establish the primary line in visibly poor veins in the hands or arms, especially when there is no evidence any other veins are poor. *See* (Dr. Zivot Deposition 78, 82) (Dr. Zivot testifies that his views on the possibility of a blown vein are limited to the peripheral veins in the hands and arms).

8. If a vein blows, pentobarbital would leak into and destroy the surrounding tissue causing extreme pain. Antognini Dep. Tr. 77:11-78:3.8.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that if a vein carrying pentobarbital were to blow, the pentobarbital would damage tissue. But whether such an accident would occur is immaterial speculation. Moreover, the testimony of Bucklew's own expert indicates that it is implausible that a central vein used in an execution would blow. (Dr. Zivot Deposition 26).

9. If the execution team cannot set an IV in a peripheral vein, they will attempt to gain venous access by means of a cutdown procedure to set a central line. Dormire Dep. Tr. 26:21-27:2; Steele Dep. Tr. 28:19-22; Antognini Dep. Tr. 94: 24-95:6.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that the anesthesiologist will necessarily use a "cut down" to access a central vein if he does not use a peripheral vein. Testimony indicated that the normal first option is to access a central vein without a "cut down" before using a "cut down" (Dr. Antognini Deposition 94–95).

10. If the technician performing a central line does not exercise skill and caution, there is a risk of accidentally injecting the drugs into a neighboring artery. Antognini Dep. Tr. 90:22-91:1.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that a "technician" as opposed to the anesthesiologist will establish the I.V. line. That is speculation. *See Ringo v. Lombardi*, 2011 WL 3584476 at *2 (W.D. Mo. 2011) (noting that the anesthesiologist M3 usually establishes the I.V. line). And it is speculation that the anesthesiologist would mistakenly establish the I.V. line in an artery as opposed to a vein as intended. This

allegation really has nothing to do with Bucklew's hemangioma, and is speculation that could be made about any execution by lethal injection.

11. A cutdown procedure is typically performed while the patient is lying in a supine position. Antognini Dep. Tr. 94:7-13.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that while in a clinical setting a cut down procedure is performed while the patient is supine. But Bucklew does not allege he must be supine.

12. A cutdown procedure is not typically used by physicians to access a femoral vein. Antognini Dep. Tr. 98:8-11, 20-25.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that a cut down is not typically done to access a femoral vein. This allegation is also inconsistent with Bucklew's claim in Paragraph 10 and demonstrates Bucklew's understanding that the anesthesiologist, not a "technician," would do a cut down to access a central vein if needed.

13. Mr. Bucklew suffers from a unique medical condition: cavernous hemangioma. ECF 182-14, Defs.' Ex. 10, McKinney Dep Tr. 12:9-14; Zivot Dep. Tr. 31:6-14.

Answer: Defendants agree that Bucklew has a cavernous hemangioma.

14. There is no known cure for Mr. Bucklew's cavernous hemangioma. McKinney Dep. Tr. 36:15-18; Zivot Suppl. Report at 3 (*see* ¶ III.A).

Answer: Defendants agree that Bucklew's hemangioma is incurable.

15. Mr. Bucklew's condition is progressive and places him at risk of choking and strangulation. Zivot Dep. Tr. 31:6-22; Zivot Suppl. Report at 3, 6, 8-9 (*see*¶¶ III.A., IV.E., V.B.10., VI.A); Antognini Dep. Tr. 72:3-16; McKinney Dep. Tr. 49:5-11.

Answer: Defendants agree that Bucklew's condition is progressive. Defendants do not necessarily agree that Bucklew is currently at a constant risk of choking and strangulation, but do agree that there is evidence that if *not* executed Bucklew will eventually be strangled to death by the hemangioma (Dr. Zivot Deposition 29–32, 90–91).

16. Mr. Bucklew experiences discomfort when forced to lie flat. Zivot Suppl. Report at 10 (see ¶ VI.H.); Antognini Dep. Tr. 146:13-147:6.

Answer: Defendants agree that Bucklew told both experts that he experienced discomfort while lying flat for one hour for medical imaging, but take no position on the veracity of the self-report.

17. The increased stress that Mr. Bucklew will experience from being forced to lie in a supine position while the execution team attempts to establish IV access in his poor peripheral veins increases the likelihood that Mr. Bucklew will experience choking sensations before the lethal injection is administered. Antognini Dep. Tr. 212:3-213:19.

Answer: Insofar as the "fact" is based on assertion that Bucklew will have to lie supine during an execution such an allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants do not agree that Bucklew will be forced to lie supine before an execution while the execution team attempts to access poor peripheral veins, or that if this did occur it would necessarily increase the risk of choking before the lethal chemical is administered for the reasons discussed in Answer to Paragraph 1. Further, Bucklew told both experts that he was able to adjust his breathing to tolerate being supine for an hour during medical imaging, and Bucklew's expert distinguished that from an execution because Bucklew would not be awake after the pentobarbital took effect, making it impossible to consciously regulate breathing (Dr. Antognini Deposition 142–50, Dr. Zivot Supplemental Report at 8).

18. Mr. Bucklew's hemangiomas are friable such that normal acts like eating or swallowing can cause bleeding. Zivot Suppl. Report at 4-8 (*see* ¶¶ III.F, V.A.4., V.B.8.); Antognini Dep. Tr. 121:25-122:11.

Answer: Defendants agree that Bucklew self-reports that he experiences bleeding from his hemangioma during normal activities, and that there is documentation of reported bleeding in medical records. But Defendants note that the treating physician, Dr. McKinney, who has been treating Bucklew since 2005, has never seen bleeding in examinations of Bucklew. *See* (Dr. McKinney Deposition at 72) (when Dr. McKinney was asked whether he aware of instances where strenuous activity had caused

Bucklew to bleed Dr. McKinney stated, "No, I think it's amazing I've been treating this guy since 2005 and I've never seen him with a bleed.").

19. Even vibrations from snoring can trigger bleeding from Mr. Bucklew's hemangiomas. Antognini Dep. Tr. 103:6-15.

Answer: Defendants agree that Bucklew has self-reported that when he wakes in the morning some bleeding from the hemangioma occurred during the night.

20. Choking is a form of suffering. Antognini Dep. Tr. 23:4-7.

Answer: Defendants agree that choking is a form of suffering, with the qualifier that the choking occurs when one is conscious and aware of the choking. Defendants do not agree that Bucklew will suffer when he is unconscious from pentobarbital and stops breathing.

21. Any length of time in which an individual is awake and choking would be painful or result in suffering. Antognini Dep. Tr. 211:22-25.

Answer: Defendants agree that a period of time when one is awake and choking can be defined as pain or suffering. But this abstract assertion is not material. Defendants do not agree that any period of time, no matter how tiny, when a person has difficulty breathing, is pain or suffering. Defendants also do not agree that Bucklew has presented any evidence that it is sure or very likely that he will not be able to breathe while he is awake, or that he will not be awake, but nevertheless, will suffer pain anyway during an execution.

22. A person may appear unconscious but still be able to experience pain and suffering. Antognini Dep. Tr. 165:23-166:21.

Answer: Defendants do agree that a theoretical person may appear unconscious and still be able to experience pain or suffering. But this statement is not material. It is not sure or very likely that Bucklew will be conscious for more than a matter of seconds after receiving pentobarbital, and it is the loss of consciousness from pentobarbital, while being supine, that Bucklew's expert defines as the event that may prevent Bucklew from regulating his breathing.

23. Mr. Bucklew will be conscious for at least 20 to 30 seconds after the pentobarbital enters his venous system. Antognini Dep. Tr. 196:12-22.

Answer: Defendants agree that Bucklew will be conscious for at least 20-30 seconds after the pentobarbital is injected.

24. Mr. Bucklew would be alive for several minutes after the injection. Antognini Dep. Tr. 45:8-15; Dormire Dep. Tr. 41:16-20.

Answer: Defendants do not necessarily agree that Bucklew will be alive "for several minutes after the injection." The study relied on by Dr. Zivot, Bucklew's expert, places "brain death" in horses injected with a similar amount of pentobarbital per weight at 73-261 seconds, although measurable brain electrical activity stops before that, within 52 seconds. Aleman, Williams, and Madigan, "Cerebral and Brainstem Electrophysiologic Activity During Euthanasia with Pentobarbital Sodium in Horses", Journal of

Veterinary Internal Medicine, Volume 29, 663–72 (loss of EEG, measuring brain electrical activity, occurred within 2 to 52 seconds after infusion with a median of 18 seconds; brain death, meaning cessation of brain stem function, occurred 73-261 seconds after infusion). Bucklew will not be pronounced dead for several minutes because a waiting period occurs before Bucklew will be examined for pronouncement of death, and then death is pronounced. (Director Dormire Deposition at 28) (offender is normally checked to confirm death after about seven minutes have passed). That does not necessarily mean Bucklew will be alive but unconscious for several minutes, or that he will be aware of any sensations while he is unconscious.

25. An individual's unique medical condition can affect the working of intravenous medication. Antognini Dep. Tr. 31:8-17, 33:1-17.

Answer: Defendants do not disagree with the abstract statement that a person's unique medical condition can affect the working of intravenous medication. But there is no evidence in this case that Bucklew's hemangioma will interfere with the circulation of pentobarbital. Indeed, both experts agree that there is no evidence that Bucklew's hemangioma will interfere with the circulation of pentobarbital. *See* (Dr. Zivot Deposition 65–66; Dr. Antognini Supplemental Report paragraphs 13, 14, and 26).

26. Mr. Bucklew's hemangioma affects his airway. Antognini Dep. Tr. 107:3-13, 108:13-14 (Q: "Does Rusty have a Mallampati 4?" A: "Yes.").

Answer: Defendants agree that Bucklew's hemangioma affects his airway.

27. Mr. Bucklew is at risk of having a hemorrhagic event causing him to aspirate his own blood during the execution procedure. Antognini Dep. Tr. 114:17-22, 216:5-14.

Answer: Defendants admit that there is some risk that Bucklew may bleed during an execution. But there is no evidence that it is sure or very likely he will have significant bleeding during an execution, let alone that he will be conscious and aware of it, or suffer pain from it. This is speculative.

This allegation is not material because it does not help establish that it is sure or very likely Bucklew will suffer serious illness or unnecessary suffering during an execution.

Defendants also note there is some risk of bleeding even if Bucklew is not executed. Eventually, if he is not executed, he will strangle to death and will definitely bleed during the process. (Dr. Zivot Deposition at 29–32, 90–91).

28. Mr. Bucklew's hemangiomas may bleed such that blood would come out of his orifices even after he is unconscious. Antognini Dep. Tr. 216:15-25.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that Bucklew might bleed after he is unconscious, but he might bleed at any time.

29. The speed at which an intravenous drug is injected impacts how long it takes for an inmate to become unconscious. Antognini Dep. Tr. 56:11-23.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that the speed of injection impacts when the pentobarbital takes effect. But testimony indicated that the injection would have to occur at an absurdly low speed for the impact to be meaningful. (Dr. Antognini Deposition at 56–57).

30. Mr. Bucklew has difficulty breathing when lying flat, which he is able to alleviate when he is awake by consciously adjusting his breathing pattern. Antognini Dep. Tr. 143:23-144:12, 188:4-9 ("He's going to have more difficulty, absolutely, than somebody else would."), 149:2-20.

Answer: Insofar as it assumes Bucklew will be forced to lie flat during an execution this allegation is not material for the reasons discussed in Answer to Paragraph 2. Defendants agree that Bucklew has stated to both experts that he has difficulty breathing while lying flat and that he is able to alleviate the difficulty by adjusting his breathing pattern.

31. As of May 17, 2010, Mr. Bucklew's tumor compromised Bucklew's airway, but did not disrupt Bucklew's quality of life or interfere with Bucklew's Activities of Daily Living. McKinney Dep. Tr. 42:2-20.

Answer: Defendants agree that Bucklew's tumor compromises his airway. Defendants agree that Dr. McKinney concluded, that although

Bucklew does not breathe completely normally, his condition is not impairing his daily activities and is not limiting him (Dr. McKinney Deposition at 43).

32. As of April 12, 2012, Mr. Bucklew was at a low risk of life-threatening hemorrhage. McKinney Dep. Tr. 44:19-45:14.

Answer: Defendants agree that Bucklew has a low risk of a life threatening hemorrhage at this time according to Dr. McKinney (Dr. McKinney Deposition at 44).

33. In October, 2013, Mr. Bucklew's treating physician observed that Mr. Bucklew's hemangioma had increased in size. McKinney Dep. Tr. 47:17-48:11.

Answer: Defendants agree that in October 2013, Dr. McKinney noted that hemangioma had increased in size.

34. In November 2015, Mr. Bucklew's treating physician again observed that Mr. Bucklew's hemangioma had increased in size. McKinney Dep. Tr. 48:16-49:4.

Answer: Defendants agree that in November 2015, Dr. McKinney noted that the hemangioma had increased in size.

35. In May 2014, Mr. Bucklew was examined by Dr. Zivot, who concluded that Mr. Bucklew's hemangiomas "severely compromised or obstructed" Mr. Bucklew's airway and that Mr. Bucklew's "dangerously compromised" airway put him at "great risk of choking and suffocation." ECF 182-1, Defs.' Ex. 1 at 183-85 (hereinafter, "5/14/14 Suppl. Aff. of Zivot"; *see* ¶¶ 6-7, 9).

Answer: Defendants agree that Dr. Zivot concluded that Bucklew is at great risk of choking and suffocation from a compromised airway during an execution. But Dr. Zivot does not opine here that this is sure or very likely

to occur during an execution. *See Jones v. Kelley*, 854 F.3d 1009 (8th Cir. 2017) (finding in as-applied challenge to execution method that Dr. Zivot's testimony of risk, that a plaintiff would suffocate and be aware of it during an execution, did not meet sure or very likely standard).

36. The current execution protocol has only been in effect since October 18, 2013. Lombardi Dep. Tr. 66:16-19; Open Portion Protocol at 2.

Answer: Defendants agree that the current protocol for lethal injection has been in place since October 2013.

37. All executions under the current protocol have been conducted while the inmate is in a supine position. Lombardi Dep. Tr. 80:22-81:8; Dormire Dep. Tr. 35:11-16; Steele Dep. Tr. 29:4-6, 15-17.

Answer: Defendants agree that in previous lethal injection executions the offender has been lying flat on a gurney. But Defendants do not agree that this must be so, or that there was any reason to vary the position in past executions (Director Dormire Deposition at 52).

38. [REDACTED]

Answer: Defendants are without sufficient information to admit or deny the contents of paragraph 38 as this paragraph is redacted from the copy of the pleading available to Defendants, and as of this writing Defendants have not been provided with an unredacted copy. To the extent an answer is required, Defendants deny.

39. The execution protocol does not contain instructions for dealing with or remedying an irregularity during an execution. Dormire Dep. Tr.

32:10-33:5; 35:17-36:18; ECF 182-11, Defs.' Ex. 7, Precythe Dep. Tr. 36:11-37:9.

Answer: This fact is not material for the reasons discussed in Defendants' Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that there is not a contingency plan for a failed execution beyond administering a second dose of pentobarbital. Defendants also note that witness statements establish that all Missouri executions using pentobarbital appeared to have been rapid and painless (Exhibit 4 to Dr. Antognini Deposition).

40. The execution protocol does not contain provisions instructing the execution team on how to respond if an inmate begins choking or hemorrhaging during the execution. Pl.'s Ex. 3, Defs.' Resp. to Pl.'s Req. for Admis. (see Defs.' Resp. to Nos. 2-3). *See also* Dormire Dep. Tr. 36:5-11; Precythe Dep. Tr. 36:11-37:9.

Answer: This fact is not material for the reasons discussed in Defendants' Answer to Paragraph 2.

To the extent an answer is required, Defendants agree.

41. The only medical information provided to the execution team regarding an inmate's existing health conditions are contained in a single page document. Dormire Dep. Tr. 43:20-44:6; Precythe Dep. Tr. 27:20-29:10. Mr. Bucklew's medical one-pager, dated May 2, 2014, listed Mr. Bucklew's "most recent vital signs," current medications, and the following "medical problems": "Gunshot wound to head 1996, Cavernous hemangioma – right half of maxilla (upper jaw) and upper lip present for 20 plus years, hard of hearing." Pl.'s Ex.4, Doc. No. 9900038, Pl.'s 5/2/14 Pre-Execution Medical Summary.

Answer: The allegations contained in this paragraph are not material to Bucklew's Fourth Amended Complaint that any means of lethal injection would be cruel and unusual based on his hemangioma for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants deny that the only information that has been or will be provided to the anesthesiologist about Bucklew's condition is necessarily in the one page summary referenced in this paragraph.

42. No individual suffering from cavernous hemangioma has been executed under Missouri's current lethal injection protocol. Defs." Resp. to Pl.'s Req. for Admis. (see Defs.' Resp. to No. 4).

Answer: Defendants agree to Defendants' knowledge.

43. The execution team cannot consult with an inmate's treating physicians regarding any atypical or unique medical conditions the inmate may have. McKinney Dep. Tr. 22:10-21.

Answer: This allegation is not material for the reasons discussed in Answer to Paragraph 2.

To the extent an answer is required, Defendants agree that medical team member members cannot "consult with an inmate's treating physicians," to perform the execution. This does not establish that the anesthesiologist cannot be provided with additional relevant medical information about Bucklew.

44. The execution team members do not have enough information to determine if an inmate is fit for execution. Precythe Dep. Tr. 31:3-8.

Answer: Defendants deny that the execution team does not have enough information to determine if Bucklew is "fit for execution" or that this assertion is material. If the execution can be conducted consistently with the Eighth Amendment, which it can, Bucklew's subjective views on fitness are not material. *See* Paragraph 2.

45. The state of Missouri authorizes the use of lethal gas for executions. Dormire Dep. Tr. 45:4-9; Breisacher Dep. Tr. 47:6-10.

Answer: Defendants agree that Mo. Rev. Stat. §546.720 states that the method execution shall be by lethal gas or lethal injection. Defendants do not agree that Missouri is capable of carrying out executions by lethal gas, and testimony in fact, indicates that the former General Counsel for the Department of Corrections was forced to give up research into the subject because his research "hit a wall" due to lack of necessary research articles and lack of expert opinions on the matter (Matthew Briesacher Deposition at 46–58).

46. If administered correctly, nitrogen hypoxia could cause less pain and suffering than lethal injection. Antognini Dep. Tr. 235:1-11.

Answer: Defendants deny that "nitrogen hypoxia could cause less pain and suffering than lethal injection." But even if taken as true, this general assertion is not material. Defendants' expert opined that nitrogen

hypoxia would *not* be more humane than lethal injection (Dr. Antognini Deposition 129, 231–36). Bucklew's expert indicated there was insufficient research to establish it would be more humane (Dr. Zivot Deposition 38–40), and the former General Counsel who researched the matter found there was insufficient research available to proceed (Matthew Briesacher Deposition 46–58). This is consistent with Eighth Circuit precedent teaching that nitrogen hypoxia cannot be categorized as a feasible and readily available alternative that will significantly reduce a risk of unnecessary pain when nitrogen hypoxia has never been used in an execution. *See McGehee v. Hutchinson*, 854 F.3d 488 (8th Cir 2017) (noting that as nitrogen hypoxia has no track record of successful use in executions, it is not likely to emerge as a more than marginally safer method of execution).

47. If administered correctly, the use of nitrogen gas in an execution would quickly achieve hypoxia and cause an inmate to become quickly unconscious. Antognini Dep. Tr. 234:12-21.

Answer: Defendants agree that Dr. Antognini stated that nitrogen gas can quickly cause hypoxia and that hypoxia can quickly cause unconsciousness. But this general statement is immaterial. Pentobarbital quickly causes unconsciousness and has, unlike nitrogen hypoxia, which has never been used in an execution, reliably done so in many executions. There is no real evidence that nitrogen hypoxia is feasible and readily available as a method of execution or that it would significantly reduce a substantial risk of

pain. Bucklew does not explain why his arguments that he might suffer while unconscious do not apply to nitrogen hypoxia, nor does he argue that his unconsciousness from nitrogen hypoxia would be as quick or as deep as from pentobarbital, or that his death from nitrogen hypoxia would be quicker.

ARGUMENT

To defeat a motion for summary judgment, the non-moving party "'must do more than simply show that there is some metaphysical doubt as to the material facts,' and must come forward with 'specific facts showing that there is a genuine issue for trial.'" *Torgeson v. City of Rochester*, 643 F.3d 1031, 1042 (8th Cir. 2011) (en banc) *quoting Matsushita Elec. Indus. Co. v. Zenith Radio Corp.,* 475 U.S. 574, 586–87 (1986). The non-moving "may not rest upon allegations, but must produce probative evidence sufficient to demonstrate a genuine issue [of material fact] for trial." *Paine v. Jefferson Nat. Life Ins. Co.,* 594 F.3d 989, 992 (8th Cir. 2010) (modification in original). "A genuine issue of fact exists 'if the evidence is such that it could cause a reasonable jury to return a verdict for either party; a fact is material if its resolution affects the outcome of the case.'" *Paine v. Jefferson Nat. Life Ins. Co.,* 594 F.3d 989, 992 (8th Cir. 2010). Conversely, "[w]here the record taken as a whole could not lead a rational trier of fact to find for the nonmoving party, there is no genuine issue for trial." *Torgeson,* 643 F.3d at 1042. (internal citations and quotations omitted).

Bucklew bears the burden of proving both elements of his Eighth Amendment method-of-execution claim. To do so he must prove that any lethal injection procedure is "sure or very likely to cause serious illness and needless suffering," and he must prove "that another execution procedure

exists that is feasible and readily implemented, and that an alternative method will significantly reduce a substantial risk of severe pain." *Zink v. Lombardi*, 783 F.3d 1089, 1102–03 (8th Cir 2015) (*en banc*). In his response, Bucklew does not demonstrate specific facts, material to the elements of these claims that are disputed. Rather, he does nothing more than present speculative conclusions and immaterial matters that do not support the elements of his claim. He has not sustained his burden.

I. Bucklew has not created a genuine dispute of fact on whether he is sure or very likely to suffer serious illness or needless suffering from all methods of lethal injection because of his hemangioma.

In rejecting the sufficiency of Dr. Zivot's testimony in *McGehee v. Hutchinson*, 854 F.3d 488, 492–93 (8th Cir. 2017) (en banc) (per curiam), the United States Court of Appeals for the Eighth Circuit emphasized that the capital defendant's burden that must be proved is "sure or very likely," and that showing a significant possibility based on equivocal evidence is not enough. The Eighth Circuit noted that if there is not a consensus, or is a paucity of evidence, a petitioner may be unable to meet his burden. *Id.*; s*ee also Jones v. Kelley*, 854 F.3d 1009, 1015 (8th Cir 2017) (Dr. Zivot's testimony that the petitioner would likely suffocate during his execution due to unique medical conditions did *not* meet the "sure or very likely" standard); *see also Williams v. Kelley*, 854 F.3d 998, 1001 (8th Cir. 2017) (Dr. Zivot's testimony

that Arkansas execution protocol would likely maim the petitioner due to his unique medical condition did *not* meet the "sure or very likely" standard).

Dr. Zivot's testimony falls short here as well. To survive summary judgment Bucklew must establish that there is a disputed issue of material fact that it is *sure or very likely* he will suffer serious illness or needless suffering if he is executed by any lethal injection procedure. The Eighth Circuit's recent cases reflect that Bucklew has not done that. In an attempt to avoid summary judgment, Bucklew seeks to create additional "facts" based on his speculation that there is some risk that something may go wrong during his execution, if and only if, a series of contingencies occur, such as his having to lie flat during the execution, and his losing consciousness and therefore losing his ability to regulate his breathing, but still being aware. He also postulates that the anesthesiologist will make a series of bad choices or otherwise failed attempts in selecting a vein and starting an I.V. But Bucklew's evidence offered in support of his claim is weaker than the evidence rejected by the Eighth Circuit in *McGehee*, *Jones,* and *Williams*.

Bucklew's sole surviving claim in his Fourth Amended Complaint, as summarized by this Court, is that *any* lethal injection violates the Eighth Amendment because lethal injection relies on the circulatory system and Bucklew's hemangioma interferes with his circulation. Specifically, Bucklew claims that any lethal chemical will not travel through the body as intended

and the hemangioma will rupture during an execution causing Bucklew to choke, making any method of lethal injection execution cruel and unusual punishment (Document 105 at 2). But the record refutes this allegation.

Following imaging of the hemangioma, Dr. Antognini concluded that the hemangioma is not the type of tumor that will interfere with the circulation of pentobarbital and Dr. Zivot admitted that there is no evidence that it is. Dr. McKinney, who has been treating Bucklew since 2005 and has never seen the hemangioma bleed, indicates that it does not interfere with Bucklew's daily activities and indicates that Bucklew has a low risk of a life threatening hemorrhage at this time. Based on this evidence, there is no reason to believe the hemangioma will delay the circulation of the chemical or that the hemangioma is on the verge of rupture.

Perhaps recognizing the evidence wholly refutes his allegation, Bucklew attempts to identify other risks. Bucklew alleges that he has difficulty sleeping in a completely supine position and props himself on a pillow, and speculates he would choke if he had to remain supine during an execution. But there is no real reason he would have to be completely supine during an execution. And Bucklew admits he was able to remain supine recently for an hour during imaging of his hemangioma and was able to regulate his breathing during that period.

Bucklew seeks to distinguish these facts by alleging that after the pentobarbital takes effect, he will no longer be conscious and therefore, will not be able to regulate his breathing, and may choke while being supine. Assuming this would even occur, the time period of potential awareness would be very brief. Dr. Antognini indicated that Bucklew can be expected to be in a coma-like state within 20–30 seconds, and the period when he could be aware of discomfort after the pentobarbital takes effect will be around 10 seconds. Dr. Zivot countered that a study on horses indicated unconsciousness would take longer (the study itself indicated cessation of measurable brain electrical activity in 2 to 52 seconds, and brain death in 73–261 seconds), and there would be some period, the length of which Dr. Zivot would not quantify, when the pentobarbital had taken effect, interfering with the regulation of breathing due to lack of consciousness, and Bucklew would still be able to sense discomfort. But the risk of discomfort Bucklew alleges here is both speculative and contingent on the procedures used, and does not create a genuine issue of material fact that he is sure or very likely to suffer serious illness or unnecessary suffering from any form of lethal injection.

Bucklew also speculates that the I.V. will not be placed properly which will lead to a series of events that cause him to suffer. During Bucklew's physical examinations, Dr. Zivot and Dr. Antognini both noted that Bucklew has poor peripheral veins in his hands and arms, but noted no other problems

with central veins or with peripheral veins in other parts of his body. Bucklew claims that the anesthesiologist will make multiple failed attempts to set an intravenous line in the visibly poor veins on both sides before choosing another location, and that the stress from this will aggravate Bucklew's hemangioma, causing bleeding and choking. Because Bucklew did not really plead this poor-vein scenario in his complaint, Defendants do not consent to his belated argument and oppose an amendment to Bucklew's fourth amended complaint or the Court's consideration of the poor-vein claim at this late date. Even if the Court considered his belated claim, his argument about the veins is both speculative and contingent on a series of events that will not necessarily occur.

In sum, Bucklew has not shown a genuine issue of material fact here that it is sure or very likely he will suffer serious illness or needless suffering from any lethal injection procedure.

II. Bucklew has not created a genuine issue of fact on whether there is a feasible and readily implemented alternate method of execution, specifically gas, that will significantly reduce a substantial risk of pain.

The Eighth Circuit recently reaffirmed that "an inmate raising an as-applied challenge still must identify a 'feasible readily implemented alternative that would significantly reduce the substantial risk of pain'" to satisfy the second-prong of the Eighth Amendment test. *Jones*, 854 F.3d at

1016. In *McGehee*, the Eighth Circuit rejected the petitioner's claim that nitrogen hypoxia is a feasible and readily available method that would significantly reduce a substantial risk of pain. *McGehee*, 854 F.3d at 493. In so doing, the appellate court noted that nitrogen hypoxia has never been used in an execution and has no track record of successful use. *Id.* Like the petitioners in *McGehee,* Bucklew also relies on nitrogen hypoxia. But *McGehee* controls. His claim must be denied.

Dr. Zivot appears to be in agreement with the Eighth Circuit. Here, Dr. Zivot opined that there are insufficient studies to determine that nitrogen hypoxia will not be a cruel method of execution. Dr. Antognini opined that the use of gas would not impact the risk of this inmate suffering and that there could be more or less suffering. Matthew Briesacher, former General Counsel of the Department, testified that his attempts to research gas as a method of execution "hit a wall" due to a lack of research articles and experts on the matter. Bucklew's "evidence" is a conclusory statement that nitrogen gas can quickly cause hypoxia, and hypoxia can quickly result in unconsciousness. That does not come close to creating a genuine issue of material fact on the issue that nitrogen hypoxia or any other form of execution by gas is a feasible and readily available alternate method of execution that would significantly reduce a substantial risk of pain to Bucklew.

III. Bucklew has not refuted the claim preclusion or statute of limitations defenses.

Bucklew provides no good reason why he could not have brought his as-applied challenge to his execution, along with the facial challenge in the *Zink* litigation to which he was a party. Therefore, Bucklew's claim is barred by claim preclusion. *See Williams v. Kelley*, 2017 WL 1437964 (E.D. Ark 2017) (Williams could and should have brought his as-applied challenge along with the facial challenge in *McGehee* in which he was a party). Nor has Bucklew overcome Defendants' assertion that Bucklew's claim is barred by the statute of limitations. As the Eighth Circuit recognized *sua sponte* on appeal and what has now been shown by the record here is that Bucklew knew the general basis of the claim in 2008, but did not assert it. Bucklew attempts to avoid the statute of limitations defense by claiming that the limitations period did not accrue until he was examined by Dr. Zivot. This argument is not reasonable. If that were the law, plaintiffs could largely ignore statutes of limitations simply by putting off medical examinations until they chose to bring suit. That is untenable.

IV. Bucklew's evidence defeats Article III jurisdiction.

Bucklew must also establish an 1) injury in fact, 2) caused by the defendants, that 3) this Court can redress, in order to establish Article III jurisdiction over the case. *See Spencer v. Kemna*, 523 U.S. 1, 8 (1998) (at

every stage of the litigation the plaintiff must have suffered or be threatened with an actual injury, traceable to the defendant, that is likely to be redressed by a favorable judicial decision). Dr. Zivot opines there is no question that unless Bucklew is executed or dies of some unforeseen cause he *will* die of strangulation by the hemangioma at some future time. According to Dr. McKinney, the treating physician, there is a low risk that the hemangioma will result in serious bleeding now; and there is at most in the record before this Court, equivocal evidence and speculation that *if* certain contingencies occur, Bucklew *might briefly* be aware of discomfort during his execution. The risk of brief discomfort during the execution is small compared to the certainty of discomfort that will result from prolonged painful strangulation in the absence of an execution. There is no constitutional injury in fact, caused by Defendants that this Court can redress here.

CONCLUSION

This Court should grant Defendants' motion for summary judgment.

Respectfully submitted,

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ATTORNEYS FOR DEFENDANTS

CERTIFICATE OF SERVICE

I hereby certify that on the 30th day of May, 2017, I electronically filed the pleading, and this Court's electronic filing system should serve counsel for Bucklew.

/s/ Michael Spillane
Assistant Attorney General

IN THE UNITED STATES DISTRICT COURT FOR THE
WESTERN DISTRICT OF MISSOURI
WESTERN DIVISION

RUSSELL BUCKLEW,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Case No. 14-8000-CV-W-BP
	)	
GEORGE A. LOMBARDI, *et al.*,	)	
	)	
Defendants.	)	

ORDER AND OPINION GRANTING DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

Pending is Defendants' Motion for Summary Judgment, which seeks summary judgment on the Eighth Amendment Claim presented in Count I[1] of the Fourth Amended Complaint. Defendants contend that the undisputed facts demonstrate (1) they are entitled to judgment as a matter of law on the merits, (2) Plaintiff's claim is barred by the statute of limitations, and (3) Plaintiff's claim is barred by principles of claim preclusion.[2] As discussed below, the Court agrees that the undisputed facts in the Record establish that Plaintiff cannot prevail on his Eighth Amendment claim, and for that reason the motion, (Doc. 181), is **GRANTED.**[3]

[1] Counts II and III were previously dismissed by the Court. (Doc. 63.)

[2] Defendants also contend the Court should dismiss the case because it lacks jurisdiction. (Doc. 182, pp. 9-10.) The argument has been presented before, and the Court rejects it for the reasons previously stated. (*See* Doc. 101.) To the extent that Defendants' argument has shifted to contend that the Court lacks jurisdiction because the Record now proves that Plaintiff will not suffer a redressable injury, the Court rejects this argument as well. Defendants' argument relates to Plaintiff's ability to prove his claim, not to the Court's jurisdiction, and crediting Defendants' argument would essentially require dismissal (without prejudice) for lack of jurisdiction anytime a plaintiff fails to prove his claim. It "is important not to conflate the injury and traceability requirements of a standing analysis with the plaintiff's ultimate burden of proof as to the issues of damages and causation at a trial on the merits," *Brown v. Medtronic, Inc.,* 628 F.3d 451, 457 (8th Cir. 2010), and this observation applies equally when the merits are considered at the summary judgment stage.

[3] The Court does not address the statute of limitations or claim preclusion arguments. These issues were not addressed before the first appeal, and the Court of Appeals declined to address them in the first instance. *Bucklew v. Lombardi*, 783 F.3d 1120, 1122 n.1, 1128-29 (8th Cir. 2015) (en banc). Following remand Defendants sought dismissal on these grounds, but the Court denied the request without prejudice because the Record was not yet

I. BACKGROUND

A. Procedural History

Plaintiff Russell Bucklew was convicted in state court of first degree murder, kidnapping, burglary, forcible rape, and armed criminal action. He was sentenced to death for the murder and various terms of years on the other crimes. *State v. Bucklew,* 973 S.W.2d 83 (Mo. 1998) (en banc), *cert. denied,* 525 U.S. 1082 (1999). His requests for postconviction relief and habeas relief were denied. *Bucklew v. State,* 38 S.W.3d 395 (Mo.) (en banc), *cert. denied*, 534 U.S. 964 (2001); *Bucklew v. Luebbers*, 436 F.3d 1010 (8th Cir.), *cert. denied,* 549 U.S. 1079 (2006).

Plaintiff filed this suit in May 2014. The Court dismissed the case, but the dismissal was reversed and the case was remanded. *Bucklew v. Lombardi*, 783 F.3d 1120, 1128 (8th Cir. 2015) (en banc). After the Mandate was issued, Bucklew filed a series of Amended Complaints. The latest – the Fourth Amended Complaint – is the operative pleading, and as noted earlier Count I is the only remaining count. Count I asserts an Eighth Amendment challenge, contending that Missouri's method of execution is unconstitutional as applied to Plaintiff because of his unique medical condition.

B. Facts

Plaintiff suffers from a congenital condition known as cavernous hemangioma. The disease causes clumps of weak, malformed blood vessels and tumors to grow throughout his body, including his head, face, neck and throat. The tumors are very susceptible to rupture. The

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sufficiently developed and various legal complexities (some of which had been identified by the Court of Appeals, 783 F.3d at 1122 n.1) had not been addressed. The Court's Order explained some of the difficulties involved in determining whether these doctrines apply. (Doc. 63, pp. 9-13.) The Supreme Court has since discussed the doctrine of claim preclusion when an as-applied challenge follows an unsuccessful facial challenge. *Whole Woman's Health v. Helerstedt,* 136 S. Ct. 2292, 2305 (2016). In reasserting these arguments Defendants have not addressed any of these factual or legal issues; they have merely cited general principles without explaining how they apply in this unique situation, and cited to the same facts that were earlier deemed to be incomplete and therefore insufficient. Given the Court's ruling on the merits there is no need to further delay resolution of this case to provide Defendants another opportunity to address these issues.

disease also affects Plaintiff's circulatory system, resulting in (among other effects) compromised peripheral veins in his hands and arms. The tumors in his throat also make it difficult for him to breathe, and that difficulty is exacerbated when he is in a supine position. Plaintiff's condition is incurable, and surgery to alleviate the tumors is not possible due to the risk of severe bleeding.

Missouri's death penalty protocol has not been succinctly described, but the parties implicitly agree (and the Record demonstrates, (*e.g.,* Doc. 182-1, pp. 135-36; Doc. 197-1; Doc. 182-7, pp. 7-9)),[4] that it involves the intravenous administration of pentobarbital in dosages sufficient to cause unconsciousness and eventually death. In terms of the IV's placement, the protocol provides as follows:

> Medical personnel shall determine the most appropriate locations for intravenous (IV) lines. Both a primary IV line and a secondary IV line shall be inserted unless the prisoner's physical condition makes it unduly difficult to insert more than one IV. Medical personnel may insert the primary IV line as a peripheral line or a central venous line (e.g., femoral, jugular, or subclavian) provided they have appropriate training, education and experience for that procedure. The secondary IV line is a peripheral line.

(Doc. 182-1, p. 1.) The parties seem to agree that because of the cavernous hemangioma Plaintiff's peripheral veins cannot be used in this process because of the risk that they will rupture (assuming that an IV could be placed in them in the first place). However, the portion of the protocol quoted above confirms that a central line in the femoral vein may be used instead of inserting an IV in the peripheral veins. With respect to the risk of Plaintiff's femoral vein rupturing, Plaintiff's expert, (Dr. Joel Zivot), testified that the femoral vein is large and capable of "tak[ing] a fair amount of fluid" when the central line is properly placed, and the risk of that vein rupturing is "unlikely." (Doc. 182-1, p. 26.) Dr. Zivot also denied having any reason to believe that Plaintiff's medical condition made his femoral vein more susceptible to rupture than

[4] All page numbers are those generated by the Court's CM/ECF system.

might otherwise be expected, and confirmed that his testimony about the risk of Plaintiff's veins rupturing was limited to Plaintiff's peripheral veins. (Doc. 182-1, pp. 70-71, 77-78.) Plaintiff also concedes that there is no evidence in the Record establishing that Plaintiff has any problem with his veins *other* than his peripheral veins, including his femoral vein. (Doc. 197, p. 9.) Finally, the Record confirms that Plaintiff's medical condition will not affect the flow of chemicals in his bloodstream once they are introduced through the femoral vein, or otherwise affect his expected response to the pentobarbital. (*E.g.,* Doc. 182-1, pp. 65-66, 213-14, 219.)

An execution is typically conducted with the prisoner lying on his back. The procedure for inserting a central line is also usually performed with the person in the supine position. The Record establishes that Plaintiff has difficulty breathing while in that position because the tumors can cause choking or an inability to breathe. Sometimes the tumors bleed, thereby exacerbating the sensation. When required to be on his back, Plaintiff can "adjust" his breathing so that he can remain in that position; for instance, Plaintiff was able to lie on his back for approximately one hour while undergoing an MRI. However, there are factual disputes as to (1) Plaintiff's ability to adjust his breathing once the pentobarbital begins to take effect, (Doc. 181-1, pp. 81-82), and (2) how quickly the pentobarbital will deprive Plaintiff of the ability to sense that he is choking or unable to breathe. On the latter point Dr. Zivot testified that it could be fifty-two to 240 seconds before the pentobarbital induces a state in which Plaintiff could no longer sense that he is choking or unable to breathe. (*E.g.,* Doc. 182-1, pp. 84-88.) Defendants point out that their expert, Dr. Joseph Antognini, opined that Plaintiff would be unconscious within twenty to thirty seconds and at that point would be incapable of experiencing pain. (Doc. 182-1, pp. 198-99; Doc. 182-5, pp. 60-62.) However, the Court cannot resolve this dispute between the experts on summary judgment.

Defendants also invite the Court to analyze the study Dr. Zivot relied upon to find that fifty-two seconds of awareness is the worst case scenario because that is when brain death occurs. (Doc. 200, p. 15.) Dr. Zivot addressed this issue in his deposition, explaining that the study's use of the term "brain death" was a "misnomer" because the study marked "brain death" before measurable brain activity terminated; he then indicated that pain might be felt until measurable brain activity ceases. (Doc. 182-1, pp. 83-86.)[5] The Court also cannot resolve this factual dispute on summary judgment. Therefore, construing the Record in Plaintiff's favor reveals that it could be fifty-two to 240 seconds before the pentobarbital induces a state in which Plaintiff could no longer sense that he is choking or unable to breathe.[6]

II. DISCUSSION

A moving party is entitled to summary judgment on a claim only upon a showing that "there is no genuine issue of material fact and that the moving party is entitled to a judgment as a matter of law." *See generally Williams v. City of St. Louis*, 783 F.2d 114, 115 (8th Cir. 1986). "[W]hile the materiality determination rests on the substantive law, it is the substantive law's identification of which facts are critical and which facts are irrelevant that governs." *Anderson v. Liberty Lobby, Inc*., 477 U.S. 242, 248 (1986). Thus, "[o]nly disputes over facts that might affect the outcome of the suit under the governing law will properly preclude the entry of summary judgment." *Wierman v. Casey's Gen. Stores*, 638 F.3d 984, 993 (8th Cir. 2011) (quotation omitted). In applying this standard, the Court must view the evidence in the light

[5] This may be a generous interpretation of Dr. Zivot's testimony. However, (1) the Record must be construed in the light most favorable to Plaintiff and (2) the Court is not required to resolve the elements of Plaintiff's claim in any particular order. Therefore, the Court deems it appropriate to adopt this interpretation of Dr. Zivot's testimony in order to frame the discussion about Plaintiff's proffered alternative method of execution.

[6] Defendants also suggest that the execution could be performed with Plaintiff in a different position, but there is no evidence whether this has an effect on the procedure as a whole or the procedure for inserting a central line specifically. In light of the Record's silence on these matters, Defendants have not provided the Court with a basis for granting summary judgment based on the possibility of performing the execution with Plaintiff in a sitting (or other) position.

most favorable to the non-moving party, giving that party the benefit of all inferences that may be reasonably drawn from the evidence. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587-88 (1986); *Tyler v. Harper*, 744 F.2d 653, 655 (8th Cir. 1984), *cert. denied*, 470 U.S. 1057 (1985). A party opposing a motion for summary judgment may not simply deny the allegations, but must point to evidence in the Record demonstrating the existence of a factual dispute. Fed. R. Civ. P. 56(c)(1); *Conseco Life Ins. Co. v. Williams*, 620 F.3d 902, 909-10 (8th Cir. 2010).

In *Glossip v. Gross*, the Supreme Court determined "what a prisoner must establish to succeed on an Eighth Amendment method-of-execution claim." 135 S. Ct. 2726, 2737 (2015). "[D]ecisions in this area have been animated in part by the recognition that because it is settled that capital punishment is constitutional, it necessarily follows that there must be a constitutional means of carrying it out." *Id.* at 2732-33. Moreover, "because some risk of pain is inherent in any method of execution, we have held that the Constitution does not require the avoidance of all risk of pain." *Id.* at 2733. In light of these observations, a prisoner alleging that a particular form of execution is cruel and unusual within the meaning of the Eighth Amendment must first establish that the method to be utilized "presents a risk that is sure or very likely to cause serious illness and needless suffering, and give rise to sufficiently imminent dangers." *Id.* at 2737 (quotations and emphasis deleted). The prisoner must then "identify a known and available alternative method of execution that entails a lesser risk of pain, a requirement of all Eighth Amendment method-of-execution claims." *Id.* at 2731. The alternative must be "feasible, readily implemented, and in fact significantly reduce[ ] [the] substantial risk of severe pain." *Id.* at 2737; *see also Bucklew,* 783 F.3d at 1128. The Court has discretion to decide the order in which it will address these two components of Plaintiff's claim. *Bucklew,* 783 F.3d at 1128.

A. Risk of Serious Illness or Needless Suffering

Defendants contend that the uncontroverted facts demonstrate that Plaintiff is not sure or likely to experience a serious injury or needless suffering. Plaintiff contends that he has demonstrated a serious risk that he will experience needless pain and suffering because (1) the weakness in his peripheral veins precludes using them to administer the pentobarbital, and (2) he will choke or otherwise be unable to breathe for an extended period of time before the pentobarbital takes full effect. The Court concludes that the Record establishes that (1) the use of Plaintiff's femoral vein does not present any risk of serious illness or needless suffering, and (2) the Record does not permit a conclusive determination regarding the risk that Plaintiff will choke and be unable to breathe for a period of time that would violate the Eighth Amendment.

1. Use of Plaintiff's Femoral Vein

As discussed in Part I.B, there is an apparent consensus that an IV cannot be safely inserted in Plaintiff's peripheral veins. However, the execution protocol allows a central line to be inserted in Plaintiff's femoral vein, and the Record establishes that this can be done without the risk of complications attributable to Plaintiff's congenital condition. The Court also notes that Plaintiff's legal argument does not discuss Defendant's evidence that his femoral vein can be used to administer the execution drugs. (Doc. 197, pp. 34-43.) Plaintiff discusses the use of his femoral vein only in the portion of his Opposition that addresses the facts in the Record, and even in that context he does not present any legal arguments based on those facts. Nonetheless, the Court will briefly discuss these factual issues.

Generally speaking, Plaintiff addresses the potential difficulty in locating the femoral vein and the fact that medical personnel might require multiple attempts to locate it.[7] This, he

[7] To the extent Plaintiff contends that there is no evidence demonstrating that Plaintiff's femoral veins are unaffected by his disease, this argument does not change the Court's opinion. If there is no evidence that will establish any

posits, will increase his stress, thereby increasing his breathing rate and making it more likely that he will choke. Plaintiff also suggests that if the procedure is not performed properly the drugs might be injected in an artery instead of the vein. (Doc. 197, pp. 18-20.) However, Plaintiff does not quantify these risks, nor (as stated) does he explain how these facts independently establish that the current protocol presents a risk of serious illness or needless suffering. The possibility that Plaintiff might experience increased stress (or, more precisely, more stress than the situation might otherwise produce) is particularly speculative, as are the effects of that extra stress. Moreover, on several occasions the Court has observed that Plaintiff cannot predicate his Eighth Amendment claim on the bare possibility that a medical procedure might be performed incorrectly.

The uncontroverted facts demonstrate that the lethal injection protocol can be implemented by using Plaintiff's femoral vein, and that doing so will not create a substantial risk of serious injury or needless suffering. Therefore, the fact that Plaintiff's peripheral veins cannot be used will not support the first component of Plaintiff's claim.

2. Plaintiff's Obstructed Airway

As discussed in Part I.B, the facts construed in Plaintiff's favor would permit a factfinder to conclude that for as long as four minutes Plaintiff could be aware that he is choking or unable to breathe but be unable "adjust" his breathing to remedy the situation. In seeking summary judgment Defendants have not contended that such a situation would not satisfy *Glossip* (and the Court does not hold whether it does or does not); Defendants' sole argument is that Plaintiff would likely experience this sensation for twenty to thirty seconds or, at worst, fifty-two seconds. As discussed before, this is a factual dispute that the Court cannot resolve on summary

problems with the use of Plaintiff's femoral vein, then there is no reason to have a trial on the issue. Without evidence, it is a foregone conclusion that Plaintiff cannot prevail on this issue.

judgment, and would have to be resolved at trial. Therefore, solely for purposes of further discussion, the Court presumes that there is a substantial risk that Plaintiff will experience choking and an inability to breathe for up to four minutes.

B. Alternative Measures

Plaintiff contends that death through nitrogen gas-induced hypoxia will significantly reduce the risks of severe pain and suffering. Defendants do not argue that this method of execution is not feasible or readily implemented. Instead, Defendants argue that the Record demonstrates this method of execution will not reduce Plaintiff's risk of pain and suffering. Plaintiff disputes this point and further contends that he is not required to identify an alternative method of execution.

The Court addresses Plaintiff's second point first. He contends that *Glossip* does not apply because that case involved a facial challenge and he presents an as-applied challenge. The Court disagrees. First, *Glossip* set forth the requirements for an Eighth Amendment challenge to an execution method. The Supreme Court did not distinguish between facial and as-applied challenges, and it did not provide a basis for interpreting *Glossip* as creating such a distinction. To the contrary, the Supreme Court specified that the need to "identify a known and available alternative method of execution that entails a lesser risk of pain [is] a requirement of *all* Eighth Amendment method-of-execution claims." *Glossip,* 135 S. Ct. at 2731 (emphasis supplied). Second, the Eighth Circuit clearly directed that Plaintiff must (1) identify at the pleading stage and (2) eventually prove that there is an alternative that will significantly reduce the risk. *Bucklew*, 783 F.3d at 1128. This is the law of the case, and the Court must adhere to it. Third, the Eighth Circuit has explicitly rejected Plaintiff's argument in other cases. *Williams v. Kelley,* 854 F.3d 998, 1001 (8th Cir.), *cert. denied,* 137 S. Ct. 1284 (2017) (citing *Johnson v. Lombardi,*

809 F.3d 388, 391 (8th Cir.), *cert. denied,* 136 S. Ct. 601 (2015)). For these reasons, the Court concludes Plaintiff is required to prove that there is a feasible and readily available alternative that will significantly reduce the risk of suffering that lethal injection will present.

The Court agrees with Defendants that the facts in the Record do not present a triable dispute on this issue. Given the risk of suffering that the Court identified as potentially supported by the Record, (*see* Part II.A.2, *supra*), the question is whether (1) the use of nitrogen gas will cause Plaintiff to become unaware of his choking and breathing difficulties sooner than he would under the current protocol, and (2) whether that difference in time is sufficient to permit the Court to find that nitrogen gas will make a "significant" difference in Plaintiff's suffering. Put another way: a finder of fact might conclude that if pentobarbital is used, there is a four minute period of time during which Plaintiff would experience significant suffering. Given that, could a finder of fact conclude that the use of nitrogen gas will significantly reduce that period of awareness?

Defendants point to their expert's supplemental report, wherein he states that "the use of lethal gas does not hold any advantage compared to lethal injection with respect to pain and suffering. Both methods would result in minimal pain and suffering." (Doc. 182-1.) This requires Plaintiff to identify facts in the Record that create a factual dispute necessitating a trial, but Plaintiff has not identified any such facts. Dr. Zivot would not address the issue in his deposition, (Doc. 182-1, pp. 38-40), and Plaintiff does not contend that Dr. Zivot's testimony creates a factual dispute. Plaintiff instead relies on Dr. Antognini's deposition, but the Court has reviewed the cited testimony and finds nothing that supports Plaintiff's position.[8] Dr. Antognini

[8] Plaintiff also attempts to create factual disputes about the Missouri Department of Corrections' efforts to research the viability and effects of executing prisoners with nitrogen gas, but the issue is not relevant under the governing legal principles.

was asked to compare the use of pentobarbital to nitrogen gas, but his answer does not indicate that there are any differences between them. (Doc. 182-5, pp. 58-59.) To the contrary, he stated:

> You know, you get – you can get suffering from hypoxia, you know, because somebody can be awake and realize that they're not getting enough oxygen. So depending on – on how it's used, you might get more suffering from nitrogen gas than you would from Pentobarbital. Or you might get less suffering, you know, it depends on how you would use it, I guess.

(Doc. 182-5, p. 59.) As relevant to the claim at issue, Dr. Antognini specifically stated that he believed there would be no difference in the "speed" of lethal gas as compared to pentobarbital. (*Id.*) Plaintiff points to Dr. Antognini's indication that nitrogen gas would "quickly" cause unconsciousness, (Doc. 182-5, p. 59), but this is unavailing for two reasons. First, Dr. Antognini said the same thing about pentobarbital; in his opinion, both would "quickly" cause unconsciousness. Thus, this opinion does not support the proposition that nitrogen hypoxia would cause unconsciousness sooner than pentobarbital. Second, the premise for Plaintiff's claim is that there is a period between unconsciousness and brain death during which he will experience pain. Therefore, establishing the speed with which unconsciousness will be achieved does not support Plaintiff's claim; he must identify evidence establishing how quickly nitrogen-induced hypoxia will cause brain death so that any such evidence can be contrasted with Dr. Zivot's testimony that Plaintiff might be aware that he is choking for up to four minutes. There is no evidence suggesting that nitrogen hypoxia will be faster than pentobarbital, so there is no factual dispute to resolve. In the absence of evidence contradicting Defendants' expert and supporting Plaintiff's theory, there is not a triable issue.

Plaintiff also points to the fact that Louisiana and Oklahoma have approved the use of nitrogen gas in their death penalty protocols. This evidence might be relevant in establishing the feasibility or ready availability of this method of execution, but it does not establish whether

nitrogen gas will significantly reduce the risk of suffering Plaintiff has described. Plaintiff cites a report from Oklahoma for the proposition that "high altitude pilots who train to recognize the symptoms of nitrogen hypoxia in airplane depressurizations do not report any feelings of suffocation, choking or gagging." (Doc. 197, p. 48 n.6 (citing Doc. 192-14, p. 78).) Assuming this is competent evidence that can be considered on summary judgment, Plaintiff is not trained to recognize the symptoms of nitrogen hypoxia and it is unlikely that the pilots who were trained to recognize the symptoms of hypoxia also suffered from cavernous hemangioma. Plaintiff additionally refers to a report from Louisiana, which itself cites other materials for the proposition that nitrogen hypoxia allows a person to expel carbon dioxide buildup and thereby reduce suffocation caused by respiratory acidosis. (Doc. 197, p. 48 n.6 (citing Doc. 192-17, p. 19).) Assuming again that this is competent evidence, Plaintiff's theory is that he will experience suffocation due to his tumors, not due to respiratory acidosis. Finally, none of this evidence purports to compare the effects of nitrogen gas hypoxia to the effects of pentobarbital, particularly as related to the speed with which brain death will occur. Therefore, this anecdotal evidence does not conflict with Dr. Antognini's testimony and therefore does not create a factual dispute.[9]

The Record establishes that the use of nitrogen gas will not act faster than pentobarbital. Therefore, nitrogen gas will not significantly reduce the risk of suffering Plaintiff faces if he is executed under Missouri's current protocol.

[9] Plaintiff has also provided a "Preliminary Draft" of a document prepared at the request of an Oklahoma State Representative. (Doc. 199-12, pp. 15-28.) The authors' qualifications to opine on medical matters are not established. The report bears the instruction "Do Not Cite." The report generally discusses the feasibility and effectiveness of using nitrogen gas in executions, but it does not purport to answer the questions relevant to the case. For these reasons, this report also does not create a factual dispute.

III. CONCLUSION

For the reasons set forth above, Defendants' Motion for Summary Judgment on Count I is **GRANTED.**

IT IS SO ORDERED.

/s/ Beth Phillips
BETH PHILLIPS, JUDGE
UNITED STATES DISTRICT COURT

DATE: June 15, 2017

IN THE UNITED STATES DISTRICT COURT FOR THE
WESTERN DISTRICT OF MISSOURI
WESTERN DIVISION

RUSSELL BUCKLEW,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Case No. 14-8000-CV-W-BP
	)	
GEORGE A. LOMBARDI, *et al.*,	)	
	)	
Defendants.	)	

ORDER AND OPINION DENYING PLAINTIFF'S MOTION TO ALTER OR AMEND JUDGMENT

On June 15, 2017, the Court granted summary judgment to Defendants on the sole remaining claim from the Fourth Amended Complaint. (Doc. 202.) In that claim, Plaintiff asserted that the State's execution protocol as applied to him would violate the Eighth Amendment's proscription against cruel and unusual punishment. Plaintiff has now filed a Motion to Alter or Amend Judgment pursuant to Rule 59(e). "Rule 59(e) motions serve the limited function of correcting manifest errors of law or fact or to present newly discovered evidence." *United States v. Metropolitan St. Louis Sewer Dist.*, 440 F.3d 930, 933 (8th Cir. 2006). Plaintiff does not seek to present newly discovered evidence. Instead, he contends the Court (1) overlooked certain facts, (2) applied the wrong legal standard, and (3) limited discovery in a manner that deprived him of a fair opportunity to support his claims. The Court discusses each of these issues below and concludes the motion, (Doc. 210), should be **DENIED**.

I. BACKGROUND

Placing Plaintiff's arguments in context requires a summary of the law governing Plaintiff's claim and the basis for the Court's June 15 Order. As the Court explained,

Resp. Ex. 9

> a prisoner alleging that a particular form of execution is cruel and unusual within the meaning of the Eighth Amendment must first establish that the method to be utilized presents a risk that is sure or very likely to cause serious illness and needless suffering, and give rise to sufficiently imminent dangers. The prisoner must then "identify a known and available alternative method of execution that entails a lesser risk of pain, a requirement of all Eighth Amendment method-of-execution claims. The alternative must be feasible, readily implemented, and in fact significantly reduce the substantial risk of severe pain.

(Doc. 202, p. 6 (quotations and citations omitted).) The current execution protocol calls for "the intravenous administration of pentobarbital in dosages sufficient to cause unconsciousness and eventually death." (Doc. 202, p. 3.) Plaintiff suffers from a congenital medical condition known as cavernous hemangioma, which "causes clumps of weak, malformed blood vessels and tumors to grow throughout his body, including his head, face, neck and throat." (Doc. 202, p. 2.) He alleges that his condition makes it difficult to breathe and that after the pentobarbital takes effect he will experience a choking sensation even after he is unconscious because he will be unable to control his breathing.

In granting Defendants' summary judgment the Court concluded that the Record, construed in the light most favorable to Plaintiff, demonstrated that there is a risk that Plaintiff will experience choking and an inability to breathe for fifty-two to 240 seconds – the time between unconsciousness and brain death. (Doc. 202, pp. 4-5, 8-9.) The Court then considered whether Plaintiff's proposed alternative – nitrogen gas – would "cause Plaintiff to become unaware of his choking and breathing difficulties sooner than he would under the current protocol, and (2) whether that difference in time is sufficient to permit the Court to find that nitrogen gas will make a 'significant' difference in Plaintiff's suffering." (Doc. 202, p. 10.) The Court reviewed the evidence in the Record and determined that the uncontroverted facts demonstrated that hypoxia induced by nitrogen gas "will not act faster than pentobarbital.

Therefore, nitrogen gas will not significantly reduce the risk of suffering Plaintiff faces if he is executed under Missouri's current protocol." (Doc. 202, p. 12.)

II. DISCUSSION

A. Factual Matters

Plaintiff contends that the Court erred by failing to contrast the effect of him being in a supine position under the State's current execution protocol evidence with his ability to be seated if he is executed with nitrogen gas. As the Court noted, Plaintiff has difficulty breathing, "and that difficulty is exacerbated when he is in a supine position." (Doc. 202, p. 3.) However, there is no evidence in the Record establishing that (1) Plaintiff must be in a supine position after the IV is inserted, or, more importantly, that (2) sitting while nitrogen gas is administered will make an appreciable difference in Plaintiff's ability to breathe. As the Court explained, "the premise for Plaintiff's claim is that there is a period between unconsciousness and brain death during which he will experience pain" because he will be unable to control his breathing and prevent choking. (Doc. 202, p. 11.) Plaintiff does not identify any overlooked evidence establishing that he must remain on his back after the IV is inserted.

He also does not identify any overlooked evidence that there is a significant difference in his ability to breathe when he is unconscious and sitting as compared to when he is unconscious and lying down. To the contrary, as the Court explained, there is no evidence in the Record establishing that nitrogen gas will cause brain death sooner than pentobarbital, which means that with nitrogen gas Plaintiff could be aware that he is choking for up to four minutes, just as the Record (construed in Plaintiff's favor) suggests would be the case with pentobarbital. (Doc. 202, p. 11.) Thus, even if he could not sit upright after the IV is inserted, there is no evidence suggesting this would cause suffering that would be alleviated through the use of nitrogen gas.

Plaintiff also contends the Court misinterpreted an Interim Report from a Grand Jury in Oklahoma, which heard testimony from a professor that "high altitude pilots who train to recognize the symptoms of nitrogen hypoxia in airplane depressurizations do not report any feelings of suffocation, choking, or gagging." (Doc. 192-14, p. 78.) The Court noted this information and observed that "[a]ssuming this is competent evidence that can be considered on summary judgment, Plaintiff is not trained to recognize the symptoms of nitrogen hypoxia and it is unlikely that the pilots who were trained to recognize the symptoms of hypoxia also suffered from cavernous hemangioma." (Doc. 202, p. 12.) Plaintiff argues that the Court misapprehended the point of this information, which was to establish that even pilots trained to recognize nitrogen hypoxia do not report choking or suffocation, so it is unlikely that Plaintiff would notice such effects. With this explanation, Plaintiff is correct that his lack of training is not relevant. However, Plaintiff has not overcome the Court's concerns that a professor's testimony to a grand jury about what pilots have reported is not competent medical evidence about the effects of nitrogen hypoxia. Relatedly, it remains unlikely that the pilots suffered from cavernous hemangioma, so their anecdotal reports are not sufficient to satisfy Plaintiff's burden.

Plaintiff's claim required evidence establishing that nitrogen hypoxia produces a shorter time between unconsciousness and brain death than would pentobarbital. There is no such evidence in the Record. There is, however, evidence that the time between unconsciousness and brain death (whatever that interval is) would be the same under both execution methods. Accordingly, there is no basis in fact for altering the Court's judgment.

B. Interpretation and Application of the Legal Standard

Plaintiff contends the Court has "imposed an impossible standard on Plaintiff" because his unique medical condition makes it impossible for him to produce the "side-by-side

comparison between the length of time required to produce unconsciousness by lethal injection versus lethal gas." (Doc. 210, p. 5.) He also believes he was "penalize[d] . . . because his expert would not opine on how to kill Plaintiff with lethal gas." (*Id.*) While Plaintiff argues against the legal standard utilized by the Court, he does not contend that it was wrong. That is, Plaintiff does not argue that the Court failed to follow the governing standard as set forth in such cases as *Glossip v. Gross*, 135 S. Ct. 2726 (2015), and *Bucklew v. Lombardi*, 783 F.3d 1120 (8th Cir. 2015) (en banc), and thus has not demonstrated that the Court committed legal error.

C. Discovery Issues

Early in the discovery process, the Court issued an Order Regarding the Scope of Discovery. (Doc. 105.) Plaintiff contends that his "ability to prove his Eighth Amendment claim has been crippled by" limits on access to information about and from members of the execution team. (Doc. 210, p. 6.) The Court addressed the issue in the order regarding the scope of discovery, as well as at other times, (*e.g.,* Doc. 183; Doc. 214), and further discussion of the issue is unnecessary.

III. CONCLUSION

For these reasons, Plaintiff's motion for relief pursuant to Rule 59(e) is **DENIED**.

IT IS SO ORDERED.

/s/ Beth Phillips
BETH PHILLIPS, JUDGE
UNITED STATES DISTRICT COURT

DATE: August 21, 2017

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

No: 17-3052

Russell Bucklew

Plaintiff - Appellant

v.

Anne L. Precythe, Director of the Department of Corrections; David Dormire; Troy Steele

Defendants - Appellees

Appeal from U.S. District Court for the Western District of Missouri - Kansas City
(4:14-cv-8000-BP)

JUDGMENT

Before WOLLMAN, LOKEN and COLLOTON, Circuit Judges.

This appeal from the United States District Court was submitted on the record of the district court, briefs of the parties and was argued by counsel.

After consideration, it is hereby ordered and adjudged that the judgment of the district court in this cause is affirmed in accordance with the opinion of this Court.

March 06, 2018

Order Entered in Accordance with Opinion:
Clerk, U.S. Court of Appeals, Eighth Circuit.

/s/ Michael E. Gans

Resp. Ex. 10

United States Court of Appeals
For the Eighth Circuit

No. 17-3052

Russell Bucklew

Plaintiff - Appellant

v.

Anne L. Precythe, Director of the Department of Corrections, et al.

Defendants - Appellees

Appeal from United States District Court
for the Western District of Missouri - Kansas City

Submitted: February 2, 2018
Filed: March 6, 2018

Before WOLLMAN, LOKEN, and COLLOTON, Circuit Judges.

LOKEN, Circuit Judge

The issue is whether the Eighth and Fourteenth Amendments, as applied, bar Missouri officials from employing a procedure that is authorized by Missouri statute to execute Russell Bucklew.

In March 2006, Bucklew stole a car; armed himself with pistols, handcuffs, and a roll of duct tape; and followed his former girlfriend, Stephanie Ray, to the home of

Michael Sanders, where she was living. Bucklew knocked and entered the trailer with a pistol in each hand when Sanders's son opened the door. Sanders took the children to the back room and grabbed a shotgun. Bucklew began shooting. Two bullets struck Sanders, one piercing his chest. Bucklew fired at Sanders's six-year-old son, but missed. As Sanders bled to death, Bucklew struck Ray in the face with a pistol, handcuffed Ray, dragged her to the stolen car, drove away, and raped Ray in the back seat of the car. He was apprehended by the highway patrol after a gunfight in which Bucklew and a trooper were wounded.

A Missouri state court jury convicted Bucklew of murder, kidnaping, and rape. The trial court sentenced Bucklew to death, as the jury had recommended. His conviction and sentence were affirmed on direct appeal. State v. Bucklew, 973 S.W.2d 83 (Mo. banc 1998). The trial court denied his petition for post-conviction relief, and the Supreme Court of Missouri again affirmed. Bucklew v. State, 38 S.W.3d 395 (Mo. banc 2001). We subsequently affirmed the district court's denial of Bucklew's petition for a federal writ of habeas corpus. Bucklew v. Luebbers, 436 F.3d 1010 (8th Cir. 2006). The Supreme Court of Missouri issued a writ of execution for May 21, 2014. Bucklew filed this action under 42 U.S.C. § 1983, alleging that execution by Missouri's lethal injection protocol, authorized by statute, would constitute cruel and unusual punishment in violation of the Eighth and Fourteenth Amendments as applied to him because of his unique medical condition. Bucklew appeals the district court's[1] grant of summary judgment in favor of the state defendants because Bucklew failed to present adequate evidence to establish his claim under the governing standard established by the Supreme Court in Baze v. Rees, 553 U.S. 35 (2008), and Glossip v. Gross, 135 S. Ct. 2726 (2015). Reviewing the grant of summary judgment *de novo*, we affirm.

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[1]The Honorable Beth Phillips, United States District Judge for the Western District of Missouri.

I.

Missouri's method of execution is by injection of a lethal dose of the drug pentobarbital. Two days before his scheduled execution in 2014, the district court denied Bucklew's motion for a stay of execution and dismissed this as-applied action *sua sponte*. On appeal, a divided panel granted a stay of execution, Bucklew v. Lombardi, 565 Fed. Appx. 562 (8th Cir. 2014); the court en banc vacated the stay. Bucklew applied to the Supreme Court for a stay of execution, and the Court issued an Order granting his application "for stay pending appeal in the Eighth Circuit." This court, acting en banc, reversed the *sua sponte* dismissal of Bucklew's as-applied Eighth Amendment claim and remanded to the district court for further proceedings. Bucklew v. Lombardi, 783 F.3d 1120, 1128 (8th Cir. 2015) ("Bucklew I"). On the same day, the en banc court affirmed the district court's dismissal on the merits of a facial challenge to Missouri's lethal injection protocol filed by several inmates sentenced to death, including Bucklew. Zink v. Lombardi, 783 F.3d 1089, 1114 (8th Cir.), cert denied, 135 S. Ct. 2941 (2015).[2]

[2]"The doctrine of res judicata or claim preclusion bars relitigation of a § 1983 claim if the prior judgment was a final judgment on the merits rendered by a court of competent jurisdiction, and if the same cause of action and the same parties or their privies were involved." Baker v. Chisom, 501 F.3d 920, 925 (8th Cir. 2007), cert denied, 554 U.S. 902 (2008). As Bucklew was a plaintiff in Zink, any facial challenge to the current method of execution in this case is precluded. Defendants argue that Bucklew's as-applied challenge is also precluded because it could have been raised in Zink. See Brown v. St. Louis Police Dep't, 691 F.2d 393, 396 (8th Cir. 1982). Like the district court, we decline to address this complex issue. See Bucklew I, 783 F.3d at 1122 n.1; cf. Whole Woman's Health v. Hellerstedt, 136 S. Ct 2292, 2305 (2016). We likewise decline to address defendants' claim that Bucklew's as-applied challenge is barred by the applicable statute of limitations. See Boyd v. Warden, Holman Corr. Facility, 856 F.3d 853, 874-76 (11th Cir. 2017).

Our decision in Bucklew I set forth in considerable detail the allegations in Bucklew's as-applied complaint regarding his medical condition. 783 F.3d at 1124-26. Bucklew has long suffered from a congenital condition called cavernous hemangioma, which causes clumps of weak, malformed blood vessels and tumors to grow in his face, head, neck, and throat. The large, inoperable tumors fill with blood, periodically rupture, and partially obstruct his airway. In addition, the condition affects his circulatory system, and he has compromised peripheral veins in his hands and arms. In his motion for a stay of execution in Bucklew I, Bucklew argued:

> Dr. Joel Zivot, a board-certified anesthesiologist . . . concluded after reviewing Mr. Bucklew's medical records that a substantial risk existed that, because of Mr. Bucklew's vascular malformation, the lethal drug will likely not circulate as intended, creating a substantial risk of a "prolonged and extremely painful execution." Dr. Zivot also concluded that a very substantial risk existed that Mr. Bucklew would hemorrhage during the execution, potentially choking on his own blood -- a risk greatly heightened by Mr. Bucklew's partially obstructed airway.
>
> * * * * *
>
> [The Department of Corrections has advised it would not use a dye in flushing the intravenous line because Dr. Zivot warned that might cause a spike in Bucklew's blood pressure.] Reactionary changes at the eleventh hour, without the guidance of imaging or tests, create a substantial risk to Mr. Bucklew, who suffers from a complex and severe medical condition *that has compromised his veins*.
>
> * * * * *
>
> The DOC seems to acknowledge they agree with Dr. Zivot that Mr. Bucklew's obstructed airway presents substantial risks of needless pain and suffering, but what they plan to do about it is a mystery. Will they execute Mr. Bucklew in a seated position? . . . The DOC should be required to disclose how it plans to execute Mr. Bucklew so that this Court can properly assess whether additional risks are present. . . . Until

> Mr. Bucklew knows what protocol the DOC will use to kill him, and until the DOC is required to conduct the necessary imaging and testing to quantify the expansion of Mr. Bucklew's hemangiomas and the extent of his airway obstruction, it is not possible to execute him without substantial risk of severe pain and needless suffering.

Defendants' Suggestions in Opposition argued that Bucklew's "proposed changes . . . with the exception of his complaint about [dye], which Missouri will not use in Bucklew's execution, are not really changes in the method of execution."

Glossip and Baze established two requirements for an Eighth Amendment challenge to a method of execution. First, the challenger must "establish that the method presents a risk that is *sure or very likely* to cause serious illness and needless suffering, and give rise to sufficiently *imminent* dangers." Glossip, 135 S. Ct. at 2737 (emphasis in original), citing Baze, 553 U.S. at 50. This evidence must show that the pain and suffering being risked is severe *in relation to* the pain and suffering that is accepted as inherent in any method of execution. Id. at 2733. Second, the challenger must "identify an alternative that is feasible, readily implemented, and in fact significantly reduces a substantial risk of severe pain." Glossip, 135 S. Ct. at 2737, citing Baze, 553 U.S. at 52. This two-part standard governs as-applied as well as facial challenges to a method of execution. See, e.g., Jones v. Kelley, 854 F.3d 1009, 1013, 1016 (8th Cir. 2017); Williams v. Kelley, 854 F.3d 998, 1001 (8th Cir. 2017); Johnson v. Lombardi, 809 F.3d 388, 390 (8th Cir. 2015); Bucklew I, 783 F.3d at 1123, 1127. As a panel we are bound by these controlling precedents. Bucklew argues the second Baze/Glossip requirement of a feasible alternative method of execution that substantially reduces the risk of suffering should not apply to "an individual who is simply too sick and anomalous to execute in a constitutional manner," like those who may not be executed for mental health reasons. See, e.g., Ford v. Wainwright, 477 U.S. 399, 410 (1986). The Supreme Court has not recognized a categorical exemption from the death penalty for individuals with physical ailments or disabilities. Thus, in the decision on appeal, the district court

properly applied the Baze/Glossip two-part standard in dismissing Bucklew's as-applied claim.

We concluded in Bucklew I, based on a record "which went well beyond the four corners of Bucklew's complaint," that the complaint's allegations, bolstered by defendants' concession "that the Department's lethal injection procedure *would be changed* on account of his condition by eliminating the use of methylene blue dye," sufficiently alleged the first requirement of an as-applied challenge to the method of execution -- "a substantial risk of serious and imminent harm that is sure or very likely to occur." 783 F.3d at 1127. We further concluded the district court's *sua sponte* dismissal was premature because these detailed allegations made it inappropriate "to assume that Bucklew would decline an invitation to amend the as-applied challenge" to plausibly allege a feasible and more humane alternative method of execution, the second requirement under the Baze/Glossip standard. Id. In remanding, we directed that further proceedings "be narrowly tailored and expeditiously conducted to address only those issues that are essential to resolving" the as-applied challenge. Id. at 1128. We explained:

> Bucklew's arguments on appeal raise an inference that he is impermissibly seeking merely to investigate the protocol without taking a position as to what is needed to fix it. He may not be "permitted to supervise every step of the execution process." Rather, at the earliest possible time, he must identify a feasible, readily implemented alternative procedure that will *significantly* reduce a substantial risk of severe pain and that the State refuses to adopt. . . . Any assertion that all methods of execution are unconstitutional does not state a plausible claim under the Eighth Amendment or a cognizable claim under § 1983.

Id. (quotation omitted; emphasis in original).

ii.

On remand, consistent with our directive, the district court first ordered Bucklew to file an amended complaint that adequately identified an alternative procedure. Twice, Bucklew filed amended complaints that failed to comply with this order. Given one last chance to comply or face dismissal, on October 13, 2015, Bucklew filed a Fourth Amended Complaint. As relevant here, it alleged:

> 106. Based on Mr. Bucklew's unique and severe condition, there is no way to proceed with Mr. Bucklew's execution under Missouri's lethal injection protocol without a substantial risk to Mr. Bucklew of suffering grave adverse events during the execution, including hemorrhaging, suffocating or experiencing excruciating pain.
>
> 107. Under any scenario or with any of lethal drug, execution by lethal injection poses an enormous risk that Mr. Bucklew will suffer extreme, excruciating and prolonged pain -- all accompanied by choking and struggling for air.
>
> 128. In May 2014, the DOC also proposed a second adjustment in its protocol, offering to adjust the gurney so that Mr. Bucklew is not lying completely prone.[3] . . . As a practical matter, no adjustment would likely be sufficient, as the stress of the execution may unavoidably cause Mr. Bucklew's hemangiomas to rupture, leading to hemorrhaging, bleeding in his throat and through his facial orifices, and coughing and choking on his own blood.
>
> 129. In order to fully evaluate and establish the risks to Mr. Bucklew from execution by lethal injection, a full and complete set of imaging studies must be conducted.

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[3]In their answer to paragraph 128, defendants alleged: "Defendants admit that the Defendants offered to have the anesthesiologist position the angle of the gurney in a proper position." Thus, this fact was established by the pleadings.

> 139. Mr. Bucklew is mindful of the Court's directive to allege a feasible, readily implemented alternative procedure . . . . Mr. Bucklew has complied . . . by researching and proposing execution by lethal gas, which is specifically authorized by Missouri law and which Missouri's Attorney General has stated the DOC is prepared to implement.
>
> 150. In adherence with the pleading requirements set forth in *Glossip*, and as stated above, Mr. Bucklew specifically alleges lethal gas as a feasible and available alternative method that will significantly reduce the risk of severe pain to Mr. Bucklew.

In other words, Bucklew took the position that no modification of Missouri's lethal injection method of execution could be constitutionally applied to execute Bucklew. He proposed massive discovery allegedly needed to establish the first Baze/Glossip requirement. But his legal theory is that alternative procedures such as adjusting the gurney's position are irrelevant because *no* lethal injection procedure would be constitutional, only a change to the use of lethal gas would be adequate.

Bucklew's as-applied claim focused on two aspects of his medical condition. First, Bucklew's experts initially opined that his peripheral veins are so weak that injection of a lethal dose of pentobarbital would not adequately circulate, leading to a prolonged and painful execution. The district court concluded that discovery and expert opinions developed on remand refuted this claim. The lethal injection protocol provides that medical personnel may insert the primary intravenous (IV) line "as a central venous line" and may dispense with a secondary peripheral IV line if "the prisoner's physical condition makes it unduly difficult to insert more than one IV." Bucklew's expert Dr. Zivot conceded, and Defendants' expert, Dr. Joseph Antognini, agreed, that the central femoral vein can circulate a "fair amount of fluid" without serious risk of rupture and that Bucklew's medical condition will not affect the flow of pentobarbital after it is injected through this vein.

Second, Bucklew's experts opined that his condition will cause him to experience severe choking and suffocation during execution by lethal injection. When Bucklew is supine, gravity pulls the hemangioma tumor into his throat which causes his breathing to be labored and the tumor to rupture and bleed. When conscious, Bucklew can "adjust" his breathing with repeated swallowing that prevents the tumor from blocking his airway. But during the "twilight stage" of a lethal injection execution, Dr. Zivot opined that Bucklew will be aware he is choking on his own blood and in pain before the pentobarbital renders him unconscious and unaware of pain. Based on a study of lethal injections in horses, Dr. Zivot estimated there could be a period as short as 52 seconds and as long as 240 seconds when Bucklew is conscious but immobile and unable to adjust his breathing; his attempts to breath will create friction, causing the tumor to bleed and possibly hemorrhage. In Dr. Zivot's opinion, there is a "very, very high likelihood" that Bucklew will suffer "choking complications, including visible hemorrhaging," if he is executed by *any* means of lethal injection, including using the drug pentobarbital.

According to Defendants' expert, Dr. Antognini, pentobarbital causes death by "producing rapid, deep unconscious[ness], respiratory depression, followed by . . . complete absence of respiration, decreased oxygen levels, slowing of the heart, and then the heart stopping." In contrast to Dr. Zivot, Dr. Antognini opined that pentobarbital would cause "rapid and deep unconsciousness" within 20-30 seconds of entering Bucklew's blood stream, rendering him insensate to bleeding and choking sensations. Dr. Antognini also challenged Dr. Zivot's opinion that a supine Bucklew, unable to adjust his breathing, will be aware he is choking on his own blood and in pain from the tumor blocking his airway before the pentobarbital renders him unconscious. Dr. Antognini noted that, between 2000 and 2003, Bucklew underwent general anesthesia eight times, at least once in a supine position. In December 2016, Bucklew lay supine for over an hour undergoing an MRI, with no more than discomfort. The MRI revealed that his tumor had slightly shrunk since 2010.

In granting defendants summary judgment, the district court declined to rely on the first Glossip/Baze requirement because these conflicting expert opinions "would permit a factfinder to conclude that for as long as four minutes [after the injection of pentobarbital Bucklew] could be aware that he is choking or unable to breathe but be unable [to] 'adjust' his breathing to remedy the situation." Rather, the court held that Bucklew failed to provide adequate evidence that his alternative method of execution -- lethal gas -- was a "feasible, readily implemented" alternative that would "in fact significantly reduce a substantial risk of severe pain" as compared to lethal injection. Glossip, 135 S.Ct. at 2737; Baze, 553 U.S. at 52.

III.

To succeed in his challenge to Missouri's lethal injection execution protocol, Bucklew must establish both prongs of the Glossip/Baze standard. Glossip, 135 S. Ct. 2737. The district court held that Bucklew failed to establish the second prong of Glossip/Baze by showing that an alternative method of execution would "in fact significantly reduce a substantial risk of severe pain." As noted, Bucklew argues the Glossip/Baze standard should not apply to an as-applied challenge to a method of execution, an argument our controlling precedents have rejected. He raises two additional issues on appeal.

A. Bucklew first argues the district court erred in granting summary judgment on the second Glossip/Baze requirement because he presented sufficient evidence that his proposed alternative method of execution -- death through nitrogen gas-induced hypoxia -- "would substantially reduce his suffering." Summary judgment is not appropriate when there are material issues of disputed fact, and the Supreme Court in Glossip made clear that this issue may require findings of fact that are reviewed for clear error. See 135 S. Ct. at 2739-41 (majority opinion) and 2786 (Sotomayor, J., dissenting). However, whether a method of execution "constitutes cruel and unusual punishment is a question of law." Swindler v. Lockhart, 885 F.2d 1342, 1350 (8th

Cir. 1989). Thus, unless there are material underlying issues of disputed fact, it is appropriate to resolve this ultimate issue of law by summary judgment.

Nitrogen hypoxia is an authorized method of execution under Missouri Law. See Mo. Stat. Ann. § 546.720. Missouri has not used this method of execution since 1965 and does not currently have a protocol in place for execution by lethal gas. But there are ongoing studies of the method in other States and at least preliminary indications that Missouri will undertake to develop a protocol. Defendants do not argue this is not a feasible and available alternative.

The district court granted summary judgment based on Bucklew's failure to provide adequate evidence that execution by nitrogen hypoxia would substantially reduce the risk of pain or suffering. The court allowed Bucklew extensive discovery into defendants' knowledge regarding execution by lethal gas. But Missouri's lack of recent experience meant that this discovery produced little relevant evidence and no evidence that the risk posed by lethal injection is substantial *when compared to* the risk posed by lethal gas. See Glossip, 135 S. Ct. at 2738; Johnson, 809 F.3d at 391. Bucklew's *theory* is that execution by nitrogen hypoxia would render Bucklew insensate more quickly than lethal injection and would not cause choking and bleeding in his tumor-blocked airway. But his expert, Dr. Zivot, provided no support for this theory. Dr. Zivot's Supplemental Expert Report explained:

> [W]hile I can assess Mr. Bucklew's current medical status and render an expert opinion as to the documented and significant risks associated with executing Mr. Bucklew under Missouri's current Execution Procedure, I cannot advise counsel or the Court on how to execute Mr. Bucklew in a way that would satisfy Constitutional requirements.

Lacking affirmative comparative evidence, Bucklew relied on Dr. Antognini's deposition. In his Expert Report, Dr. Antognini concluded that "the use of lethal gas

would not significantly lessen any suffering or be less painful than lethal injection in this inmate." At his deposition, Dr. Antognini was asked:

> Q. Why does lethal gas not hold any advantage compared to lethal injection.
>
> A. Well . . . there are a lot of types of gases that could be used . . . . [U]sing gas would not significantly lessen any suffering or be less painful. Because, again, their onset of action is going to be relatively fast, just like Pentobarbital's onset -- onset of action.
>
> Q. That's it? Simply because it would happen quickly?
>
> A. Correct.

The district court concluded this opinion provided nothing to compare:

> Dr. Antognini specifically stated that he believed there would be no difference in the "speed" of lethal gas as compared to pentobarbital. . . . In the absence of evidence contradicting Defendants' expert and supporting Plaintiff's theory, there is not a triable issue.

On appeal, Bucklew argues the district court should have compared Dr. Zivot's opinion that lethal injection would take up to four minutes to cause Bucklew's brain death with Dr. Antognini's testimony that lethal gas would render him unconscious in the same amount of time as lethal injection, 20 to 30 seconds. But Dr. Antognini's comparative testimony was that both methods would result in unconsciousness in approximately the same amount of time. Bucklew offered no contrary *comparative* evidence and thus the district court correctly concluded that he failed to satisfy his burden to provide evidence "establishing a known and available alternative that would significantly reduce a substantial risk of severe pain." McGehee v. Hutchinson, 854 F.3d 488, 493 (8th Cir. 2017).

In addition, Bucklew's claim that he will experience choking sensations during an execution by lethal injection but not by nitrogen hypoxia rests on the proposition that he could be seated during the latter but not the former. He argues there is evidence he will be forced to remain supine during an execution by lethal injection, when his tumor will cause him to sense he is choking on his own blood, whereas he could remain seated during the administration of lethal gas, which would not cause a choking sensation. But this argument lacks factual support in the record. Having taken the position that *any* lethal injection procedure would violate the Eighth Amendment, Bucklew made no effort to determine what changes, if any, the DOC would make in applying its lethal injection protocol in executing Bucklew, other than defendants advising -- prior to remand by this court -- that dye would not be used.

Based on Bucklew's argument to the en banc court, we expected that the core of the proceedings on remand would be defining what changes defendants would make on account of Bucklew's medical condition and then evaluating *that modified procedure* under the two-part Baze/Glossip standard. On remand, Director of Corrections Ann Precythe testified that the medical members of the execution team are provided a prisoner's medical history in preparing for the execution. Precythe has authority to make changes in the execution protocol, such as how the primary IV line will be inserted in the central femoral vein or how the gurney will be positioned, if the team advises that changes are needed. While Bucklew sought and was denied discovery of the identities of the execution team's medical members, he never urged the district court to establish a suitable fact-finding procedure -- for example, by anonymous interrogatories or written deposition questions to the execution team members -- for discovery of facts needed for the DOC to define the as-applied lethal injection protocol it intends to use for Bucklew. As Bucklew did not pursue these issues, the pleadings established that defendants have proposed to reposition the gurney during Bucklew's deposition, and Director Precythe testified that she has authority to make this type of change in the execution protocol based on the execution team's advice based on review of Bucklew's medical history, but the record does not

disclose whether Bucklew will in fact be supine during the execution,[4] nor does it disclose that a "cut-down" procedure will not be used to place the primary IV line in his central femoral vein, a procedure Dr. Antognini opined was unnecessary. Bucklew simply asserts that, in comparing execution by lethal injection and by lethal gas, we must accept his speculation that defendants will employ these risk-increasing procedures. This we will not do.

Like the district court, we conclude the summary judgment record contains no basis to conclude that Bucklew's risk of severe pain would be substantially reduced by use of nitrogen hypoxia instead of lethal injection as the method of execution. Evidence that "is equivocal, lacks scientific consensus and presents a paucity of reliable scientific evidence" does not establish that an execution is sure or very likely to cause serious illness and needless suffering. Williams v. Kelley, 854 F.3d at 1001 (quotation omitted). Therefore, he failed to establish the second prong of the Glossip/Baze standard.

B. Bucklew further contends the district court erred in denying his requests for discovery relating to "M2" and "M3," two members of the lethal injection execution team. Bucklew argues he was entitled to discovery of the medical technicians' qualifications, training, and experience because it would "illuminate the nature and extent of the risks of suffering he faces." For example, if M3 was not qualified to safely place his IV in the central femoral vein, this would directly impact the risk of

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[4]Dr. Zivot surmised that Bucklew will be required to lie flat during lethal injection based on what he observed at an execution in Georgia. He gave no reason to believe that pentobarbital could not be injected through a femoral vein while Bucklew is seated. He merely opined that "[i]t's more difficult" to administer an anesthetic to someone who is sitting up. Dr. Antognini, in addition to opining that Bucklew would be rendered unconscious and insensate within 20 to 30 seconds of pentobarbital injection, noted that it was not necessary that Bucklew be supine in order to inject pentobarbital in his femoral vein.

pain and suffering. We review a district court's discovery rulings narrowly and with great deference and will reverse only for a "gross abuse of discretion resulting in fundamental unfairness." Marksmeier v. Davie, 622 F.3d 896, 903 (8th Cir. 2010).

Bucklew's argument proceeds from the premise that M2 and M3 may not be qualified for the positions for which they have been hired. But we will not assume that Missouri employs personnel who are incompetent or unqualified to perform their assigned duties. See Clemons v. Crawford, 585 F.3d 1119, 1128 (8th Cir. 2009). He further argues that deposition of M2 and M3 is necessary to understand how they will handle a circumstance in case something goes wrong during Bucklew's execution. The potentiality that something may go wrong in an execution does not give rise to an Eighth Amendment violation. Zink, 783 F.3d at 1101. "Some risk of pain is inherent in any method of execution -- no matter how humane -- if only from the prospect of error in following the required procedure.... [A]n isolated mishap alone does not give rise to an Eighth Amendment violation." Baze, 553 U.S. at 47, 50. Thus, the district court's ruling was consistent with our instruction in remanding that Bucklew "may not be permitted to supervise every step of the execution process." Bucklew I, 783 F.3d at 1128 (quotation omitted). The Baze/Glossip evaluation must be based on the as-applied pre-execution protocol, assuming that those responsible for carrying out the sentence are competent and qualified to do so, and that the procedure will go as intended.

III. Conclusion

Having thoroughly reviewed the record, we conclude that Bucklew has failed to establish that lethal injection, as applied to him, constitutes cruel and unusual punishment under the Eighth and Fourteenth Amendments. Therefore, we affirm the judgment of the district court.

COLLOTON, Circuit Judge, dissenting.

Russell Bucklew alleges that the State of Missouri's method of execution by lethal injection violates his rights under the Eighth and Fourteenth Amendments. He seeks an injunction prohibiting an execution by that method. The district court granted summary judgment for the State, but there are genuine disputes of material fact that require findings of fact by the district court before this dispute can be resolved. I would therefore remand the case for the district court promptly to conduct further proceedings.

Bucklew's claim under 42 U.S.C. § 1983 requires him to prove two elements: (1) that the State's method of execution is sure or very likely to cause him severe pain, and (2) that an alternative method of execution that is feasible and readily implemented would significantly reduce the substantial risk of severe pain. *Glossip v. Gross*, 135 S. Ct. 2726, 2737 (2015); *Bucklew v. Lombardi*, 783 F.3d 1120, 1123, 1128 (8th Cir. 2015) (en banc). On the first element, the district court concluded that taking the evidence in the light most favorable to Bucklew, there is a substantial risk under Missouri's lethal injection protocol that Bucklew will experience choking and an inability to breathe for up to four minutes. On the second element, however, the court ruled as a matter of law that Bucklew's suggested alternative method—execution by administration of nitrogen gas—would not significantly reduce the substantial risk that the court identified under the first element. In my view, the district court's reasoning as to the first element is inconsistent with its summary disposition of Bucklew's claim on the second.

On the first element, Bucklew's theory is that he will suffer severe pain by prolonged choking or suffocation if the State executes him by lethal injection. He contends that when he lies supine on the execution gurney, tumors in his throat will block his airway unless he can "adjust" his positioning to enable breathing. Bucklew

argues that if an injection of pentobarbital renders him unable to adjust his positioning while he can still sense pain, then he will choke or suffocate.

In assessing that claim, the district court cited conflicting expert testimony from Bucklew's expert, Dr. Joel Zivot, and the State's expert, Dr. Joseph Antognini. Dr. Antognini testified that if the State proceeded by way of lethal injection using pentobarbital, then Bucklew would be unconscious within twenty to thirty seconds and incapable of experiencing pain at that point. R. Doc. 182-5, at 10, 40-41. Dr. Zivot, however, differed: "I strongly disagree with Dr. Antognini's repeated claim that the pentobarbital injection would result in 'rapid unconsciousness' and therefore Mr. Bucklew would not experience any suffocating or choking." R. Doc. 182-1, at 147. Zivot opined that Bucklew "would likely experience unconsciousness that sets in progressively as the chemical circulates through his system," and that "during this in-between twilight stage," Bucklew "is likely to experience prolonged feelings of suffocation and excruciating pain." *Id.*

In his deposition, Dr. Zivot opined that "there will be points," before Bucklew dies, "where he's beginning to experience the effects of the pentobarbital, where his ability to control and regulate and adjust his airway will be impaired, although there will still be the experience capable of knowing that he cannot make the adjustment, and will experience it as choking." *Id.* at 81. When directed to Dr. Antognini's opinion that Bucklew would be unaware of noxious stimuli within twenty to thirty seconds of a pentobarbital injection, Dr. Zivot observed that Antognini's opinion was based on a study involving dogs from fifty years ago and testified that his "number would be longer than that." *Id.* at 85. When asked for his "number," Dr. Zivot pointed to a study on lethal injections administered to horses; he said the study recorded "a range of as short as fifty-two seconds and as long as about two hundred and forty seconds before they see isoelectric EEG." *Id.* at 85-86. Dr. Zivot noted that the "number" that he derived from the horse study was "more than twice as long as" the number suggested by Dr. Antognini. *Id.* at 86. He defined "isoelectric EEG" as

"indicative of at least electrical silence on the parts of the brain that the electroencephalogram has access to." *Id.*

The district court observed that "[a]n execution is typically conducted with the prisoner lying on his back," and that the record "establishes that [Bucklew] has difficulty breathing while in that position because the tumors can cause choking or an inability to breathe." The court understood Dr. Zivot to mean that "it could be fifty-two to 240 seconds before the pentobarbital induces a state in which [Bucklew] could no longer sense that he is choking or unable to breathe." Thus, the court concluded that "construing the Record in [Bucklew's] favor reveals that it could be fifty-two to 240 seconds before the pentobarbital induces a state in which [Bucklew] could no longer sense that he is choking or unable to breathe." Again, the court reasoned that "the facts construed in [Bucklew's] favor would permit a factfinder to conclude that for as long as four minutes [Bucklew] could be aware that he is choking or unable to breathe but be unable to 'adjust' his breathing to remedy the situation." On that basis, the court presumed for purposes of the motion for summary judgment that "there is a substantial risk that [Bucklew] will experience choking and an inability to breathe for up to four minutes."

The State disputes that there is a genuine dispute of material fact on the first element of Bucklew's claim, but the district court properly concluded that findings of fact were required. Bucklew pointed to evidence from Missouri corrections officials that prisoners have always laid flat on their backs during executions by lethal injection in Missouri. R. Doc. 182-7, at 10; R. Doc. 182-9, at 1; R. Doc. 182-12, at 29, 91. One official testified that he did not know whether the gurney could be adjusted. R. Doc. 182-12, at 91. Another official believed that the head of the gurney "could" be raised (or that a gurney with that capability could be acquired), and that an anesthesiologist would have "the freedom" to adjust the gurney "if" he or she determined that it would be in the best medical interest of the offender to do so. R. Doc. 182-7, at 14. But the State did not present evidence about how it would position

Bucklew or the gurney during his execution. On a motion for summary judgment, the district court was required to construe the evidence in the light most favorable to Bucklew. Under that standard, without undisputed evidence from the State that it would alter its ordinary procedures, the court did not err by concluding that a finder of fact could infer that the State would proceed as in all other executions, with Bucklew lying on his back.[5]

The State argues that the district court erred in discerning a genuine dispute of material fact on the first element because Dr. Zivot did not specify the length of the expected "twilight stage" during which Bucklew would be unable to adjust his positioning yet still sense pain. The State also complains that Dr. Zivot did not specify that Bucklew's pain awareness would continue for fifty-two seconds or longer until brain waves ceased. There certainly are grounds to attack the reliability and credibility of Dr. Zivot's opinion, including the imprecision of some of his testimony, his opposition to all forms of lethal injection, his possible misreading of the horse study on which he partially relied, and his inaccurate predictions of calamities at prior executions. But he did opine that Bucklew was likely to "experience prolonged feelings of suffocation and excruciating pain" if executed by lethal injection, R. Doc. 182-1, at 147, and that there "will be points" before Bucklew dies when his ability to regulate his airway will be impaired so that he "will experience it as choking." *Id.* at

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[5]Bucklew alleged in Paragraph 128 of his complaint that the State had offered to adjust the gurney so that Bucklew is not lying completely prone, but then continued as follows immediately thereafter: "Although the stated intent was to reduce the choking risk to Mr. Bucklew, the DOC has obtained no imaging studies of Mr. Bucklew since 2010, and therefore has no information on which to base any decisions about the angle of the gurney." R. Doc. 53, at 43-44. The district court noted the State's suggestion "that the execution could be performed with [Bucklew] in a different position," but explained that "there is no evidence whether this has an effect on the procedure as a whole," and concluded that the State had "not provided the Court with a basis for granting summary judgment based on the possibility of performing the execution with [Bucklew] in a sitting (or other) position."

81. The district court did not err in concluding that it could not resolve the dispute between the experts on summary judgment.

On the second element of Bucklew's claim, the district court concluded as a matter of law that Bucklew failed to show that his proposed alternative method of execution—administration of nitrogen gas—would significantly reduce the substantial risk of severe pain that the court recognized under the first element. The majority affirms the district court's judgment on this basis. Taking the evidence in the light most favorable to Bucklew, however, a factfinder could conclude that nitrogen gas would render Bucklew insensate more quickly than pentobarbital and would thus eliminate the risk that he would experience prolonged feelings of choking or suffocation. Dr. Antognini testified that a person who is administered nitrogen gas "would be unconscious very quickly," and that the onset of action from lethal gas "is going to be relatively fast, *just like Pentobarbital's onset*." R. Doc. 182-5, at 58-59 (emphasis added). Given Dr. Antognini's testimony that pentobarbital would render Bucklew insensate within twenty to thirty seconds, the record in the light most favorable to Bucklew supports a finding based on Antognini's testimony that nitrogen gas would relieve Bucklew from any pain of choking or suffocating within twenty to thirty seconds. A trier of fact may accept all, some, or none of a witness's testimony, *United States v. Candie*, 974 F.2d 61, 65 (8th Cir. 1992), and a plaintiff may rely on testimony from the defendant's expert to meet his burden if the testimony is advantageous to the plaintiff. *See IBEW Local 98 Pension Fund v. Best Buy Co., Inc.*, 818 F.3d 775, 782 (8th Cir. 2016). If the factfinder accepted Dr. Zivot's testimony as to the effect of pentobarbital, and Dr. Antognini's uncontroverted testimony as to effect of nitrogen gas, then Bucklew's proposed alternative method would significantly reduce the substantial risk of severe pain that the district court identified in its analysis of the first element.

For these reasons, there are genuine disputes of material fact that preclude summary judgment and require findings of fact by the district court. I would

therefore remand the case for further proceedings. The district court may then promptly make appropriate factual findings about, among other things, how Bucklew will be positioned during an execution, whether his airway will be blocked during an execution, and how pentobarbital (and, if necessary, nitrogen gas) will affect his consciousness and ability to sense potential pain.

* * *

The State contends that we should not reach the merits of Bucklew's claim because several procedural obstacles require dismissal of his complaint. The majority does not rely on these points, and I find them unavailing.

First, the State contends that Bucklew did not raise his present claim in his fourth amended complaint. Bucklew's complaint, however, does allege the essence of his current theory. The complaint asserts that the tumors in Bucklew's throat require "him to sleep with his upper body elevated" because if he lies flat, "the tumor then fully obstructs his airway." *Id.* at 18-19. It continued: "Executions are conducted on a gurney, and the risks arising from Mr. Bucklew's airway are even greater if he is lying flat. Because of the hemangiomas, Mr. Bucklew is unable to sleep in a normal recumbent position because the tumors cause greater obstruction in that position." R. Doc. 53, at 35. Bucklew further alleged that execution by lethal injection "poses an enormous risk that Mr. Bucklew will suffer extreme, excruciating and prolonged pain – all accompanied by choking and struggling for air." *Id.* at 36. The complaint was adequate under a notice pleading regime to raise a claim that the execution procedure would result in an obstructed airway and choking or suffocation.

If necessary, moreover, the district court acted within its discretion by treating the complaint as impliedly amended to include Bucklew's present claim. *See* Fed. R. Civ. P. 15(b)(2). Bucklew clearly notified the State of his contention in his opposition to the State's motion for summary judgment. R. Doc. 192-1, at 1-3, 11-17.

Yet rather than communicate surprise and object that the claim was not pleaded, the State addressed Bucklew's contention on the merits. R. Doc. 200, at 4-5. Where a party has actual notice of an unpleaded issue and has been given an adequate opportunity to cure any surprise resulting from a change in the pleadings, there is implied consent to an amendment. *Trip Mate, Inc. v. Stonebridge Cas. Ins. Co.*, 768 F.3d 779, 784-85 (8th Cir. 2014).

Second, the State argues that the five-year statute of limitations bars Bucklew's claim, because he was aware of his claim in 2008 and did not file his complaint until May 9, 2014. A claim under § 1983 accrues when a plaintiff has "a complete and present cause of action" and "can file suit and obtain relief." *Wallace v. Kato*, 549 U.S. 384, 388 (2007) (quoting *Bay Area Laundry & Dry Cleaning Pension Trust Fund v. Ferbar Corp. of Cal.*, 522 U.S. 192, 201 (1997)). Bucklew asserts that he did not have knowledge of his present claim, and therefore could not have filed suit and obtained relief, until his medical condition progressed and he was examined by Dr. Zivot in April 2014. As evidence that Bucklew could have brought his claim earlier, the State relies on a 2008 petition that Bucklew submitted to the Missouri Supreme Court. The petition sought funding for an expert witness to investigate the interaction of the State's existing execution protocol with Bucklew's health condition. The possible claim addressed in the 2008 funding petition, however, focused on the potential for uncontrolled bleeding and ineffective circulation of drugs within Bucklew's body under the State's former three-drug execution protocol. The petition does not demonstrate that Bucklew was then on notice of a claim that a future execution protocol using the single drug pentobarbital would create a substantial risk of severe pain resulting from tumors blocking his airway while laying supine during an execution.

Third, the State urges that Bucklew's claim is barred by *res judicata* or claim preclusion, because Bucklew could have litigated his as-applied challenge to the execution protocol in an earlier case styled *Zink v. Lombardi*, No. 12-04209-CV-C-

BP. In *Zink*, a group of inmates sentenced to death, including Bucklew, brought a facial challenge to Missouri's execution protocol. A complaint was filed in August 2012, and the eventual deadline for motions to amend pleadings was January 27, 2014. Principles of claim preclusion do not bar Bucklew's as-applied challenge if he was unaware of the basis for the claim in time to include it in the *Zink* litigation. *See Whole Woman's Health v. Hellerstedt*, 136 S. Ct. 2292, 2305 (2016). The State again points to Bucklew's 2008 funding petition in support of its preclusion defense, but for reasons discussed, that petition does not establish that Bucklew's present claim was available to him in 2008. At oral argument, the State argued that Bucklew could have added his as-applied challenge to the *Zink* litigation after he was examined by Dr. Zivot in April 2014, because the district court granted the *Zink* plaintiffs leave to amend their complaint in May 2014. But the court's order allowed the *Zink* plaintiffs leave to amend only a single count of the complaint to allege a feasible alternative method of execution. The order did not reopen the pleadings deadline for as-applied claims by the several individual plaintiffs. *See Zink v. Lombardi*, No. 12-04209-CV-C-BP, 2014 WL 11309998, at *4-5, 12 (W.D. Mo. May 2, 2014). The State therefore has not established that Bucklew's as-applied claim is barred by *res judicata*.

* * *

For these reasons, I would reverse the judgment of the district court and remand for further proceedings to be conducted with dispatch.

IN THE SUPREME COURT OF MISSOURI

RUSSELL BUCKLEW, Relator, v. MISSOURI STATE PUBLIC DEFENDER SYSTEM, and J. MARTY ROBINSON, DIRECTOR OF MISSOURI STATE PUBLIC DEFENDER SYSTEM, Respondents.	)	**CAPITAL CASE** No. _____

INDEX TO EXHIBITS DEPOSITED *EX PARTE* AND UNDER SEAL IN SUPPORT OF PETITION FOR WRIT OF MANDAMUS DIRECTING THE MISSOURI PUBLIC DEFENDER SYSTEM TO PROVIDE EXPERT SERVICES

IN THE
UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

RUSSELL BUCKLEW,	)	
	)	
Petitioner-Appellant,	)	
	)	**THIS IS A CAPITAL CASE**
v.	)	
	)	No. 03-3721-WMKC
DONALD ROPER,	)	
	)	
Respondent-Appellee.	)	

FILED EX PARTE AND UNDER SEAL:

MOTION TO APPOINT MEDICAL EXPERT TO EVALUATE WHETHER PETITIONER'S EXECUTION BY LETHAL INJECTION CONSTITUTES CRUEL AND UNUSUAL PUNISHMENT IN LIGHT OF PETITIONER'S MEDICAL CONDITION

EXHIBIT
1

IN THE
UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

RUSSELL BUCKLEW,	)	
	)	
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FILED EX PARTE AND UNDER SEAL:

MOTION TO APPOINT MEDICAL EXPERT TO EVALUATE WHETHER PETITIONER'S EXECUTION BY LETHAL INJECTION CONSTITUTES CRUEL AND UNUSUAL PUNISHMENT IN LIGHT OF PETITIONER'S MEDICAL CONDITION

Petitioner Russell Bucklew, by and through counsel appointed by this Court to seek executive clemency for him, hereby moves the Court for an order under 18 U.S.C. § 3006(a) and 18 U.S.C. § 3599(f) authorizing petitioner's counsel to obtain expert services reasonably necessary to determine whether petitioner's execution by lethal injection constitutes cruel and unusual punishment in light of petitioner's affliction with a rare and dangerous vascular disorder. This disorder is characterized by grossly dilated blood vessels prone to uncontrolled bleeding. The administration of general anesthesia may pose an extreme risk of hemorrhaging and excruciating pain.

In support of this motion, the petitioner states all as follows:

1. In 1997, a jury in Boone County, Missouri, found Russell Bucklew guilty of one count of first-degree murder, for which he was sentenced to death. This Court has affirmed the denial of federal habeas corpus relief and has appointed the undersigned counsel and authorized them to seek executive clemency. On Friday, May 30, 2008, the Missouri Supreme Court issued an order saying that it would set an execution date against Mr. Bucklew "in due course."

2. At all times relevant to this motion, Mr. Bucklew has been found indigent by the state and federal courts, and has been represented first by the Missouri State Public Defender System and then by counsel appointed by the federal courts.

3. The Criminal Justice Act permits a "financially unable" defendant to request funding for "expert, or other services necessary for adequate representation." 18 U.S.C. § 3006A(e). In analyzing such a claim for expert services, petitioner must "do more than allege the services would be helpful, rather he must show they are 'necessary' to afford him 'an adequate opportunity to present [his] claims fairly.'" *U.S. v. Ross*, 210 F.3d 916, 921 (8th Cir. 2000) (citing to *Ake v. Oklahoma*, 470 U.S. 68, 77, 80 (1985). In *Little v. Armontrout*, 835 F.2d 1240 (8th Cir. 1987)), the Eighth Circuit adopted the standard set in *Ake* and extended this right to nonpsychiatric experts, recognizing "no principled way to distinguish between psychiatric and nonpsychiatric experts." 835 F.2d at 1243.

Accordingly, Mr. Bucklew, consistent with the determinations of his indigence, is entitled to expert services, provided the requested services are necessary to afford him an adequate opportunity to present his claims as part of petition for executive clemency. *See Ake*, 470 U.S. at 77, 80.

4. Mr. Bucklew seeks to present these claims as part of a request for executive clemency for which this court has appointed counsel. Under 21 U.S.C. § 848(q)(8); 18 U.S.C. § 3599(e), counsel is obligated to continue representing petitioner "in every subsequent stage of available judicial proceedings," including specifically, "proceedings for executive or other clemency." 21 U.S.C. § 848(q)(8); 18 U.S.C. § 3599(e). These duties are also defined in the American Bar Association's GUIDELINES FOR THE APPOINTMENT & PERFORMANCE OF DEFENSE COUNSEL IN DEATH PENALTY CASES (rev. ed. Feb. 2003), 1.1B, 10.15.2, 31 HOFSTRA L. REV. 913, 919 & 1088 (2003). *See also Wiggins v. Smith*, 539 U.S. 510, 522, 524-25 (2003) (recognizing GUIDELINES as setting constitutional norm).

5. Mr. Bucklew's efforts to obtain appointment of a medical expert for executive clemency proceedings under a claim of cruel and unusual punishment in light of his rare and dangerous condition are consistent with the ABA's GUIDELINES FOR PERFORMANCE OF COUNSEL IN DEATH PENALTY CASES. *See Wiggins*, 539 U.S. at 522, 524-25; *see also* GUIDLINE 10.15.2 "Duties of Clemency Counsel." The ABA GUIDELINES require clemency counsel be familiar with the

"personal characteristics of the condemned" and that the "presentation should be as complete and persuasive as possible, utilizing all appropriate resources in support . . . and discussing explicitly why the clemency-dispenser should act favorably[.]" GUIDLINE 10.15.2. Here, Mr. Bucklew seeks appointment of a medical expert to articulate risks uniquely faced by Mr. Bucklew in light of his personal medical characteristics in an effort to persuade the Governor to grant clemency. Accordingly, full compliance with *Wiggins* and the ABA's GUIDELINES outlining the "Duties of Clemency Counsel" demand that a medical expert be appointed to evaluate the risk of cruel and unusual punishment through infliction of Missouri's lethal injection protocol.

6. While investigating possible clemency-related claims, counsel obtained Mr. Bucklew's medical records from the Missouri Department of Corrections. Counsel conducted a review of these records and discovered repeated references to Mr. Bucklew suffering from excruciating pain and bleeding caused by a rare vascular condition called cavernous hemangioma.

7. Cavernous hemangioma is a dangerous vascular disorder characterized by grossly dilated and unstable blood vessels producing excruciatingly painful tumerous growths. While these growths can appear throughout the body, Mr. Bucklew's condition is especially prevalent in his face and cranial regions, causing Mr. Bucklew to suffer from excruciating pain,

intermittent bleeding through his eyes and facial orifices, and neurological afflictions manifest by deteriorated vision, hearing, and seizures.

8. Counsel has learned that individuals afflicted with cavernous hemangioma may die when they experience uncontrolled general anesthesia because anesthetics may pose a grave risk, as the drugs used may compromise the sufferer's veins. Counsel also understands the placement of Mr. Bucklew's hemangiomas, primarily in the head and face, enhances the risk and severity of possible complications by disrupting blood flow to the brain.

9. Mr. Bucklew has been afflicted with cavernous hemangioma all of his adult life, and has, at times, been gravely ill with its symptoms. This Court noted, in its opinion affirming the denial of habeas relief for Mr. Bucklew, that medical records establish that:

> Bucklew suffers from the condition of cavernous hemangioma, which is inoperable and requires extensive pain medication. Bucklew's cavernous hemangioma "is a large distorted collection of blood vessels" which "occupies a better part of the right side of his face and portion of his head."

Bucklew v. Leubers, 436 F.3d 1010, 1014 n.2 (8th Cir. 2006). Bucklew's condition was repeatedly described in his brief on appeal. (*See* Appellant's opening brief at 1, 5, 16, 19-31, 56). At times Bucklew was so ill from the disease that he became extremely gaunt and bled from around his eyes. (Brief at 29; PCR Tr. 265).

10. Cavernous hemangioma is a rare disease, and only a few reported cases discuss it. In *Jones v. Bock* 127 S. Ct. 910 (2007), the Supreme Court noted

that the petitioner suffered from a cavernous hemangioma in his right arm – a "medical condition that causes pain, immobility and disfigurement . . ." *Id.* at 917. In *Graham v. Massanari*, 2001 WL 527326, *7 (N.D. Ill. 2001), the district court of the Northern District of Illinois noted that a disabled plaintiff had "severe status post lesion in the brain [from a] cavernous hemangioma that had bled." In *Hopper v. Regional Scaffolding & Hoisting Co., Inc.*, 21 A.D.3d 262 (N.Y. S.Ct. Appellate Div. 2005), an appeals court in New York noted that the plaintiff employee had suffered from cavernous hemangioma, which caused a hemorrage in his spinal cord, leading to "tremendous pain, an inability to walk accompanied by a dropped foot and loss of feeling in his legs as well as a host of other neurological complications." *Id.* at 264. As even this small sampling of cases makes clear, cavernous hemangioma is potentially a very serious condition that may cause uncontrolled bleeding and extreme, unremitting pain.

11. Although the United States Supreme Court recently held, in *Baze v. Rees*, 128 S. Ct. 1520 (2008), that Kentucky's lethal injection protocol was constitutional, Mr. Bucklew's case presents unique issues far beyond what *Baze* addresses. Counsel has serious concerns that Mr. Bucklew will suffer the risk of serious harm amounting to cruel and unusual punishment during the administration of Missouri's lethal injection protocol in light of his affliction with cavernous hemangioma. To constitute cruel and unusual punishment post-*Baze*, an execution

method must present a "substantial risk of serious harm." 128 S. Ct. at 1531. Here, petitioner seeks to demonstrate, through expert medical services, that Missouri's method of execution, *as applied uniquely to Mr. Bucklew*, may constitute cruel and unusual punishment. Accordingly, Mr. Bucklew seeks the appointment of a medical expert to examine the severity of such complications arising from his cavernous hemangioma.

12. In the present motion, Mr. Bucklew seeks the appointment of Dr. Adam Cohen, M.D., an opthalmologic surgeon with experience treating, researching and diagnosing cavernous hemangioma (Declaration of Dr. Adam Cohen Pg. 1). Dr. Cohen's curriculum vitae and other credentials are attached to this motion.

13. According to Dr. Cohen's signed declaration, attached to this motion, "without further medical research and evaluation, the application of Missouri's lethal injection procedure on a person with facially located hemangiomas presents a substantial or objectively intolerable risk of inflicting serious harm and excruciating pain." (Declaration of Dr. Cohen Pg. 2). Dr. Cohen understands that Mr. Bucklew exhibits several clinical symptoms of this disease including, "recurrent headaches, focal neurological deficits, auditory deficits, hemorrhagic stroke, seizures, excruciating pain and bleeding." *Id.* Dr. Cohen also warns of the risks posed by anesthesia, including death and that the "effects of Missouri's lethal

injection protocol, including the administration of sodium thiopental, on persons suffering from cavernous hemangioma is unknown." *Id.*

14. The following is an estimated budget based on Dr. Cohen's fees:

Record review:	10-14 hours @ $300/hr	$3,000 - $4,200
Medical research:	3-5 hours @ $300/hr	$900 - $1,500
Report preparation:	3-5 hours @ $300/hr	$900 - $1,500
TOTAL:	**19-24 hours**	**$5,700 - $7,200**

15. A review of these fees establishes that Dr. Cohen's appointment should not exceed the statutory cap of $7,500 provided in 18 U.S.C. § 3599(g)(2) and that these fees are justified and necessary to afford Mr. Bucklew an adequate opportunity to present his executive clemency claim that execution by lethal injection may pose a substantial and objectively intolerable risk of inflicting serious harm and excruciating pain. Petitioner therefore seeks appointment of Dr. Cohen as an expert, with this Court authorizing $7,200 in fees.

WHEREFORE, for all the above-stated reasons, petitioner seeks this Court's order appointing Dr. Cohen as an expert under 18 U.S.C. § 3006A and 18 U.S.C. § 3599(f) to conduct a review of Mr. Bucklew's medical records and a medical literature search as described above, and further, seeks this Court's order authorizing up to $7,200 in fees for Dr. Cohen.

Respectfully Submitted,

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DECLARATION OF ADAM JENNINGS COHEN, MD

COMES NOW the declarant, Adam J. Cohen, M.D., and as authorized by 28 U.S.C. § 1746, states and declares under penalty of perjury all as follows:

1. My name is Adam Jennings Cohen.
2. I practice Medicine in the area of Chicago, IL.
3. I earned a bachelor's degree in accounting, Cum Laude, from Brooklyn College in 1991.
4. I earned a Doctor of Medicine from the Albany Medical College in 1996.
5. I completed a fellowship in Oculoplastic and Orbital Surgery/Neuroophthalmology at the University of Vermont College of Medicine in 2002.
6. I have received certification from the American Board of Opthalmology in June 2004.
7. In addition to practicing as a board certified opthamologist I ~~serve as~~ am an ~~Asseciate~~ Fellow for the American College of Surgeons, as an Active Fellow with the American Academy of Opthalmology, and an Associate Member of the Europeon Society of Opthalmic Plastic and Reconstructive Surgery.
8. I have studied and published [redacted] the subject of cavernous hemangioma.
9. In MAY of 2008, I prepared the attached curriculum vitae marked as Exhibit 1. It is a true and correct presentation of my detailed contact information and of my credentials for giving an expert opinion on the effects of cavernous hemengioma on the body of an individual.

10. I have been contacted by Cheryl Pilate to serve as an expert, by appointment of a federal court, in evaluating the present condition of Russell Bucklew in suffering from cavernous hemangioma.

11. Cavernous Hemangioma is a vascular condition of the central nervous system characterized by grossly dilated blood vessels resembling raspberries in external structure.

12. Clinical symptoms of this disease may include recurrent headaches, focal neurological deficits, auditory deficits, hemorrhagic stroke, seizures, excruciating pain and bleeding. I understand that Russell Bucklew has exhibited several of these symptoms.

13. In patients afflicted with cavernous hemangioma, mortality can result from intraoperative complications such as bleeding and the risk of general anesthesia.

14. Further, I understand many of Russell Bucklew's hemangiomas are facially located. Such placement enhances the risk and severity of possible complications by disrupting blood flow to the brain.

15. To the best of my knowledge, the effects of Missouri's lethal injection protocol, including the administration of sodium thiopental, on persons suffering from cavernous hemangioma is unknown.

16. Without further medical research and evaluation, the application of Missouri's lethal injection procedure on a person with facially located hemangiomas presents a substantial or objectively intolerable risk of inflicting serious harm and excruciating pain.

17. If the Court authorizes funding for my professional time and expenses in doing so, I would commence a detailed medical literature review of the effects of Missouri's lethal injection protocol on an individual afflicted with facial cavernous hemangioma. In addition, to render an accurate medical

opinion on the potential for excruciating pain, I would travel to Missouri and perform a diagnostic evaluation of Russell Bucklew's condition.

18. Each and every statement in the foregoing declaration is true and correct according to my personal knowledge and belief.

Further, the declarant saith naught.

I declare under penalty of perjury that the foregoing is true and correct. Executed:

6/3/18
Today's date

ADAM JENNINGS COHEN, M.D.

Adam J Cohen MD, FACS
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DATE AND LOCATION OF BIRTH

May 27, 1968, Brooklyn, NY, USA

EDUCATION

Doctorate of Medicine 1996
The Albany Medical College, Albany, NY, USA

Bachelor of Science, Accounting, Cum Laude 1991
Brooklyn College, Brooklyn, NY, USA

POST GRADUATE TRAINING

Internship
Staten Island University Hospital, Staten Island, NY, USA – Internal Medicine 1996-1997

Residencies
Staten Island University Hospital, Staten Island, NY, USA – Internal Medicine 1997-1998
Nassau University Medical Center, East Meadow, NY, USA – Ophthalmology 1998-2001

Fellowships
University of Vermont, Fletcher Allen Healthcare, Burlington, VT, USA
Oculoplastic and Orbital Surgery/Neuroophthalmology 2001-2002
Providence Hospital and Medical Center, Southfield, MI, USA
Craniofacial Plastic and Reconstructive Surgery 2003-2004

BOARD CERTIFICATION/STATE LICENSURE/SOCIETIES

Board Certification
American Board of Ophthalmology 2004

State Licensure
Illinois (active)
New York (active)
Michigan (expired)
New Mexico (expired)
Vermont (expired)

Societies
Fellow, American Board of Surgeons 2005
Member, Committee on Young Surgeons, American College of Surgeons 2008
Active Fellow, American Academy of Ophthalmology 2003

ACADEMIC APPOINTMENTS

Assistant Professor, Department of Ophthalmology
Northwestern University, Feinberg School of Medicine

PUBLICATIONS:

TEXTBOOKS

Cohen AJ, Mercandetti M, Brazzo BG (eds). The Lacrimal System: Diagnosis, Management and Surgery. Springer-Verlag, 2006.

TEXTBOOK CHAPTERS

1) Cohen AJ, Waldrop FC, Weinberg DA. Revision Dacryocystorhinostomy. Chapter 25. In: The Lacrimal System: Diagnosis, Management and Surgery. Springer-Verlag, 2006.

2) Mercandetti M, Cohen AJ. Complications of Laser Resurfacing. Chapter 3. In: Oculoplastic Pearls and Complications. Springer-Verlag, 2003.

3) Parisier SC, Cohen AJ, Selkin BA, Han JC. Acquired Cholesteatoma. Chapter 20. In: Pediatric Otology and Neurotology. Lippencott-Raven, 1997.

JOURNALS

1) Donnenfeld ED, Selkin BA, Moadel K, Selkin GT, Cohen AJ, Sperber TB. Controlled Evaluation of a Bandage Contact Lens and a Topical Non-Steroidal Anti-inflammatory Drug in the Treatment of Traumatic Corneal Abrasions. *Ophthalmol*. June 1995: 102:979-984.

2) Parisier SC, Hanson MB, Han JC, Cohen AJ. Pediatric Acquired Cholesteatoma: An Individualized Single-Stage Approach. *Otolaryngol Head Neck Surg* 1996; 115(1): 107-14.

3) Cohen AJ, Mercandetti M, Weinberg DA. There's No Reason to Cry. Diagnosis and Management of the Tearing Patient. *Comp Ophthalmol Update*.2001; 2:169-78.

4) Mercandetti M, Putterman AM, Mirante JP, Cohen ME, Cohen AJ. Internal Levator Advancement via Muller's Muscle-Conjunctival Resection: Technique and Review. *Arch Facial Plastic Surg*. 2001; 3(2):104-110.

5) Cohen AJ, Weinberg DA. Muller's Muscle-Conjunctival Resection for Blepharoptosis with Poor Levator Function. *Ophthalmic Surg Lasers*. 2002; 33:491-492.

6) Cohen AJ, Mercandetti M. 1-2-3 Lift: Blepharoptosis Repair. *Review of Ophthalmology*. 2003; 10(8):73-75.

7) Cohen AJ. Mercandetti M. Nuances of Lower Eyelid Blepharoplasty. *Review of Ophthalmology*. 2003; 10(11): 119-124.

8) Cohen AJ, Mercandetti M. Endonasal Balloon Assisted Dacryocystorhinostomy. *Techniques in Ophthalmology*. 2003; 1(4): 223-226.

9) Cohen AJ. A New Filler for Soft Tissue Augmentation. *Review of Ophthalmology*. 2004; 11(5):104-5.

10) Kelly CP, Cohen AJ, Yahuzer, CR, Jackson IT. Medial Canthopexy: A Proven Technique. *Ophthal Plast Reconstr Surg*. 2004; 20(5): 337-341.

11) Kelly CP, Cohen AJ, Yahuzer CR, Jackson IT. Cranial Bone Grafting to the Orbit: Is it Still the Best? *J Craniofac Surg*. 2005; 15(1): 181-185.

12) Cohen AJ, Mercandetti M. Diagnosis and Management of Acquired Epiphora. *Review of Ophthalmology*. 2005 CME Section. 12(6): 74-78.

13) Cohen AJ. Oculoplastic and Orbital Surgery. *Ophthalmol Clin North Am*. June 2006. 19(2): 257-267.

14) Weinberg DA, Tham V, Hardin N, Antley C, Cohen AJ, Hunt K, Glasgow BJ, Baylis HI, Shorr N, Goldberg RA. Eyelid mucous membrane grafting: A histologic study of hard palate, nasal turbinate and buccal mucosal grafts. *Ophthal Plast Reconstr Surg*. 2007. 23(3):211-16.

15) Cohen AJ, Bernstein JA. Muller's Muscle Conjunctival Resection for Blepharoptosis Repair. *Techniques in Ophthalmology*. 2007. 5(3): 121-124.

ELECTRONIC JOURNALS

1) Cohen AJ, Mercandetti M. Ptosis, Adult. *eMedicine*. In: Ophthalmology/Lid.*

2) Cohen AJ, Mercandetti M. Cavernous Hemangioma. *eMedicine*. In: Ophthalmology/Orbit.*

3) Mercandetti M, Cohen AJ. Orbital Tumors. *eMedicine*. In: Ophthalmology/Orbit.*

4) Mercandetti M, Cohen AJ. Exophthalmos. *eMedicine*. In: Ophthalmology/Orbit.*

5) Cohen AJ, Mercandetti M, Chang EW. Rhytidectomy, Subperiosteal Facelift. *eMedicine*. In: Otolaryngology/Facial Plastic Surgery.*

6) Mercandetti M, Cohen AJ, Mirante JP. Sinusitus, Ethmoid, Acute Surgical Treatment. *eMedicine*. In: Otolaryngology/Facial Plastic Surgery.*

7) Mercandetti M, Cohen AJ, Chang EW. Facial Analysis for Skin Resurfacing. *eMedicine*. In: Otolaryngology/Facial Plastic Surgery.*

8) Mercandetti M, Cohen AJ, Chang EW. Implants, Soft Tissue. Gore-Tex. *eMedicine*. In: Otolaryngology/Facial Plastic Surgery.*

9) Cohen AJ, Mercandetti M. Facelift, Platysmoplasty. *eMedicine*. In: Plastic Surgery.*

10) Mercandetti M, Cohen AJ, Laub D. Facelift, Rhytidectomy, SMAS placation. *eMedicine* In: Plastic Surgery.*

11) Cohen AJ, Mercandetti M. Facial Fractures. Orbital Floor Fractures. *eMedicine*. In: Plastic Surgery.*

12) Cohen AJ, Mercandetti M. Facial Fractures. Zygomatic Arch Fractures. *eMedicine*. In: Plastic Surgery.*

13) Mercandetti M, Cohen AJ. Wound Healing. Healing and Repair. *eMedicine*. In: Plastic Surgery.*

*http://www.emedicine.com

PRESENTATIONS

1) Cohen AJ. Management of Facial Fractures. Otolaryngology Resident's Lecture Series. Manhattan Eye, Ear and Throat Hospital. New York, NY. September, 1995

2) Parisier SC, Hanson MB, Han JC, Cohen AJ. Pediatric Cholesteatoma. To Stage or Not To Stage. American Academy of Otolaryngology-Head and Neck Surgery. New Orleans, LA. September, 1995.

3) Cohen AJ, Weinberg DA, Mercandetti M. Transcaruncular Approach to Orbital Decompression. Innovative Approaches to the Treatment of Graves' Orbitopathy. Columbia University-Harkness Eye Institute. New York, NY September, 2001

4) Cohen AJ. Epiphora. Grand Rounds. Division of Ophthalmology. University of Vermont College of Medicine. Burlington, VT. October, 2001.

5) Cohen AJ. Transient Monocular Visual Loss. Grand Rounds. Division of Ophthalmology. University of Vermont College of Medicine. Burlington, VT. April, 2002.

6) Cohen AJ. A Cornucopia of Orbitofacial Surgery and Neuro-ophthalmology. New Mexico Ophthalmology Society. Bernalillo, NM. September 2002.

7) Cohen AJ. Case Studies in Orbitofacial Surgery. Department of Ophthalmology. Duke University. Durham, NC. May 2003.

8) Cohen AJ, Kelly CP, Yavuzer CP, Jackson IT. Medial Canthopexy: Proven Technique. European Society of Oculoplastic Surgery Annual Meeting. Leuven, Belgium. June 2004.

9) Cohen AJ, Kelly CP, Yavuzer CP, Jackson IT. Medial Canthopexy: Proven Technique. American Society of Oculoplastic and Reconstructive Surgery Annual Meeting. New Orleans, LA. September 2004.

10) Cohen AJ, Kelly CP, Yavuzer CP, Jackson IT. Cranial Bone Grafting to the Orbit. American Society of Oculoplastic and Reconstructive Surgery Annual Meeting. New Orleans, LA. September 2004.

11) Mercandetti M, Cohen AJ. Endoscopic Forehead Lifting Using the Endotine System. American Society of Oculoplastic and Reconstructive Surgery Annual Meeting. New Orleans, LA. September 2004.

DIDACTIC COURSES

1) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Instructor, Laboratory Portion. American Academy of Ophthalmology National Meeting. Dallas, TX. October 2000.

2) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Instructor, Laboratory Portion. American Academy of Ophthalmology National Meeting. New Orleans, LA. November 2001.

3) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Instructor, Laboratory Portion. American Academy of Ophthalmology National Meeting. Orlando, FL. November 2002.

4) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Instructor, Laboratory Portion. American Academy of Ophthalmology National Meeting. Anaheim, CA. October 2003.

5) DCP, DCR and Transcanalicular DCR. Lecturer and Instructor, Laboratory Portion. American Academy of Ophthalmology National Meeting. New Orleans, LA. October 2004.

6) The Wide World of Midface Lifting. Senior Instructor.
American Academy of Ophthalmology National Meeting. New Orleans, LA. October 2004.

7) Diagnosis and Management of Epiphora. Senior Instructor.
American Academy of Ophthalmology National Meeting. New Orleans, LA. October 2004.

8) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Senior Instructor.
American Academy of Ophthalmology National Meeting. Chicago, IL. October 2005.

9) Dacryoplasty, Balloon Catheters, Endoscopic and External DRC's. Senior Instructor.
American Academy of Ophthalmology National Meeting. Las Vegas, NV. October 2006.

10) The Transition: From Resident to Attending. Southwest Chapter of the American College of Surgeons. Houston, TX. February 2008.

SCIENTIFIC POSTERS

1) Cohen AJ, Weinberg DA. Bilateral Ischemic Orbitopathy and Optic Neuropathy Due to Giant Cell Arteritis. North American Neuro-Ophthalmology Society Annual Meeting. Copper Mountain, CO. February 2002.

2) Berke SJ, Cohen AJ, Coronia RT, Sturm RJ. Endoscopic Cyclocoagulation in the Treatment of Refractory Glaucoma. American Glaucoma Society Annual Meeting. San Antonio, TX. March 2002.

LETTERS TO THE EDITOR

1) Cohen AJ. Ophthal Plastic Reconstr Surg. 2004; 20(5):404-405.

EDITORIAL BOARDS

1) Review of Ophthalmology

2) Journal of Ocular Prosthetics

3) Techniques in Ophthalmology

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

No: 03-3721

Russell Bucklew,

Appellant

v.

Al Luebbers,

Appellee

Appeal from U.S. District Court for the Western District of Missouri - Kansas City
(4:01-CV-8000 DW)

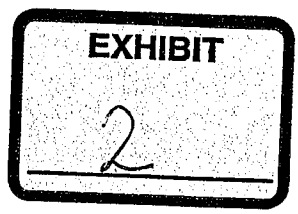
IN CAMERA ORDER

Appellant's Motion to Appoint Medical Expert to Evaluate Whether Petitioner's Execution by Lethal Injection Constitutes Cruel and Unusual Punishment in Light of Petitioner's Medical Condition has been considered by the court and is denied.

June 27, 2008

Order Entered at the Direction of the Court:
Clerk, U.S. Court of Appeals, Eighth Circuit.

/s/ Michael E. Gans



Affidavit of Adam J. Cohen, M.D.

COMES NOW Adam J. Cohen, M.D., being duly deposed and sworn, and states on his oath or affirmation all as follows:

1. My name is Adam J. Cohen.

2. I reside in Chicago, Illinois.

3. I am of legal age and of sound mind and body.

Professional Qualifications

4. I received my undergraduate degree, cum laude, from Brooklyn College in New York City in 1991.

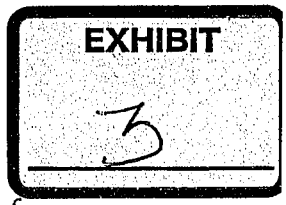
5. I earned my doctorate in medicine from Albany Medical College in 1996.

6. I did my internship at Staten Island University Hospital in New York City from 1996 to 1997, and a residency in Internal Medicine at the same hospital from 1997 to 1998.

7. One generally does not intern in the narrow field in which one intends to specialize, but in a more general field such as Internal Medicine, General Surgery, or Pediatrics, to get a broader feel for patient care.

8. Residencies can last for two years to five years. A resident has more responsibility than an intern.

9. I did a residency in Ophthalmology at Nassau University Medical Center, East Meadow, New York, from 1998 to 2001.



10. I completed a fellowship in Oculoplastic and Orbital Surgery/Neuroophthalmology at the University of Vermont College of

Medicine, in Burlington, Vermont, from 2001 to 2002. During this year, I performed surgery of the eyelid, forehead, and orbit (the bony structure surrounding the eye), as well as treating disorders of the visual system resulting from orbital and nervous system disease (for example, double vision, stroke of the optic nerve, and orbital tumors).

11. I developed a post-residency level of expertise about diseases and surgeries of the facial region.

12. After a year of private practice, I embarked on and then completed a fellowship in Craniofacial Plastic and Reconstructive Surgery at Providence Hospital and Medical Center, Southfield, Michigan, from 2003 to 2004.

13. During this year, I trained under Dr. Ian Jackson, a world-renowned expert in plastic surgery—originally from Scotland and a former Chief of Plastic Surgery at the Mayo Clinic—who attracted patients from around the world to the hospital in Michigan where we worked.

14. During this fellowship I spent a year treating a wide variety of bony, soft-tissue, and vascular abnormalities, acquired and congenital, in patients of all age groups.

15. I am board-certified in ophthalmology, having received certification from the American Board of Ophthalmology in June 2004, after passing written and oral examinations by seasoned board-certified ophthalmologists. As a practical matter, one must have completed a residency certified by the American Council for Graduate Medical Education in order to sit for the exam. In addition, the substance of the

testing requires knowledge that one is likely to acquire only through such practice.

16. I have continued to develop as a board-certified ophthalmologist in private practice since 2004.

17. I divide my practice between Evanston-Northwestern Hospital, where I do my major surgeries, and North Shore Same Day Surgeries for simpler procedures.

18. In addition, I have served as Assistant Professor in the Department of Ophthalmology at the Feinberg School of Medicine of Northwestern University, in Evanston, Illinois, which has recently been involved in a restructuring and will soon be under the aegis of the University of Chicago.

19. I was the lead co-editor of A.J. COHEN, M. MERCANDETTI & B.G. BRAZZO (EDS.), THE LACRIMAL SYSTEM: DIAGNOSIS, MANAGEMENT & SURGERY, published by Springer-Verlag in 2006. This is a treatise used by post-graduate physicians in training and full-fledged practioners. In addition to editing it with my co-editors, I co-authored, with Drs. F.E. Waldrop and D.A. Weinberg, Chapter 25, *Revision Dacryocystorhinostomy*, which deals with procedures to address previously unsuccessful tear-duct surgeries.

20. I have also co-authored, with Dr. Michael Mercandetti, Chapter 3, *Complications of Laser Resurfacing*, in OCULOPLASTIC PEARLS & COMPLICATIONS (Springer-Verlag, 2003); and, with S.C. Parisier, M. Selkin, and J.C. Han, Chapter 20, *Acquired Cholesteatoma*, in PEDIATRIC OTOLOGY &

NEUROTOLOGY (Lippencott-Raven, 1997), relating to a benign middle-ear tumor in children, and its surgical management.

21. I have authored or co-authored 15 articles that have been published in hard-copy peer-reviewed journals in ophthalmology or plastic and reconstructive surgery, as set forth in the attached curriculum vitae.

22. I serve on the editorial boards of three journals in my practice areas: REVIEW OF OPHTHALMOLOGY, JOURNAL OF OCULAR PROSTHETICS, and TECHNIQUES IN OPHTHALMOLOGY. I also review articles for the peer reviewed journals: OPHTHALMOLOGY; OPHTHALMIC PLASTIC & RECONSTRUCTIVE SURGERY; and JOURNAL OF NEURO-OPHTHALMOLOGY.

23. I have also authored or co-authored 13 articles that are part of Web-based medical science resources, as set forth in the attached curriculum vitae. The process for preparing, submitting, and revising an article for any of the Web-based resources in which I have published, such as eMedicine, is comparable to the process for the hard-copy publications in which I have published and on whose editorial boards I serve.

24. I am the lead author of the eMedicine article on cavernous hemangioma.

25. My co-authors of the eMedicine article on cavernous hemangioma were Drs. Michael Mercandetti, Consulting Staff, Department of Surgery, Doctors Hospital of Sarasota; and David A. Weinberg, FACS, Director, Oculoplastic and Orbital Surgery, Assistant Professor of Neurology and Ophthalmology, Department of Surgery, Division of Ophthalmology, Fletcher Allen Health Care.

26. Our work was edited by experienced practitioners in the same specialty or in a related specialty:

- Andrew W. Lawton, M.D., Medical Director of Neuro-Ophthalmology Service, Section of Ophthalmology, Baptist Eye Center, Baptist Health Medical Center;
- Francisco Talavera, PHARM.D., PH.D., Senior Pharmacy Editor, eMedicine;
- Mark T. Duffy, M.D., PH.D., Consulting Staff, Division of Oculoplastic, Orbito-facial, Lacrimal, and Reconstructive Surgery, Green Bay Eye Clinic, Bay Care Clinic;
- Lance L. Brown, O.D., M.D., Ophthalmologist, Affiliated with Freeman Hospital and St John's Hospital, Regional Eye Center, Joplin, Missouri; and
- Hampton Roy, Sr., M.D., Associate Clinical Professor, Department of Ophthalmology, University of Arkansas for Medical Sciences.

27. I have made at least 13 presentations at professional meetings within my practice areas, and in addition have conducted at least 10 courses at these meetings involving the use of cadavers or other hands-on teaching aids, all as set forth in the attached curriculum vitae.

28. I am a Fellow for the American College of Surgeons and an Active Fellow of the American Academy of Ophthalmology. By contrast, I

do not belong to any organization that has as its primary objective the abolition of the death penalty.

29. In addition to making presentations and conducting demonstrative courses at professional meetings, I attend them as an audience member and participate in discussions of my own work and the work of others both at these meetings and throughout the year, all in the normal process of continuing to keep up with my field as a practitioner, researcher, and educator in it.

30. My professional training, experience, and research extends beyond the diagnosis and treatment of conditions of the eye in that my fellowships allowed me to develop an expertise within a broad area of diseases and surgeries of the facial region.

31. I attach as "Cohen Exhibit 1" a curriculum vitae that I prepared in May 2008, and that is a true and correct representation of my detailed professional qualifications and of my professional contact information.

Role as Expert Witness

32. In other cases, I have been retained by plaintiff's counsel to review charts and render expert opinions regarding an eyelid surgery and another facial surgery. I did not find any evidence of malpractice on the part of the treating physicians. I was not hired as a testifying expert.

33. I do not have a fixed position on the abstract question of capital punishment.

34. I understand that Cheryl A. Pilate and John William Simon are federal court appointed counsel for Russell E. Bucklew, a Missouri prisoner under sentence of death.

35. Ms. Pilate and Mr. Simon have contacted me to seek my services as an expert witness regarding a vascular condition of Mr. Bucklew.

36. Counsel have provided me with a compact disk containing, in Portable Document Format, what they represent to be the medical files on Mr. Bucklew as the Department of Corrections of the State of Missouri provided to them in 2008.

37. I have specifically reviewed several entries in the Medical Accountability Record System printout, at pages 35, 60-61, 92-93, 103-06, 177, and 208-09, which I am attaching collectively as "Cohen Exhibit 2," showing that medical professionals employed by the state or its contractors have found Mr. Bucklew to have cavernous hemangiomas.

Cavernous Hemangioma

38. A cavernous hemangioma (also known as "angioma") is a collection of abnormal blood vessels.

39. The term "angioma" is synonymous with "hemangioma." An "oma" is a growth; a collection of blood vessels is an "angioma." The prefix "hem-" refers to blood, and is theoretically redundant because no one uses the term "angioma" to refer to anything but an abnormal vascular growth.

Interplay Between Cavernous Hemangioma and Lethal Injection

45. Counsel has informed me and has provided me documentation to the effect that the State of Missouri conducts judicial executions using a three-chemical sequence of sodium pentothal (or thiopental), pancuronium bromide, and potassium chloride, which are administered intravenously.

46. Counsel has informed me and has provided me documentation to the effect that it is accepted by the Supreme Court of the United States, and is not seriously contested elsewhere, that if a person were injected with either or both of the second two chemicals in a quantity sufficient to cause death, without anesthesia, the person would suffer excruciating pain, from suffocation in the case of pancuronium bromide and from burning in the veins and from a heart attack in the case of the potassium chloride. See *Baze v. Rees*, 128 S.Ct. 1520, 1533 (Roberts, C.J.) (announcing the judgment) ("It is uncontested that, failing a proper dose of sodium thiopental that would render the prisoner unconscious, there is a substantial, constitutionally unacceptable risk of suffocation from the administration of pancuronium bromide and pain from the injection of potassium chloride") & 1557 (Ginsberg, J., dissenting) ("Use of pancuronium bromide and potassium chloride on a conscious inmate, the plurality recognizes, would be "constitutionally unacceptable").

47. From these premises, it follows to a reasonable degree of scientific certainty that the avoidance of excruciating pain from the State of Missouri's chosen form of judicial execution depends on the efficacy of the sodium pentothal as an anesthetic.

40. The symptoms associated with cavernous hemangiomas are the threat of stroke, seizures, visual and hearing loss, double vision, pain, bleeding, difficulty swallowing and breathing, and disfigurement. With large hemiangiomas, spontaneous and uncontrolled bleeding may occur resulting in death.

41. My review of the documents provided by counsel from the Department of Corrections indicate that Russell Bucklew has exhibited several of these symptoms.

42. From my education, training, experience, research, and participation in editing articles in my practice areas as aforesaid, I am familiar with all contemporary published research on the effect of cavernous hemagiomas on the vascular system and on the human body and mind generally. In addition, I am at least informally aware of much of the unpublished research that has been tendered for publication in journals which I edit and that is presented at meetings I attend or discussed within my network of professional contacts.

43. Persons with a cavernous hemangioma may die from intraoperative complications such as uncontrolled bleeding, blood pressure fluctuations, stroke, and other added dangers over and above the inherent risks of general anesthesia.

44. From the documents I have received in this matter, I understand many of Mr. Bucklew's hemangiomas are located within his face. The location of the hemangiomas increases the occurrence and severity of complications one would generally expect with anesthesia.

48. There is no research—published, for sure, or in preparation, to the best of my knowledge, which is substantially comprehensive as explained in Paragraph 42, *supra*—directly bearing on the effect of cavernous hemangiomas on the efficacy of sodium pentothal as an anesthetic.

49. It is my opinion, to a reasonable degree of scientific certainty, that what the scientific community ***does*** know about cavernous hemangiomas casts doubt on the efficacy of an injection of sodium pentothal as an anesthetic for a person with cavernous hemangiomas, in that, for example, Mr. Bucklew has high-flow cavernous hemangiomas, meaning that they are supplied by an artery rather than a vein; and, therefore, given the fact that the cavernous hemangiomas are supplied by the same arterial system that supplies the brain, the cavernous hemagiomas are a factor what would cause slowing of the sodium pentothal to reach the circulatory system of the brain.

50. If the Court authorizes funding for my professional time and my out-of-pocket expenses in doing so, I will immediately commence a detailed medical literature review to see if I can find any existing research that might indirectly bear on the effects of Missouri's lethal injection protocol on an individual afflicted with one or more facial cavernous hemangioma. In addition, I would travel to Missouri and perform a diagnostic evaluation of Mr. Bucklew's specific condition.

51. In the absence of detailed findings by a qualified professional in my specialty as aforesaid, and the Department of Corrections' following the conclusions of such findings, the application of a three-chemical protocol for lethal injection to Mr. Bucklew creates a known likelihood of anesthetic failure resulting in abnormal prolongation of his execution, during which he would by definition be conscious to some extent, and/or his consciously enduring the pain and suffering that the Supreme Court has held to be unconstitutional from the second and third chemicals.

Further, the affiant saith naught.

I swear or affirm that the foregoing is true and correct.

Adam J Cohen
ADAM J. COHEN

STATE OF ILLINOIS)
) SS.
COUNTY OF _____)

Subscribed and sworn to before me, a Notary Public, this 15th day of December 2008.

Carol M Sidor
NOTARY PUBLIC

My commission expires on 9/26/10.

OFFICIAL SEAL
CAROL M SIDOR
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:09/26/10

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MISSOURI

RUSSELL BUCKLEW,	)	
***Plaintiff*,**	)	
v.	)	**Case No. 14-08000**
GEORGE A. LOMBARDI,	)	
DAVID A. DORMIRE,	)	
And	)	
TERRY RUSSELL,	)	
Defendants.	)	

FOURTH AMENDED COMPLAINT

Plaintiff Russell Bucklew, by and through his counsel, hereby files his Fourth Amended Complaint, requesting this Court declare and enforce his rights under the First and Fourteenth Amendments and issue an injunction under 42 U.S.C. § 1983 and the Eighth Amendment commanding defendants not to carry out any execution by lethal injection on him. Because of Mr. Bucklew's unique medical condition, Missouri's execution procedures will almost certainly cause him to suffer a bloody, prolonged and excruciating death.

As required by this Court in light of the Supreme Court's decision in *Glossip v. Gross*, 135 S. Ct. 2726 (2015), Mr. Bucklew specifically alleges a "feasible, alternative" method of execution, lethal gas. This alternative method is specifically authorized by Missouri law, Mo. Rev. Stat. § 546.720.1, and will significantly

Resp. Ex. 12

reduce the risk of severe pain by avoiding the circulation of the lethal agent through Mr. Bucklew's impaired and abnormal vascular system. (Doc. 52 at 7-8)

Mr. Bucklew suffers from a rare disease – cavernous hemangioma – that is unique, severe, and progressive. Since Mr. Bucklew filed the present lawsuit in May 2014, his condition has grown significantly worse, with the blood-engorged, unstable tumors in his head and throat causing daily pain, regular bleeding, and an ever-enlarging obstruction to his airway, causing him to struggle for air when he lies flat. The blood-filled tumors are prone to rupture under stress or any rise in blood pressure. When this occurs, Mr. Bucklew bleeds through his facial orifices and in his throat, further obstructing his airway and causing him to choke. These vascular abnormalities also create a great risk that the lethal drug will not circulate as intended in Mr. Bucklew's body, leading to a prolonged and very painful death.

Any attempt to execute Mr. Bucklew under Missouri's present protocol, or by *any* means of lethal injection, will almost inevitably lead to a prolonged and tortuous execution, with Mr. Bucklew hemorrhaging, struggling to breathe and suffocating. Because lethal gas will bypass Mr. Bucklew's impaired circulatory system, it is more likely than any other feasible and available alternative method to significantly reduce the risk of severe pain. *See Glossip*, 135 S. Ct. at 2737.[1] The use of lethal gas, for

[1] A firing squad would similarly reduce the risk of severe pain, but it is not authorized under Missouri law. Mo. Rev. Stat. § 546.720.1

instance, will likely reduce the great risk that Mr. Bucklew will choke and suffocate on his own blood; it is also likely to significantly reduce the likelihood of a prolonged and excruciating execution.

The use of lethal gas is both a "known" and "available" alternative, as it is one of the two methods specifically authorized by Missouri statute, Mo. Rev. Stat. § 546.720.1. Given the State of Missouri's unwillingness to disclose the most basic information regarding its execution protocol and procedures – refusing to confirm, for instance, even the type of drug it is using, whether manufactured or compounded pentobarbital – and given the DOC's refusal to obtain up-to-date medical imaging of Mr. Bucklew's hemangiomas, it appears that, by far, the most "feasible" method with this medically fragile prisoner is to employ the alternative method of lethal gas.

INTRODUCTION

1. Mr. Bucklew has suffered his entire life from a dangerous, and, at times, debilitating congenital condition – cavernous hemangioma – that causes clumps of weakened, malformed vessels to grow in his head, face, neck, and throat, displacing healthy tissue and rupturing under stress. Mr. Bucklew has had this condition since birth, and his vascular malformations have grown progressively worse throughout adulthood, causing constant facial pain and pressure, labored breathing, and impairment of his hearing and vision.

2. Mr. Bucklew's vascular malformations have proved resistant to any form of medical or surgical treatment. Surgery has been rejected because the results would be both disfiguring and disabling, and the only medical treatment for the past several years has been pain management.

3. Mr. Bucklew's vascular tumors are massive, occupying his nose, throat, and airway passages. He hemorrhages on a regular basis, and sometimes experiences a major rupture with extensive bleeding.

4. The size of Mr. Bucklew's tumors and the weakness of his distended vessels create a very substantial risk that he will suffer excruciating, even tortuous pain during an execution.

5. Because the vascular tumors partially obstruct Mr. Bucklew's airway, he is at high risk of choking during an execution, particularly if the distended vessels in his mouth or throat rupture and bleed. This will cause gasping, coughing and choking that Mr. Bucklew will experience as suffocation.

6. There is also a grave risk that, because of Mr. Bucklew's severe vascular malformations, the lethal drug will not circulate as intended, delaying the suppression of the central nervous system and prolonging the execution – which will likely cause excruciating pain to Mr. Bucklew. These grave risks – which establish that execution by lethal injection is highly likely to violate Mr. Bucklew's rights

under the Eighth Amendment – are heightened even further by the use of a drug, pentobarbital, whose provenance Missouri has shrouded in complete secrecy.

7. Because of his unique condition, which poses specific and substantial risks, Mr. Bucklew cannot be executed under Missouri's protocol without inflicting cruel and unusual punishment in violation of the Eighth Amendment of the United States Constitution.

8. Mr. Bucklew's medical condition is well documented in the Department of Corrections' own records, which describe the hemangiomas as "very massive" and "extensive" with "bulging lesions." As repeatedly documented, the hemangiomas cause chronic facial pain, recurrent bleeding, frequent headaches and spells of dizziness and even loss of consciousness. Mr. Bucklew also suffers from impaired hearing and vision.

9. Various therapies to treat the hemangiomas – including chemotherapy, radiation therapy and sclerotherapy – have all failed, and doctors have stated that any effort to remove them surgically would be "mutilating and very risky as far as blood loss." Mr. Bucklew is presently on a regimen of daily narcotic pain medication.

10. Mr. Bucklew's vascular tumors have grown throughout his adult life, including his 19 years in prison, and have continued to grow progressively larger in

the last year. More recently, the growing tumors in his throat have increasingly interfered with his ability to speak clearly, typically causing labored breathing and slurred, indistinct speech.

11. Despite the progressive nature of his condition and Missouri's obligations under the Eighth Amendment, the Department of Corrections (DOC) has obtained no diagnostic imaging (CT scans or MRI) in the past five years. This is significant because the imaging studies are necessary to guide proper medical care and the day-to-day management of Mr. Bucklew's condition. They also are essential to provide the information that Mr. Bucklew needs to litigate his present claims. Indeed, even though Mr. Bucklew has made clear for more than a year his need for up-to-date imaging, the Department of Corrections still has not arranged such diagnostic testing, despite its constitutional obligation to do so.

12. By the mid-1990s, doctors noted that Mr. Bucklew's hemangiomas were impinging on his airway. In 2010, an MRI established that the large degree of airway obstruction was beyond dispute. Following an MRI in June 2010 – the last diagnostic imaging of Mr. Bucklew -- the treating physician issued a report to the DOC describing Mr. Bucklew's tumors as a "large complex right facial mass" that extended through the right-side nasal passages, sinuses, pharynx, jaw, palate and throat. As a result of the large mass, Mr. Bucklew's *"airway is severely compromised."* (Emphasis added).

13. Two highly trained, board-certified physicians – an anesthesiologist who teaches at the Emory University School of Medicine and a neuroradiologist who practices at St. Luke's Hospital in St. Louis – have provided sworn statements stating that Mr. Bucklew's vascular malformations create a significant risk that the lethal drug will not circulate properly during an execution. This will create a great risk of prolonging the execution and causing Mr. Bucklew to suffer excruciating pain.

14. Both doctors state in their affidavits that an examination of Mr. Bucklew and his vascular malformations is necessary to evaluate the specific risks to Mr. Bucklew during an execution by lethal injection. An adequate examination would necessarily include up-to-date medical imaging.

15. Dr. Joel Zivot, the Emory anesthesiologist, has reviewed Mr. Bucklew's medical records and imaging studies and has also examined him at the prison.[2] He has also spoken recently with Mr. Bucklew by telephone to obtain updated information regarding his symptoms. In his sworn statements, Dr. Zivot has addressed the risk of Mr. Bucklew hemorrhaging during an execution as well as the risks posed by the severe degree of Mr. Bucklew's airway obstruction, which could readily lead to choking and suffocation.

[2] Dr. Zivot examined Mr. Bucklew in the prison cafeteria, which was the space the administration at Potosi Correctional Center made available.

16. Following his review, Dr. Zivot provides his expert opinion in great detail, stating the following points:

-- a substantial risk exists that Mr. Bucklew will suffer from "extreme or excruciating pain as a result of hemorrhaging or abnormal circulation of the lethal drug, leading to a prolonged execution";

-- Mr. Bucklew's airway, partially obstructed by unstable and blood-engorged tumors, creates a very substantial risk that Mr. Bucklew could choke, cough and gasp for air during an execution;

-- the mass in his airway continues to increase in size, likely causing the labored breathing and speech difficulties that Mr. Bucklew has experienced in recent months;

-- during an execution by lethal injection, Mr. Bucklew is at high risk of a blood pressure spike, and such a spike greatly increases the risk that Mr. Bucklew will suffer hemorrhaging in his face, mouth and throat, leading to further coughing and choking and increasing the risk of suffocation; and,

-- Mr. Bucklew's multiple medications create a substantial risk of an adverse drug interaction during an execution by lethal injection.

(*See* Exhibit 1 at¶¶ 15, 17, 18, Zivot Declaration of May 8, 2014; *see also* Exhibit 4 at ¶¶ 4-17; Exhibit 5 at ¶¶ 6-21).

17. To monitor the delivery of the drug and flush the intravenous lines, the training regimen for Missouri executions has historically provided for the use of methylene blue as a dye in the IV line. (Exhibit 1 at ¶ 17) As Dr. Zivot noted, however, methylene blue tends to cause a rise in blood pressure – a dangerous side effect that would likely prompt Mr. Bucklew's hemangiomas, already engorged with blood, to "rupture, resulting in significant bleeding in the face, mouth and throat." If blood enters Mr. Bucklew's airway, "it would likely cause choking and coughing, which Mr. Bucklew will experience as severe pain and suffocation." (Exhibit 1 at ¶18; Exhibit 5 at ¶29). Moreover, the use of methylene blue creates a great risk of a dangerous drug interaction with the regular medications that are prescribed to Mr. Bucklew, including those that are necessary to treat his psychiatric condition. (Exhibit 5 at ¶¶30-35).

18. Mr. Bucklew brings this lawsuit, as the sole plaintiff, because his situation is unique and the risks to him during an execution are grave. The claims raised in this suit are based on his particular medical condition and are separate and distinct from those raised in *Zink v. Lombardi*, Case No. 12-4209 (W.D. Mo).

19. Unlike the Eighth Amendment claims in the Zink case, which specifically challenged the use of compounded pentobarbital, Mr. Bucklew's claims rest on his specific and unique medical condition. Although the risks to Mr. Bucklew are heightened further by Missouri's alleged use of a compounded drug of unknown origin, purity and potency, lethal injection by *any* drug creates a very substantial risk that Mr. Bucklew will suffer hemorrhaging, choking and suffocation during the execution, thereby inflicting cruel and unusual punishment in violation of the Eighth Amendment.

20. Thus, it is clear that the claims of Mr. Bucklew are wholly separate from the claims raised in *Zink*. It is also clear from the stay of execution granted by the United States Supreme Court that Mr. Bucklew's ability to prevail on his claims bears no relationship to the ability of the other *Zink* petitioners to prevail on theirs. Indeed, the two cases rest on completely separate and distinct facts and legal theories.

21. Mr. Bucklew further alleges that the claims raised in *Zink* may have been ***moot*** at the time they were raised. To the extent that those claims rested on the claim that Missouri was using compounded pentobarbital, reasonable inferences from the known facts – including Missouri's steadily growing inventory of pentobarbital, much of which has been stockpiled for months – strongly suggest that since

approximately February 2014, Missouri has been using *manufactured* pentobarbital, not *compounded* pentobarbital.

22. *Alone* among all of the states conducting executions and using pentobarbital, Missouri has had ongoing, unimpeded access to a steady supply of pentobarbital, permitting it to build up its inventory to an amount sufficient to conduct 16 or more executions. The stockpiling of pentobarbital is inconsistent with the use of the compounded form of the drug, which has a very short shelf life.

23. What is also telling – and seems to confirm that the DOC is no longer using compounded pentobarbital – is that Missouri has recently begun hedging in its pleadings, stating in a filing with the United States Supreme Court that it did not "admit or deny" that Missouri is using compounded as opposed to manufactured pentobarbital.[3]

24. In Mr. Bucklew's case, the State of Missouri has similarly made its arguments in carefully couched language, and recently suggested that it was *Mr. Bucklew*, *not the State of Missouri*, who originated the allegation that Missouri uses the compounded form of pentobarbital in carrying out executions. In its second

[3] [3] Although Missouri has maintained since October 2013 that its lethal drug is a 5 gram dose of *compounded* pentobarbital, it has recently hedged about this, stating in its brief in opposition to the petition for writ of certiorari in *Zink v. Lombardi*, Case No. 14-9223, that it "does not admit or deny the chemical now used is compounded as opposed to manufactured [pentobarbital]." Brief in Opposition (filed April 30, 2015).

Motion to Dismiss, Defendants state: "Bucklew does not limit his allegations to compounded pentobarbital, which is the type of pentobarbital *he alleges* will be used in the execution." (Doc. 47 at 8)(emphasis added). This coy deflection by Defendants further cements the wall of secrecy surrounding Missouri executions.

25. The extreme secrecy regarding the nature of the pentobarbital used by Missouri is troubling, as the sole FDA-approved source of pentobarbital, manufacturer Akorn, prohibits its suppliers from selling to correctional institutions. http://investors.akorn.com/phoenix.zhtml?c=78132&p=irol-newsArticle&ID=2022522 This suggests that Missouri's growing inventory of pentobarbital may have been procured through improper means. If Missouri is using manufactured pentobarbital, then it is either: obtaining pentobarbital manufactured by Akorn in violation of Akorn's purchasing agreements, or it is using pentobarbital manufactured for veterinary use that is not approved for use in humans, or it is obtaining pentobarbital illegally from a non-FDA approved, foreign source.

26. Putting aside the issue of the drug's origin, Mr. Bucklew's medical condition is so grave and the risks of hemorrhage and airway obstruction are so great that execution by lethal injection with *any* drug creates a very substantial risk that Mr. Bucklew will suffer a tortuous and prolonged execution, in violation of the Eighth Amendment's prohibition on cruel and unusual punishment.

27. To properly proceed with his Eighth Amendment claims – supported primarily at this point by a physician who has not been granted access to conduct a full examination – Mr. Bucklew needs a complete medical exam complete with appropriate imaging studies. (Exhibit 1 at ¶¶20-21, 31; Exhibit 4 at ¶17; Exhibit 5 at ¶¶16-18, 38).

28. To adequately identify and evaluate the risks that are unique and specific to Mr. Bucklew – and therefore to provide the further factual underpinning for his Eighth Amendment claims – Mr. Bucklew must be provided a high resolution CT scan of his chest, head, neck and brain as well as an angiogram to assess the degree of vascularity of Mr. Bucklew's hemangiomas. (Exhibit 1 at ¶¶ 20-21; Exhibit 4 at ¶17; Exhibit 5 at ¶¶16-18, 38). Obtaining this information will allow Mr. Bucklew to establish that execution by lethal injection creates a "substantial risk of serious harm" and an "objectively intolerable risk of harm" and is "sure or very likely to cause serious illness and needless suffering." *Baze v. Rees*, 553 U.S. 35, 50-52 (2008).

29. Although Mr. Bucklew's counsel lack the medical and scientific expertise necessary to conduct in-depth research evaluating alternative methods of execution,[4]

[4] Although Dr. Zivot has been both willing and able to thoroughly acquaint himself with Mr. Bucklew's medical condition and render opinions regarding the severe risks posed by lethal injection, he has also made clear, that, as a medical doctor, he is "ethically prevented from prescribing or proscribing a method of executing a person." Exhibit 5 at ¶5. Dr. Zivot also

the research they have been able to conduct allows them to conclude that lethal gas is a "feasible" and "alternative" method that is highly likely to "significantly reduce the risk of severe pain" as it bypasses Mr. Bucklew's circulatory system. With execution by gas, the lethal agent enters the body through the lungs, presumably causing death without prolonged or excruciating pain.

30. Lethal injection is not only authorized by the State of Missouri, the DOC also appears to have an execution chamber available for the use of lethal gas. (*See* Exhibit 6, photograph of Missouri gas chamber). Indeed, section 546.720.1 states that the director of the DOC is "directed to provide a suitable and efficient room or place…and the necessary appliances for carrying into execution the death penalty by means of the administration of lethal gas or…lethal injection." Further, Missouri Attorney General Chris Koster has publicly stated that the gas chamber is an "option we have to enforce Missouri law" if death by lethal injection is not feasible or possible. *See* Associated Press, "Missouri Could Resort to Gas Chamber Attorney General Warns." *St. Louis Post Dispatch*, July 3, 2013, available at: http://www.stltoday.com/news/local/crime-and-courts/missouri-could-resort-to-

points out that he is a member of the American Society of Anesthesiology, and that if any board-certified anesthesiologist participated in lethal injection he or she would lose board certification. *Id*. Dr. Zivot is bound by his profession's ethics. Although he can identify and opine on the risks associated with lethal injection under Missouri's protocol, he attests that he "cannot advise counsel or the Court on how to execute Mr. Bucklew in a way that would satisfy Constitutional requirements."

gas-chamber-attorney-general-warns/article_7470560c-2ae3-5b38-91f5-0c8d77a91c86.html. Under these circumstances, it would appear that the use of lethal gas is certainly "feasible."

JURISDICTION AND VENUE

31. Jurisdiction is conferred by 28 U.S.C. §1331 and §1343, which provide for original jurisdiction of this Court in suits based respectively on federal questions and authorized by 42 U.S.C. §1983, which provides a cause of action for the protection of rights, privileges or immunities secured by the Constitution of the United States. Jurisdiction is further conferred by 28 U.S.C. §2201 and §2202, which authorize actions for declaratory and injunction relief.

32. Venue is proper in the Western District of Missouri under 18 U.S.C. §1391(b)(1)-(3) in that defendant Lombardi resides in the territorial jurisdiction of this district, and defendant Lombardi's decisions regarding Missouri's execution protocol are made within this court's territorial jurisdiction.

PARTIES

33. Plaintiff Russell Bucklew is a resident of the State of Missouri and presently resides at Potosi Correctional Center in Mineral Point, Missouri. He is sentenced to death, and was scheduled to die by lethal injection on May 21, 2014, but obtained on that date a stay of execution from the United States Supreme Court,

pending the outcome of his appeal to the Eighth Circuit Court of Appeals, *Bucklew v Lombardi*, Case No. 14-2163. Mr. Bucklew has exhausted his claims administratively through Potosi's grievance procedures.

34. Defendant George Lombardi is the Director of the Department of Corrections (DOC) of the State of Missouri. His office is located at the DOC's central office at 2729 Plaza Drive, Jefferson City, Missouri.

35. A Missouri statute, Mo. Rev. Stat. §536.720, authorizes and directs the Director of the DOC to prescribe and direct the means by which the Department carries out executions within the statutorily prescribed methods of lethal gas or lethal injection. Director Lombardi fulfills that statutory role and carries out those responsibilities.

36. Defendant David R. Dormire is the Director of the Division of Adult Institutions at the Department of Corrections of the State of Missouri. His office is also at the DOC's central office in Jefferson City, Missouri.

37. Defendant Dormire is the chief executive officer of the Division of Adult Institutions, and has command-and-control authority over the DOC officials, officers, contractors and employees who are involved, directly or indirectly, with carrying out executions.

38. Defendant Terry Russell is the Warden of the Eastern Reception and Diagnostic & Correctional Center (ERDCC), 2727 Highway K, Bonne Terre, Missouri. The State of Missouri has conducted its executions at ERDCC since April 2005.

39. By virtue of his authority over the staff at ERDCC, defendant Russell is responsible for the manner in which executions are conducted in Missouri.

40. All defendants are sued in their official and individual capacities. All actions taken by them are taken under color of state law.

FACTUAL BACKGROUND

Russell Bucklew's Medical Condition

41. Mr. Bucklew has suffered from the symptoms of congenital cavernous hemangioma his entire life, including frequent hemorrhaging through his facial orifices, disturbances to his vision and hearing, difficulty breathing, pain and pressure in his head, constant headaches, dizziness, and episodes of loss of consciousness. He frequently bleeds through his mouth, nose and ears, and has sometimes bled even through his eyes.

42. The hemangiomas—which are clumps of weak, malformed vessels – fill Mr. Bucklew's face, head, neck and throat, displacing healthy tissue and stealing

blood flow from normal adjacent tissues, depriving those tissues of necessary oxygen. (Exhibit 1 at ¶13).

43. The hemangiomas are vascular tumors, and, by their nature, these tumors continuously expand. Although the tumors are classified as benign, their growth is locally invasive and destructive.

44. Over the years, Mr. Bucklew's doctors have noted recurrent episodes of bleeding and associated hospitalizations. One doctor consulted about the bleeding stated: "I have real concerns that this I/M [inmate] may have future *uncontrollable bleeding*." (Emphasis added). Another doctor noted the "increasing frequency of bleeding [in the] oral cavity and nose."

45. Mr. Bucklew's hemangiomas grow throughout his head, neck and throat, protruding even into his airway, causing labored breathing and requiring him to sleep with his upper body elevated. Doctors have repeatedly noted the looming threat from the growing obstruction in Bucklew's airway. A specialist examining Bucklew in 2010 stated that a "complex right facial mass" extended to the parapharyngeal space and occupied a large area with the "oropharynx and hypopharynx" right above the epiglottis. As a result, Mr. Bucklew's airway, partially obstructed for many years, was now *"severely compromised."* (Emphasis added).

In the last five years, Mr. Bucklew has particularly suffered from labored breathing and cannot sleep lying flat as the tumor then fully obstructs his airway.

46. Over the years, doctors have attempted treatment on many occasions, only to conclude that the available treatments – chemotherapy, sclerotherapy, radiation therapy and surgery – have all failed and that they offer no appreciable chance of success.

47. In 1991, a specialist who examined Mr. Bucklew and treated his hemangioma for many years noted that any attempt to surgically remove the vascular tumor "would require extensive surgery which would be mutilating and *very risky as far as blood loss."* (Emphasis added).

48. In April 2012, another doctor's report notes the minimal success of the various attempts at treatments and states: "The large size makes the hemangioma not amenable to sclerotherapy." The report also notes that surgery would result in "large concomitant disability and disfiguration."

49. Doctors have described the hemangiomas as "very massive," "extensive" and a "large complex…mass." In March 2003, a physician caring for Mr. Bucklew wanted him examined immediately by a specialist because of the progression of the vascular tumor, which the doctor believed "could be *potentially fatal to the patient*." (Emphasis added).

50. In 2011, a doctor described the alarming expansion of the hemangioma, stating it encompassed "the entire soft palate and uvula, which are impossible to visualize due to the expansion of the lesion." The doctor further noted: "This lesion also extends into the right cheek and entire right maxilla. *This has been present for 20 plus years but has increasingly grown larger and larger."* (Emphasis added).

51. Throughout the medical records, doctors repeatedly warn of the ongoing expansion of the vascular tumor. There are also many references to "recurrent bleeding," pain associated with bleeding, and increasing frequency of oral and facial hemorrhages.

52. The possibility of another attempt at treatment was dismissed in April 2011, when Mr. Bucklew's doctor observed "there was minimal benefit from the previous sclerotherapy" and that the "large size" of the hemangioma precluded effective treatment with sclerotherapy.

53. A physician's report in 2011 noted Mr. Bucklew's increasing anxiety regarding the growth of the hemangiomas and the obstruction of his airway: "He is also afraid that the hemangioma will occlude his throat and he cannot breathe." Subsequent reports document difficulty with "bleeding management," and a report in March 2013 describes an episode of severe pain, with lightheadedness and loss of consciousness. Doctors ordered narcotic drugs for pain.

54. Periodically, the blood-filled tumors rupture, and Mr. Bucklew bleeds in his throat and through his facial orifices. Medical personnel provide gauze and biohazard bags so that he can collect the bloody discharge.

55. Mr. Bucklew frequently suffers from nausea, dizziness and bouts of excruciating pain. He is treated with narcotic pain medication, which he must take three times per day.

56. In recent months, Mr. Bucklew's condition has continued to worsen, a course long predicted by his doctors given the progressive nature of cavernous hemangioma. He is experiencing increased episodes of pain and dizziness and has ongoing problems with balance and coordination. The bleeding in his nasal and oral cavities has grown worse, and the bloody tumors are now pressing into Mr. Bucklew's right eye, causing problems with his vision.

57. In addition, the "massive hemangioma" growing in Mr. Bucklew's airway increasingly causes "stridor" (noisy and labored breathing), and it often makes it difficult for Mr. Bucklew to speak clearly. (*See* Exhibit 5 at ¶21).

58. Along with the tumor growth, Mr. Bucklew has also experienced a vast array of new and deeply troubling psychiatric symptoms in recent months. Although he previously suffered from extreme anxiety and mood swings, Mr. Bucklew's mental issues have grown dramatically worse since May 2014.

59. Following his return to Potosi Correctional Center from the death house at Bonne Terre (where he came within hours of execution), Mr. Bucklew has suffered from auditory and visual hallucinations, flashbacks, nightmares, and episodes of uncontrollable crying. In a short period of time, he lost 20 pounds and suffered constant insomnia. A prison psychiatrist diagnosed him with "stress-induced psychotic reaction." For the past 10 months, Mr. Bucklew has been on a heavy regimen of psychiatric drugs, including medication used to treat psychosis, schizophrenia and bipolar disorder.

Missouri's Lethal Injection Protocol

60. Missouri's lethal injection protocol calls for the administration of 5 grams of pentobarbital,[5] divided into two syringes, and administered through an IV line into the execution chamber, where the prisoner is alone and strapped to a gurney. No medical personnel are close at hand, and the prisoner is monitored remotely from the "execution support room." Although medical personnel insert the IV lines at the outset, the lethal drug itself is injected by non-medical personnel pushing syringes into the IV line at a pre-determined flow rate.

[5] Missouri's protocol is silent on whether the pentobarbital is compounded or manufactured. It appears that the written protocol would allow the use of either form of the drug.

61. The procedure itself begins with the insertion of the IV lines – one in each arm (or a central line in the femoral, jugular or subclavian vein if venous access in the arms is limited). About 15 to 30 minutes before the lethal drug is injected, a saline solution, which has historically been colored with methylene blue (or another dye), is injected into the prisoner to determine if the lines are clear. The gurney is positioned so medical personnel can remotely observe the prisoner's face, directly, "or with the aid of a mirror." Medical personnel "monitor" the prisoner remotely during the execution.

62. Non-medical personnel administer the lethal drug through syringes into the IV lines. After the administration of the initial 5 grams of pentobarbital, the non-medical personnel flush the IV lines with saline and methylene blue. Shortly thereafter, the execution chamber's curtains are closed and medical personnel check the prisoner to see if he is dead.

63. If the prisoner is not dead, then non-medical personnel then inject an additional 5 grams of pentobarbital through two additional syringes.

64. During the administration of the lethal drug, no one is in the execution chamber other than the prisoner, and no medical personnel are at hand. The prisoner is monitored only remotely from the "execution support room." The members of the execution team only enter the execution chamber when the curtains are closed and

only to determine if the prisoner has died. They check after administration of the first 5 grams of pentobarbital, and then again after the administration of the second 5 grams of pentobarbital.

65. If the prisoner does not die after the administration of 10 grams of pentobarbital, Missouri's protocol provides no further guidance. The protocol is completely silent on what procedures to follow in the event the lethal drugs do not properly enter the prisoner's body or do not properly circulate within the body.

66. If the prisoner is not killed by the execution, there is no protocol or equipment for resuscitating the prisoner.

67. If the execution is halted, and the prisoner remains alive, the State of Missouri must resume medical care of the prisoner, as it is obligated to do under the Eighth Amendment of the United States Constitution. Missouri's protocol is completely silent on this possible scenario.

68. A 2014 execution in Oklahoma was halted because the lethal drugs did not properly enter the prisoner's body and did not cause death. The prisoner, Clayton Lockett, reportedly died of a heart attack after the attempt to execute him failed. After Mr. Lockett groaned and writhed and it was clear he was still alive, Oklahoma officials hastily closed the window blinds on the execution chamber. They reportedly considered taking Lockett to the hospital to resuscitate, but it was too late.

A subsequent review of the botched execution concluded that an improperly placed intravenous line allowed the drugs to perfuse surrounding tissue rather than flowing directly into Lockett's bloodstream. The problems with the Lockett execution could recur – in an even more horrific fashion – with an attempt to execute Mr. Bucklew, given his gross vascular abnormalities and the risk of venous rupture.

69. Mr. Bucklew's unique vascular malformations create a substantial risk that the execution will not proceed as intended, and that the lethal drug will not properly enter or circulate in Mr. Bucklew's body, leading to an ugly, prolonged and excruciating execution. The weak, malformed veins in Mr. Bucklew's head and throat could easily rupture – leading to facial bleeding, internal hemorrhaging, choking and suffocation.

70. The risk that the lethal drug will not properly enter Mr. Bucklew's veins is heightened by the apparent abandonment – at least at present – of the use of any dye in the IV line. (It is not known whether this change is temporary or permanent, and, of course, the use of methylene blue carries its own risks). Although the execution team training records show that they have been trained to carry out their tasks aided by the use of a dye in the IV line – which helps team members determine if the solution is flowing properly into the prisoner's veins as opposed to diffusing in the surrounding tissue -- records recently obtained through a request under Missouri's Sunshine Act, Mo. Rev. Stat. 610.010 *et seq*., show that the Department

of Corrections has not possessed either methylene blue or indigo carmine since February 2015. Nothing in the protocol specifically addresses the use of dye or how team members – including its non-medical members – can safely run the IV line and inject the lethal drug in the absence of a visual indicator that the line is flowing properly.

71. Further, there is no aspect of Missouri's execution protocol that addresses how to handle the risks posed by a prisoner's unique medical or physical condition, particularly a congenital vascular malformation such as Mr. Bucklew's, which creates very grave risks. The last-minute protocol adjustments proposed by the State of Missouri in May 2014, as discussed below, not only fail to ameliorate any potential risks to Mr. Bucklew, they actually increase the risk of an extended, excruciating procedure that will be visually horrifying to witnesses and tortuous for Mr. Bucklew.

72. Although Mr. Bucklew's medical records run into the thousands of pages, the "Pre-Execution Summary of Medical History" – to be reviewed by medical personnel on the execution team – is merely one page, asking such simple questions as whether the "offender recently had a cold or flu" or suffered from "back pain."

73. There is no consideration of adverse medication interactions or serious chronic conditions or grave illness. A "yes" answer to any of the screening questions must be answered in three lines at the bottom of the page.

74. Missouri's protocol is grossly inadequate to address the significant risks to Mr. Bucklew during an execution – risks that could cause a prolonged and excruciating procedure, in which Mr. Bucklew hemorrhages through his mouth, nose, eyes or ears, and chokes or suffocates on his own blood.

75. No medical assistance will be at hand – instead the "medical personnel" will be watching from the "execution support room," unable to lend any aid to Mr. Bucklew.

Affidavit of Dr. Gregory Jamroz

76. Gregory Jamroz, M.D. is board-certified radiologist. He practices in the specialty of neuroradiology at St. Luke's Hospital in St. Louis, Missouri.

77. After reviewing the medical records of Mr. Bucklew, Dr. Jamroz concluded to a reasonable degree of scientific certainty that the use of a blood-borne sedative or other drug would not likely bring about a rapid, humane death for Mr. Bucklew, given his unique medical condition. (Exhibit 2 at ¶ 23). Dr. Jamroz stated that Bucklew's vascular malformations cause "shunting" of the blood, which would likely affect the circulation of the lethal drug to the brain.

78. Dr. Jamroz opined that an examination was essential to determine the precise quantity of shunting. But regardless of the "quantity of shunting, [the] presence of vascular malformations compromises the supply of blood to the brain." (Exhibit 2 at ¶ 21). These malformations have been present in Mr. Bucklew's head and neck since infancy. (Exhibit 2 at ¶ 14). The hemangiomas are "tangle[s] of arteries and veins" with "low vascular resistance," which leads to "shunting" of the blood and decreased blood flow to the brain. (Exhibit 2 at ¶¶ 15-19)

79. Dr. Jamroz concluded: "[I]t is my opinion to a reasonable degree of scientific certainty that reliance on a blood-borne sedative or other substance to bring about a rapid and painless death in Mr. Bucklew's case is questionable, and that in light of the pre-existing medical condition discussed in this declaration, examination of the vascular malformations is indicated…." (Exhibit 2 at ¶ 23).

Affidavit of Dr. Joel Zivot

80. Dr. Joel Zivot is a board-certified anesthesiologist who teaches at the Emory University School of Medicine and serves as Medical Director of the Cardio-Thoracic Intensive Care Unit at Emory University Hospital.

81. Dr. Zivot has reviewed Mr. Bucklew's medical records as well as Missouri's Execution Protocol and related documents. Also, in May 2014, he examined Mr. Bucklew at Potosi Correctional Center, although a full exam could

not be conducted because of the inadequate lighting, limited facilities and restrictions imposed by the DOC. (As reflected in footnote 2, *supra*, the examination occurred in the prison cafeteria).

82. Based on his review of Missouri's execution protocol and Mr. Bucklew's medical records, Dr. Zivot opines that a "substantial risk exists that, during [an] execution, Mr. Bucklew will suffer from extreme or excruciating pain as a result of hemorrhaging or abnormal circulation of the lethal drug, leading to a prolonged execution." (Exhibit 1 at ¶15; *see also* Exhibit 5 at).

83. Dr. Zivot identifies unique dangers arising from Mr. Bucklew's partially obstructed airway, including "a very substantial risk that during an execution he could suffocate." (Exhibit 1 at ¶15). Dr. Zivot also observes that Mr. Bucklew is prescribed several medications, including medications for pain, and there a "substantial risk he will suffer an adverse event from drug interactions." (Exhibit 1 at ¶15). Since Dr. Zivot issued his initial Declaration, the number and dosage of Mr. Bucklew's medications have increased, creating an even greater risk of adverse medication interactions, as discussed further below.

84. Before the lethal drug is even injected, Mr. Bucklew is at risk from the use of methylene blue, which has historically occupied a critical role in Missouri's execution procedures. Methylene blue is part of the saline mixture supposedly used

to check the flow in the IV line and to ensure that the lethal drug is properly flowing into the vein rather than simply spreading into the surrounding tissues. Although methylene blue would not pose a risk to most inmates, it poses a unique and grave risk to Mr. Bucklew. Methylene blue is a nitric oxide scavenger and will likely "cause a spike in blood pressure if injected." (Exhibit 1, ¶16; Exhibit 5 at ¶¶ 28-29; *see also* Exhibit 3 at ¶¶ 8-9, 20, Declaration of Dr. Larry Sasich).[6]

85. Blood pressure is not monitored during lethal injection. Yet, any spike in blood pressure raises a great risk of hemorrhage for Mr. Bucklew, as the hemangiomas are a "plexus of blood vessels that are abnormally weak and can easily rupture, even when the blood pressure is normal." (Exhibit 1, ¶17).

86. If Mr. Bucklew's "blood pressure spikes after the methylene blue injections, the hemangiomas, now further engorged with blood, are likely to rupture, resulting in significant bleeding in the face, mouth and throat." If blood enters Mr. Bucklew's airway, "*it would likely cause choking and coughing, which Mr. Bucklew will experience as severe pain and suffocation.*" (Ex. 1¶ 18) (Emphasis added). The suffocation risk is further heightened by the fact that Mr. Bucklew's airway is

[6] Missouri has grown progressively more secretive about its execution procedures, and it is not known whether methylene blue is presently being used by the execution team. The team has historically trained with it, however, and DOC records from 2013 and 2014 show that the DOC maintained a stock of methylene blue and/or indigo carmine for execution purposes.

severely obstructed, and any further swelling of the hemangiomas or rupturing of the tumors would likely cause Mr. Bucklew to gasp and struggle for air.

87. Mr. Bucklew's vascular malformations also give rise to a great risk that the lethal drug will not circulate as intended. The cavernous hemangiomas create "alternative low-resistance pathways to injected drugs." It is highly likely "that this abnormal circulation will inhibit the effectiveness of the pentobarbital…." (Exhibit 1 at ¶ 19).

88. The "reduced effectiveness of the pentobarbital and the delayed depression of the central nervous system will create a substantial risk of a prolonged and extremely painful execution for Mr. Bucklew." (Exhibit 1 at ¶19).

89. All of these risks are further augmented by the fact that Mr. Bucklew takes several medications to manage his medical condition, including narcotic pain medication and several psychiatric medications. This creates a substantial risk of adverse events resulting from drug interactions. (Exhibit 1 at ¶ 22). The risk of a dangerous drug interaction has increased greatly in the last year, as additional, potent drugs have been prescribed to address Mr. Bucklew's worsening psychiatric problems, including stress-induced psychotic reaction and post-traumatic stress disorder. The need for a thorough evaluation of all of Mr. Bucklew's medications

is addressed further below, and will require consultation with experts as well as additional discovery from the Department of Corrections.

90. The lethal drug itself poses additional problems. Pentobarbital is not an analgesic (pain reducer), but is, in fact, an *antalgesic*, that is, it tends to exaggerate or worsen pain. (Exhibit 1 at ¶ 23). Mr. Bucklew's medications may interact with pentobarbital – an antalgesic – in a manner that increases pain, causing a substantial risk that Mr. Bucklew will experience an extremely painful death. (Exhibit 1 at ¶ 24).

91. The risks arising from drug interactions and the antalgesic effects of pentobarbital are further exacerbated by the use of a compounded drug (assuming that Missouri is indeed still using compounded pentobarbital). A compounded drug, unlike a manufactured drug, carries no guarantees of its safety, potency, or purity. (Exhibit 1 at ¶¶23-25; Exhibit 3 at ¶¶ 12-20, Declaration of Dr. Larry Sasich).

92. To date, Defendants have accorded little or no attention to the risks that attend the execution of Russell Bucklew, other than proposing hasty, last minute changes to the protocol aimed at rushing Mr. Bucklew into the execution chamber when he faced a May 21, 2014 execution date.

93. Just two weeks before that scheduled date, on May 7, 2014, counsel in the Missouri Attorney General's Office contacted counsel for Mr. Bucklew and

inquired about conducting a venous study of Mr. Bucklew's arms. There was no request to conduct any scans of the engorged and unstable vascular malformations in Mr. Bucklew's head, neck and throat.

94. Indeed, the Department of Corrections has obtained no imaging studies of Mr. Bucklew's cavernous hemangiomas since 2010 when an MRI was performed. The imaging report described Mr. Bucklew's hemangioma as "a large complex right facial mass" and noted that Mr. Bucklew's airway was "severely compromised."

95. In contrast to the indifferent conduct of the Missouri Department of Corrections, counsel for Mr. Bucklew endeavored to obtain a timely examination of Plaintiff in May 2014. Although hindered by a lack of resources and the inability to examine Mr. Bucklew in a properly equipped medical setting, Dr. Zivot was able to conduct at least a limited visual examination and medical interview.

96. Following that examination, on May 12, 2014, Dr. Zivot provided a supplemental affidavit stating additional opinions and observations. (*See* Exhibit 4).

97. Dr. Zivot noted that, during the examination, Mr. Bucklew's blood pressure was elevated, 140/100 on both arms, representing severe hypertension. (Exhibit 4 at ¶ 4). Certainly, an increase in blood pressure was not surprising, given the stress of the then-scheduled execution and Mr. Bucklew's fear and discomfort.

98. Examining the interior of Bucklew's mouth and throat, Dr. Zivot noted a "very large vascular mass" that arises "through the hard palate, extends into the upper maxilla on the right, and fully encompasses the uvula and distorts the anatomy of Mr. Bucklew's airway." (Exhibit 4 at ¶ 4).

99. Mr. Bucklew's airway is "severely compromised or obstructed due to the hemangiomas." The airway "is also friable, meaning it is weak and could tear or rupture. If you touch it, it bleeds." (Exhibit 4 at ¶ 6).

100. Dr. Zivot observed that if Mr. Bucklew were his patient, "managing his airway would be a top priority during any medical procedure" and would require the "highest level of vigilance from a medical team." (Exhibit 4 at ¶ 7). Indeed, the only way to properly perform a medical procedure on Mr. Bucklew would be to perform it in a hospital with a fully equipped surgical suite and the ability to do an emergency tracheostomy if necessary. (Exhibit 4 at ¶ 8).

101. During an execution, Mr. Bucklew will be at "great risk of choking and suffocating because of his partially obstructed airway and complications caused by the hemangiomas." (Exhibit 4 at ¶ 9). At the same time, the use of any tube or other standard airway equipment typically used to maintain an open airway will only create more problems "as the placement of any device in the pharynx will cause

instant bleeding" and such bleeding would further constrict the airway and also impair the visibility of it. (Exhibit 4 at ¶10).

102. Executions are conducted on a gurney, and the risks arising from Mr. Bucklew's airway are even greater if he is lying flat. (Exhibit 4 at ¶ 11). Because of the hemangiomas, Mr. Bucklew is unable to sleep in a normal recumbent position because the tumors cause greater obstruction in that position. (Exhibit 4 at ¶ 11). "Mr. Bucklew's airway tumors are of a dynamic nature. That is, they worsen when he is recumbent, even when recumbent for only a few moments." (Exhibit 4 at ¶ 11).

103. Dr. Zivot further opines that any increase in Mr. Bucklew's blood pressure, such as from stress, will only further aggravate the vascular tumors and increase the risk of airway obstruction. If any secretions enter the airway or he starts breathing hard – because of stress or any other cause – his airway will become even more constricted. (Exhibit 4 at ¶ 12). This will likely start a "dangerous cycle in which more strenuous attempts to breathe by Mr. Bucklew will only increase the degree of his airway obstruction….[T]he harder he tries to breathe, the less air he will get." (Exhibit 4 at ¶ 12).

104. Any effort to prevent such a gruesome scenario for Mr. Bucklew in any medical setting would require physicians experienced in airway management to be

at arm's length proximity to Mr. Bucklew and prepared to perform an emergency tracheostomy. (Exhibit 4 at ¶ 14).

105. Missouri's execution protocol provides no contingency for a failed execution or any situation in which a prisoner starts gasping for air or experiences hemorrhaging. (Exhibit 4 at ¶ 13).

106. Based on Mr. Bucklew's unique and severe condition, there is no way to proceed with Mr. Bucklew's execution under Missouri's lethal injection protocol "without a substantial risk to Mr. Bucklew of suffering grave adverse events during the execution, including hemorrhaging, suffocating or experiencing excruciating pain." Exhibit 4 at ¶ 16).

107. Under any scenario or with any type of lethal drug, execution by lethal injection poses an enormous risk that Mr. Bucklew will suffer extreme, excruciating and prolonged pain – all accompanied by choking and struggling for air.

108. Mr. Bucklew's condition is inoperable and incurable. Indeed, it is steadily progressive and will likely ultimately cause his death. There is no medical procedure that will allow his blood-engorged tumors to be excised or reduced in size. Therefore, any execution of Mr. Bucklew by lethal injection, regardless of the drug used, violates the Eighth Amendment's prohibition on cruel and unusual punishment.

Nature of Mr. Bucklew's Claims: Separate and Distinct from *Zink*

109. Because Mr. Bucklew's claims concern the specific and unique risks posed to *him* by lethal injection, and those risks exist regardless of the drug used, his claims are entirely separate and distinct from those raised in *Zink v. Lombardi*, Case No. 12-4209.

110. Mr. Bucklew understands that if both cases had not been dismissed, that it might have been efficient to consolidate them for discovery purposes, given the general subject matter and common parties. The *Zink* discovery was limited, however, and no discovery has yet occurred in the *Bucklew* case.[7]

111. When Mr. Bucklew filed his suit on May 9, 2014, the *Zink* case was still pending before this Court and was not finally dismissed as to all claims until May 16, 2014. (Case No. 12-4209). Had this Court wished to consolidate the two cases, it could have done so. Similarly, the two cases could have been consolidated in the Eighth Circuit, and they were not. Moreover, the Eighth Circuit granted relief to Mr. Bucklew while denying relief to the other *Zink* plaintiffs, clearly suggesting that Mr. Bucklew is situated differently than the other prisoners challenging Missouri's execution procedures. *Zink v. Lombardi*, Case No. 14-2220 (March 6, 2015)

[7]

(affirming dismissal of case); *Bucklew v. Lombardi*, Case No. 14-2163 (reversing and remanding for further proceedings).

112. Further, as is apparent, entirely different facts and legal theories support Mr. Bucklew's claims as compared with the plaintiffs' claims in *Zink*. None of the *Zink* plaintiffs challenged Missouri's execution protocol based on their unique medical condition. To the contrary, their claims were almost entirely based on the variety of risks posed by the use of compounded pentobarbital. While those risks are not wholly irrelevant to Mr. Bucklew's case, Mr. Bucklew's claims under the Eighth Amendment exist regardless of the particular drug used. The great likelihood that Mr. Bucklew will suffer extreme and tortuous pain during an execution is based on the dangers caused by his abnormal circulatory system, his malformed veins, the blood-engorged tumors that fill his head and throat, and the severe obstruction of his airway. These physical conditions, by themselves and irrespective of the drug used, place Mr. Bucklew at grave risk during an execution by lethal injection.

Mr. Bucklew's Condition Worsening in the Past 12 Months

113. Since Mr. Bucklew filed the present lawsuit in May 2014, his medical condition has significantly worsened, with the blood-filled tumors growing larger and more unstable and causing additional pain, balance problems, impairment to his vision and problems with breathing. Following a recent telephone call with Mr.

Bucklew, Dr. Zivot noted that the increasing size of the hemangioma obstructing Mr. Bucklew's airway was causing "stridor" or noisy breathing. (Exhibit 5 at ¶¶ 20-21). Because of the growing obstruction, Mr. Bucklew frequently has difficulty speaking clearly.

114. Mr. Bucklew's medical records from May 2014 to the present refer to increased dizziness, episodes of stumbling and falling, increased facial pain, bleeding from his mouth, and pressure on his right eye from an encroaching hemangioma.

115. Even more pronounced than the physical changes have been the changes in Mr. Bucklew's mental state. His psychiatric condition has markedly deteriorated, and he is presently on an extensive regimen of drugs used to treat psychosis, schizophrenia and bipolar disorder.

116. One of the prison psychiatrists who treated Mr. Bucklew documented an array of alarming psychiatric symptoms that developed in the wake of Mr. Bucklew's near execution in May 2014. Although Mr. Bucklew's previous mental problems primarily involved General Anxiety Disorder, Mr. Bucklew began suffering from flashbacks, nightmares of being injected with poison, and auditory and visual hallucinations. He lost 20 pounds and had episodes of uncontrollable crying.

117. The psychiatrist diagnosed him with "stress-induced psychotic reaction," and prescribed an array of psychiatric drugs, most of which are not typically taken together and many of which pose a risk for adverse drug interactions during an execution.

118. The medications currently prescribed to Mr. Bucklew include Clonazepam (Klonipin), Fluphenazine (Prolixin), Hydroxyzine Pamoate (Vistaril), Mirtazapine (Remeron), Olanzapine (Zyprexa), Perphenazine (Trilafon) and Tramadol. All of the drugs, except for Tramadol, are psychiatric drugs used to treat mood disorders, psychosis, schizophrenia or bipolar disorder.

119. In a recent psychiatric visit, Mr. Bucklew reported ongoing auditory hallucinations and/or "intrusive thoughts." His psychiatric records contain several references to a potential diagnosis of Post-Traumatic Stress Disorder.

120. Mr. Bucklew's medication regimen gives rise to a number of potentially troubling side effects, including "Serotonin Syndrome," for which he is already at risk, as documented in his medical records. Serotonin Syndrome results from a buildup of high levels of serotonin in the brain and features an array of troubling side effects, including twitching, lethargy, confusion, delirium, agitation, and seizures.

121. Significantly, the use of methylene blue during an execution poses an additional and severe threat to an individual already at risk for Serotonin Syndrome.

(*See* Exhibit 5 at ¶¶31-35). In 2011, the FDA issued a "Safety Announcement," indicating that except in emergency circumstances, methylene blue should *never* be administered to an individual at risk for Serotonin Syndrome or taking certain psychiatric drugs, including Mirtazapine (Remeron). Mr. Bucklew is presently taking Mirtazapine daily for treatment of one of his severe psychiatric conditions. (*See* Exhibit 5 at ¶¶31-35).

122. Any plan to move forward with an execution of Mr. Bucklew must include not only a complete physical examination of him, including imaging studies, but must also include a thorough evaluation of his medications and the potential for adverse interactions during an execution.

Missouri's On-the-Fly Adjustments to Protocol Insufficient

123. In May 2014, as Mr. Bucklew faced an execution date and raised the issues addressed in this lawsuit, the Missouri Department of Corrections hastily attempted some last-minute, ill-considered changes to the execution protocol that would actually have the effect of *increasing* the risk to Mr. Bucklew.

124. The DOC, in response to concerns raised regarding methylene blue, stated it would not use methylene blue, but would instead use indigo carmine. (Documents obtained through a Missouri Sunshine Act request revealed that when the DOC offered this adjustment, it had already been using indigo carmine for four

months, with no disclosure to counsel for any of the prisoners). When counsel for Mr. Bucklew pointed out that indigo carmine posed the same (or worse) risks as methylene blue, the DOC stated it would forego the use of *any* dye, even though the execution team (which includes non-medical members) is trained only to carry out executions with the use of a medical dye in the intravenous lines.

125. The use of dye is essential to ensure that the IV line is flowing properly. It also provides a telling visual indicator if the saline infusion is not entering the bloodstream but is in fact dispersing in surrounding tissues, as it did in Oklahoma's botched execution of Mr. Lockett. Absent the use of a dye, the non-medical members of the execution team, who do the actual pushing of the syringes, will have no way of determining whether the saline solution and the lethal drug are entering Mr. Bucklew's bloodstream. Given the risks already posed by Bucklew's vascular malformations and the likelihood the drug will not circulate properly, the increased risk posed by using *no dye* – a method for which the team has received no training – poses a constitutionally intolerable threat to Mr. Bucklew.

126. The risks to Mr. Bucklew are further increased by the alleged use of a compounded drug, pentobarbital, which, unlike a manufactured drug, carries no guarantees of its safety, potency, or purity. (Exhibit 1 at ¶¶23-25; Exhibit 3 at ¶¶ 12-20, Declaration of Dr. Larry Sasich).

127. Because the State of Missouri improperly refuses to provide any information about the safety, purity or provenance of its lethal drug – or even confirm whether or not the drug is tested – Plaintiff is left to draw inferences about the precise nature of the drug being used. Given the seeming ease with which Missouri apparently procures what is alleged to be pentobarbital when other states are stymied in their efforts to obtain a reliable supply of the drug, one may logically infer that perhaps Missouri's drug has been obtained through improper channels, perhaps through a foreign, non-FDA approved source or through a supplier for the sole FDA-approved manufacturer, Akorn, which has distribution controls in place to preclude the sale of the drug to prison systems.[8] (*See* paragraph 25, *supra*). That said, *regardless of the particular drug used,* execution by lethal injection poses a very substantial risk that Mr. Bucklew will suffer a prolonged and tortuous death in violation of the Eighth Amendment.

128. In May 2014, the DOC also proposed a second adjustment in its protocol, offering to adjust the gurney so that Mr. Bucklew is not lying completely prone. Although the stated intent was to reduce the choking risk to Mr. Bucklew, the DOC has obtained no imaging studies of Mr. Bucklew since 2010, and therefore has no

[8] The DOC has taken the position that providing an answer to the question of whether or not the pentobarbital is tested would tend to reveal the source of the drug. Plaintiff finds the DOC's position perplexing, as it tends to suggest that the drug may have been obtained in manufactured form from an improper source.

information on which to base any decisions about the angle of the gurney. As a practical matter, no adjustment would likely be sufficient, as the stress of the execution may unavoidably cause Mr. Bucklew's hemangiomas to rupture, leading to hemorrhaging, bleeding in his throat and through his facial orifices, and coughing and choking on his own blood.

Diagnostic Imaging Studies Essential to Evaluate and Establish Risks

129. In order to fully evaluate and establish the risks to Mr. Bucklew from execution by lethal injection, a full and complete set of imaging studies must be conducted. (*See* Exhibit 5 at ¶¶ 16-17). This is necessary to allow Plaintiff to prove his claims under the Eighth Amendment.

130. Mr. Bucklew's vascular malformations occupy much of the right side of his face and head, extending into his nose, sinuses, jaw, mouth and throat – and, more recently, his right eye. The blood-engorged tumors put constant pressure on Bucklew's face and brain, and may even extend into his brain.

131. To identify the "full extent of the tumor's involvement with Mr. Bucklew's airway and brain, a repeat high resolution CT of Mr. Bucklew's chest, neck, head and brain should be performed." (Exhibit 1 at ¶ 20; Exhibit 5 at ¶16). The CT study should be performed with and without contrast to characterize the extent of the anticipated abnormal intracranial structures. The CT scan is necessary

to characterize the location and extent of the tumor and to assess the severe degree of compromise of Mr. Bucklew's airway." (Exhibit 1 at ¶ 20; Exhibit 5 at ¶16).

132. If the CT scan does not fully characterize "the extent of the known soft tissue tumors, then an MRI should be performed. In addition, a venogram and ultrasound evaluation should be performed of Mr. Bucklew's upper extremities" to determine venous patency and vascular access locations. (Exhibit 1 at ¶ 21). In addition, an angiogram would also be necessary to further establish the risks to Mr. Bucklew, and would also help determine the degree of vascularity of Mr. Bucklew's hemangiomas. (Exhibit 4 at ¶ 17; Exhibit 5 at ¶17).

133. Although there are aspects of the lethal injection protocol that, superficially, appear to draw on medical expertise, lethal injection does not possess any of the safeguards of the practice of medicine and anesthesiology. (Exhibit 1 at ¶ 26).

134. Execution team members either lack the necessary training to safely carry out lethal injection – particularly in the case of someone like Mr. Bucklew who has a complex medical condition – or they are acting explicitly contrary to the dictates of safe medical practice. (Exhibit 1 at ¶ 27).

135. If an execution by lethal injection goes forward, the enormous risks to Mr. Bucklew necessitate monitoring by a qualified physician who is in the execution

chamber for the purpose of being able to revive Mr. Bucklew in the event the execution is unsuccessful. The physician would not be a member of the execution team and would have no role or assignment in any way with lethal injection. (Exhibit 1 at ¶28).

136. The State of Missouri has no plan for handling an execution that does not proceed as intended. Significantly, there is no equipment or protocol for resuscitating a prisoner who survives an execution.

137. The State of Missouri lacks any kind of back up or contingency plan for unanticipated events during an execution. Contingency plans are especially important given the likelihood of adverse events during an execution of someone like Mr. Bucklew who has a very serious medical condition. The risk of adverse events is furthered heightened by the alleged use of compounded drugs that are not approved or reviewed by the FDA and which are not prepared in an FDA-regulated facility. The risk of contaminants, allergens, and improperly adjusted pH levels is particularly substantial with compounded drugs. These risks are heightened further in Mr. Bucklew's case because of his weak, distended and malformed veins. Yet, the State of Missouri has provided no information whatsoever about its lethal drug and will not even confirm whether the drug is tested for safety, potency or purity.

138. Regardless of the drug used, however, Mr. Bucklew's severe vascular abnormalities, standing alone, create a situation of extreme risk to Mr. Bucklew, as he is highly likely to experience a prolonged, excruciating and tortuous execution.

139. Mr. Bucklew is mindful of the Court's directive to allege a "feasible, readily implemented alternative procedure that will *significantly* reduce a substantial risk of severe pain…" (Doc. 52 at 11) (emphasis added). Mr. Bucklew has complied with the Court's order by researching and proposing execution by lethal gas, which is specifically authorized by Missouri law and which Missouri's Attorney General has stated the DOC is prepared to implement. The Missouri Attorney General has also suggested that the legislature should appropriate funds for the purpose of implementing this alternative form of execution. *See* paragraph 30, *supra*, including cited article from the Associated Press.

140. In the event that an execution by lethal injection proceeds despite the grave risks arising from Mr. Bucklew's condition, the Department of Corrections should not proceed in the absence of a full and proper evaluation of Bucklew's present medical condition. To properly identify and evaluate these unique risks, it is essential that Mr. Bucklew receive a thorough medical examination, including all of the medical imaging studies described above. Absent a physical exam and up-to-date imaging, any attempt to reduce the risks to Mr. Bucklew during lethal injection would be based on nothing more than speculation.

141. Given the complexity of Mr. Bucklew's medical condition, it is essential that the parties be able to obtain expert guidance from qualified professionals. At present, both sides are hampered by their lack of access to qualified medical professionals. Mr. Bucklew has no appointed expert, although Dr. Zivot has worked on the case diligently to this point. Further, the DOC's expert for many years, Dr. Mark Dershwitz, has informed all of the states that he was advising on lethal injection, including Missouri, that he will no longer fulfill that role. Dr. Dershwitz announced his decision to terminate his role in June 2014, indicating that statements made by the State of Ohio in connection with a particular execution could jeopardize his standing with the American Board of Anesthesiology.

142. Obviously, Mr. Bucklew cannot further identify or quantify the risks posed by lethal injection absent additional consultation with an expert who is able to conduct a proper examination of Mr. Bucklew in a fully equipped medical setting and also obtain up-to-date imaging studies.

143. To obtain access to the necessary medical information and expertise, Mr. Bucklew intends to seek the appointment of Dr. Zivot by this Court. To date, Dr. Zivot has been compensated for only a small portion of his fees, through monies provided by Mr. Bucklew's family. Dr. Zivot's out-of-pocket expenses have been largely covered by counsel.

144. Based on all of the allegations stated here, Mr. Bucklew has fully complied with the requisites of the Court's pleading requirements and the standards set by *Glossip*. Certainly, the stay of execution, issued by the United States Supreme Court on May 21, 2014, also provides a strong basis for inferring that Mr. Bucklew has satisfied the standards for properly pleading an Eighth Amendment claim.

145. Mr. Bucklew's claims, while fully ripe, did not accrue until it was clear that his airway obstruction would likely cause choking and suffocation during any execution. Indeed, the very substantial risk that Mr. Bucklew would suffocate to death during any execution by lethal injection is the core of his Eighth Amendment claim. That claim did not accrue until May 2014, when Dr. Zivot was able to examine Plaintiff's medical records and examine him in person, thereby identifying the grave risk posed by Mr. Bucklew's obstructed and fragile airway. Until May 2014, the Department of Corrections was in sole possession of evidence necessary to raise Mr. Bucklew's Eighth Amendment claim and had the sole ability to procure and obtain necessary diagnostic assessment and medical imaging. Prior to May 2014, when Mr. Bucklew's counsel were able – under the press of an execution date -- to persuade Dr. Zivot to undertake Mr. Bucklew's case, Plaintiff had no ability to assert a viable Eighth Amendment claim and litigate a well-supported motion for stay of execution.

146. Although Mr. Bucklew's counsel sought court funding no less than eight times in six years for the purpose of obtaining an expert opinion on Mr. Bucklew's medical condition, those requests – to the United States District Court, the Eighth Circuit and every level of the Missouri state courts – were repeatedly denied. Because the State of Missouri repeatedly and effectively opposed Mr. Bucklew's efforts to obtain expert funding (in those instances when the requests were filed in open court, rather than *ex parte*), Defendants here should be estopped from arguing that Mr. Bucklew failed to timely assert his claims. Indeed, it is State of Missouri that is largely responsible for Mr. Bucklew's inability, since 2008, to obtain the necessary expert services.

147. By June 2010, the blood-engorged tumor in Mr. Bucklew's throat had grown to a sufficiently large size as to create a severe blockage to Mr. Bucklew's airway. It was in the June 2010 imaging report that Mr. Bucklew's physician reported that the "large complex facial mass" had extended into multiple cavities, severely compromising Mr. Bucklew's airway.

148. Despite the troubling report issued by Mr. Bucklew's physician, the DOC obtained no further diagnostic tests or imaging of Mr. Bucklew's vascular tumors. Since June 2010, the DOC has failed to assess or monitor the growth of Mr. Bucklew's tumors, and medical care has been restricted to the provision of medications intended to treat pain and anxiety.

149. Under these circumstances, when the DOC has had exclusive custody and control over Mr. Bucklew and exclusively held the ability to obtain appropriate testing, no claim based on Mr. Bucklew's medical condition could accrue. At the earliest, such claim accrued at the point that Mr. Bucklew's counsel were able to obtain, with no promise of payment, the expert services and opinions of Dr. Zivot.

Count I

Claim Against All Defendants Under the Cruel and Unusual Punishment Clause of the Eighth Amendment Based on the Use of Missouri's Lethal Injection Protocol on Mr. Bucklew

Plaintiff realleges the foregoing and further states as follows:

150. Execution by lethal injection poses unique and specific risks to Mr. Bucklew that arise from his lifelong and severe medical condition.

145. Executing Mr. Bucklew by lethal injection will cause extreme and needless suffering to Mr. Bucklew, including but not limited to hemorrhaging during the execution; coughing, choking and suffocating; and suffering a prolonged and excruciating execution because the lethal drug fails in its intended effect or fails to circulate properly in Mr. Bucklew's body.

146. Mr. Bucklew's unique and severe medical condition is further exacerbated by his deteriorating psychiatric condition. He suffers from extreme anxiety and has been diagnosed with stress-induced psychotic reaction disorder. He

experiences intrusive thoughts, flashbacks and auditory and visual hallucinations. The stress that he would almost certainly experience during an execution poses an extreme and additional risk to Mr. Bucklew, both because of the psychiatric drugs he takes which give rise to adverse interactions with methylene blue, and because the stress he experiences is likely to cause a rise in blood pressure, thereby triggering hemorrhaging. Plaintiff knows of no steps that have been taken or will be taken to ameliorate the grave and specific risks attendant to executing Mr. Bucklew by lethal injection.

147. If Missouri proceeds with its execution of Mr. Bucklew, it will be conducting an unregulated experiment on a human subject, as there are no studies that support Defendants' use of Missouri's lethal injection protocol on an individual suffering from vascular malformations and prone to hemorrhaging and choking or suffocating to death.

148. Missouri's lethal injection protocol, *as applied* to Mr. Bucklew, presents a substantial risk of causing excruciating or tortuous pain and inflicting needless suffering.

149. Absent a thorough physical examination and complete imaging studies, it is not possible to further address whether any additional or specific changes or adjustments to the lethal injection protocol would reduce the very substantial risk

that Mr. Bucklew will suffer extreme and excruciating pain during an execution by lethal injection.

150. In adherence with the pleading requirements set forth in *Glossip*, and as stated above, Mr. Bucklew specifically alleges lethal gas as a feasible and available alternative method that will significantly reduce the risk of severe pain to Mr. Bucklew.

151. Defendants' intended actions under their lethal injection protocol, as set forth in this Fourth Amended Complaint, will inflict extreme, tortuous and unnecessary pain on Mr. Bucklew and will therefore violate the Cruel and Unusual Punishments Clause of the Eighth Amendment of the United States Constitution.

Count II

Claim Against All Defendants for Failure to Take Reasonable and Necessary Precautions with Regard to Mr. Bucklew's Execution, thereby Acting with Deliberate Indifference to Plaintiff's Serious Medical Needs in Violation of the Eighth and Fourteenth Amendments of the United States Constitution

Plaintiff realleges the foregoing and further states as follows:

152. Defendants have taken no reasonable and necessary steps to assess the risks to Mr. Bucklew during an execution by lethal injection. They have not conducted a thorough physical examination nor obtained up-to-date imaging studies to determine whether or how Mr. Bucklew may be executed without violating the Eighth Amendment of the United States Constitution.

153. Defendants' failure to take reasonable and necessary steps to assess and monitor Mr. Bucklew's condition constitutes deliberate indifference to Mr. Bucklew's serious medical needs, as Mr. Bucklew has a right to appropriate medical care up to the moment of his death.

154. As long as Mr. Bucklew is a prisoner within the custody and control of Defendants, they have a constitutional obligation to provide for his serious medical needs. Although they have the right to carry out a death sentence, Defendants may only do so consistently with the dictates of the United States Constitution, including the Eighth Amendment.

155. Defendants have not only failed to take reasonable and necessary steps to determine whether or how Mr. Bucklew may be executed within the parameters of the Constitution, they have made no contingency plan in the event the lethal drugs fail to kill Mr. Bucklew. The Missouri protocol is completely silent on such a possibility. There is no equipment or protocol for resuscitation.

156. Instead, Mr. Bucklew, an individual with a largely obstructed airway and distended, malformed vessels, will be alone in the execution chamber, monitored only remotely by medical personnel who are not tasked with providing any assistance in the event of a botched execution.

157. Even if such an eventuality did not previously occur in the State of Missouri, the botched execution of Clayton Lockett in Oklahoma establishes that an execution can go tragically wrong when the lethal drugs either do not properly enter the prisoner's body or fail for some other reason. Despite the Oklahoma failure, an event of nationwide prominence, Defendants have made no changes to their execution protocol to address unforeseen or unintended events.

158. Defendants' failures and omissions constitute deliberate indifference to the serious medical needs of Mr. Bucklew, in violation of the Eighth Amendment.

159. Defendants' actions have caused, and will continue to cause, needless harm and extreme suffering to Mr. Bucklew, who faces undergoing lethal injection in the absence of necessary precautions or any assessment of whether he may be executed by lethal injection without violating the Eighth Amendment's prohibition on cruel and unusual punishment. Defendants' actions therefore violate the Eighth Amendment of the United States Constitution as well as the Due Process Clause of the Fourteenth Amendment.

Count III

Claim Against All Defendants for Violation of Mr. Bucklew's First Amendment Right to Petition the Government for Redress of Grievances and His Rights to Due Process and Access to the Courts Under the Fourteenth Amendment

Plaintiff realleges the foregoing and further states as follows:

160. Defendants' execution practices and its use of a lethal drug are shrouded in secrecy.

161. Defendants refuse to provide any information whatsoever regarding the purported pharmacist or the pharmacy that prepares the drug, or how or when the drug is prepared, or where or when the active pharmaceutical ingredient is obtained, or whether the pharmacy is registered with or has ever been inspected by the Food and Drug Administration or even whether the drug has been subjected to any testing for safety, potency or purity. Indeed, Defendants refuse to even admit or deny whether the pentobarbital they claim to use is compounded as opposed to manufactured.

162. Defendants' utter failure to provide a single relevant fact about the provenance or safety of the execution drug prevents Mr. Bucklew, an individual whose vessels are abnormally weak and prone to rupture, from petitioning the government for redress of grievances.

163. Absent basic information about the provenance, purity, potency and safety of the drug, any allegations by Mr. Bucklew about the drug are vulnerable to being labeled "speculation."

164. To effectively petition the government for redress of grievances, as is his right under the First Amendment, and to exercise his right of access to the courts

under the Due Process Clause of the Fourteenth Amendment, Mr. Bucklew needs access to information about the safety, purity, potency and origins of the drug. Such information is now completely withheld, as Defendants refuse to even state whether the drug is subjected to any laboratory testing or whether it is compounded at all or whether it is a manufactured drug, which has been obtained through unknown means.

165. Defendants' practice of shrouding the execution drug in extreme secrecy violates Mr. Bucklew's rights under the First and Fourteenth Amendments, causing him to be subjected to experimental and dangerous drug protocols with no ability to effectively challenge the drug protocol in court or to petition any agency of the federal, state or local government for redress.

166. In addition, any requirement that Mr. Bucklew plead with any greater specificity than he already has violates his rights to due process, fundamental fairness and access to the courts. Absent fundamental information about the lethal drug being used or the specifics of Missouri's lethal injection protocol, Mr. Bucklew is unconstitutionally constrained in seeking redress or any further remedies, either from this Court or any other agency of local, state or federal government.

PRAYER FOR RELIEF

WHEREFORE, Mr. Bucklew requests the following relief:

1. That this Court assume jurisdiction of this cause and set this case for a hearing on the merits.
2. That this Court issue a declaratory judgment declaring and enforcing the rights of Plaintiff Bucklew, as alleged above, and further issue a temporary restraining order or preliminary or permanent injunction to enforce Plaintiff's rights under the First, Eighth and Fourteenth Amendments, commanding Defendants to provide necessary information about the provenance, safety, potency and purity of the lethal drug so as to permit Plaintiff to petition for redress of grievances, and, further to permit Plaintiff access to the courts, consistent with the requirements of the Due Process Clause.
3. That this Court issue a declaratory judgment declaring and enforcing Plaintiff's rights under the Eighth Amendment and, further, issue a temporary restraining order or a preliminary or permanent injunction directing Defendants to not carry out any execution by lethal injection on Mr. Bucklew until such time as Plaintiff has conducted discovery, reasonable and necessary medical tests have been performed, and reasonable and necessary steps have been taken to determine whether and how Mr. Bucklew may be executed by lethal injection, or any feasible

alternative method, without violating the prohibition on cruel and unusual punishment of the Eighth Amendment.

4. Mr. Bucklew also seeks this Court's order under 42 U.S.C. ¶1988 awarding him a reasonable attorneys' fee and costs, and such further relief as this Court deems just and proper.

WHEREFORE, Plaintiff Bucklew prays this Court for its order and judgment as stated above.

Respectfully Submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, on October 13, 2015, I served the foregoing Fourth Amended Complaint on all counsel of record via the Court's ECF filing system.

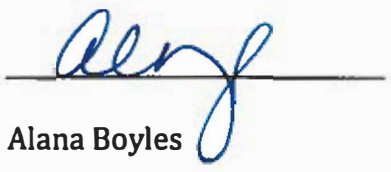
/s/ Cheryl A. Pilate

AFFIDAVIT OF ALANA BOYLES

I, Alana Boyles, being first duly sworn, states as follows:

1. I am over 18 years of age and competent to make this statement.
2. I am currently employed as Director of the Division of Adult Institutions and have been so employed since May 1, 2017.
3. As the Director of the Division of Adult Institutions, I am responsible for the general supervision, management and control of the division. As a part of my duties I have personal knowledge of the Department's execution protocols and the facilities used to execute those protocols.
4. When the Department executes an offender, the offender lies on an adjustable gurney. The top portion of the gurney can be positioned at various degrees of inclination ranging from fully upright to completely reclined.
5. In carrying out the Missouri Supreme Court's order to execute Russell Bucklew, the Department will adjust the gurney so that Mr. Bucklew is not lying fully supine at the time the Department administers the lethal chemicals.

FURTHER AFFIANT SAYETH NOT.



Alana Boyles

Resp. Ex. 13

Subscribed and sworn before me, a Notary Public in and for said County and State, on this 9th day of March 2018.

Teresa A. Wehmeyer

Notary Public

My commission expires:

TERESA A. WEHMEYER
Notary Public - Notary Seal
STATE OF MISSOURI
County of Cole
My Commission Expires 2/07/2022
Commission # 14932654

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

Case 17-3052

RUSSELL BUCKLEW,

Bucklew-Appellant

vs.

ANNE PRECYTHE, ET AL.,

Defendants-Appellees

On Appeal from the United States District Court
for the Western District of Missouri
Case 4:14-CV-08000-BP

REPLY BRIEF FOR APPELLANT RUSSELL BUCKLEW

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ARGUMENT

I. Defendants' Procedural Arguments Failed To Forestall Review On The Merits Below And Should Likewise Fail Here.

A. Bucklew's Pleading Asserted The Claim That The Parties Litigated, The District Court Ruled Upon On The Merits, And Bucklew Has Now Appealed.

Defendants begin with the baseless assertion that Bucklew has not appealed "the claim he pleaded." (Appellee Br. at 21.) The operative (Fourth Amended) Complaint states that Bucklew's "blood-filled tumors are prone to rupture under stress or any rise in blood pressure. When this occurs, Bucklew bleeds through his facial orifices and in his throat, further obstructing his airway and causing him to choke." (APP0086.) Bucklew alleged that "the risks arising from Bucklew's airway are even greater if he is lying flat." (APP0119, ¶102.) He asserted that "[a]ny attempt to execute [him] under Missouri's present protocol, or by *any* means of lethal injection, will almost inevitably lead to a prolonged and tortuous execution, with Bucklew hemorrhaging, struggling to breathe, and suffocating." (APP0086.) It is true that the Complaint asserts that Bucklew's condition "*also* create[s] great risk that the lethal drug will not circulate as intended …." (*Id.* at ¶6) (emphasis added). But this Court should reject Defendants' effort to treat Bucklew's claim as *limited* to that risk.

It is also true that not every detail of the claim that Bucklew asserted below and presents on appeal was alleged in the Complaint. Defendants contend that

Bucklew's claims are new because he did not specifically allege that his "uvula" will obstruct his airway, that he will be "forced" to lie supine, or that he will experience a period of time in which he is conscious and sentient to pain but unable to manage his airway. (Appellee Br. at 37.) But the law does not require so much. The law requires a complaint that specifies "the bare minimum facts necessary to put the defendant on notice of the claim so that he can file an answer." *Higgs v. Carver*, 286 F.3d 437, 439 (7th Cir. 2002); *Gerstner v. Sebig, LLC*, 386 F. App'x 573, 575 (8th Cir. 2010) (A Complaint need only "contain sufficient factual matter, accepted as true, to state a claim to relief that is plausible on its face . . . [and] need not include detailed factual allegations.") (citing *Ashcroft v. Iqbal*, 1299 S.Ct. 1937, 1949 (2009)); *C.N. v. Willmar Pub. Sch., Indep. Sch. Dist. No. 347*, 591 F.3d 624, 619 (8th Cir. 2010))); *see also Thrift v. Estate of Hubbard*, 44 F.3d 348, 356 (5th Cir. 1995) ([A] pleading . . . need not specify in exact detail every possible theory of recovery."). The risk of airway obstruction is frequently alleged in the Complaint.[1] Bucklew's Complaint comfortably meets this low threshold.

The proceedings below confirm as much. Defendants attempted in the District Court to confine Bucklew to a claim limited to inadequate circulation of

[1] (*See, e.g.*, APP0087, ¶1; APP0088, ¶5; APP0089-90, ¶¶10, 12; APP0091, ¶15; APP0092, ¶16; APP0096, ¶26; APP0102-03, ¶¶43, 45; APP0104, ¶53; APP0105, ¶57; APP0113, ¶83; APP0114-15, ¶86; APP0118-19, ¶¶98-99, 101; APP0119, ¶¶102-03; APP0122-23, ¶113; APP0128-29, ¶131; APP0134, ¶147.)

the lethal drug. (APP0267-68.) Bucklew objected to that too-narrow view of his claim, with citations to his Complaint. (APP1058-59.) The District Court agreed with Bucklew, ruling on the merits of the arguments he asserts on appeal. (ADD007-09.) Defendants suggest that Bucklew has somehow raised a "new claim on appeal." (Appellee Br. at 21.) The record demonstrates the contrary.

The Supreme Court has set the pleading standard at a level that provides adequate protection to Defendants against undue surprise when combined with liberal discovery rules. *Swierkiewicz v. Sorema N.A.*, 534 U.S. 506, 512-13 (2002) ("The provisions for discovery are so flexible . . . that attempted surprise in federal practice is aborted very easily. . ."). Any claim of surprise here is frivolous given the course of proceedings below. Those proceedings included Defendants' successful efforts to *prevent* discovery that would have enabled Bucklew to more fully develop the factual basis of the claims he asserts on appeal, *infra* pp. 20-25, and an (erroneous) ruling by the district court that the claims Bucklew raises on appeal failed as a matter of law.

B. Neither The Statute Of Limitations Nor *Res Judicata* Bars Review On The Merits.

Defendants assert that Bucklew's claims are barred because he could have raised his as-applied challenge in his earlier lawsuit, which asserted a facial challenge to lethal injection. The District Court rightly rejected both the statute of limitations and *res judicata* versions of this argument. The record is clear:

Bucklew lacked sufficient information to assert this claim until Dr. Zivot examined his medical records in April 2014. Just a few weeks thereafter, he filed this lawsuit asserting his as-applied challenge. His claim is timely and not barred by prior litigation.

The statute of limitations for Bucklew's Section 1983 as-applied challenge is five years. *See Johnson v. Lombardi*, C.A. No. 2:15-cv-4237-DGK, 2016 WL 5852868, at *5 (W.D. Mo. Sept. 30, 2016); Mo. Rev. Stat. § 516.120(4). "The limitations clock . . . [does not] begin ticking" until "the plaintiff can file suit and obtain relief" on the particular claim in question. *Johnson*, 2016 WL 5852868, at *5 (quotation omitted). Bucklew filed his as-applied challenge on May 9, 2014. So unless he could have asserted and potentially obtained relief on his as-applied challenge as far back as May 8, 2009, his claim is timely.

Defendants rely only on Bucklew's 2008 petition for expert funding as evidence that he could have and should have brought his as-applied challenge sooner. But the 2008 petition was simply a request for funding so that Bucklew could investigate his medical condition *to uncover facts that might support a proper claim*. ECF No. 182-15 at 1. It is true, as Defendants observe, that Bucklew in 2008 (1) knew he had a hemangioma and (2) that it was a "high flow" condition. (Appellee Br. at 40.) But that Bucklew knew he had a disease and

generally knew something about its effects does not come close to showing that he possessed the facts needed to bring an *as-applied* challenge at that time.

Importantly, the court denied Bucklew's 2008 request for funding to obtain an expert. That left him without any means to discover whether the State's means of execution would exacerbate his medical condition to create the sort of substantial risk of pain and suffering that might support an as-applied challenge. In 2014, Zivot examined Bucklew and his medical records and gave him the information needed to bring his claim. As the District Court observed, "the factual basis for [Bucklew's] Fourth Amended Complaint is derived from medical examinations conducted in 2014." (APP0211.) That is why Bucklew sued in 2014.

Defendants suggest that Bucklew could have brought a claim and then asked for an expert. But the law does not require a party to sue *before* he has a factual basis to assert a claim, and hope one appears later. Without an expert, Bucklew lacked the facts to bring his claim. Defendants also ignore the undisputed fact that Bucklew's condition is progressive, "which means his condition was different (and indeed, worse) in 2014 when Zivot examined him than it was in 2008." (APP1054-55.) By 2014, his condition had grown so severe that it posed an imminent risk of life-threatening hemorrhage. (APP1055 (citing 5/14/14 Suppl.

Aff. of Zivot at 1-2.)) Whether an examination in 2008 would have supported the claim he asserted in 2014 is a question Bucklew cannot and need not answer.

Defendants' *res judicata* argument also relies solely on the assertion that Bucklew could have brought his claim in 2008. (Appellee Br. at 43.) So all the same reasons why Bucklew's claim is not time-barred apply equally to the assertion that it is *res judicata*: Bucklew could not have brought his claim while he was litigating his facial challenge and while he lacked the necessary facts. *See Lovell v. Mixon*, 719 F.2d 1373, 1376 (8th Cir. 1983) ("res judicata or claim preclusion bars the relitigation of issues which were actually litigated or which could have been litigated in the first suit" and only after "a full and fair opportunity to litigate the issue in question") (internal quotations, citations, and emphasis omitted). As the Supreme Court recently explained in *Whole Woman's Health v. Hellerstedt*, an as-applied challenge is not necessarily "the very same claim" as a facial challenge. 136 S. Ct. 2292, 2305 (2016). "The Restatement of Judgments notes that development of new material facts can mean that a new case and an otherwise similar previous case do not present the same claim." *Id.* In 2014, Zivot gave Bucklew new and specific information about his worsening condition. That gave rise to a new claim different from the one he had been pursuing.

Nothing in this Court's prior ruling suggests that this Court expected the District Court to reject Bucklew's claim as either time-barred or precluded. In

2015, this Court remanded Defendants' statute-of-limitations and *res judicata* arguments because they turned on factual disputes that would have to be resolved by the District Court to support a ruling. This Court observed that only a single document filed with it in the past "may suggest" a statute of limitations issue and that the District Court should consider it. *Bucklew v. Lombardi,* 783 F.3d 1120, 1129 (8th Cir. 2015). As several judges concurring in this Court's last opinion noted: "it is for the district court to determine in the first instance whether Bucklew's claim is timely." *Id.* at 1130. Likewise, this Court observed merely that "[i]t is by no means certain" whether *res judicata* would apply to Bucklew's "unusual situation." *Id.* at 1122 n.1. Defendants have added nothing to the record to support their arguments. These issues cannot now be resolved in their favor.

The District Court chose "not to address the statute of limitations or claim preclusion arguments" because "the Record was not yet sufficiently developed" and "factual issues" remained unresolved. (ADD001-02, n.3.) Defendants had the burden of developing the record with respect to their affirmative defenses. Whether they simply chose not to do so or recognized that the effort would be futile, they have, at this point, waived those defenses. As the District Court noted, Defendants "merely cited general principles without explaining how they apply in this unique situation, and cited to the same facts that were earlier deemed to be incomplete and therefore insufficient." (ADD002, n.3.) That is insufficient to

preserve an issue for appeal. *United States v. Hester*, 140 F.3d 753, 761-62 (8th Cir. 1998) (although the defendants raised an argument, they failed to adequately develop and press it in the trial court—thus waiving it on appeal). This Court can and should proceed to consider the merits.

II. Bucklew Has Already Presented Evidence Sufficient To Support A Reasonable Factfinder's Conclusion That His Execution Will Likely Cause Him Needless Suffering Which Can Be Avoided By Using Nitrogen-Induced Hypoxia.

A. Missouri's Execution Procedure Places Bucklew At Substantial Risk Of Serious Harm And Needless Suffering.

Defendants defend the summary judgment ruling by arguing that there is no substantial risk that Bucklew will suffer needlessly. To prevail on this basis, they must demonstrate that no reasonable factfinder could conclude that Bucklew faces a substantial risk of needless suffering from the execution Missouri proposes to carry out. Their arguments and the record fall far short of their burden. Bucklew has provided ample evidence that could lead a reasonable factfinder to conclude that his risk of needless suffering is substantial and violates the Eighth Amendment.

A reasonable factfinder could conclude that Bucklew faces a substantial risk of (1) being required to lay flat (which causes him to experience the sensation of suffocating) while (2) an unskilled medical professional uses an outdated cut-down procedure to access his femoral vein (increasing his stress and exposing someone

with his rare medical condition to the risk of ruptured tumors and bleeding), even before the pentobarbital begins to take effect, and (3) after he starts to experience the drug's effect, he will continue to experience the sensation of choking for several more minutes and be exposed to still further risks of ruptured tumors and bleeding. Defendants deny that there is a triable issue of fact on each of these three propositions. A reasonable factfinder could rule in Bucklew's favor on each. Summary judgment on this basis is inappropriate.

1. A Reasonable Factfinder Could Conclude That Bucklew Will Be Forced To Lie Supine Consistent With Missouri's Long-Standing Practice.

A factfinder reasonably could conclude that Bucklew will be positioned in the only way Missouri has ever positioned an inmate during an execution by lethal injection—fully supine. Specifically, Defendants Steele, Dormire, and Lombardi each testified that in their decades of employment with the MDOC, they have only ever witnessed executions in which the inmate is lying supine. (APP0291, 35:11-16; APP0298, 80:19-81:15 ("Q. In your experience have all executions taken place while the gurney is lying flat? A. Yes."); APP0310, 29:4-8; 15-20.)

Defendants note that the Execution Protocol does not *require* that Bucklew lay flat, and further that it states that the gurney will be "positioned" so that medical personnel can observe the inmate's face directly "or with the aid of a mirror." (APP0446). They also point to testimony that states that the gurney is

"not a fixed gurney as far as *attached to the building* or anything" (Appellee Br. at 23, **(**citing APP0293, 51:19-22)) (emphasis added). From this Defendants infer that it will be up to M2 and M3 to decide whether to reposition the head of the gurney so Bucklew does not lay flat, if the circumstances warrant it. (*Id*.) But such speculation cannot be enough to warrant summary judgment in Defendants' favor, especially in the face of the evidence that Bucklew produced.

Defendants' evidence says nothing about adjusting the gurney so that the inmate is seated upright—and Defendants testified they have never seen this done. (*See* Appellant Br. at 36 (citing APP0291 at 35:11-16; APP0310 at 29:4-6, 15-17).) It is hardly clear as a matter of fact that the gurney at issue even has an adjustable head. The testimony about it not being "fixed" is not addressed to that question and Defendants have no other evidence, beyond the unfounded guess of a single defendant, to suggest the head is adjustable. Indeed, medical personnel would not need a mirror to observe the inmate's face if it were expected that the gurney could be adjusted. A reasonable factfinder putting this together could conclude that the protocol suggests that a gurney holding a patient lying flat would be "positioned" along with mirrors to ensure that the inmate's face is visible while lying flat, and that no other position for the inmate is even possible. Defendants are simply *guessing* that the "head" of the gurney might be adjusted, and that M3 would choose to do so in Bucklew's case. As discussed below, Defendants successfully

persuaded the district court to prevent Bucklew from discussing this or any other issue with M2 or M3, so nobody knows whether they would choose to seat Bucklew upright, even if that is possible. Defendants simply lack the evidence to support summary judgment.[2]

Defendants, lacking evidence, assert that Bucklew has conceded that the gurney could seat him upright so he does not experience a prolonged sensation of suffocating. (Appellee Br. at 23.) But in his Complaint, Bucklew alleged only that *Defendants* proposed to change its protocol and position the gurney so Bucklew would not lie prone. (APP0127-28 at ¶128.) But that allegation is not evidence, and neither is the offer. It is just another assertion that Defendants have not supported with facts. Any allegation that Bucklew conceded this point as a matter of fact misstates the record.

2. A Reasonable Factfinder Could Conclude That A Cut-down Will Be Used.

Defendants assert that "nothing suggests a cut-down procedure will be used." (Appellee Br. at 48.) But there is evidence that a cut-down has been used when access through the arms to the inmate's veins is not possible. (APP0309, 28:13-22 ("A. …[T]hen I've definitely seen on one occasion where we couldn't

[2] For the same reasons, Defendants' assertion that Bucklew could be repositioned after the IV is inserted cannot support summary judgment. (*See* Appellant Br. at 34-37.)

use the arms at all. Q. And where was the IV inserted then? . . .A. I don't know, specifically, but we did the technique which is called . . . a cutdown, where they had to do the line in the leg area.")).) Both experts agree that the veins in Bucklew's arms are severely compromised and unlikely to be suitable for IV access. (ADD03; APP0351 at 94:24-95:6.) If a cut-down is used when the arms are inaccessible, and here it is clear that the arms are very likely inaccessible, the risk that Bucklew will be subjected to a cut-down procedure is substantial.

Defendants point to expert testimony, which they assert makes clear that it is so easy to access the femoral artery without a cut-down procedure that there is no reason to believe a cut-down will be used here. (Appellee Br. 48.) But that testimony falls far short of preventing a reasonable factfinder from concluding that what has been done before will be done again here.

Dr. Antognini has never even observed an execution, and cannot know what will be done in an execution chamber. ECF No. 182-5, Antognini Dep. Tr. at 69:20-24. Similarly, Dr. Zivot repeated multiple times that the medical setting differs from the execution chamber. (*See e.g.* APP0371-72.) Neither Antognini nor Zivot were asked to consider the difficulty of accessing the femoral vein on a patient with Bucklew's rare condition, and neither could opine on the accessibility of Bucklew's femoral vein, as neither expert examined any veins other than the peripheral veins in his arms. That condition makes it likely that he will be gagging

on his uvula while the effort to visualize the femoral artery is ongoing, risking rupture and choking on his own blood as the procedure continues. The confidence expressed by counsel for Defendants—a 99 percent probability of success on no more than two tries (Appellee's Br. at 48)[3]—ignores the very basis of Bucklew's claim: he is not a typical patient, his circumstances are unique and present substantial risks not present in the general population, and Missouri's Execution Protocol and the evidence of its execution practices place him at unusually high risk.

Defendants ignore not only Bucklew's rare condition. They also ignore that there is no reason to believe that either M2 or M3 will have been informed of Bucklew's rare condition until just before the procedure begins. (APP1066, APP1091.) Nor is there any evidence that either will appreciate from the information they receive the particularly rare form of the disease Bucklew has, and the particularly acute risks he faces. This further undermines the generic, non-specific testimony upon which they rely to overcome the historical fact that a cut-down procedure has been used in the past when veins in the arms were

[3] This figure is also statistically insignificant and is not competent evidence of the likely error rate of every physician. The figures are extrapolated from Dr. Zivot's *guess* as to his own historic failure rate.

inaccessible. On this record, a factfinder could reasonably conclude that the medical professionals who have used a cut-down before will also likely do so here.

The factfinder would also be justified in concluding that the result of using that procedure is likely to be an especially gruesome and needlessly painful execution. The cut-down procedure falls short of what both Drs. Antognini and Zivot explained is acceptable medical practice, even when performed on a healthy patient. But Bucklew is prone to hemorrhaging under stress and struggling, likely with at best limited success, to breathe. This execution, a reasonable factfinder could conclude, will be especially macabre. Defense counsels' assurances to the contrary are not enough to support allowing this execution to proceed on this record.

3. A Reasonable Factfinder Could Conclude That Bucklew Will Experience An Unconstitutionally Long Period In Which He Is Sentient To Pain But Unable To Breathe.

Defendants assert that Bucklew "presente[d no] evidence to suggest when he would become so unconscious that he would lose mental awareness." (Appellee Br. at 56.)[4] That assertion is frivolous. Defendants' admitted that their own expert

[4] Defendants also assert that Zivot equivocally opined only that Bucklew "might" experience a "twilight" period. (Appellee Br. at 27.) Zivot's testimony was far from equivocal on this point. He opined that "there *will* be points [before Bucklew stops breathing] where he's not dead and he's not . . . [able] to control and regulate and adjust his airway . . . [and] *will* still be . . . capable of knowing that he cannot

believed this phase would occur within 20-30 seconds. (APP1030-31.) Defendants further admitted that Zivot opined at his deposition that Bucklew would be conscious and sentient to pain, but unable to control his airway, for as long as 52-240 seconds. (APP1030-32.) That is why the District Court assumed, in its ruling, that Bucklew will experience sufocation for as much as 4 minutes. (ADD005.) Beyond those admissions, the record also includes Zivot's Supplemental Report, in which Zivot opined—on the basis of more than two decades of experience, treatment of more than 42,000 patients, and a thorough examination of Bucklew—that Bucklew would very likely be awake and sentient to pain for as long as *several minutes*, without the ability to regulate his airway. (APP0402-03, 405, ¶III.E.) (emphasis added).

So when the Defendants argue that, based on the evidence provided, "no factfinder could determine how long the stage [at which Bucklew is conscious but unable to control his breathing] might last," (Appellee Br. at 55), they are really just disagreeing with Zivot. The District Court never denied that several minutes of experiencing the sensation of suffocating, potentially from one's own blood due to hemorrhaging from tumors in one's own throat, fails to meet the Eighth Amendment's standard for cruel and unusual punishment. To the extent

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make the adjustment, and *will* experience it as choking." ECF No. 182-1, Zivot Dep. Tr. 81:12-22 (emphasis added).

Defendants are suggesting that the factfinder needs to be told *precisely* how long such suffering would be experienced, this Court should reject their view. It is the province of the factfinder to weigh the expert testimony and make a judgment about the degree of risk an execution protocol poses, considered in light of the magnitude of that risk. *See Johnson v. Mead Johnson & Co., LLC*, 754 F.3d 557, 564 (8th Cir. 2014) ("[The factfinder] should be the one to decide among the conflicting views of different experts.") (internal quotations omitted.) Here, given the evidence that Bucklew is facing an unusually bloody execution—involving bleeding from his facial orifices while gagging on his own blood—the factfinder could comfortably conclude that the several minutes Zivot believes is reasonable to expect is too much time to spend gasping and gurgling through one's blood-filled airway. (APP0405, ¶III.E.)

Defendants simply refuse to grapple with the entire record when they assert that "fifty-two seconds of awareness is the worst case scenario" supported by one of the studies upon which Zivot relied. (Appellee Br. at 56; ADD005.) The District Court rightly chose not to "resolve this factual dispute on summary judgment." (ADD005.) The question, at this stage of the proceedings, is not what does one particular study show, just because Defendants decided to discuss that study with Zivot at length during his deposition. The question is what conclusion would the record as a whole support. And Zivot's opinion, based on his decades of

professional medical expertise, is clear: Bucklew will experience suffering for several minutes. Defendants are, of course, free to urge a factfinder to conclude that the study, as they read it, should overcome Zivot's experience and judgment; that is why we have trials. But they are not entitled to be relieved of the burden of persuading a factfinder just because they believe Zivot is wrong.

B. Bucklew Has Established A Triable Issue Of Fact Regarding Whether Execution By Nitrogen Hypoxia Is Feasible And Will Substantially Reduce His Risk Of Suffering.

Defendants' expert conceded, and the District Court accepted, that nitrogen hypoxia "would result in minimal pain and suffering." (Appellee Br. at 29 (citing ADD010).) Defendants brush this concession aside by asserting that Antognini's statement "concerned cyanide gas, not nitrogen." (Appellee Br. at 58.)[5] But the testimony makes clear that he was specifically opining on nitrogen hypoxia. (APP0362, 234:12-235:19 ("When you go from 79 percent nitrogen, now to 100 percent nitrogen . . . you quickly achieve hypoxia and somebody would be unconscious very quickly").) Antognini's testimony regarding the relative

[5] Defendants relied on statements related to cyanide poisoning, rather than nitrogen hypoxia, when it suited their purposes. In attempting to establish the possibility of painful side effects during an execution by nitrogen hypoxia, they relied on evidence regarding cyanide poisoning. (*See* Appellee Br. at 9 (*citing Gray v. Lucas*, 463 U.S. 1237, 1241 (1983) (noting that a person executed by cyanide poisoning—a method not proposed by Bucklew—may "begin to drool, urinate, defecate, or vomit.")).)

painlessness of nitrogen hypoxia is corroborated by the documented experiences of volunteer study participants and high altitude pilots, which show that nitrogen hypoxia does not typically cause feelings of suffocation, pain, or choking in the average person. (APP0792; APP0910 ("At low levels of hypoxia, [pilot] trainees typically feel little more than euphoria . . .[A]t higher levels . . . trainees will quickly become unconscious."); *see also* APP0907 ("[H]uman volunteers that hyperventilated on pure nitrogen gas . . . lost consciousness [when the tests were expanded to seventeen-to-twenty seconds]. . . . There was no reported physical discomfort associated with inhaling pure nitrogen.")[6]; APP0792 ("[R]esearchers found that executions by nitrogen hypoxia would be humane").) It is true that the pilots did not have cavernous hemangioma, and, once again, Defendants would be free to argue to the factfinder that for that reason these experiences should not be considered persuasive. At this procedural stage, what matters is that Bucklew presented evidence sufficient to support a reasonable factfinder's conclusion that nitrogen-induced hypoxia will significantly reduce his risk of pain and suffering both because it is generally demonstrated to be painless and because Bucklew will

[6] Nitrogen hypoxia does not cause the same physical discomfort as asphyxiation because "hypoxia via the inhalation of nitrogen allows the body to expel the carbon dioxide buildup that is normally associated with the respiratory cycle." (APP0907; *see also* APP0911 ("Inert [nitrogen] gas hypoxia is considered such a humane and dignified process to achieve death that it is recommended as a preferred method by right-to-die groups.").)

not be required to lie flat during a nitrogen-hypoxia based execution procedure. In addition, this procedure would completely obviate the grave risk he faces of suffering a cut-down procedure to access his femoral vein.

In an effort to blunt the clear significance of an alternative procedure that will enable Bucklew to manage his condition by allowing him to sit upright, Defendants assert that Bucklew has failed to provide evidence that he could sit upright during a nitrogen-hypoxia execution. (*See* Appellee Br. at 58-59.) Bucklew has thoroughly explained the conditions which will necessitate forcing him into a supine position during a lethal injection procedure, and the absence of those conditions in a nitrogen-induced hypoxia procedure. (Appellant Br. at 39-41; APP1062; APP1072.) Even Missouri's now defunct gas chamber used a chair, rather than a gurney. Moreover, as the Oklahoma legislature found, nitrogen hypoxia could be administered through a face mask, (*see* APP1069), and nothing about the mechanics of a face mask would necessitate lying supine.

Bucklew's supposed failure to "present[] evidence to establish how quickly or slowly nitrogen gas takes effect," (Appellee Br. at 58), is another red-herring. If Bucklew is not bleeding from his eyes, nose, and ears while choking and gagging on his own blood, a factfinder could reasonably find that death by nitrogen-hypoxia presents a substantially lesser risk of harm, *even if* it could take longer than death by lethal injection.

Finally, as the District Court observed, Defendants made no arguments below concerning the feasibility or availability of lethal gas. (ADD009 ("Defendants do not argue that this method of execution is not feasible or readily implemented.").)[7] Even if they had, Bucklew presented more than sufficient evidence showing that implementation of lethal gas would be safe, inexpensive, and relatively simple as it would only involve the purchase of a canister of nitrogen and a suitable face mask (as opposed to a gas chamber). (APP1069 (citing Pl.'s Ex. 11, Okla. House Bill 1879 Fiscal Impact Statement (dated Feb. 4, 2015) ("The costs would be minimal and include the one time purchase of a gas mask (similar to what one experiences at the dentist), and the price for a canister of nitrogen.")).) In any event, Bucklew's evidence is sufficient grounds for a factfinder to determine that execution by nitrogen hypoxia is both feasible and available.

III. The District Court Improperly Denied Bucklew Discovery Material To His Claims And That Could Make Even More Clear How The Impending Execution Will Violate The Eighth Amendment.

As the discussion above and in Bucklew's Opening Brief amply demonstrate, discovery from M2 and M3 is not merely relevant to Bucklew's

[7] Moreover, rather than simply *authorizing* lethal gas, Missouri has by law "direct[ed] the director of the department of corrections . . . to provide a suitable and efficient room or place . . . and the necessary appliances for carrying into execution the death penalty by means of the administration of lethal gas . . . ." MO. STAT. ANN. §546.720.1.

claims, it is potentially some of the most powerful and clear evidence impacting the central issues in the case. This Court overrules a district court's denial of discovery where, as here, the denial resulted in "fundamental unfairness" to Bucklew. *Sheets v. Butera*, 389 F.3d 772, 780 (8th Cir. 2004). Defendants represent that Bucklew "has not provided any basis from which to determine *how much* suffering he might experience." (Appellee Br. at 54, (emphasis added); *compare* ADD008 (holding that Bucklew failed to "quantify these risks" associated with lethal injection).) As discussed above, that is wrong. But *if* it were right, that would make the denial of discovery all the more fundamentally unfair. Because of Bucklew's unique medical condition, and the poor venous access in his arms, the medical expertise of M2 and M3 are especially relevant to establishing "how much" Bucklew will suffer during the Execution Procedure. (*See* Appellant Br. at 16-19.) Whether M2 or M3 have ever seen a patient with Bucklew's condition is unknown. Whether they are even aware that his especially rare version of the disease exists is unknown. Whether they have any idea how to mitigate the special risks Bucklew faces is unknown.

Defendants distract from the unfairness by mischaracterizing Bucklew's argument. Bucklew is not asserting the mere possibility that medical personnel will make a mistake when applying the Execution Protocol to Bucklew. (Appellee Br. at 62.) Bucklew is asserting that the District Court denied him the chance to

explore whether M2 and M3 are sufficiently medically trained so that it is even possible for them to administer the execution protocol in a way that accounts for Bucklew's rare condition and minimizes the substantial risk he faces of suffering a gruesome, prolonged, excrutiating execution. Given the many ways in which this execution can go badly wrong in light of Bucklew's condition, underqualified medical personnel are nearly certain to carry out the execution in a medically unacceptable manner.

This is not bare speculation. Defendant Steele has observed M3 set a central line in the femoral vein using an archaic cut-down procedure (*see* Appellee Br. at 48); *supra* pp. 11-12, suggesting that M3 is not skilled enough to set a line in a femoral vein in the manner described by Doctors Antognini and Zivot. (APP0352, 98:6-25 (Antognini explaining that a cutdown procedure *shouldn't* be necessary to insert a femoral line in the groin region because "the femoral vein is . . .easily accessed"); APP0376, 72:11-73:23 (Zivot describing successful use of a "blind technique," not a cutdown, when accessing the femoral vein).) Despite the relative ease with which a trained anesthesiologist, even an inexperienced one (APP0375, 72:11-73:3), should be able to obtain venous access through the femoral vein using the "blind technique" (APP0352, 98:6-25; APP0376, 73:8-17), M3 chose—either out of disregard for acceptable medical practice or inadequate expertise—to use an outdated surgical procedure to cut away an inmate's flesh and visualize the femoral

vein. *Supra* pp. 11-12. That M3 is so unskilled as to be unable to competently gain access to the femoral vein without visually exposing the vein through a cut-down provides reason to doubt M3's skill and training. After all, Defendants' expert described using such a "blind" procedure as "not . . . problematic" to perform on an average inmate. And, as repeatedly noted above, Bucklew is far from average.

The evidence indicates that M2 and M3 will not even learn that Bucklew suffers from cavernous hemangioma until the day of his execution. (APP1091.) There is no reason to believe the information they receive about his condition will provide the kind of detail necessary to grasp its rare nature and the exceedingly uncommon risks he faces. Under these circumstances, without discovery, there is no way to know whether M2 and M3 will even understand what problems might arise, much less be sufficiently trained to deal with them. Put simply, nobody knows what M2 or M3 will do when Bucklew begins hemorrhaging, choking and gurgling on his own blood, and bleeding from his eyes and ears while M2 and M3 (and the witnesses for the victim, the State, and Mr. Bucklew) watch.

Defendants' confidence that M2 and M3 will handle whatever arises, and make whatever adjustments are required to reduce Bucklew's suffering only underscores the impropriety of denying Bucklew his requested discovery. Defendants' confidence is merely hope. Discovery would produce evidence either

confirming that their confidence is warranted or demonstrating that it is not. M2 and M3 can tell us whether the gurney may be adjusted, and in what manner, and under what circumstances they would adjust it. M2 and M3 can tell us what familiarity, if any, they have with Bucklew's rare condition. M2 and M3 can explain when and why they would choose to perform a cut down procedure.[8]

Finally, Defendants falsely assert that Bucklew seeks to discover the "identities" of M2 and M3. (*See, e.g.*, Appellee Br. at 18, 34, 61.) Bucklew has made clear to Defendants before this Court (Appellant Br. at 51-52), and the District Court (APP1019), that any deposition of M2 or M3 would protect the identities of M2 and M3 from disclosure to Bucklew or his Counsel, and that their identities would be further protected by placing the deposition transcripts under seal, as has been done in past lethal injection cases. Moreover, M2's and M3's interest in anonymity cannot overcome Bucklew's fundamental right to access to evidence central to his claim. *See Hamdi v. Rumsfeld*, 542 U.S. 507, 529 (2004) (quoting *Mathews v. Eldridge*, 424 U.S. 319, 335 (1976) (contemplating a

[8] Defendants again argue that testimony from M2 and M3 is not relevant because Bucklew has not pled that a change in the execution team would resolve his claim, (Appellee Br. at 61-62.) The relevance of M2 and M3's testimony is patently obvious in light of extensive deposition testimony demonstrating that much of the Execution Procedure is dictated by M2 and M3's discretionary decisions, (*see* APP1058-60), and Defendants' own insistence that Bucklew show this Court "how much" suffering (Appellee Br. at 54) he is very likely to experience under the current protocol as carried out by M2 and M3.

judicious balancing of "the private interest that will be affected by the official action against the Government's asserted interest.")) (internal quotations omitted.)

IV. This Court Is Not Precluded From Reconsidering En Banc Its Earlier Decision Regarding The Applicabiliy of *Glossip's* Alternative Method Requirement To Bucklew's As-Applied Claim.

Defendants argue that this Court may not reconsider its prior *en banc* decision regarding the applicability of the *Glossip* pleading requirements to Bucklew's as-applied claims. (Appellee Br. at 65.) Certainly nothing in the Supreme Court's rulings prevents this Court from altering its prior ruling. *Glossip* has not "squarely foreclosed" Bucklew's view that he need not plead an available alternative method of execution in this as-applied challenge. *Glossip v. Gross* concerned a facial challenge and did not consider whether that requirement applied to as-applied challenges. 135 S. Ct. 2726, 2731 (2015).

That leaves only this Court's prior ruling. The law of the case is a discretionary rule that "expresses the practice of courts generally to refuse to reopen what has been decided, but it is not a limit to their power." *Cottier v. City of Martin*, 604 F.3d 553, 556 (8th Cir. 2010); *see also United States v. Lucas*, 521 F.3d 861, 867 (8th Cir. 2008); *Little Earth of the United Tribes, Inc. v. United States Dep't of Housing and Urban Dev.*, 807 F.2d 1433, 1440-41(8th Cir. 1986). Given the evidence that the Court now has before it of the extreme rarity of Bucklew's condition and the special and severe risks he faces, Bucklew submits

reconsideration is warranted. While it is true that a panel of this Court may not overrule an *en banc* decision, no rule prohibits this Court from reviewing *en banc* its earlier *en banc* decision.[9] It is also possible that a panel of this Court could, on its own motion, poll whether the Court believes a full *en banc* rehearing is required. *See* Internal Operating Procedures, United States Court of Appeals Eighth Circuit (May 20, 2013), ¶IV.D; Fed. R. App. P. 35(a). Regardless, it remains within the power of this Court to prevent Bucklew from suffering a gruesome, prolonged, and needlessly painful procedure, even if his rare medical condition precludes him from proposing an alternative procedure that would comport with Eighth Amendment standards.

CONCLUSION

For the foregoing reasons, Bucklew respectfully requests that this Court vacate the District Court's order granting summary judgment to Defendants, and remand for further proceedings including limited discovery in the form of depositions of M2 and M3, and an evidentiary hearing, as well as an order directing that he need not prove the existence of a feasible and readily available

[9] The authorities cited by Defendants on this issue are inapt for Defendants' purposes. In *Cottier v. City of Martin*, this Court held only that a *panel* of the Court could not overrule an *en banc* decision. 604 F.3d 553 (8th Cir. 2010); *United States v. City of Detroit*, 401 F.3d 448, 452 (6th Cir. 2005) (same).

alternative method of execution that will substantially reduce his suffering, and any other legal or equitable relief this Court deems appropriate.

Dated: January 17, 2018

/s/ Robert N. Hochman

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CERTIFICATE OF COMPLIANCE WITH FEDERAL RULE OF APPELLATE PROCEDURE 32(a) AND LOCAL RULE 28A(h)(2)

This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because it contains 6,465 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

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Dated: January 17, 2018

/s/ Raechel J. Bimmerle
Raechel J. Bimmerle

Counsel for Appellant/Bucklew
Russell Bucklew

CERTIFICATE OF SERVICE

I hereby certify that on January 17, 2018, I caused the forgoing Reply Brief for Appellant Russell Bucklew to be filed electronically with the Clerk of the Court for the United States Court of Appeals for the Eighth Circuit by using the CM/ECF system. I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the CM/ECF system.

/s/ *Raechel J. Bimmerle*
Raechel J. Bimmerle

Supreme Court of the United States
Office of the Clerk
Washington, DC 20543-0001

Scott S. Harris
Clerk of the Court
(202) 479-3011

May 22, 2015

Clerk
United States Court of Appeals for the Eighth Circuit
Thomas F. Eagleton Courthouse
111 S. 10th Street, Rm. 24329
St. Louis, MO 63102

Re: Russell Bucklew
v. George A. Lombardi, et al.
Application No. 14A1200
(Your No. 14-2163)

Dear Clerk:

The application for an extension of time within which to file a petition for a writ of certiorari in the above-entitled case has been presented to Justice Alito, who on May 22, 2015, extended the time to and including August 3, 2015.

This letter has been sent to those designated on the attached notification list.

Sincerely,

Scott S. Harris, Clerk

by

Jacob C. Travers
Case Analyst

Resp. Ex. 15

Supreme Court of the United States
Office of the Clerk
Washington, DC 20543-0001

Scott S. Harris
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NOTIFICATION LIST

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Dennis M. Fisher, M.D., Editor

Anesthesiology 2000; 93:1336–44

Development and Clinical Application of Electroencephalographic Bispectrum Monitoring

Jay W. Johansen, M.D., Ph.D., Peter S. Sebel, M.B., B.S., Ph.D., M.B.A.†*

UNTIL recently, anesthesiologists lacked the ability to monitor the effects of anesthetics on the brain in terms of "depth" or "adequacy" of anesthesia. Typically, surrogate measures of autonomic activity, such as changes in blood pressure and heart rate, have been used to assess the adequacy or inadequacy of anesthesia. Because it is believed that general anesthetics block consciousness by depressing the central nervous system, and electrical activity of the cerebral cortex can be measured using the electroencephalogram (EEG), it is expected that some component of the EEG should relate to adequacy of anesthesia. Such a relation was first suggested in 1937.[1] With the advent of the microcomputer technology, it became possible to reduce the amount of data obtained from an EEG to various processed derivatives.[2] Derivatives such as the power spectral edge, median frequency, and zero-crossing frequency, among others, have been described as potential measures of anesthetic effect on the central nervous system.[3–6] In that these measures were found to depend on specific drug combinations and were not monotonically related to drug effect or clinical response, no gold standard for measuring the entire spectrum of anesthetic effect has been widely accepted.

The first and only technology approved by the U.S. Food and Drug Administration (October 1996) for marketing as an EEG-based monitor of anesthetic effect is the bispectral analysis derivative known as the Bispectral Index Scale (BIS, Aspect Medical Systems, Natick, MA). The purpose of this review is to describe the clinical development of this technology and to assess our current understanding of its utility in clinical practice.

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Key Words: Awareness; electroencephalogram; technology assessment.

Bispectral Analysis

Bispectral analysis is a statistical technique that allows study of phenomena with nonlinear character, such as surf beats and wave breaking.[7] Bispectral analysis provides a description to a continuous pseudo–randomly varying signal (*e.g.*, EEG) that is an alternative to other conventional power spectral analysis techniques derived from fast Fourier transformation. The mathematics of bispectral analysis have been described elsewhere.[7–11] The first studies of EEG bispectral analysis were published in 1971.[12] Bispectral analysis is computationally intensive, and it was not until fast microprocessors were developed that online bispectral analysis of the EEG in the operating room became possible.

Conventional analysis of the EEG using fast Fourier transformation produces information regarding the power, frequency, and the phase of the EEG signal. Typical displays, such as the compressed spectral array, graph power and frequency information and discard the phase information.[2] Bispectral analysis represents a different description of the EEG in that interfrequency phase relations are measured, *i.e.*, the bispectrum quantifies relations among the underlying sinusoidal components of the EEG.[2] Additional details regarding the computation of bispectral data can be found in Sigl and Chamoun[13] and in a review by Rampil.[2] The data contained in both the bispectral analysis and conventional frequency–power analyses of the EEG are used to create the proprietary parameter of the bispectral index, or BIS.[2,13] BIS is a dimensionless number scaled from 100–0, with 100 representing an awake EEG and zero representing complete electrical silence (cortical suppression). During development, BIS went through several revisions (table 1) and the currently available versions (versions 3.3 and 3.4) are scaled as shown in figure 1.

The BIS integrates various EEG descriptors into a single variable. The mixture of subparameters of EEG activity was derived empirically from a prospectively collected database of anesthetized volunteers with measures of clinically relevant sedative endpoints and hypnotic drug concentrations.[14] The process by which BIS was derived is shown schematically in figure 2. The EEG was recorded onto a computer and was time-matched with clinical endpoints and, where available, drug concentrations. The raw EEG data were inspected, sections con-

Table 1. Bispectral Index Development

BIS Version	Release Date	Clinical Endpoint	Comment
1.0	1992	MAC/Hemodynamic	Agent-specific, modified by analgesic dose
2.0	1994	Hypnosis/Awareness	Reformulation of index, agent-independent
2.5	1995	″	"Awake" artifact recognition/removal
3.0	1995*	″	Sedation performance enhanced
3.1	1996	″	EEG burst suppression detection enhanced
3.2	1997	″	EMG and "near" suppression handling improved
3.3	1998	″	EMG detection/removal improved
3.4	1999	″	15 s Smoothing, less susceptable to "arousal delta" patterns on emergence

* FDA premarket approval granted October 1996.

BIS = Bispectral Index; MAC = minimum alveolar concentration suppressing movement to surgical incision by 50%; EEG = electroencephalogram; EMG = electromyogram.

taining artifact were rejected, and spectral calculations were then performed to produce both bispectral and power spectral variables. Following statistical ranking, the variables correlating best with the clinical endpoint were chosen. These were then fitted to a multivariate statistical model using the maximum likelihood solution to a logistic regression analysis to produce a continuous series of BIS values. This index was then tested offline in a prospective manner on a new database, and studies evaluated its clinical utility. The parameters used in the current implementations of BIS have been detailed by Rampil.[2]

The BIS monitor represents the successful effort to model EEG *versus* behavioral responses. The BIS algorithm uses various derivatives from conventional EEG power spectral analysis as well as elements of bispectral analysis.

Initial Clinical Studies

In the absence of a gold standard for determining anesthetic depth, initial clinical studies evaluated the predictive power of BIS for clinical endpoints including patient movement to skin incision (similar to the determination of minimum alveolar concentration [MAC]) and autonomic responses to stimulation (hypertension and tachycardia [MAC_{BAR}]). Data from the first two clinical studies were combined to form the database from which BIS version 1.1 was derived.[15,16] BIS was compared with other commonly used power spectral derivatives to predict movement following skin incision in patients receiving thiopental–isoflurane anesthetic.[17] EEG variables 2.0 min before incision were used as individual controls. A statistically significant difference between BIS levels, but not in spectral edge or median frequency, in subjects who moved at skin incision (BIS 65 ± 15, mean ± SD) was noted compared with those who did not move (BIS 40 ± 16). The accuracy (overall accuracy of prediction)‡ was 83%, but the ability to correctly identify nonmovers (specificity) was only 63%. Power spectral derivatives did not predict movement in response to skin incision; this was confirmed in a recent study during thiopental–isoflurane anesthesia.[18]

The BIS version 1.1 was also evaluated for its ability to predict hemodynamic responses (more than 20% increase in blood pressure or heart rate) to laryngoscopy during a thiopental–nitrous oxide–opioid anesthetic technique.[16] A statistically significant difference was found between patients who mounted a hemodynamic response (BIS 67 ± 10) compared with those who did not (BIS 45 ± 14). In this study, power spectral edge and median frequency did not distinguish those subjects who responded from those who did not. However, other researchers have found power spectral edge to be a useful predictor of hemodynamic response to laryngoscopy.[5]

To evaluate the predictive ability of BIS for movement

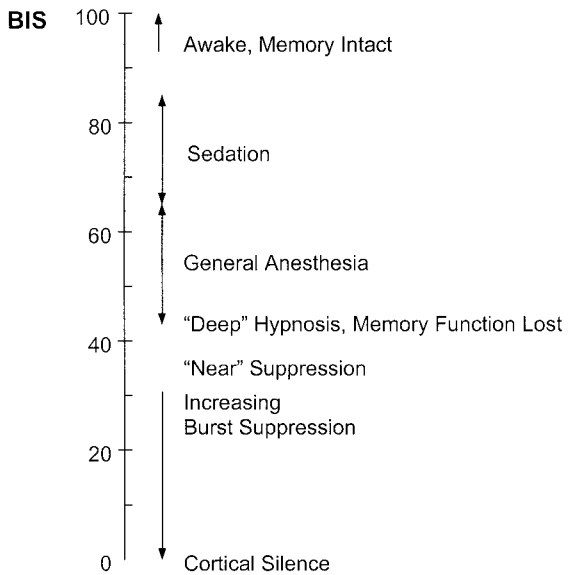

Fig. 1. The Bispectral Index Scale (BIS versions 3.0 and higher) is a dimensionless scale from 0 (complete cortical electroencephalographic [EEG] suppression) to 100 (awake). BIS values of 65–85 have been recommended for sedation, whereas values of 40–65 have been recommended for general anesthesia. At BIS values lower than 40, cortical suppression becomes discernible in raw EEG as a burst suppression pattern.

‡ $\text{Accuracy} = \left(\frac{\text{Total number} - [(\text{False positive}) + (\text{False negative})]}{\text{Total number}}\right) \times 100.$

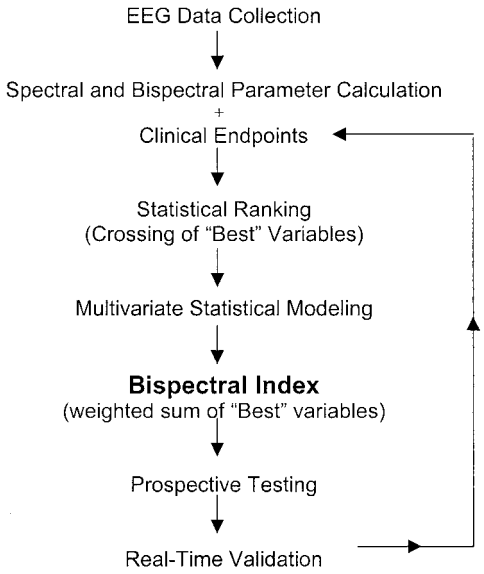

Fig. 2. Bispectral Index Scale (BIS) development process. BIS versions 2.0 and higher were reformulated using hypnosis and awareness as clinical endpoints (see table 1).

using different anesthetic techniques, a prospective comparison was conducted using computer-controlled infusions of propofol (target plasma concentration, 4 μg/ml) plus alfentanil (125 ng/ml) compared with isoflurane (end-tidal concentration, 0.5%) plus alfentanil (125 ng/ml) anesthetics, techniques expected to achieve a 50% movement response to skin incision.[19] In the period before skin incision, BIS was statistically significantly different for those who moved at incision compared with those who did not for each anesthetic technique, whereas other EEG derivatives were not significantly different. However, there was no difference between the patients in the isoflurane–alfentanil group that did not move (BIS 63 ± 10) and those in the propofol–alfentanil group who did move (BIS 63 ± 9). These studies demonstrate that BIS version 1.1 could predict movement response to incision but depended on the anesthetic agents used.

Based on these results, a multicenter study of 300 patients from seven study sites using seven different anesthetic techniques was undertaken.[20] Anesthetic technique was specific to each site and did not vary within each site, although there was significant overlap among drugs used at the various sites. One half of the patients at each site were randomized to receive anesthetic doses in which 50% of patients were expected to move in response to skin incision. The other half was randomized to a treatment group in which the anesthetic drug dose was adjusted to produce a BIS value of less than 60. The percentage of patients who moved in the group where a 50% movement rate was expected was 43% (BIS 66 ± 19 before incision). In the BIS-guided group (in whom anesthetic doses were larger), the movement response rate was significantly lower (13%), as was the BIS (51 ± 19). Overall, as BIS decreased, the probability of a movement response also decreased. At some sites where opioid doses were relatively large, there was no apparent relation between BIS and the probability of movement. Retrospective pharmacodynamic modeling using STANPUMP (Steven Shafer, VA Medical Center, Palo Alto, CA) was performed to estimate the effect-site concentrations of the intravenously administered anesthetics and opioids during balanced anesthesia. Using logistic regression analysis, an interaction model for the effects of the inhalational and intravenous anesthetics and opioids was derived. As the concentration of isoflurane and propofol increased, a decreasing BIS was associated with a decreasing probability of movement. In contrast, increasing opioid dose was associated with a decreased probability of movement without significant changes in BIS. Thus, when large doses of opioids are used, there is a poor association between the probability of remaining immobile after incision and BIS.

Concurrently, several studies furthered our understanding of the anatomic pathways underlying the movement response to surgery. In rats, Rampil *et al.*[21] demonstrated that MAC did not change following removal of the forebrain structures *via* craniotomy. They also demonstrated in the same model that spinal cord transection at C1–C2 level did not alter MAC.[22] Antognini *et al.*[23] separated the systemic and cranial circulations in the goat using bypass circuits to selectively anesthetize either the head or the body (including spinal cord). When the whole animal was anesthetized, MAC of isoflurane was 1.2%. When the cranial circulation alone was anesthetized, MAC was 2.9%. The conclusion from these three studies was that the movement response–reflex to skin incision is mediated primarily at spinal cord level.[24] This anatomic separation of EEG generator sites from the somatic motor control sites in the spinal cord may explain the inability of BIS, which is derived from cortical EEG, to predict reflex movement. Therefore, clinical endpoints used during the development of the BIS version 1.1 were reevaluated.

Reformulation of BIS

These data indicate that the hypnotic component of anesthesia (*i.e.*, "sleep") differs from the analgesic component[25] (fig. 3) and suggest that a satisfactory anesthetic state can be obtained by a balance of hypnotic drugs (*e.g.*, volatile or intravenous anesthetics) and analgesic drugs (*e.g.*, opioids), resulting in unconsciousness and areflexia. Generally, a balance between hypnosis and analgesia is sought. If the dose of hypnotic agent is large, then relatively smaller amounts of analgesic are needed. If analgesic doses are relatively large, then hypnotic medications are decreased to avoid hemodynamic instability. Sedation was selected as the most appropriate clinical endpoint of hypnosis, and BIS was reformulated

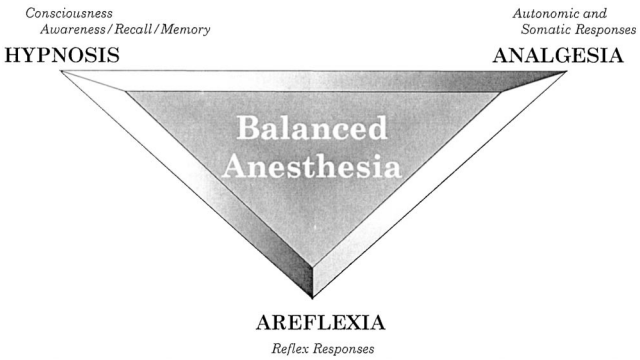

Fig. 3. Components of balanced anesthesia: separation of analgesia, hypnosis, and areflexia (based on Gray's triad).[25]

(version 2.0 and greater) from the existing database[26] (table 1).

A study in 72 volunteers established the relation between BIS, plasma drug concentrations, and level of sedation.[14] These data were also used to develop BIS version 3.0 offline. Steady-state equilibration of plasma drug concentration and effect-site or brain concentration were achieved using computer-controlled, pharmacokinetically driven infusion devices targeted to hold plasma drug concentrations constant for a minimum of 15 min. In these volunteers, the relation between BIS, sedation, and memory function were evaluated using propofol, midazolam, isoflurane (end-tidal concentration held constant) or alfentanil, administered individually. Concentrations of each individual drug were increased in a stepwise fashion after equilibration at each level in a sequence of three to four steps to beyond the level that would normally cause unconsciousness. Subsequently, doses were decreased in a stepwise manner and increased again, and then patients were allowed to recover, so any EEG evidence of acute tolerance could be evaluated. The BIS version 3.0 score ($r = 0.883$) correlated significantly better with the Observer's Assessment of Awareness/Sedation (OAA/S) than did the measured propofol concentration ($r = -0.778$, $P < 0.05$).[27] The correlations between BIS and OAA/S for isoflurane and midazolam were 0.85 and 0.75, respectively; these values were not statistically different from the correlation obtained between measured drug concentrations and OAA/S. BIS values representing unconsciousness (OAA/S = 2) in 50% and 95% of volunteers were 67 and 50, respectively. BIS version 3.0 also had a very high prediction probability (P_K)[28]§§ (0.88–0.98) for correctly identifying loss of consciousness. Alfentanil (50 or 100 ng/ml), alone or in combination with propofol,[29] did not influence this version of BIS. Gajraj *et al.*[30] studied 12 patients with spinal anesthetics (but no surgical stimulation) during repeated transitions from consciousness to unconsciousness following propofol infusions. At a BIS of 55, all patients were unconscious. No data presently exist on the effect of surgical stimulation on the thresholds (BIS) for awareness and memory under general anesthesia.

The BIS version 3.0 was also found to predict responsiveness to verbal command during sedation or hypnosis better than either targeted or measured serum propofol concentration (with or without nitrous oxide).[31] Katoh *et al.*[32] demonstrated the value of this BIS version as a tool for predicting depth of sedation and hypnosis in patients anesthetized with sevoflurane. The P_K[29] for BIS and sevoflurane concentration (0.966) was consistent over the entire sedative range. Both BIS and sevoflurane concentration had a linear relation with OAA/S. Loss of response to mild prodding, defined as a transition from OAA/S score of 2 to 1, occurred at a mean ED_{50} BIS of 66 (95% confidence interval [CI], 64–68; $ED_{95} = 58$). No EEG parameter, including BIS, was a significant predictor of movement in response to skin incision in this study. Other studies confirmed the relation between BIS and level of sedation after midazolam,[33] intraoperative recall after propofol sedation,[34] and suppression of learning after propofol.[35] Taken together, these data suggest that BIS accurately reflects the degree of sedation with volatile and intravenous hypnotic agents, including midazolam. However, reformulation of the BIS decreased the ability to predict movement responses or hemodynamic changes to painful surgical stimulation.[36]

The ED_{50} for unconsciousness (BIS 67) in volunteers[14] was confirmed in paralyzed patients anesthetized with thiopental or propofol.[37] In this study, patients received a single dose of propofol or thiopental and were paralyzed with vecuronium (0.1 mg/kg). The forearm was isolated from the neuromuscular blocking agent by a tourniquet inflated above systolic blood pressure, and return of consciousness was defined as the patient squeezing the investigator's hand twice in response to command. In this study, no patient recovered consciousness with a BIS less than 58, and a BIS of 65 signified a less than 5% probability of return of consciousness within 50 s. BIS did not specifically identify when a particular patient would return to consciousness. This was confirmed by other investigators.[30,38] A limitation of all the "return of consciousness" studies described in this review is that they were conducted in the absence of noxious stimulation. It should also be noted that the definition of "return to consciousness" varies widely across the referenced studies and does not consistently include evaluation of complex command performance (*e.g.*, "move your left hand" or "squeeze my hand twice"). Ethical concerns make it impossible to intentionally provoke return of consciousness during the noxious stimulation of surgery. Thus, there are no data to provide confidence in transferring consciousness thresh-

§§ Prediction probability (P_K) has a value of 1 when the indicator predicts observed anesthetic depth perfectly, and a value of 0.5 when the indicator predicts no better than a 50:50 chance.

olds determined from volunteer studies into the practice of clinical anesthesia.

Pharmacokinetics, Pharmacodynamics, and BIS

Electroencephalographic power spectral parameters display complex relations with hypnotic drug dose that are unique to each class of agents.[39] As mentioned previously, BIS and intravenous or volatile hypnotic dose have been shown to correspond in a statistically significant, linear, monotonic fashion during clinical trials, with BIS decreasing as hypnotic dose increased.[29,32,35,40] When modeling effect-site concentrations of sevoflurane or isoflurane in surgical patients before intubation, BIS had a high predictive power (median coefficients of determination, 0.92 and 0.93, respectively) and displayed some hysteresis (effect site equilibration half time ($t_{1/2}k_{e0}$), 3.5 ± 2.0 min and 3.2 ± 0.7 min, respectively) with end-tidal anesthetic measurements.[40] Quantitative analysis of hysteresis provides information on the speed of onset–uptake and offset–elimination of anesthetic action, whereas monitored or estimated plasma or effect-site drug concentrations does not. The only previous investigation of the dynamic relation between BIS (version 1.1) and end-tidal volatile anesthetic concentration cannot be directly compared because of subsequent reformulation of the BIS.[39]

To date, the most direct evidence linking BIS to brain cellular activity was provided by Alkire, who investigated the correlations between cerebral metabolic rate, sedation, and BIS.[41] With each patient serving as his or her own awake baseline control, regional cerebral metabolic activity was imaged using positron emission tomography under three different conditions: propofol sedation, unconscious propofol, or isoflurane anesthesia. Alkire found that the magnitude of the anesthetic-induced changes in the EEG, evident during sedation and light anesthesia, paralleled the reduction in global cerebral metabolism. Reduction of whole-brain metabolic activity was dose-dependent and decreased in a linear fashion.

The BIS has recently been used as a surrogate measure of anesthetic effect on the brain and employed as the control variable for closed-loop feedback for propofol-based general anesthesia. Mortier *et al.*[42] used effect-site–targeted, computer-controlled propofol infusions continuously adjusted to maintain an average BIS of 65—a BIS value at which patients lost consciousness. This feedback model was able to "clamp" BIS levels by adjusting effect-site propofol concentration to within 10–20% of predicted values despite varying levels of stimulation.

Sedation, Learning, and Memory

There are limited data on the relation between BIS and memory formation under sedation and anesthesia. Liu *et al.*[33,34] demonstrated that BIS correlates well with OAA/S during sedation with both propofol and midazolam during surgery under regional anesthesia. An OAA/S score of 3 or response to a loud voice corresponded to a BIS value of 87 ± 6 and a 40% probability of recall. An OAA/S score of 2 or response to mild prodding corresponded to a BIS value of 81 ± 8 and represented a complete lack of picture recall. In volunteers administered a trivia-type question task, propofol causes a concentration-related impairment of learning.[35] Based on nonlinear regression analysis, learning was suppressed by 50% at a BIS value of 91 ± 1. These findings were validated by Iselin-Chaves *et al.*[29] in volunteers during propofol anesthesia. Recall was impaired at much higher BIS values than response to command with BIS_{50}‖ of 89 (95% CI, 85–93) and BIS_{95} at 79 (95% CI, 70–88) for recall and BIS_{50} of 64 (95% CI, 61–66) and BIS_{95} of 49 (95% CI, 45–54) for consciousness. It should be noted that these studies were conducted in the absence of surgical stimulation.

Lubke *et al.*[43] assessed explicit and implicit memory formation in 96 acute trauma patients across a wide range of BIS values (20–90) during surgery. Memory was tested by stem completion of words presented intraoperatively. No patient had documented "explicit" awareness. However, there was a clear relation between BIS and the ability of patients to complete word stems with words heard during surgery (implicit memory), *i.e.*, at higher BIS levels, patients were more likely to accurately complete word stems than would be expected by chance. Auditory information processing occurred even at BIS levels between 60 and 40. This study demonstrated that memory formation was related to the depth of hypnosis.

Hypnotic titration using BIS has been associated with a reduction in anesthetic agent dosage (see examples in Clinical Utility Trials).[44,45] This reduction in anesthetic dose could theoretically lead to an increase in the incidence of awareness. The incidence of awareness during elective general anesthesia has been reported to be between 0.2% (elective and emergency surgery)[46] and 0.4% (elective surgery).[47] To date, there have been approximately 1,000,000 uses of BIS with an incidence of awareness 0.003% (35 cases) reported to Aspect Medical Systems as of February 2000 (Manberg P, Aspect Medical Systems, Natick, MA, personal communication). BIS was 65 or greater in 17 cases in which BIS trends were available. Eighteen cases were inconclusive because of either a lack of BIS recording (6 cases) or inconsistent descriptions or timing of events (12 cases). Therefore, although the incidence of awareness may be underreported, use of BIS monitoring to guide anesthetic delivery does not appear to increase the likelihood of awareness.

‖ BIS_{50} or BIS_{95} defines the BIS at which 50% or 95% of subjects, respectively, had no response.

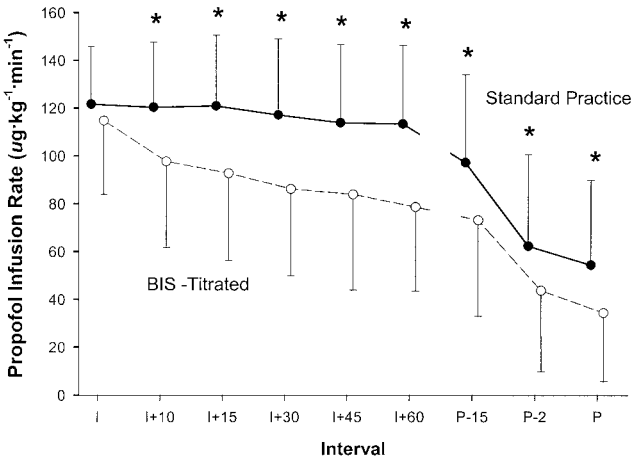

Fig. 4. Plot of propofol infusion rates ($\mu g \cdot kg^{-1} \cdot min^{-1}$, mean ± SD) at various milestones during surgery. The solid line with closed circles indicates the standard practice group, and the dashed line with open circles indicates the Bispectral Index Scale (BIS) group (titration to BIS 45–60). Endpoints are abbreviated as time from procedural start (I) to discontinuing propofol (P). The numbers accompanying these abbreviations refer to minutes before or after the respective endpoint. Statistical significance ($P \leq 0.05$) is indicated with an asterisk. Adapted from Gan *et al.*[44]

Clinical Utility Trials

A patient's response to sedation and hypnosis is difficult to predict because of a complex interplay of factors, including coadministration of multiple synergistic medications and significant individual pharmacokinetic and pharmacodynamic variability. Continuous real-time measurement of anesthetic effect using BIS should allow optimization of drug delivery to each patient, preventing both potential underdosing and overdosing of hypnotic medications. The upper limit of hypnotic titration is defined by the absence of awareness and memory. It should also be associated with the minimum dose of hypnotic agent. Prevention of relative hypnotic overmedication should theoretically speed emergence and recovery.

Gan *et al.*[44] reported a randomized, controlled, blinded, multicenter trial in 302 patients using a standard propofol–alfentanil–nitrous oxide anesthetic technique. Patients were randomized either to a blinded, standard practice group or to standard practice with BIS titration. Propofol infusions were adjusted by clinical observation in the standard practice group and by titration to BIS values of 45–60 during maintenance (60–75 prior to emergence) in the unblinded group. Anesthetic maintenance in the standard practice group typically resulted in average BIS values in the low 40s compared with approximately 50 in the treated group. The propofol infusion rate required for maintenance of anesthesia was decreased in the treated group compared with the standard practice group (fig. 4). Although the total propofol dose used was lower in the BIS group, the total duration of anesthesia was also significantly shorter in this group. Time to extubation was 11.22 min (95% CI, 8.51–13.60 min) in the control group and decreased to 7.27 min (95% CI, 6.23–8.28 min) with BIS titration. In the BIS-monitored group, 43% of patients were fully orientated on arrival in the postanesthesia care unit compared with 23% in the standard practice group. The incidence of postoperative complications did not differ between groups. This study demonstrated that hypnotic titration during anesthetic maintenance can speed emergence and recovery from anesthesia while reducing propofol use.

Song *et al.*[45] studied female outpatients undergoing laparoscopic tubal ligation. Patients were randomly assigned to receive either desflurane or sevoflurane anesthesia, and the anesthesiologist was either unaware of BIS value (blinded) or used BIS (to a value near 60) to titrate volatile anesthetic dose. BIS values in the blinded groups averaged 40 during anesthetic maintenance, whereas those in the titration groups averaged 60. Volatile anesthetic usage decreased significantly by 30–38% compared with blinded controls. Time to extubation decreased from 6.5 ± 4.3 min (mean ± SD) to 3.6 ± 1.5 min (45% decrease) for desflurane and from 7.7 ± 3.5 min to 5.5 ± 2.2 min (29% decrease) for sevoflurane. With BIS monitoring, time to verbal responsiveness decreased from 6.0 ± 3.4 min to 2.8 ± 1.2 min (53%) for desflurane and 7.6 ± 2.7 min to 5.0 ± 2.0 min (34%) for sevoflurane. However, time to orientation, duration of postanesthesia care unit stay, time to oral intake, and time to home-readiness were not affected by BIS monitoring.

Known Limitations of BIS Monitoring

In contrast to other anesthetic agents, ketamine is a dissociative anesthetic with excitatory effects on the EEG. Ketamine doses of 0.25–0.5 mg/kg sufficient to produce unresponsiveness did not reduce BIS.[48,49] When ketamine was used in conjunction with propofol sedation, there was an additive interaction to achieve hypnotic endpoints,[50] yet ketamine did not change BIS values.[50,51] Thus, it appears that BIS cannot be used to monitor hypnosis during ketamine anesthesia.

Inhalation of nitrous oxide at levels of up to 50% does not alter BIS, nor does it cause unconsciousness.[52] At 70% nitrous oxide, responsiveness to voice command is lost, but BIS does not change.[53] Thus, sedative concentrations of nitrous oxide do not appear to affect BIS, which is consistent with its use as a hypnotic index. The addition of nitrous oxide to stable plasma concentrations of propofol in volunteers decreased the probability of response to a range of stimuli at any given BIS level.[31] However, no studies have investigated the effect of the addition of nitrous oxide to a stable general anesthetic during surgical stimulation.

Data are currently lacking regarding opioid dose–responses and interaction of opioids (across a wide spectrum of doses) with hypnotics on BIS. No studies have

evaluated the utility of BIS monitoring in anesthetics based on large doses of opioids.

There is insufficient data to evaluate the use of BIS in patients with neurologic disease. In one subject who was subsequently found to have a genetically determined low-voltage EEG, BIS values were abnormally low (awake baseline = 40).[54] In the intensive care unit (ICU) setting, BIS did not reflect mental status in encephalopathic or neurologically injured patients.[55]

Significant electromyographic (EMG) activity may be present in sedated, spontaneously breathing patients, interfering with EEG signal acquisition and contaminating the BIS calculation. Conventionally, EEG signals are considered to exist in the 0.5- to 30-Hz band and EMG signals exist in the 30- to 300-Hz band, although BIS uses EEG signals up to 47 Hz. This separation is not absolute, and low-frequency EMG signals can occur in the conventional EEG band range. This EMG activity is interpreted as high-frequency, low-amplitude waves, falsely elevating the BIS. Similarly, falsely elevated BIS values can also occur with high electrode impedances produced by inadequate electrode attachment or misplacement. Although quantitative EMG activity (decibels) can be displayed on the monitor, there is no simple method to correct the BIS value. Therefore, BIS values that are unexpectedly high based on clinical observation should be interpreted concurrently with the amount of EMG activity.

Other Applications of BIS Monitoring

Pediatrics

Only adults were used to develop and test the BIS. The influence of neuronal and physiologic maturation of the brain on BIS, as well as its correlation to drug effects and anesthetic outcome, is unknown in pediatric patients. Significant barriers exist to defining and testing awareness in the pediatric population, and adult guidelines should not be adopted without validation. Correlation between awareness, level of sedation, and anesthetic outcome with BIS in children have not been published. However, Denman *et al.*[56] reported an approximately linear relation between BIS and end-tidal sevoflurane concentration in infants and children. BIS decreased by 50% in infants younger than 2 yr of age at an end-tidal sevoflurane concentration of 1.55% (95% CI, 1.40–1.70%) compared with 1.25% (95% CI, 1.12–1.37%) in children, consistent with the known increase in MAC in this age group.[57,58] More work is necessary to establish whether BIS provides an age-independent measure of hypnotic drug effect.

Sedation: Monitored Anesthesia Care and Intensive Care

Validated sedation scales, such as the five-point OAA/S,[27] have been used to measure the level of alertness in sedated patients and in the development of the BIS. As described previously, a number of investigators have replicated the high correlation between BIS, hypnotic drug concentration, and OAA/S for perioperative sedation.[29,33–35] It follows that BIS may be effective for defining adequate sedation during monitored anesthesia care, preventing inadvertent and unrecognized oversedation. Iselin-Chaves *et al.*[29] described the BIS_{50} for loss of consciousness as 64–72 and the BIS_{50} for lack of recall as 83–89. BIS correlated more significantly than any other EEG variable with both loss of consciousness and return to consciousness after midazolam[33] and propofol sedation.[34] These studies suggest that BIS values of 65–80 define an acceptable loss in conscious information processing and recall during sedation–hypnosis.[29,31,33,34]

Propofol and midazolam are both used extensively for long-term sedation in ICUs despite poorly defined clinical endpoints and significant pharmacy costs. The influence of multisystem failure on hypnotic pharmacokinetic–pharmacodynamic response is unpredictable in these patients. It would probably benefit patients and speed recovery from long-term sedation to accurately monitor and titrate hypnosis in the ICU. It is not known whether patients should receive continuous, unvarying hypnotic infusions or whether doses should be cycled to allow periods of wakefulness or sleep. Natural sleep can decrease BIS markedly, although clear identification of natural sleep using BIS may be difficult.[59] A direct measure of individual, hypnotic pharmacodynamics would allow adjustment for tachyphylaxis and tolerance during long-term hypnotic infusions. However, future investigations must address the meaning of awareness and recall in the ICU setting. A number of logistical problems must be solved for continuous 24-h recordings of patients in the ICU (*e.g.*, electrodes, montage, EMG activity) The ICU is an electrically hostile environment for recording EEG, and it is unclear how much useful information can be derived in this setting.[55] Evaluating the BIS in the ICU is a fruitful area of research, because preliminary data from the ICU suggest that oversedation is common.[60]

Current Perspective

BIS was developed using clinical endpoints of sedation and relates monotonically to both the hypnotic component of anesthesia and to anesthetic drug concentration. It has been tested and validated in prospective, randomized clinical trials. BIS indicates both the potential for awareness and of "relative" hypnotic overdose but does not predict movement or hemodynamic response to stimulation, neither can it predict the exact moment consciousness returns.

Some limitations exist to the use of BIS. It is not useful during ketamine anesthesia or in patients with neuro-

logic disease. Although advances in sensor technology have produced an easily applied, three-electrode forehead sensor, this sensor will not function beyond the hairline. EMG activity from electrode placement over the frontalis and temporalis muscles can contaminate and falsely elevate the BIS. Anesthesia providers must be trained to detect EMG activity and to be aware of the problems involved in monitor and sensor application. A future version of the BIS, intended to make the index less sensitive to EMG contamination, is being developed (Chamoun N, Aspect Medical Systems Inc., Natick, MA, personal communication).

As we move toward more evidence-based medicine, new technologies will have to be assessed in a manner that demonstrates both their efficacy and utility in clinical practice.[61] Our understanding of the clinical application of this new technology is in its infancy, and its full contribution to the practice of anesthesiology has yet to be determined.

References

1. Gibbs FA, Gibbs EL, Lennox WG: Effect on the electroencephalogram of certain drugs which influence nervous activity. Arch Intern Med 1937; 60: 154–66
2. Rampil IJ: A primer for EEG signal processing in anesthesia. ANESTHESIOLOGY 1998; 89:980–1002
3. Schwilden H, Schüttler J, Stoeckl H: Quantitation of the EEG and pharmacodynamic modelling of hypnotic drugs: Etomidate as an example. Eur J Anaesth 1985; 2:121–30
4. Levy WJ, Shapiro HM, Maruchak G, Meathe E: Automated EEG processing for intraoperative monitoring: A comparison of techniques. ANESTHESIOLOGY 1980; 53:223–36
5. Rampil IJ, Matteo RS: Changes in EEG spectral edge frequency correlate with the hemodynamic response to laryngoscopy and intubation. ANESTHESIOLOGY 1987; 67:139–42
6. Schwilden H, Stoeckl H: Effective therapeutic infusions produced by closed-loop feedback control of methohexital administration during total intravenous anesthesia with fentanyl. ANESTHESIOLOGY 1990; 73:225–9
7. Rosenblatt M, Van Ness JW: Estimation of the bispectrum. Ann Math Stat 1972; 36:1120–36
8. Nikias CL, Raghuveer MR: Bispectrum estimation: A digital signal processing framework. IEEE Proc 1987; 75:869–91
9. Huber PJ, Kleiner B, Gasser T, Dumermuth G: Statistical methods for investigating phase relations in stationary stochastic processes. IEEE Trans Audio Electroacoust 1971; 19:78–86
10. Brillinger DR: An introduction to polyspectra. Ann Math Stat 1965; 36: 1351–74
11. Dumermuth G: Numerical EEG analysis in the frequency domain. Medinfo 1974; 74:713–22
12. Barnett TP, Johnson LC, Naitoh P, Hicks N, Nute C: Bispectrum analysis of electroencephalogram signals during waking and sleeping. Science 1971; 172: 401–2
13. Sigl J, Chamoun N: An introduction to bispectral analysis for the electroencephalogram. J Clin Monit 1994; 10:392–404
14. Glass PSA, Bloom M, Kearse L, Rosow CE, Sebel PS, Manberg PJ: Bispectral analysis measures sedation and memory effects of propofol, midazolam, isoflurane, and alfentanil in healthy volunteers. ANESTHESIOLOGY 1997; 86:836–47
15. Dutton RC, Smith WD, Smith NT: The use of EEG to predict movement during anesthesia, Consciousness, Awareness and Pain in General Anaesthesia. Edited by Rosen M, Lunn JN. London, Butterworth, 1987, pp 72–82
16. Kearse LA, Manberg PJ, deBros F, Chamoun N, Sinai V: Bispectral analysis of the electroencephalogram during induction of anesthesia may predict hemodynamic responses to laryngoscopy and intubation. Electroenceph Clin Neurophysiol 1994; 90:194–200
17. Sebel PS, Bowles SM, Saini V, Chamoun N: EEG bispectrum predicts movement during thiopental isoflurane anesthesia. J Clin Monit 1995; 11:83–91
18. Dwyer RC, Rampil IJ, Eger IEI, Bennett HL: The electroencephalogram does not predict depth of isoflurane anesthesia. ANESTHESIOLOGY 1994; 81:403–9
19. Vernon JM, Lang E, Sebel PS, Manberg PJ: Prediction of movement using bispectral EEG during propofol/alfentanil or isoflurane/alfentanil anesthesia. Anesth Analg 1995; 80:780–5
20. Sebel PS, Lang E, Rampil IJ, White PF, Cork RC, Jopling M, Smith NT, Glass PSA, Manberg PJ: A multicenter study of bispectral electroencephalogram analysis for monitoring anesthetic effect. Anesth Analg 1997; 84:891–9
21. Rampil IJ, Mason P, Singh H: Anesthetic potency (MAC) is independent of forebrain structures in the rat. ANESTHESIOLOGY 1993; 78:707–12
22. Rampil IJ: Anesthetic potency is not altered after hypothermic spinal cord transection in rats. ANESTHESIOLOGY 1994; 80:606–10
23. Antognini JF, Schwartz K: Exaggerated anesthetic requirements in the preferentially anesthetized brain. ANESTHESIOLOGY 1993; 79:1244–9
24. Kendig JJ: Spinal cord as a site of anesthetic action. ANESTHESIOLOGY 1993; 79:1161–2
25. Gray TC, Jackson Rees G: The role of apnoea in anaesthesia for major surgery. Br Med J 1952; 2:891–2
26. Greenwald S, Chiang HH, Devlin P, Smith C, Chamoun N: The bispectral index (BIS 2.0) as a hypnosis measure. ANESTHESIOLOGY 1994; 81:A477
27. Chernik DA, Gillings D, Laine H, Hendler J, Silver JM, Davidson AB, Schwam EM, Siegel JL: Validity and reliability of the Observer's Assessment of Alertness/Sedation scale: Study with intravenous midazolam. J Clin Psychopharmacol 1990; 10:244–51
28. Smith WD, Dutton RC, Smith NT: Measuring the performance of anesthetic depth indicators. ANESTHESIOLOGY 1996; 84:38–51
29. Iselin-Chaves IA, Flaishon R, Sebel PS, Howell S, Gan TJ, Sigl J, Ginsberg B, Glass PSA: The effect of the interaction of propofol and alfentanil on recall, loss of consciousness and the bispectral index. Anesth Analg 1998; 87:949–55
30. Gajraj RJ, Doi M, Mantzaridis H, Kenny GNC: Analysis of the EEG bispectrum, auditory evoked potentials and the EEG power spectrum during repeated transitions from consciousness to unconsciousness. Br J Anaesth 1998; 80:46–52
31. Kearse LA, Rosow CE, Zaslavsky A, Connors P, Dershwitz M, Denman W: Bispectral analysis of the electroencephalogram predicts conscious processing of information during propofol sedation and hypnosis. ANESTHESIOLOGY 1998; 88: 25–34
32. Katoh T, Suzuki A, Ikeda K: Electroencephalographic derivatives as a tool for predicting the depth of sedation and anesthesia induced by sevoflurane. ANESTHESIOLOGY 1998; 88:642–50
33. Liu J, Singh H, White PF: Electroencephalogram bispectral analysis predicts the depth of midazolam-induced sedation. ANESTHESIOLOGY 1996; 84:64–9
34. Liu J, Harbhej S, White PF: Electroencephalographic bispectral index correlates with intraoperative recall and depth of propofol-induced sedation. Anesth Analg 1997; 84:185–97
35. Leslie K, Sessler DI, Schroeder M, Walters K: Propofol blood concentration and the bispectral index predict suppression of learning during propofol/epidural anesthesia in volunteers. Anesth Analg 1995; 81:1269–74
36. Shafer SL: Clinical signs and drug concentrations: What really predicts depth of anesthesia? New Balanced Anesthesia. Edited by Amsterdam MK, New York, Elsevier, 1998, pp 85–92
37. Flaishon R, Windsor A, Sigl J, Sebel PS: Recovery of consciousness after thiopental or propofol: Bispectral index and the isolated forearm technique. ANESTHESIOLOGY 1997; 86:613–9
38. Doi M, Gajraj RJ, Mantzaridis H, Kenny GNC: Relationship between calculated blood concentration of propofol and electrophysiological variables during emergence from anaesthesia: Comparison of bispectral index, spectral edge frequency, median frequency and auditory evoked potential index. Br J Anaesth 1997; 78:180–4
39. Billard V, Gambus PL, Chamoun N, Stanski DR, Shafer SL: A comparison of spectral edge, delta power, and bispectral index as EEG measures of alfentanil, propofol, and midazolam drug effect. Clin Pharmacol Ther 1997; 61:45–58
40. Olofsen E, Dahan A: The dynamic relationship between end-tidal sevoflurane and isoflurane concentrations and bispectral index and spectral edge frequency of the electroencephalogram. ANESTHESIOLOGY 1999; 90:1345–53
41. Alkire MT: Quantitative EEG correlations with brain glucose metabolic rate during anesthesia in volunteers. ANESTHESIOLOGY 1998; 89:323–33
42. Mortier E, Struys M, De Smet T, Versichelen L, Rolly G: Closed-loop controlled administration of propofol using bispectral analysis. Anaesth 1998; 53:749–54
43. Lubke GH, Kerssens C, Phaf RH, Sebel PS: Dependence of explicit and implicit memory on hypnotic state in trauma patients. ANESTHESIOLOGY 1999; 90:670–80
44. Gan TJ, Glass PSA, Windsor A, Payne F, Rosow CE, Sebel PS, Manberg PJ, and the BIS Utility Study Group: Bispectral index monitoring allows faster emergence and improved recovery from propofol, alfentanil, and nitrous oxide anesthesia. ANESTHESIOLOGY 1997; 87:808–15
45. Song D, Girish PJ, White PF: Titration of volatile anesthetics using bispectral index facilitates recovery after ambulatory anesthesia. ANESTHESIOLOGY 1997; 87:842–8
46. Liu WHD, Thorp TA, Graham SG, Aitkenhead AR: Incidence of awareness with recall during general anaesthesia. Anaesth 1991; 46:435–7
47. Ranta SO, Laurila R, Saario J, Ali-Melkkila T, Hynynen M: Awareness with recall during general anesthesia: Incidence and risk factors. Anesth Analg 1998; 86:1084–9

48. Morioka N, Ozaki M, Matsukawa T, Sessler DI, Atarashi K, Suzuki H: Ketamine causes a paradoxical increase in the bispectral index. ANESTHESIOLOGY 1997; 87:A502

49. Suzuki M, Edmonds HL, Tsueda K, Malkani AL, Roberts CS: Effect of ketamine on bispectral index and levels of sedation. J Clin Monit 1998; 14:373

50. Sakai T, Singh WD, Kudo T, Matsuki A: The effect of ketamine on clinical endpoints of hypnosis and EEG variables during propofol infusion. Acta Anaesth Scand 1999; 43:212–6

51. Avramov MN, Badrinath S, Shadrick M, Ivankovich AD: The effect of ketamine on EEG-bispectral index (BIS) during propofol sedation. ANESTHESIOLOGY 1997; 87:A501

52. Rampil IJ, Kim JS, Lenhardt R, Negishi C, Sessler DI: Bispectral EEG index during nitrous oxide administration. ANESTHESIOLOGY 1998; 89:671–7

53. Barr G, Jakobsson JG, Owall A, Anderson RE: Nitrous oxide does not alter bispectral index: Study with nitrous oxide as sole agent and as adjunct to i.v. anaesthesia. Br J Anaesth 1999; 82:827–30

54. Schnider TW, Luginbuhl M, Petersen-Felix S, Mathis J: Unreasonably low bispectral index values in a volunteer with genetically determined low-voltage electroencephalograhic signal. ANESTHESIOLOGY 1998; 89:160–1

55. O'Connor M, Kress JP, Pohlman A, Tung A, Hall J: Pitfalls of monitoring sedation in the ICU with the Bispectral Index. ANESTHESIOLOGY 1998; 89:A461

56. Denman W, Rosow D, Ezbicki K, Rosow CE: Correlation of bispectral index (BIS) with end-tidal sevoflurane concentration in infants and children. Anesth Analg 1998; 86:S396

57. Stevens WC, Dolan WM, Gibbons RT, White A, Eger EIII, Miller RD, de Jong RH, Elashoff RM: Minimum alveolar concentrations (MAC) of isoflurane with and without nitrous oxide in patients of various ages. ANESTHESIOLOGY 1975; 42:197–200

58. Katoh T, Ikeda K: Minimum alveolar concentration of sevoflurane in children. Br J Anaesth 1992; 68:139–41

59. Sleigh JW, Andrzejowski J, Steyn-Ross A, Steyn-Ross M: The bispectral index: A measure of depth of sleep. Anesth Analg 1999; 88:659–61

60. De Deyne C, Struys M, Decruyenaere J, Creupelandt J, Hoste E, Colardyn F: Use of continuous bispectral EEG monitoring to assess depth of sedation in ICU patients. Intensive Care Med 1998; 24:1294–8

61. Fleisher LA, Mantha S, Roizen MF: Medical technology assessment: An overview. Anesth Analg 1998; 87:1271–82

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

No: 17-3052

Russell Bucklew

Appellant

v.

Anne L. Precythe, Director of the Department of Corrections, et al.

Appellees

Appeal from U.S. District Court for the Western District of Missouri - Kansas City
(4:14-cv-8000-BP)

ORDER

A judge in regular active service having requested a poll on whether to hear Bucklew's motion for stay of execution en banc, a poll was conducted. A majority of the judges in regular active service did not vote to hear the motion en banc.

Judge Kelly would hear the motion en banc.

Judge Benton took no part in the consideration of this motion.

March 15, 2018

Order Entered at the Direction of the Court:
Clerk, U.S. Court of Appeals, Eighth Circuit.

/s/ Michael E. Gans

Resp. Ex. 17

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

Case 17-3052

RUSSELL BUCKLEW,

Bucklew-Appellant

vs.

ANNE PRECYTHE, ET AL.,

Defendants-Appellees

On Appeal from the United States District Court
for the Western District of Missouri
Case 4:14-CV-08000-BP

OPENING BRIEF FOR APPELLANT RUSSELL BUCKLEW

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Resp. Ex. 18

SUMMARY OF THE CASE AND REQUEST FOR ORAL ARGUMENT

Appellant Russell Bucklew maintains that his rare medical condition makes it highly likely that Missouri's Execution Procedure will be cruel and unusual, in violation of the Eighth Amendment, as applied to him. This Court has held that, when asserting an as-applied challenge to a state's method of execution, the plaintiff must prove that (1) the challenged method of execution poses a substantial risk of inflicting serious pain and needless suffering as applied to plaintiff, and (2) a feasible and available alternative method of execution exists that would significantly reduce plaintiff's risk of harm. The District Court granted summary judgment in favor of Defendants, concluding that Bucklew had failed to create a genuine issue of material fact as to the second requirement.

Bucklew argues that (1) the evidence he submitted created a material issue of fact as to both parts of this Court's test, (2) that he was wrongly denied access to discovery of the medical personnel who will administer Missouri's Execution Procedure, which Bucklew reasonably believes will strengthen his Eighth Amendment claim, and (3) that this Court should reconsider its requirement that an as-applied challenge to a state's method of execution must include a feasible and readily available alternative method of execution that will substantially reduce the claimant's pain and suffering. Each argument independently warrants vacating the summary judgment order, and Bucklew respectfully submits that this Court should

address *all* of the arguments to ensure that Bucklew has a full and fair opportunity on remand to prevent the State from executing him in violation of the Eighth Amendment.

Bucklew requests that the Court allow 30 minutes per side for oral argument to allow the parties to aid the Court in addressing the complex issues in this case.

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JURISDICTIONAL STATEMENT

The Western District of Missouri had jurisdiction over Bucklew's Section 1983 claim pursuant to 28 U.S.C. §1343.

The District Court's final judgment was entered on June 15, 2017, and denial of Plaintiff's timely Motion to Alter or Amend Judgment was entered on August 21, 2017. Plaintiff filed a timely notice of appeal on September 19, 2017. This Court has jurisdiction pursuant to 28 U.S.C. §§ 1292(a)(1).

STATEMENT OF THE ISSUES PRESENTED

1. Whether the evidence creates a genuine issue of material fact that nitrogen-induced hypoxia will substantially reduce Bucklew's suffering as compared with Missouri's Execution Procedure.

The cases most relevant to this issue are:

Glossip v. Gross, 135 S. Ct. 2726 (2015)

Bucklew v. Lombardi, 783 F.3d 1120 (8th Cir. 2015)

Jones v. Kelly, 854 F.3d 1009 (8th Cir. 2017)

Vermont Teddy Bear Co., Inc. v. 1-800 Beargram Co., 373 F.3d 241 (2d Cir. 2004)

2. Whether the District Court wrongfully denied Bucklew discovery related to the qualifications and experience of the medical personnel who will administer his execution.

The cases and statutory provisions most relevant to this issue are:

United States v. Holmes, 751 F.3d 846 (8th Cir. 2014)

Plott v. Gen. Motors Corp., Packard Elec. Div., 71 F.3d 1190 (6th Cir. 1995)

Wilson v. Weisner, 43 F. App'x 982 (7th Cir. 2002)

Mathews v. Eldridge, 424 U.S. 319 (1976)

FED. R. EVID. 401

3. Whether Bucklew must prove an adequate alternative method of execution to state an as-applied challenge to Missouri's Execution Procedure in light of his rare and severe medical condition.

The cases most relevant to this issue are:

Glossip v. Gross, 135 S. Ct. 2726 (2015)

Baze v. Rees, 553 U.S. 35 (2008)

Jones v. Kelly, 854 F.3d 1009 (8th Cir. 2017)

Moore v. Texas, 137 S. Ct. 1039 (2017)

STATEMENT OF THE CASE

I. Statement of Facts.

In 1998, Russell Bucklew was sentenced to death for first degree murder, kidnapping, burglary, forcible rape, and armed criminal action. The instant appeal stems from litigation begun in May 2014, in which Bucklew asserts that the method that Missouri will use to execute him violates the Eighth Amendment. In particular, Bucklew asserts that the rare medical condition from which he suffers makes it likely that Missouri's Execution Procedure will cause him to experience prolonged excruciating pain and needless suffering for as long as four minutes. The District Court assumed that this is true. (ADD007-09)[1] It has approved that method of execution anyway. On November 21, 2017, the Supreme Court of Missouri scheduled Bucklew's execution for March 20, 2018. (APP0440.)[2]

A. Bucklew's Medical Condition

Bucklew suffers from a rare, progressive, and incurable medical condition known as cavernous hemangioma, which has caused large, blood-filled tumors to grow in his nasal passage, throat, uvula and face. (ADD002-03; APP1054-55; APP0345 at 72:3-16; APP0325 at 49:5-11; APP0404 at ¶III.A.) Cavernous hemangiomas occur in roughly .2% of the general population. *About Cavernous*

[1] Citations to "ADD" are to Bucklew's Addendum.

[2] Citations to "APP" are to Bucklew's Appendix.

Angioma, Angioma Alliance (last updated Aug. 26, 2016), *available at* http://www.angiomaalliance.org/pages.aspx?content=62. Cavernous hemangioma in the oral cavity typically affects the lips, tongue, buccal mucosa, and palate, and, is exceedingly rare, with a prevalence rate of less than 1% of those with cavernous hemangioma (.002% of the general population). Wang, Minhua, MD et al., *Cavernous Hemangioma of the Uvula: Report a Rare Case with Literature Review*, North American Journal of Medicine and Science, Vol 8, 1 at 56 (June 2015). A case like Bucklew's involving the uvula "is extremely rare." *Id*.

Because of his condition, Bucklew's uvula is grossly enlarged and his airway is severely compromised. (ADD002-03; APP0404 at ¶III.A; APP0407 at ¶V.A.1.) Further, the tumors in his airway are "very susceptible to rupture." (ADD002-03; APP0405 at ¶III.F; APP0352 at 101:3-21; APP0356 at 114:17-115:2.) The tumors in Bucklew's airway, including his grossly swollen uvula, make it difficult for him to breathe, a difficulty exacerbated when Bucklew is forced to lie supine. (ADD003; APP0408 at ¶V.B.1-2, 7; APP0411 at ¶VI.H; APP1062-63; *see* APP0354 at 106:7-107:13.) When Bucklew is in a fully supine position, his uvula is pulled, by force of gravity, back into his airway thereby effectively blocking airflow. (*See* APP0408 at ¶V.B.1.) To prevent suffocation while in the supine position, Bucklew must consciously monitor and mechanically adjust his breathing in order to shift his swollen uvula and permit airflow.

(ADD004; APP0408 at ¶V.B.1; APP0359 at 143:23-144:12.). Bucklew sleeps upright to avoid choking and hemorrhaging. (APP1059; APP0408 at ¶V.B.1.)

Bucklew also experiences frequent hemorrhages, severe enough that the prison regularly provides him with biohazard bags and gauze to staunch his bleeding. (APP1059, APP0407 at ¶V.A.3-4); APP0466.) Friction caused by activities as routine as snoring or eating chips have caused the delicate tissue of Bucklew's airway and uvula to tear or leak. (APP1044 at ¶18; APP0409 at ¶V.B.8; APP0353 at 103:6-15; APP0357-58 at 121:25-122:11.) Bucklew's physicians have stated that this condition is progressive, and that if the hemangiomas continue to grow, his risk of experiencing a catastrophic hemorrhage increase. (APP1055; APP0321-22 at 44:11-45:22; APP0328.) Moreover, the condition is incurable. Sclerotherapy, an injection of prescription medication that can sometimes aid those with hemangiomas, will not help Bucklew because of the size of his tumors, and surgery would introduce risks of excessive bleeding during the procedure and gross deformities were Bucklew to survive. (APP0407 at ¶V.A.2; APP0321-22 at 44:23-45:9.)

B. The State's Execution Protocol Poses Substantial Risks To Bucklew

Missouri's Execution Procedure (the "Execution Procedure") follows both a written protocol (the "Execution Protocol") and unwritten procedures. (*See* ADD003; APP1010; APP1017-18; *see e.g.* APP0309 at 28:4-22; APP0311-12 at

55:20-56:8.) Missouri's Execution Procedure employs lethal injection. Under the Execution Protocol, medical personnel are tasked with determining the most appropriate locations for intravenous (IV) lines to inject the lethal chemical pentobarbital. (APP0445.) The primary IV line may be inserted in the inmate's peripheral or central (e.g., femoral, jugular, or subclavian) veins, provided that the medical personnel have appropriate training, education, and experience for the procedure. (ADD003; APP0445.) Both parties' experts note that Bucklew's peripheral veins are difficult to visualize, increasing the likelihood that numerous attempts to set an IV would be necessary, and would probably be unsuccessful. (APP0346 at 77:3-21; APP0348 at 84:14-25; APP0352 at 99:14-20, 100:1-12; APP0372-73 at 69:25-70:6; APP0377 at 74:6-25; APP0411 at ¶VI.G.) Even if the execution team were able to set an IV in Bucklew's peripheral veins, there would be an extremely high risk that the weak vein would rupture once the high-volume injection of pentobarbital began. (APP1043; APP0349 at 87:13-24; APP0379 at 78:12-19.) If the peripheral vein ruptured, the pentobarbital would enter and begin eroding the surrounding muscle tissue, causing an excruciatingly painful burning sensation as the tissue died. (APP1043; APP0346-47 at 77:11-78:3.)

Thus both parties agree that the use of a central line would be necessary. (ADD03; APP0351 at 94:24-95:6) However, neither expert has opined on the state of Bucklew's femoral vein, as neither expert has examined the veins in Bucklew's

lower extremities. (*See* APP0393 at ¶3.4; APP0409 at ¶V.B.6; APP0373 at 70:7-14.) There is no evidence that suggests Bucklew's femoral vein is in any better condition than his peripheral veins. Nevertheless, according to the Execution Protocol and deposition testimony, central line access would be obtained through Bucklew's femoral vein, using an outdated, infrequently used surgical procedure known as a "cut-down." (APP1043; APP0309 at 28:19-22; APP0290 at 26:21-27:2; APP0351 at 94:24-95:6.) The femoral vein is located in the groin region, so it will be necessary for Bucklew to lie in a supine position. (APP0351 at 94:7-13; APP1043 at ¶11.) There is no reason to believe this procedure could be performed while the inmate is anything other than supine.[3]

One Defendant testified that on one occasion an execution team had to employ a cut-down procedure to gain venous access through the femoral vein using a prepared packet, and that it was a medical member of the execution team that carried out this procedure. (APP0309 at 28:4-22.) He did not recall exactly how long the cut-down procedure took, only that it took several minutes. (APP0311 at 55:20-56:17.) Both experts testified that not every anesthesiologist is

[3] One Defendant testified that he believed "the head" of the gurney in the execution chamber might be adjusted. (APP0293 at 51:17-52:1.) However, he was not certain, and also testified that inmates had been positioned in the supine position for the duration of prior executions. (APP0291 at 35:11-16.) Another Defendant Steele testified that inmates were lying supine in the executions he had previously observed. (APP0310 at 29:4-6, 15-17; *see also* APP0298 at 80:22-81:8.)

qualified or skilled at performing a central line procedure, and that a cut-down would not be the preferred method of inserting a central line. (APP0375 at 72:9-21; APP0347 at 81:22-24; APP0362 at 237:11-19; APP0352 at 98:8-11, 20-25.) The experts' testimony is consistent with the Execution Protocol, which explicitly takes into account the relevance of the training of the execution team members as it relates to establishing venous access. (APP1011; APP0445 ("Medical personnel may insert the primary IV line . . . as a central venous line . . . provided they have appropriate training, education, and experience for that procedure.").)

The Execution Protocol leaves the medical team with substantial discretionary authority in the execution chamber. (*See* APP0338-40 at 35:21-37:9; APP0341-42 at 43:11-44:22; APP0313 at 77:18-24.) The medical technicians responsible for the execution have been designated "M2" and "M3." The medical technicians are responsible for establishing intravenous access after Bucklew is strapped to the gurney in a supine position. (APP0308 at 22:19-24.) By virtue of having established intravenous access in prior executions, these individuals are in the best position to know whether the gurney on which an inmate is strapped may be adjusted. Moreover, the medical technicians have the discretionary authority to determine whether a cut-down procedure will be employed. (*See* APP0337-38 at 34:25-35:20; APP0341-42 at 43:11-44:22.) They also have the discretionary authority to determine when and how the cut-down procedure will be performed.

(APP0308 at 22:19-24; APP0313 at 77:18-24.) Their skill and expertise necessarily determine how quickly the cut-down will be performed and whether the procedure will be successful. (*See* APP0347-48 at 81:13-82:25; APP0362 at 237:11-19.)

Once intravenous access has been established, Bucklew will be forced to remain in a supine position while the pentobarbital injection is administered. (*See* APP0298 at 80:22-81:8; APP0310 at 29:4-6, 15-17.) No evidence in the record suggests that Bucklew could be moved to a seated position after the IV is established.

Once the pentobarbital enters Bucklew's bloodstream, he will begin to lose the ability to consciously and mechanically manage the airway obstructed by his blood-swollen uvula while he is lying flat. (APP0411-12 at ¶VI.I-J.) Bucklew will experience this as suffocation. (*Id.*) By reflex, Bucklew will begin choking on his uvula in an effort to breathe. (APP0412 at ¶VI.J-L.) The violence of Bucklew's choking will likely cause the friable tissue of Bucklew's tumors to rupture, causing Bucklew to hemorrhage and aspirate his own blood. (*Id.* ¶VI.M.)

The parties' experts agree that there will be some period of time during which Bucklew will be conscious and sensate to the pain and fear associated with suffocation and choking on his own blood while being physically unable to manage his airway. (ADD003-04). The experts disagree on the duration of time

Bucklew will be forced to consciously endure this gruesome experience: Bucklew's expert opines that Bucklew could be in this state for 52 to 240 seconds, while Defendants' expert opines that Bucklew would be conscious and aware of extreme pain and suffocation for 20 to 30 seconds. (ADD004.)

Prison officials have no contingency plans in place should any aspect of an execution fail to go as planned; any calls regarding how best to handle an inability to obtain venous access, use of a cut-down procedure, an inmate choking, gagging, or hemorrhaging blood, or any other catastrophe are left to the sole discretion of the medical members of the execution team. (APP0339-40 at 36:11-37:9; APP0299-300 at 93:11-96:9; APP0291 at 36:5-11; APP0448 at Nos. 2-3.) All decision-making in the event of complications during an execution is left to the discretion of the medical members of the execution team. (APP0337-38 at 34:25-35:20; APP0341-42 at 43:11-44:22; APP0313 at 77:18-24; APP0297 at 74:19-75:14; APP0299-300 at 93:11-96:9.) The State has never executed an inmate who suffers from cavernous hemangioma. (APP1047 at ¶42; APP0448 at No. 4.) And the medical personnel who perform the execution will not be provided any information regarding Bucklew's medical history beyond a single-page document that, without explanation, identifies "cavernous hemangioma" in his medical history. (APP1047; APP0292 at 43:20-44:6; APP0334-36 at 27:20-29:10; APP0464.) Given the rarity of the location of Bucklew's hemangiomas,

specifically his oral cavity and uvula, it is unlikely that quick research of "cavernous hemangioma" would adequately prepare the medical team for Bucklew's condition.

C. Nitrogen-Induced Hypoxia is a Feasible, Available Alternative Method that is Likely to Significantly Reduce the Risk of Harm.

Bucklew provided substantial evidence to the District Court demonstrating that nitrogen-induced hypoxia is both a feasible and available alternative method of execution. Lethal gas is an authorized method of execution under Missouri Law. Mo. Stat. Ann. § 546.720. In addition, two other states—Louisiana and Oklahoma[4]—have extensively investigated the feasibility and availability of lethal gas. (APP1069; APP0546-47; APP0898-99.) While Louisiana's investigation is ongoing, Oklahoma has adopted a statute adopting lethal gas as an authorized alternative method of execution. Okla. Stat. Tit. 22 § 1014(B) (2015). Oklahoma's legislature determined that "[t]he costs would be minimal and include the one time purchase of a gas mask (similar to what one experiences at the dentist), and the price for a canister of nitrogen." (APP0470.) An Oklahoma Grand Jury also concluded that given the abundance of nitrogen gas, it would be

[4] A third state, Alabama, is also considering the use of lethal gas as an alternative method of execution. The Alabama Senate and House Judiciary Committee have both passed the bill, a vote of the full House is pending. SB12, 2017 Regular Session of the Legislature of Alabama (2017).

easy and inexpensive to obtain. (APP0546-47.) Evidence also suggests that nitrogen-induced hypoxia would be an easy method of execution to administer, and would not require the participation of licensed medical professionals. (*Id.*) And Defendants have demonstrated that they are both willing and capable of engaging in the necessary research to implement this alternative method in Missouri, as shown by correspondence regarding the safety inspection and remodeling of Missouri's existing gas chamber. (APP1069-70; APP0880-89.) Further, as the District Court recognized, Defendants do not contest that nitrogen-induced hypoxia is both a feasible and available alternative method of execution. (ADD009.)

Ample evidence also supports Bucklew's assertion that execution by nitrogen-induced hypoxia will significantly reduce his risk of experiencing excruciating pain and needless suffering as a result of its interaction with his medical condition. First, there is no evidence that nitrogen-induced hypoxia would pose a risk of substantial pain or needless suffering in the absence of Bucklew's cavernous hemangioma. Studies conducted with high altitude pilots demonstrate that nitrogen-hypoxia does not typically cause any feeling of suffocation or pain such as choking or gagging. (APP1072, n. 6; APP0547. *See also* APP0792; APP0898-99.) Moreover, Defendants' own expert, Dr. Antognini, opined that if administered correctly, nitrogen hypoxia could cause less pain and suffering than lethal injection. (APP1047; APP0362 at 234:12-21, 235:1-11.)

In Bucklew's case, the relative benefits of nitrogen-induced hypoxia over lethal injection are even more pronounced. Not only does nitrogen-induced hypoxia not cause choking or gagging sensations on its own, but it is highly unlikely that nitrogen-induced hypoxia would negatively impact Bucklew's cavernous hemangioma in his airway. First and foremost, while Bucklew would be forced to lie supine during an execution by lethal injection, he would not for an execution by nitrogen-induced hypoxia. (APP1072; *see* APP0298 at 80:22-81:8; APP0291 at 35:11-16; APP0310 at 29:4-6, 15-17.) If Bucklew is sitting upright once he begins to lose physical control of his airway, gravity will not cause his uvula to fully obstruct his airway as it would if he were forced to lie supine. Evidence suggests that breathing nitrogen gas, properly administered through a mask while sitting upright would virtually eliminate the substantial risk of choking, gagging, hemorrhage and suffocation posed by lethal injection. (APP0547; APP0898-99.)

Evidence in the record also suggests that nitrogen gas would more rapidly cause complete unconsciousness than would pentobarbital. The Defendants' own expert testified that the inhalation of nitrogen gas "would quickly achieve hypoxia and cause an inmate to become quickly unconscious." (APP0362 at 234:12-21; APP1071; APP0890 (noting that available evidence suggests unconsciousness would be achieved within 20 seconds of breathing pure nitrogen.).) By contrast,

Dr. Zivot opined, and the District Court accepted as true for purposes of summary judgment, that a lethal injection of pentobarbital may not induce full unconsciousness for up to 240 seconds (four minutes). (APP0382 at 88:14-18; ADD004-05.)

II. Proceedings Below

A. Appellant's Claims

On May 9, 2014, Bucklew filed his initial Complaint in the United States District Court for the Western District of Missouri. (APP0001.) On May 19, 2014, the District Court dismissed Bucklew's claims *sua sponte*. This Court reversed the District Court's summary dismissal and remanded for further proceedings. (APP0083.) On remand, the District Court ordered Plaintiff to file an amended complaint, which was subsequently amended several additional times. Bucklew filed his Fourth Amended Complaint ("the Complaint"), which is the operative complaint here, on October 13, 2015. (APP0085.)

Bucklew claims in Count I that "Missouri's lethal injection protocol, *as applied* to Mr. Bucklew, presents a substantial risk of causing excruciating or tortuous pain and inflicting needless suffering" and will therefore violate the Eighth Amendment's prohibition of cruel and unusual punishment. (APP0136-37

at ¶¶ 148, 151.)[5] Bucklew further alleges that the risk that he will experience excruciating pain and needless suffering if subjected to Missouri's Execution Procedure stems from his "lifelong and severe medical condition" which makes it certain or very likely that he will experience "coughing, choking and suffocating" as well as hemorrhaging during the Execution Procedure. (APP0135 at ¶¶144-45; *see also* APP0221.) Bucklew maintains that he has no obligation to prove the existence of a feasible alternative method of execution because he is pursuing an as-applied challenge to his method of execution. Nonetheless, he has alleged that lethal gas is a "feasible and available alternative method that will significantly reduce the risk of severe pain." (APP0137 at ¶150.)

B. The District Court Denies Bucklew's Requests for Relevant Deposition Testimony from M2 and M3

To prove his as-applied challenge to the Execution Procedure, Bucklew sought discovery of information likely to establish precisely how the Execution Procedure will be applied to him. In particular, Bucklew sought discovery about the medical members of the execution team who would be responsible for implementing the Execution Protocol. In light of "the severity of his medical condition" Bucklew told the District Court that "the training and qualifications of

[5] Counts II and III were dismissed by the District Court on Defendant's Motion to Dismiss. (*See* APP0201.)

the execution team members are especially important." (APP0222.) Bucklew specifically requested documents detailing the current members, roles and monikers of the execution team, any legal claim or disciplinary proceedings by any medical or academic board or court of law relating to any member of the execution team, copies of any professional licenses, degrees or certifications of the medical members of the execution team, and documents sufficient to show job descriptions, qualifications and the resumes or CVs of those considered for recruitment to the execution team. (APP0224-25.) For each request, Bucklew specifically indicated that any identifying information could be redacted. (*Id*.) In addition, Bucklew requested to depose medical members of the execution team. (APP0226.) Bucklew explained that without such discovery he would "not know the current composition of the execution team, the type of equipment presently being used or whether any monitors for blood pressure, heart rate or oxygen are available in the execution chamber." (APP0222.)

Despite the fact that the purpose of the discovery was to enable Bucklew to fully uncover and explain the nature and magnitude of the risks the Execution Procedure posed for him, Defendants responded that Bucklew's discovery should be permitted only in phases. Specifically, Defendants asserted that he must prove that lethal gas was an available alternative method that would significantly reduce the (as-yet not fully known) risk of harm he faced from Missouri's Execution

Procedure. (APP0232-33.) Defendants then argued that Bucklew should only be permitted to discover information about lethal injection generally, without any specifics relating to Missouri's Execution Protocol or the medical professionals tasked with implementing the protocol. (APP0234-37.)

On August 11, 2016 before any depositions or other discovery had been completed, the District Court rejected the bulk of Bucklew's request for discovery. (APP0240.) The District Court agreed with Defendants that "detailed discovery about the execution team members is unnecessary to resolving the issues in this case." (APP0247.) Ignoring the wide variations in training and qualifications for any given category of medical professional, the District Court permitted Bucklew discovery only of information regarding the number of doctors, nurses, or anesthesiologists on the execution team. (*Id.*) Bucklew received no information pertaining to those individuals' actual expertise in the skills necessary to carry out the execution on an individual with his severe and unusual medical condition. (*Id.*) And Bucklew was denied the opportunity to depose any of the professionals who would administer his execution. (*Id.*)

The District Court later granted Bucklew permission to file a Motion to Compel outlining the need for the requested discovery. (APP1005.) In his Motion to Compel, Bucklew explained that "throughout discovery, the training of the medical members of the execution team has squarely been placed at issue,

particularly as it relates to Mr. Bucklew's as-applied challenge." (APP1010.) The relevance of testimony by M2 and M3 could no longer be doubted, particularly because testimony from prison officials revealed the discretionary authority granted to the medical members of the execution team. Discovery had also revealed the previously unknown use of a cut-down procedure to obtain venous access to the femoral vein, the equivocal testimony regarding the feasibility of repositioning the gurney, and testimony indicating that not all medical professionals are qualified or sufficiently skilled to perform a central line procedure. (APP1016-20.) Bucklew explained that, without information regarding the training and expertise of the medical professionals on the execution team, he could not know how the medical professionals would exercise their discretion or what types of procedures they are qualified to perform, nor could he know how they would address any of the contingencies likely to arise during his execution. (*Id.*) In short, without discovery about M2 and M3, Bucklew could not know how the execution protocol would actually be applied to him, raising an unprecedented barrier to his *as-applied* method of execution challenge. (*Id.*)

The District Court again rejected Bucklew's request. (ADD020-37.) The District Court decided, at the prompting of Defendants, that the requested discovery could only be relevant if Bucklew alleged that the Execution Protocol could be altered in some way that would reduce the risk of harm. (ADD020.) That

is, the District Court again denied Bucklew discovery into the extent of the risk he faced from the Execution Protocol because he had not yet proved that an available and feasible alternative method could reduce that as-yet unknown risk.

M2 and M3 had been previously deposed telephonically in 2010 in connection with *Ringo v. Lombardi*, Case No. 09-4095-BP (W.D. Mo.), and in 2013 and 2014 in connection with *Zink v. Lombardi*, Case No. 12-4209-BP (W.D. Mo.).[6] Appointed counsel, Ms. Pilate, has reviewed those sealed depositions because Bucklew was a party to those cases. But pro bono counsel, Sidley Austin, who joined Bucklew's team later, has been barred from reviewing them. (APP1019.) In response to the Defendants' Motion for Summary Judgment, Appointed Counsel requested the District Court's permission to file a supplemental sealed brief regarding the prior testimony of M2 and M3 in support of Bucklew's opposition to summary judgment, contending that she had reason to believe that the contents of those depositions directly contravened the Defendants' statement of allegedly undisputed facts. (APP0278.) The request was denied. (APP0284.) The District Court also again denied Ms. Pilate's request to share the contents of the

[6] In fact, Bucklew's appointed counsel, Ms. Pilate, separately requested permission to file under seal relevant portions of M3's prior depositions as an exhibit in support of Bucklew's Reply Brief in Support of His Motion to Compel. (APP0249.) The District Court denied the request. (APP0253.)

M2 and M3 depositions with Sidley Austin in connection with Bucklew's Rule 59(e) Motion to Alter or Amend the Judgment. (APP0285.)

C. The District Court Rejects Bucklew's Claim As a Matter of Law.

On June 15, 2017, the District Court granted summary judgment in favor of Defendants. The District Court accepted for purposes of its ruling that Bucklew had established "a substantial risk that [he] will experience choking and an inability to breathe for up to four minutes." (ADD009.) The District Court did not state whether it believed such a risk satisfied the first step in the legal test, articulated in *Glossip v. Gross*, 135 S. Ct. 2726 (2015), requiring a prisoner asserting an Eighth Amendment method-of-execution claim to establish "a risk that is sure or very likely to cause needless suffering." *Id.* at 2737 (quotation marks and emphasis omitted). Instead, the District Court proceeded directly to the second step in the *Glossip* test: whether Bucklew had "identif[ied] a known and available alternative method of execution that entails a lesser risk of pain." *Id.* at 2731.

Bucklew had argued that he need not prove that there exists a feasible alternative method of execution because he has raised an as-applied challenge to his method of execution. The District Court rejected that argument. (ADD009-10.)

The District Court then concluded that Bucklew had failed to a create triable issue of fact regarding whether his alternative method of execution (nitrogen-induced hypoxia) would significantly reduce the risk of experiencing four minutes

of suffering to which the State's method of execution exposes him. The District Court observed that Defendants' own expert had testified, without contradiction, that nitrogen induced hypoxia would quickly cause Bucklew to lose consciousness and therefore not experience the sensation of suffocation for anything close to four minutes. (ADD011.) But, the District Court observed, Defendants' expert had also testified that the State's Execution Procedure would equally quickly cause Bucklew to lose consciousness and not experience the sensation of suffocation for anything close to four minutes. (*Id*.) The District Court, ignoring that it had already assumed, based on Bucklew's expert's testimony, that the State's proposed use of pentobarbital would lead to four minutes of suffering, reasoned that there was *no* evidence that nitrogen-induced hypoxia would cause significantly less suffering than the State's Execution Procedure. (*Id*.)

The District Court's summary judgment ruling discussed the need to administer the Execution Protocol through Bucklew's femoral vein. (ADD007-08.) And, as noted above, the District Court assumed that following the Execution Procedure would entail a substantial risk of four minutes of suffering. But it did not address the fact that part of the reason why Bucklew is likely to experience as much as four minutes of suffering through the State's Execution Procedure is his need to be supine throughout the process. And when the District Court compared the risks posed by Bucklew's alternative method with the risk posed by the State's

Execution Procedure, the District Court did not address the fact that Bucklew would not be required to be supine during administration of his proposed method. Bucklew thus moved for reconsideration of the District Court's grant of summary judgment, pointing out this material distinction in execution methods for someone with Bucklew's medical condition. (APP1077.)

The District Court denied Bucklew's motion, ruling that he had not produced evidence creating a factual dispute that (1) he would have to remain supine during administration of the State's Execution Procedure, and (2) there is a significant difference in his ability to breathe while unconscious when sitting as compared to when supine. (ADD016.) The District Court adhered to its view that it would be unreasonable to conclude, on this record, that there is any material difference in his risk of suffering between the two methods. (ADD017.)

SUMMARY OF THE ARGUMENT

Bucklew's execution, if it follows the Execution Protocol, is likely to be especially gruesome and impose substantial needless suffering upon him. Bucklew's rare medical condition has caused large, blood-filled tumors to grow in his nasal passage, throat, uvula and face. When he lies down, these tumors push into his airway and can start bleeding, causing him to choke on his own blood. The record reveals that the State of Missouri will execute Bucklew by laying him down on a table so they can access his femoral vein. An execution team—apparently with no expertise or training in handling this rare condition—will then watch as Bucklew suffocates on his own blood for as long as four minutes.

It is agreed that nitrogen-induced hypoxia is a feasible and available alternative method of executing Bucklew. Nevertheless, the District Court has allowed Missouri to execute Bucklew according to the Execution Protocol, because it believes that nitrogen-induced hypoxia will not "substantially reduce" his risk of excruciating pain and needless suffering. That conclusion is wrong for three independent reasons, each of which sufficiently warrants vacating the judgment. And because each reason would set the case on a different path for proceedings on remand, this Court should consider *all* three grounds to ensure that further proceedings follow their proper course to the ultimate resolution of Bucklew's claim.

First, Bucklew has already produced ample evidence from which a jury can find that nitrogen-induced hypoxia will substantially reduce the risk of suffering posed by Missouri's Execution Procedure. The District Court reasoned that the only suffering at issue is how long it will take Bucklew to lose consciousness and that there is not enough evidence that nitrogen-induced hypoxia will reduce that period. However, even operating under the District Court's mistaken presumption that the time to unconsciousness is all that matters, there is evidence that nitrogen-induced hypoxia will cause Bucklew to more quickly lose consciousness and the ability to sense his pain.

In addition, the District Court erroneously believes there is no dispute that Bucklew can be in an upright position during both the Execution Protocol and Bucklew's alternative. This is important because being upright (which he would be during a nitrogen-induced hypoxia protocol) will substantially reduce his risk of experiencing choking, gagging, or suffocation—regardless of the duration of time before the onset of complete unconsciousness. When Bucklew is forced to lay down, he may choke and gag on his tumors until he hemorrhages and suffocates on his own blood. The District Court improperly found that Bucklew could be moved to an upright position during the Execution Procedure after a central line is set in his femoral vein—a finding unsupported by the record.

Second, Bucklew was erroneously denied discovery that is essential for him to understand and present to the Court the full extent of the risks he faces from the execution protocol. So any remand this Court orders for further proceedings should not be limited to the record that has already been developed. Bucklew is entitled to present the trier of fact the full story about his execution team's qualifications and training as well as information about how the team would handle his unique conditions during the execution. Bucklew should be granted the discovery he requested from M2 and M3.

The District Court denied Bucklew's discovery based on an erroneous legal standard. According to the District Court, Bucklew has no right to discovery from M2 and M3 unless his claims expressly "*require*[] consideration" of them. The law entitles Bucklew to discover any facts that could reasonably *lead to* material evidence. Obviously, discovery into M2's and M3's knowledge and expertise concerning Bucklew's condition and any plans they might have for dealing with potential complications during a lethal injection procedure could reasonably lead to—indeed, is all but certain to lead to—material evidence.

Further, it does not matter, as the District Court believes, that Bucklew no longer brings a claim directly based on the execution team's qualifications. The execution team's qualifications and skill to carry out a challenging atypical execution while causing minimal suffering remains directly relevant to Bucklew's

claim that an alternative will reduce that suffering. As noted above, Bucklew has already presented evidence that could lead a reasonable factfinder to conclude that his alternative will substantially reduce his risk of suffering. That evidence becomes all the more compelling, and thus all the more likely to *convince* the reasonable factfinder, to the extent he presents additional evidence of even greater risk of suffering from the Execution Procedure than he has already produced.

For example, the discovery Bucklew requested could definitively establish that he will have to be supine during the Execution Procedure, or could support an enhanced risk of suffering due to M2's or M3's inability to perform a cut-down procedure safely on someone with Bucklew's rare condition, or might show that M2 or M3 lack plans for any of a variety of complications that can reasonably be expected to arise from a lethal injection into someone with Bucklew's rare condition. There is no legal basis for endorsing the Execution Protocol while denying Bucklew discovery into its full risks. Indeed, doing so violates Bucklew's right to Due Process.

Third, requiring someone like Bucklew to prove that an alternative will substantially reduce his suffering disregards the unique nature of Bucklew's claim and disease. Bucklew acknowledges that existing precedent requires him to prove that there is an effective and feasible alternative even in an as-applied challenge to a method of execution. But his unique medical condition warrants revisiting the

question, by immediate *en banc* review if necessary. Bucklew's condition poses a unique and extensive array of challenges to any execution protocol. Not only have none of the Defendants participated in an execution involving a condition like Bucklew's, but there is no evidence to suggest that any execution team in any state that permits the death penalty has executed an inmate with Bucklew's condition. The Eighth Amendment should not be interpreted to require someone with a rare medical condition to show that a feasible and available alternative protocol already exists that will avoid unconstitutional suffering because it is exceedingly unlikely that any protocol already developed would have taken such a rare condition as Bucklew's into consideration. This Court should reach this question as well, even if it remands for further proceedings for either or both of the reasons discussed above, because it will determine who bears the burden to establish a protocol constitutionally suitable for someone with Bucklew's rare condition.

ARGUMENT

I. Standard of Review

An appellate court reviews a grant of summary judgment under Rule 56 *de novo*, "viewing the evidence in the light most favorable to the nonmoving party." *Barkley, Inc. v. Gabriel Bros., Inc.*, 829 F.3d 1030, 1038 (8th Cir. 2016) (quotation marks omitted). This Court should affirm the District Court's judgment only if "the record shows that there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law." *Beverly Hills Foodland, Inc. v. United Food and Commercial Workers Union, Local 655*, 39 F.3d 191, 194 (8th Cir. 1994).

A denial of a Rule 59(e) motion is reviewed for an abuse of discretion. *Anderson v. Family Dollar Stores of Ark., Inc.*, 579 F.3d 858, 861-62 (8th Cir. 2009) (reviewing underlying summary judgment de novo but reviewing Rule 59(e) motion for abuse of discretion). This Court reviews discovery orders for an abuse of discretion. *United States v. White Horse*, 316 F.3d 769, 773 (8th Cir. 2003).

II. This Court Should Vacate The Judgment Because Bucklew Presented Sufficient Evidence That Execution By Nitrogen-Induced Hypoxia Will Substantially Reduce His Risk Of Needless Suffering.

To prevail on his as-applied Eighth Amendment method-of-execution claim, this Circuit requires Bucklew to prove both that Missouri's Execution Procedure (1) places him at a substantial risk of serious harm and needless suffering, and (2)

that there is an available and feasible alternative method of execution that will significantly reduce the risk of serious harm. *See Glossip*, 135 S. Ct. at 2737 (citing *Baze v. Rees*, 553 U.S. 35, 50-52 (2008)); *Zink v. Lombardi*, 783 F.3d 1089, 1103 (8th Cir. 2015); *Bucklew v. Lombardi*, 783 F.3d 1120, 1128 (8th Cir. 2015); *Jones v. Kelly*, 854 F.3d 1009, 1016 (8th Cir. 2017). In light of Bucklew's evidence, the District Court correctly assumed that Bucklew faced a substantial risk of experiencing the sensation of suffocating, hemorrhaging, or choking on his own blood for as long as four minutes. (ADD008-09.) The District Court also concluded that Bucklew presented evidence that his proposed alternative method, nitrogen-induced hypoxia, is both feasible and available. (ADD009.) According to the District Court, Defendants were entitled to summary judgment solely because Bucklew failed to present any evidence that could support a finding that nitrogen-induced hypoxia would substantially reduce his risk of suffering. (ADD010.) The District Court erred for three independent reasons.

First, the District Court concluded that Mr. Bucklew is at equivalent risk of experiencing suffocation for a similar period of time from either execution method because Defendants' expert had testified that, in his opinion, both methods would result in Bucklew quickly becoming unconscious. (ADD011.) But the record clearly supports Bucklew's view that the Execution Procedure poses a substantial risk of him being conscious or semi-conscious for a prolonged period of time, and

thus able to experience the sensation of suffocation and choking on his own blood. Indeed, the District Court itself had earlier in its ruling recognized precisely that. (ADD004-05.) The only evidence regarding nitrogen-induced hypoxia is that Bucklew will quickly lose consciousness and the ability to sense pain and suffocation. (ADD011; APP0362 at 234:12-21.) The disputed evidence of the Execution Procedure requires (at this stage) the assumption that the Execution Procedure will involve a sustained period of consciousness and the ability to sense suffocation. Thus the record can support a reasonable factfinder's judgment that Bucklew's alternative method will substantially reduce his risk of needless suffering.

Second, the District Court equated the two execution methods because the District Court believes Bucklew can remain seated for the bulk of both execution methods. (ADD016.) But there is no evidence to support the view that Bucklew can remain seated during the Execution Procedure. And the evidence is abundant that Bucklew's medical condition imposes upon him substantial risk of a prolonged sensation of suffocation and choking on his own blood while lying supine. (APP1058-67; APP0411-13 at ¶¶VI.G-VI.N; *see also* APP0352 at 101:3-21; APP0356 at 114:17-115:2.)

Third, the District Court erroneously set aside evidence that nitrogen-induced hypoxia is unlikely to cause a sensation of choking. (ADD012; ADD017.)

A. The Evidence Already In The Record Supports Bucklew's Assertion That Nitrogen-Induced Hypoxia Will Result In Bucklew Being Rendered Insensate to Pain More Quickly Than The Execution Procedure.

The District Court determined that Bucklew failed to show that nitrogen-induced hypoxia would more quickly render Bucklew unconscious and insensate to pain than would the Execution Procedure. Not only was the District Court's focus on the length of time it would take for nitrogen-induced hypoxia to cause brain death a red-herring, (*see* ADD010), but in reaching this conclusion, the District Court contradicted its own prior holding.

In the first instance, the District Court accepted, for purposes of summary judgment, that there was sufficient evidence to support Bucklew's contention that he could be awake and sensate to pain, while suffocating and unable to control his airway, for as long as four minutes. (ADD008-09.) That evidence satisfies Bucklew's burden to present a material question of fact that he faces a substantial risk of pain and needless suffering under the Execution Procedure.

When it came time to assess whether Bucklew had met his burden to present a material question of fact that he faces a lesser risk of harm posed by nitrogen-induced hypoxia, the District Court abandoned Bucklew's evidence and its own (proper) assumption that the Execution Procedure could create as much as four minutes of excruciating pain and needless suffering. It is undisputed that the Defendants' own expert, Dr. Antognini, testified that nitrogen-induced hypoxia

would quickly and painlessly induce brain death. (ADD011; APP0362 at 234:12-21, 235:1-11.) The District Court found this evidence inadequate because Dr. Antognini also testified the same was true of the Execution Procedure. (ADD011.) Because Dr. Antognini claimed that both methods would act quickly, the District Court concluded that there was no difference in the duration of suffering that would result from either method. (*Id.*)

However, this conclusion by the District Court demonstrates a failure to construe all evidence in the light most favorable to Bucklew, the non-moving party. With respect to the duration of time Bucklew would suffer under the Execution Procedure, there was a material dispute of fact. Dr. Antognini's opinion that Bucklew would suffer for only 20-30 seconds conflicts with Dr. Zivot's opinion that Bucklew would suffer for 52 seconds to four minutes. (ADD004.) With respect to the duration of time Bucklew would suffer if executed by nitrogen-induced hypoxia, there was no conflict: Dr. Antognini's statement that nitrogen-induced hypoxia would quickly induce brain death is unrebutted. (*Id.*) Thus, the proper evidentiary comparison on summary judgment was between Dr. Antognini's assertion that nitrogen-induced hypoxia would cause brain death "quickly" and Dr. Zivot's assertion that the Execution Procedure would allow for as long as four minutes of excruciating pain and needless suffering. Construing this evidence in the light most favorable to Bucklew, the District Court should

have found that sufficient evidence demonstrated that nitrogen-induced hypoxia would act more quickly to induce full unconsciousness than would the Execution Procedure. For this reason alone, this Court should vacate the summary judgment order.

B. There Is No Support In The Record For the District Court's Assertion That Bucklew Can Be Seated During Any Portion Of The Execution Procedure.

Bucklew produced substantial evidence that when he lies supine, he is at greater risk of experiencing the sensation of suffocation. During the Execution Procedure, that risk is heightened because the effects of the pentobarbital will inhibit his ability to manage his airway in order to prevent choking and suffocating on his blood-filled tumors, specifically his enlarged uvula.

The District Court pushed aside these substantial risks by assuming that Bucklew can be seated after a central line is inserted in the femoral vein in Bucklew's groin region. (ADD016.) This assumption was error, and it taints the District Court's entire decision. A key finding supporting the District Court's ruling equating the risks of suffering during the two execution methods—that Bucklew can be seated during *either* method—is a disputed issue of fact. Indeed, on this record, there is *no* evidence to support the District Court's view. This error independently warrants reversal.

1. There is a triable issue as to whether Bucklew will be forced to lie supine for the duration of the Execution Procedure.

The District Court assumed, for purposes of its ruling, that the Execution Procedure will be administered by accessing the femoral vein. The femoral vein is located in the groin region, thus a central line is necessarily set while the individual is in a supine position. (APP1062; APP0351 at 94:7-13.) The District Court acknowledged that, but then asserted that after the line is inserted, Bucklew could be placed in a seated position. (ADD016.) That conclusion is unsupported by the record.

The District Court ruled against Bucklew despite the absence of any evidence he can be placed in a seated position during the Execution Procedure because the Court put the burden of proof on Bucklew to establish that he could *not* be seated during the Execution Procedure. The District Court stated that "there is no evidence in the Record establishing that . . . Plaintiff must be in a supine position after the IV is inserted." (ADD016.) But it was not Bucklew's burden to affirmatively prove he "must" be in a supine position when Defendants had offered no evidence to support the possibility of Bucklew being seated. *Vermont Teddy Bear Co., Inc. v. 1-800 Beargram Co.*, 373 F.3d 241, 244 (2d Cir. 2004) ("If the evidence submitted in support of the summary judgment motion does not meet the movant's burden of production, then summary judgment must be denied even if no opposing evidentiary matter is presented.") (citation omitted)

It is true that Defendant Dormire testified that he "believed" the "head" of the execution chamber gurney could be repositioned. (APP0293 at 51:17-52:1.) But that is not evidence that Bucklew would be seated after a central line had been inserted through his femoral vein. Not only was Dormire uncertain about the gurney itself (making even the physical possibility of raising the head of the gurney doubtful), but Dormire has no way of knowing whether repositioning someone with a central line inserted is advisable or medically even possible. (*See* APP0289 at 15:15-18.)

Moreover, Bucklew put forth evidence demonstrating that he would be required to lie supine for the duration of the Execution Procedure. The experts dispute whether the pentobarbital injection would have the same effect if Bucklew were in a seated position, even assuming such positioning were possible without dislodging or pinching the central line. (APP1061; APP0385 at 93:16-20; APP0387 at 95:3-11; APP0394.) If pentobarbital does not have the same effect while an inmate is seated upright, (APP385 at 93:16-20; APP0387 at 95:3-11), then Bucklew must necessarily remain in the supine position for the duration of the Execution Procedure. Additionally, Defendants' own witnesses testified that they had never seen an inmate positioned in any way other than supine. (APP0291 at 35:11-16; APP0310 at 29:4-6, 15-17.) A finder of fact could reasonably conclude that Defendants' past practice is an indicator of future performance.

Bucklew has demonstrated a genuine issue of material fact regarding whether he will be required to lie supine for the duration of the Execution Procedure. The District Court's resolution of this dispute was reversible error.

2. There Is Ample Evidence That Bucklew's Suffering Will Substantially Increase During An Execution In The Supine Position.

There can be no doubt that Bucklew's suffering will substantially increase during an execution in which he is forced to remain supine. Ample evidence in the record demonstrates that even under the best circumstances—sleeping in his own bed—Bucklew cannot comfortably or safely recline in a fully supine position. (APP0408 at ¶V.B.1.) Rather, he is forced to prop himself up at an incline using extra pillows while lying on his side so that gravity will pull his uvula to one side of his airway allowing air to pass through the other side while he sleeps. (*Id.*) Defendants argue that because Bucklew was able to lie flat for an MRI in December 2016, there is no reason why he could not lie flat during the execution procedure. (APP0260; APP0359-61.) However, this assumes that there is an apt comparison between a medical MRI procedure and the Execution Procedure. There is not.

First, unlike in the MRI, during the Execution Procedure Bucklew would be forced to lie flat while a medical professional of unknown skill or qualification carves into his upper thigh near his groin in order to visualize the femoral vein to

establish a central line to inject a lethal chemical. *See supra* pp. 7-8, 18. This "cut-down" procedure is both scientifically outdated and highly invasive. *See supra* at 8. Bucklew will be fully conscious at this stage of the Execution Procedure and struggling to breathe as his engorged uvula plugs his airway at the back of his throat. Given the incredibly invasive and mutilating nature of this procedure, it is no surprise that a cut-down is no longer the accepted practice for gaining access to the femoral vein. *See supra* p. 8.; *see also Workman v. Bredensen*, 486 F.3d 896, 925 (6th Cir. 2007) (Judge Cole dissenting) ("As Columbia University anesthesiologist Dr. Mark Heath explains, [the cut-down procedure] is an outdated method of achieving venous access . . . [u]sing the . . . method would defy contemporary medical standards and would be in violation of any modern standard of decency.") Performing such a macabre procedure while Bucklew is fully conscious and anxiously working to manage his obstructed airway would dramatically increase his risk of serious harm and needless suffering and cannot be fairly compared to a routine MRI under the supervision of trained medical professionals responsible for keeping him alive in a hospital setting.

Bucklew produced substantial evidence that he cannot lie in a supine position without gravity causing his blood-filled tumor to shift so as to completely obstruct his airway. *See supra* p. 5, 10. Once the pentobarbital begins to take effect, but before he becomes insensate to pain, Bucklew will lose the physical

ability to intentionally combat the workings of gravity by his own conscious effort. *Supra* p. 5; (APP1063.) As he loses his ability to mechanically open his airway, Bucklew's uvula will fall back into his airway causing Bucklew to reflexively choke and gag on his tumor. *Supra* p. 5; (APP1063.) The violence of Bucklew's reflex reaction to suffocation—choking and gagging—will very likely cause Bucklew's tumor to rupture. *Supra* p. 10.

Ultimately, Bucklew is very likely to hemorrhage and die choking and gagging on his own blood while strapped to a gurney in the execution chamber, an eventuality that the District Court recognized was supported by evidence in the record. (ADD004-05, 08-09.)

C. Evidence Supports Bucklew's Contention that Nitrogen-Induced Hypoxia Would Not Cause Feelings of Suffocation.

Bucklew presented sufficient evidence regarding the lesser risk of harm posed by an execution by nitrogen induced hypoxia to survive summary judgment. First, contrary to the District Court's understanding of Bucklew's claim, Bucklew does not simply contend that nitrogen-induced hypoxia will substantially reduce his risk of harm because it will be faster-acting. Rather, Bucklew also asserts that because he will be able to remain upright, rather than supine, gravity will not cause his grossly enlarged uvula to shift so as to completely obstruct his airway, thereby substantially reducing the risk that he will choke or gag on his blood-filled uvula once he begins to lose the ability to swallow voluntarily. (APP1072, 1099-1100.)

In contrast to Defendants' failure to present any evidence supporting the opposite conclusion, this fact alone is sufficient evidence to render summary judgment on the issue inappropriate.

However, Bucklew also provided evidence that nitrogen-induced hypoxia is generally painless and unlikely to cause feelings of suffocation regardless of Bucklew's unique medical condition. For instance, in a study of high-altitude pilots, participants were asked to report the symptoms they experienced when subjected to non-lethal, but heightened, levels of nitrogen. (APP1072, n. 6; APP0547.) Participants did not report feelings of suffocation, choking, or gagging. (APP0547.) And Defendants' own expert testified that nitrogen-induced hypoxia is generally painless. (APP0362 at 234:12-21, 235:1-11.) Defendants failed to provide any evidence at all that nitrogen-induced hypoxia would be likely to cause Bucklew to experience feeling of suffocation, choking, gagging, or hemorrhage.

In sum, the District Court made several missteps in finding that the record presented no triable issues of fact. The District court did not view the evidence in a light most favorable to Bucklew when it found, as a matter of law, that the two methods would result in the same period of suffocation; the Court ignored evidence that Bucklew would be forced supine during the procedure, which tainted the entire decision; and the Court ignored the evidence suggesting that nitrogen-induced hypoxia would not cause feelings of suffocation. Each of these errors

undermined the District Court's grant of summary judgment—each created a triable issue about whether Bucklew's proposed alternative would substantially reduce his suffering, *and that was the District Court's sole grounds for ruling the way it did*. If this Court agrees on any of these three points, it should reverse.

III. The Judgment Should Be Vacated Because The District Court Denied Bucklew's Requests for Discovery from M2 and M3.

A. The District Court Committed Reversible Error By Concluding that Discovery from the Medical Team was Irrelevant.

When a trial court abuses its discretion in refusing to compel discovery—and that discovery would potentially aid a party in defeating summary judgment—the trial court's summary judgment order must be overturned. *See White Horse*, 316 F.3d at 773 (holding that a trial court's wrongful denial of a motion to compel warrants reversal "on a showing that the error was prejudicial"); *Gov't of Ghana v. ProEnergy Servs., LLC*, 677 F.3d 340, 345 (8th Cir. 2012) (same). Reversal is thus warranted if: (1) evidence about M2 and M3's experience and qualifications was discoverable, and (2) that discovery could have led to evidence aiding Bucklew in his opposition to summary judgment.

1. M2 and M3's experience and qualifications are relevant to establishing Bucklew's risk of harm under Missouri's Execution Procedure and the lesser risk of harm posed by Bucklew's proposed alternative method.

Bucklew was entitled to discovery if it could lead to relevant evidence—evidence that has "any tendency" to make a material fact more or less probable.

FED. R. CIV. P. 26. Although a trial court has some discretion to settle discovery disputes, it may not deny a plaintiff access to relevant evidence without good reason. And "[t]he standard for relevance is low." *United States v. Holmes*, 751 F.3d 846, 851 (8th Cir. 2014); *United States v. Oldrock*, 867 F.3d 934, 940 (8th Cir. 2017); *see also* FED. R. EVID. 401.

It is axiomatic that "before ruling on summary judgment motions, a district judge must afford the parties adequate . . . discovery, in light of the circumstances of the case." *Plott v. Gen. Motors Corp., Packard Elec. Div.*, 71 F.3d 1190, 1195 (6th Cir. 1995); *see Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 n.5 (1986) (stressing importance of allowing ample time for discovery); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322, 326 (1986) (same).

The District Court made several missteps in its discovery determinations here. First, the court turned Rule 26's "extremely low bar" on its head. *Marvin Lumber & Cedar Co. v. Sapa Extrusions, Inc.*, No. 10-3881, 2013 WL 1687700, at *1 (D. Minn. Apr. 18, 2013) . The Court determined that Bucklew had no right to discovery because he had not pled that an alteration of the team or Execution Protocol would reduce his risk of harm and therefore his claims did not "*require*[] consideration of the execution team's qualifications and training." (ADD023 (emphasis added)); ADD022 ("Plaintiff's claim does not *depend* on 'how well qualified' the execution team is") (emphasis added); *see also supra* pp 18-19. But

the right to discovery does not turn on whether evidence is "required" to support a claim—it turns on whether evidence might reasonably "lead" to evidence that has "any tendency" to support a claim. And here, as discussed below, there is no doubt that, even though Bucklew established without discovery that he would experience extreme suffering from the Execution Procedure, the information he was denied would further illuminate the nature and extent of the risks of suffering he faces. The District Court's mistaken belief that the medical technicians' qualifications were discoverable only if strictly "required" to support Bucklew's claim is enough to warrant reversal. *Lauer v. Barnhart*, 321 F.3d 762, 764 (8th Cir. 2003) ("A district court abuses its discretion when it applies an incorrect legal standard.").[7]

Second, and related, the District Court acknowledged that discovery "is appropriate to determine . . . the risk of pain and suffering," but then ignored the overwhelming evidence in the record suggesting that M2 and M3's qualifications, training, and experience *directly impact that risk*. (ADD022); *see supra* at 8-11. For instance, if M3 is incapable of safely performing a cut-down procedure, and the vein either ruptures or the central line comes loose mid-procedure, the results

[7] This Court's instruction that, on remand, discovery should be "narrowly tailored" and 'expeditiously conducted" was no reason for the District Court to deny Bucklew access to information that is essential to establishing the nature and magnitude of the risk of suffering he faces from the Execution protocol. *See Bucklew v. Lombardi*, 783 F.3d at 1128.

would be even more catastrophic than already anticipated. *See supra* p. 7. Not only would Bucklew be lying on his back choking and gagging on his own blood, he would also be conscious while the pentobarbital leaks into his groin region and begins to kill healthy muscle tissue. *Id.* Alternatively, given the proximity of the femoral vein to the femoral artery, if M3 is unskilled, as we must assume he or she is because no discovery was permitted on this issue, M3 may inadvertently inject the drugs into the femoral artery rather than the femoral vein, producing damage to the artery and potential destruction of the surrounding tissue. (*See* APP0346-47 at 77:11-78:8; APP0349-50 at 89:11-91:1.)

The District Court was correct that evidence about the risk of the State's planned method of execution must be discoverable. After all, though Bucklew has established that the current method of execution presents a substantial risk of excruciating pain and needless suffering, he cannot quantify the full extent of that risk without knowing the skills, training, and expertise of M2 and M3. Nor can Bucklew establish the full measure by which his proposed alternative method significantly reduces the risks posed by the current Execution Procedure unless he can first prove precisely the magnitude of the risks posed by the Execution Procedure. *Glossip v. Gross*, 135 S. Ct. 2726, 2737 (2015) (holding that plaintiffs must prove that an alternative means of execution will "in fact significantly

reduce[s] a substantial risk of severe pain" posed by the state's existing execution method); (ADD008 (requiring Bucklew to "quantify the risks" of harm)).

The District Court ignored the fact that M2's and M3's training and experience can have a dramatic impact on the extent to which the Execution Procedure, as applied to Bucklew, will lead to substantial suffering—and thus this evidence can have a substantial impact on *whether an alternative will substantially reduce that severe level of suffering*. *See supra* pp. 9-11 (describing the discretionary authority M2 and M3 have to carry out the Execution Procedure as they see fit). Bucklew's execution will not be like every other execution; indeed, given the rarity of Mr. Bucklew's condition, it may well be like *no* other execution the medical technicians have ever trained for or carried out.

There is evidence that implementing the State's Execution Procedure will be difficult and unusual given Bucklew's severe medical condition. There is evidence that Bucklew will be forced to lie supine, resulting in choking, gagging, hemorrhaging, and ultimately suffocation on his own blood. *See supra* pp. 5, 8, 10. In addition, the District Court acknowledged that the State's Execution Procedure will require the medical team to obtain IV access through the femoral vein by way of an invasive and outdated cut-down procedure. *Supra* pp. 7-9. Yet the District Court denied Bucklew discovery into the training and experience of the medical personnel that would disclose whether the person who will administer

Bucklew's execution knows how or has *any* experience performing a cut down procedure or is aware of special considerations necessary when dealing with a patient suffering from cavernous hemangioma.

The District Court noted that Missouri's Execution Procedure, as applied to Mr. Bucklew, *could* be administered via a cut down procedure. (ADD008.) But the Execution Procedure itself does not contemplate much less *require* use of a cut down procedure. (*See* APP0445; APP0313 at 77:18-24 (noting that he knew that the protocol *could* be altered to permit a cut-down procedure, but he did not know that it *would* be altered since he is not a doctor).) And the District Court denied Mr. Bucklew the discovery necessary to confirm that the procedure *would* actually be used, and that it would be handled competently without imposing needless suffering on Mr. Bucklew. (*see* APP0375 at 72:9-21 (not all anesthesiologists are expert in setting a central line); APP0362 at 237:11-19 (same))

Bucklew's concerns regarding M2's and M3's ability to carry out this admittedly difficult procedure, particularly in light of Bucklew's very rare and several medical condition, are not merely speculative. Evidence in the record establishes that (1) not all medical professionals, nor even all anesthesiologists, are capable of setting a central line, (APP1017-18; APP0362-63 at 237:11-238:14), (2) the use of a cut-down procedure is not the standard of medical practice today, though that is the procedure the State proposes (but will not be required) to use on

Bucklew, *supra* pp. 8, 38, and (3) Bucklew's medical condition is so unusual that none of the deponents have executed an individual with his condition (APP1047 at ¶42; APP0448.) In light of these circumstances, Bucklew has met his burden of establishing that the medical technicians' qualifications and experience could have "any tendency" to increase his risk of suffering. Indeed, it is beyond question that discovery into these qualifications and experience could well establish that the State's personnel are incapable of administering the procedure Defendants agreed is required and the District Court assumed will occur. For this reason alone, this Court should vacate the summary judgment ruling and remand the case to the District Court to allow discovery.

2. M2 and M3's Testimony is Relevant Because Defendants' own witnesses testified that the medical technicians' discretionary decisions will dictate what measures will be performed during an execution to accommodate Bucklew's serious medical condition.

Without discovery, Bucklew cannot even know what procedures his execution will entail. Defendants' testimony makes clear that the medical team has discretion to make all decisions during the execution regarding unexpected contingencies, including an inmate choking or hemorrhaging on the gurney. *See supra* pp. 9-11. As discussed above, without discovering evidence from them about how they will deal with his unique medical condition, Bucklew cannot fully

develop relevant evidence about the likely length and nature of suffering he will likely experience during the Execution Procedure.

The District Court granted summary judgment because it concluded that the medical technicians could reposition the gurney and place Bucklew in a seated position after inserting the line in the femoral vein. (*see* ADD007-08; ADD016.) But that conclusion is based on guesswork. Defendant Dormire testified that he "believe[s]" the "head" of the gurney could be adjusted, but he was not certain. (APP1061; APP0293 at 51:17-52:1.) Nobody could competently testify as to what the technicians would actually do, even assuming the gurney can be repositioned. The discovery Bucklew sought would provide insight into the accuracy of the speculation that forms the basis of the District Court's improper judgment.

Similarly, Bucklew's proposed discovery would cast essential light on what training and experience and judgment regarding a cut down procedure and Bucklew's rare medical condition M2 or M3 possess. *See supra* pp. 16-20. This evidence, too, will provide critical details about the method of execution Bucklew is actually facing, and what risks it entails. There can be no serious dispute that Bucklew's request for discovery from M2 and M3 met the "quite minimal" discovery standard. *United States v. Holmes*, 413 F.3d 770,773 (8th Cir. 2005).

3. The District Court's mistake was likely prejudicial, warranting reversal.

A district court's wrongful denial of discovery warrants reversal if potential evidence could have created a triable issue of fact. *Wilson v. Weisner*, 43 F. App'x 982, 987 (7th Cir. 2002) (failure to grant motion to compel reversible error because discovery could have produced key evidence non-movant needed to survive a motion for summary judgment); *see also Dobbins v. Craycraft*, 423 F. App'x 550, 552 (6th Cir. 2011) ("A non-movant who loses at the summary judgment stage can challenge the dismissal as premature if the district court did not afford him an opportunity to present facts essential to justify [his] opposition.") (quotation marks omitted). Because the District Court improperly denied Bucklew's requests to depose M2 and M3, this Court must, for purposes of this appeal, assume that a deposition of M2 or M3 would yield evidence favorable to Bucklew regarding the uncertainties described above, *supra* pp. 16-20, 43-48, and resolve all justifiable inferences in Bucklew's favor.

As previously discussed, the District Court's sole basis for granting summary judgment against Bucklew is that he has not shown that an alternative method will significantly decrease the risk of suffering posed by the existing method of execution. *See supra* pp. 20-23. But to reach that conclusion, the District Court assumed that the medical technicians will use, and be competent to

perform, a cut down procedure to insert a central line in his femoral artery, (*see* ADD007-08), and that Bucklew could be positioned upright during the Execution Procedure. (ADD016.) The risks posed by such a procedure provided the baseline against which the District Court compared the risk posed by Bucklew's alternative proposal. (*Id.*) Given Bucklew's rare medical condition, if those assumptions do not hold, he faces even more substantial risks than those assumed by the District Court. *See e.g., supra* p. 7. As noted above, the whole point of the discovery Bucklew sought was to determine whether those assumptions reasonably do hold, especially in light of the evidence already in the record that raises doubts about those assumptions. This Court should vacate the judgment and remand with an order that Bucklew be granted the discovery that will potentially aid him in proving his claim.

B. The District Court's Discovery Decision Also Violated Bucklew's Due Process Right to Access Material Evidence.

When a district court wrongly bars a plaintiff from accessing *material* evidence—evidence that could mean the difference between winning and losing a claim—that may be not only reversible error, but also a violation of that party's fundamental right to due process. To determine whether a party's due process rights have been violated, courts balance "the importance of the evidence . . . against the interests the state has in excluding the evidence." *Richmond v. Embry*, 122 F.3d 866, 872 (10th Cir. 1997). This balancing is born of *Mathews v.*

Eldridge, 424 U.S. 319, 333 (1976), which "dictates that the process due in any given instance is determined by weighing 'the private interest that will be affected by the official action' against the Government's asserted interest, 'including the function involved' and the burdens the Government would face in providing greater process." *Hamdi v. Rumsfeld*, 542 U.S. 507, 529 (2004) (quoting *Mathews*, 424 U.S. at 335).

Bucklew's interest in this evidence is more than compelling. It would be difficult to overstate the interest a plaintiff has in avoiding cruel and unusual punishment—needless suffering—at the hands of the State. And the State's interest is minimal.

Defendants suggest that M2 and M3's anonymity is at stake. (APP0237-38.) That is not so. M2 and M3 have been deposed in prior litigation, by means of telephonic deposition, thereby preserving the secrecy of their identities. Furthermore, as has been done in prior litigation, the entirety of the deposition transcripts could be placed under seal, thereby limiting the dissemination of potentially identifying background information and qualifications to the parties to this lawsuit. Indeed, the District Court has demonstrated the efficacy of placing deposition transcripts under seal by refusing to permit Bucklew's Appointed Counsel, Cheryl Pilate, to share the contents of M2 and M3's prior depositions with Bucklew's Pro Bono Counsel at Sidley Austin, despite the fact that the

contents of those transcripts are known to Appointed Counsel, the District Court Judge, Bucklew, and the State. There is no reason to doubt that a proper protective order can protect M2 and M3's identities from disclosure.

IV. Bucklew Should Not Be Required To Prove The Existence Of An Alternative Method That Will Substantially Reduce His Risk of Harm As Part Of His As-Applied Challenge

Bucklew recognizes that this Court has previously concluded that those challenging a method of execution as applied to them must present a feasible alternative method of execution that substantially reduces their risk of suffering. *Zink*, 783 F.3d at 1103; *Bucklew*, 783 F.3d at 1128-29; *Jones*, 854 F.3d at 1016. Nonetheless, to preserve this issue in the event that this Court wishes to reconsider its prior rulings (and Bucklew welcomes immediate *en banc* review to do so), and to preserve the issue for further review, Bucklew maintains his view that he should not be required to provide an alternative method of execution because he is raising an as-applied challenge.

Bucklew's medical condition is rare. *See supra* pp. 4-5. As discussed at length above, his condition poses a unique and extensive array of challenges to any execution protocol. His rare condition may mean that there is no execution protocol capable of satisfying the Eighth Amendment's prohibition against cruel and unusual punishment.

In this case, the risks of a bloody, prolonged execution are very high. Bucklew's medical condition makes it very likely that while he is lying supine on the execution chamber gurney, he will begin to choke and gag on his enlarged uvula. *See supra* p. 10. The trauma that this will cause to the friable tissue of Bucklew's blood-filled tumors will likely cause the tissue to tear, resulting in hemorrhaging in Bucklew's mouth and throat. These hemorrhages will fill Bucklew's airway with blood, causing him to choke and gag, feeling as though he is suffocating on his own blood. *See supra* p. 10. Not only have none of the Defendants participated in an execution involving a condition like Mr. Bucklew's, (APP1047), but there is no evidence to suggest that any execution team in any state that permits the death penalty has executed an inmate with Bucklew's condition. This is unsurprising given the low incidence, less than 1%, of cavernous hemangioma in the general public. *Supra* p. 4. And it would be up to the discretion, skills, and expertise of M2 and M3 to decide at a moment's notice in the execution chamber how best to deal with an inmate who is lying on the gurney struggling to breathe while gagging on his own blood. *Supra* pp. 9-11. Under these circumstances, given the rarity and severity of Bucklew's medical condition, the potentially catastrophic and bloody results of an unsuccessful attempt to execute Bucklew, and the lack of any specialized preparation, guidance, or training for the medical members of the execution team, it is more than plausible that

Bucklew is an example of an individual who is simply too sick and anomalous to execute in a constitutional manner.

It is true that the Supreme Court has observed that because the Constitution permits execution, it must permit a method of execution. *Glossip*, 135 S. Ct. at 2733 (quotations and internal citations omitted). Bucklew does not challenge that general proposition. Rather, he challenges the very different proposition that this Court has implicitly held: that because the Constitution permits the death penalty, it must permit a method of execution *for every person*. That is not the law. The Supreme Court has held that certain individuals cannot be executed for mental health or other reasons. *Ford v. Wainwright*, 477 U.S. 399, 410 (1986) ("The Eighth Amendment prohibits the State from inflicting the penalty of death upon a prisoner who is insane"); *Moore v. Texas*, 137 S. Ct. 1039, 1048 (2017) (holding that individuals with certain mental deficiencies cannot be constitutionally executed); *Hall v. Florida*, 134 S.Ct. 1986, 1992 (2014) ("[P]ersons with intellectual disability may not be executed."); *Roper v. Simmons*, 543 U.S. 551, 575 (2005) ("[T]he death penalty cannot be imposed upon juvenile offenders."). That is, even though the Constitution permits the death penalty, the Eighth Amendment does not permit the execution of *some* people based on their mental health or capacity.

There is no reason to treat physical health or capacity differently from mental health. *Some* people may have medical conditions that make it impossible to execute them consistent with Eighth Amendment standards. At a minimum, *some* people may have medical conditions that make it impossible to execute them according to already developed protocols that could satisfy the "feasible and readily available" standard the law currently requires. *Baze*, 553 U.S. at 63 (quotation marks omitted). Such people should not be made to suffer a cruel and unusual execution because of a medical condition beyond their control and because no execution protocol developed to date has needed to or tried to take their rare medical conditions into account.

This is not to deny that it might be possible for Missouri to develop a protocol that would satisfy Eighth Amendment standards for someone, like Bucklew, suffering from a severe and unusual form of cavernous hemangioma. If the State wishes to try to develop such a protocol, Bucklew and a court can evaluate it just like any other. But the law should not be made to require Bucklew to develop an execution protocol that will satisfy the Eighth Amendment.

Indeed, if the Eighth Amendment were interpreted to require Bucklew to develop a new execution protocol suitable for his medical condition, then it would be imposing upon him an impossible task. To present a new method would require Bucklew to obtain expert testimony from medical professionals familiar with his

condition. But medical professionals' ethical obligations prohibit designing protocols for execution.[8] The District Court noted this difficulty in its Order, citing Dr. Zivot's unwillingness to testify as to the comparative effects of nitrogen-induced hypoxia. (ADD010; APP0404 at ¶II.B.) The Supreme Court has recognized that an inmate cannot meet his burden of proving an available alternative method of execution exists by suggesting methods that ethical rules foreclose. *Baze*, 553 U.S. at 59-60. Bucklew now asks this Court to apply the logical corollary to this holding: the State should not be allowed to defeat an inmate's claim by "foisting on the inmate the burden to offer evidence those same ethical rules preclude him from obtaining." *Arthur v. Dunn*, Case No. 16-602, 2016 WL 6577255, *5 (Nov. 3, 2016) (Br. of Amici).

Bucklew has not asked any court to declare that Missouri's Execution Procedure is unlawful in general. Missouri's Execution Procedure will remain in place and potentially applicable to other inmates under sentence of death whether Bucklew's claim succeeds or fails. Therefore, nothing in Bucklew's claim runs contrary to either *Glossip* or *Baze*, even if his as-applied claim succeeds without

[8] *AMA Principles of Medical Ethics,* Title 9.7.3 "Capital Punishment" (Chicago: American Medical Association, 2016), 124, *available at* https://www.ama-assn.org/sites/default/files/media-browser/code-of-medical-ethics-chapter-9.pdf ("However, as a member of a profession dedicated to preserving life when there is hope of doing so, a physician must not participate in a legally authorized execution.").

proof that an alternative method of execution would substantially reduce his suffering. He simply seeks what the Eighth Amendment guarantees him and all others: that he be free from cruel and unusual punishment.

CONCLUSION

For the foregoing reasons, Bucklew respectfully request that this Court vacate the District Court's order granting summary judgment in favor of Defendants, and remand for further proceedings including limited discovery in the form of depositions of M2 and M3, and an evidentiary hearing, as well as an order indicating that he need not prove the existence of a feasible and readily available alternative method of execution that will substantially reduce his suffering.

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CERTIFICATE OF COMPLIANCE WITH FEDERAL RULE OF APPELLATE PROCEDURE 32(a) AND LOCAL RULE 28A(h)(2)

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Dated: November 30, 2017

/s/ Raechel J. Bimmerle
Raechel J. Bimmerle

Counsel for Appellant/Bucklew
Russell Bucklew

CERTIFICATE OF SERVICE

I hereby certify that on November 30, 2017, I caused the forgoing Brief for Appellant Russell Bucklew to be filed electronically with the Clerk of the Court for the United States Court of Appeals for the Eighth Circuit by using the CM/ECF system. I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the CM/ECF system.

/s/ *Raechel J. Bimmerle*
Raechel J. Bimmerle

U.S. DISTRICT COURT

Western District of Missouri (Kansas City)

CIVIL DOCKET FOR CASE #: 4-14-cv-08000-BP

RUSSELL BUCKLEW,

Plaintiff,

vs.

GEORGE LOMBARDI, et al.,

Defendants.

DEPOSITION OF MATTHEW BRIESACHER

Taken on behalf of the Plaintiff

January 25, 2017

not use lethal injection?
A. I know there are states that have options for lethal injection or some other method as an option. I'm not aware of any state that lethal injection is not at least an option.
Q. What other options are available at the states that you've looked into?
A. I want to say one of the states still has a firing squad, I think one state still technically on the books has the electric chair as an option. I think one state may technically still have hanging as an option but may have come out and said they won't use it. But now I'm really stretching my memory.
Q. Sure. I believe you mentioned lethal gas as one of the options?
A. I'm not aware --
Q. Sorry, maybe you didn't mention lethal gas.
Are you aware of any other states that use lethal gas as a means of execution?
A. I'm not aware of any state that has adopted lethal gas as a current method of execution.
Q. Are you aware of states that have it

where it's legally allowed as a means of execution?
A. I think there are states that have statutes that would allow it but I'm not aware of any state that has a protocol to use it. Missouri being an example of that.
Q. So is Missouri legally allowed to use lethal gas?
A. The statute in Missouri says that the director can pick a protocol that's either lethal injection or lethal gas.
Q. Does Missouri have a lethal gas protocol?
A. No. Not that I'm aware of.
Q. When you were asked to draft or revise the lethal injection protocol, were you asked to either draft or revise a lethal gas protocol?
A. I was specifically told lethal injection.
Q. Just want to make sure that you're answering the question I'm asking. Were you also asked to look into either drafting or revising a lethal gas protocol?
A. No one asked me to do that.
Q. Have you ever drafted a lethal gas

protocol?
A. No, I have not.
Q. Are you aware of anyone else who was asked to draft a lethal gas protocol?
A. Not at Missouri.
Q. You're aware of someone outside the state of Missouri who was asked to draft a lethal gas protocol?
A. I know there were two states who were asked to research that subject. I don't know if they drafted protocols or not.
Q. Do you know what states those were?
A. Louisiana and Oklahoma.
Q. Do you know why those states drafted a lethal gas protocol?
A. As I said I don't know that they drafted protocol.
Q. I'm sorry. I apologize. Thank you for clarifying.
Do you know why they looked into drafting a lethal gas protocol?
A. I don't recall specifically. I think it was either the direction of a governor or legislature.
Q. Are you aware of anybody in the

Department of Corrections or otherwise works for the state of Missouri currently or formerly who has undertaken any efforts to draft a lethal gas protocol?
A. To my knowledge nobody in the Department of Corrections has taken efforts to draft a lethal gas protocol.
Q. What about outside the Department of Corrections?
A. Not that I'm aware of. And I guess to be clear, I'm not aware of the department asking anybody to do that.
Q. Have you ever spoken to legislators about adopting lethal gas?
A. I have not.
Q. Do you know if any individuals in the Department of Corrections have spoken to legislators about adopting lethal gas?
A. Not that I recall.
Q. Does Missouri have a gas chamber?
A. Not a functioning one.
Q. Can you be a little bit -- so when you say not a functioning one, what do you mean by that?
A. The old Missouri state penitentiary

had a gas chamber and Missouri used to use lethal gas. I believe the state still technically owns the property and I'm not sure if that property's been leased to the city of Jefferson or not but I know the old chamber which is no longer functioning is part of a tour of the old Missouri state penitentiary.

Q. Is the old Missouri state penitentiary a museum now?

A. Yes.

Q. So the old gas chamber is part of the tour of the museum?

A. I believe so.

Q. Do you know how much it would cost to conduct an execution by gas?

A. No.

Q. Do you know how much it costs to conduct an execution by lethal injection?

A. No.

Q. Do you know if anyone's undertaken any studies to determine the costs to conduct an execution by either gas or lethal injection?

A. I don't know that anybody's done a study but I know the department could calculate what they pay for an execution by lethal injection.

Q. Could the department also calculate how much it costs to do an execution by gas?

A. No.

Q. Why couldn't the department do that?

A. There are too many unknown variables about what an execution by gas would entail so it would be impossible to figure that cost out.

Q. Has the department ever tried to figure that out?

A. Not to my knowledge.

Q. And what variables are you referring to when you say there would be too many variables?

A. Well, without protocol we wouldn't know even basic things, like the cost of the gas, the cost of equipment to administer the gas, the cost of whatever facility would be necessary to construct or modify to conduct the execution there. We wouldn't know the number of staff members needed to conduct the execution and then based on where that execution occurred the number of staff members necessary for safety of the -- and security of the location. And those are just off the top of my head. There may be others.

Q. Sure. But to your knowledge has the Department of Corrections, let's take Missouri in

general, ever looked into answering those questions?

A. Not to my knowledge.

Q. Do you know if it's possible that you would not need an actual gas chamber or facility but execution by gas could be conducted using a gas mask?

A. I'm not sure. I don't have the expertise to tell you whether or not an actual chamber is needed or if it would be sufficient to do it by mask.

Q. Do you have the expertise to determine how to execute someone by lethal injection?

A. Personally, no.

Q. How did you develop the expertise or at least the appropriate level of skills to draft the protocol, or to revise the protocol for the lethal injection?

MS. COULTER: I'm going to object to any questions regarding the development of the current protocol. It is prohibited by the discovery order.

MR. FOGEL: I think it's relevant because at this moment we're probing the

feasibility of using lethal gas and the witness has testified that he does not have the expertise or did not have the expertise when he was in the position at the Department of Corrections to be able to answer those types of questions. Yet if the witness can still develop a protocol on lethal injection, I think it's fair to probe why he has the certain set of skills to do it for one means of execution but not the other.

MS. COULTER: I think you can ask about what skills he may have -- I understand where you're going but I think you can go head and limit it to asking him what skills he has that allowed him to participate in the drafting but I don't think you can get into how -- who he may have consulted with in forming the policy. If that makes any sense.

MR. FOGEL: So let me ask a question this way and then you let me know if it's permissible or not.

MS. COULTER: Okay.

Q. (BY MR. FOGEL) Did you have at the time that you were asked to revise the lethal injection execution protocol, did you already have sufficient knowledge to revise the protocol at that

point in time?
A. At the time I was asked, no, I did not.
Q. Did you develop knowledge or we'll even say sufficient expertise in order to be qualified to revise the lethal injection open protocol?
A. After I was asked to revise the protocol I developed the knowledge I believed was necessary to present the draft that I presented.
Q. Have you ever attempted to acquire similar knowledge in order to develop a lethal gas protocol?
A. I have thought about it but I have not undertaken the kind of efforts that I did for the lethal injection protocol.
Q. What did you think about when, as you just said, what were you thinking about?
A. As I mentioned before Missouri statute allows lethal injection and lethal gas, so I did a little bit of research so that I could become familiar with what that could mean or could entail. I read a few articles that were available theorizing how an execution by lethal gas would be both feasible and legal. And then at that point I

kind of hit a wall. Those articles were more theoretical and I didn't know where to go from there on how to draft a protocol and since it was more just having a working knowledge of what that would be, I didn't really dig deeper.
Q. Was this approximately in 2013?
A. It would have been over the course of time, between 2013 and 2000 -- while I was general counsel.
Q. And was this, the review of these articles, or would it be fair to say, is it okay if I call it research, would that accurately describe?
A. Yes, I'm okay with that.
Q. So did you undertake this research relating to lethal gas in connection with your responsibilities of revising the execution protocol for lethal injection?
A. I'm not sure I can agree with that. I felt as the general counsel it was my responsibility to be at least familiar with the legal methods of execution. You know, I mentioned I did that for lethal gas because it was in the Missouri statute but I also researched other methods in other states, that's how I know that firing squad is legal in one state. So I wanted a

working knowledge so as general counsel if I was asked what are other states doing I could somewhat answer that question or very quickly know the resources that I could go to to answer those questions.
Q. You mentioned that you quote, hit a wall when you were researching lethal gas. Can you expand on what you mean by that?
A. There are a number of factors to write a protocol that I -- the research available was not sufficient to answer to me and given the difference between lethal gas, you know, the articles I read were transitioning from, for lack of a better word, poison gases that were used historically to more inert gases. You know, I read articles that proposed various gases but I didn't even know what kind of expert I would need to go to to tell me which inert gas would work more effectively or less effectively.
Delivery methods, there wasn't really any discussion on the research that I found about as we talked about before. Would you need an actual chamber or would some kind of face mask or gas mask be sufficient. If it was, what were the requirements of that.

I knew that because we were doing this on -- in a workplace, there would be OSHA guidelines. So I tried to look, if you're using some kind of toxic or hazardous gas material, what the requirements for venting the rooms and those kind of things. And execution by lethal gas falls outside the -- I'm sorry, I shouldn't be sarcastic, but execution, this kind of situation didn't seem to comply with the regulations, or be contemplated by the regulations of OSHA, so I didn't know who would I go to about that.
I wouldn't know the quantity or the concentration of the gas. Again, the articles were theoretical and I wouldn't know what kind of expert to go to or what kind of person to go to to answer those questions. You know, which gas is better. If I use a gas, what quantity or quality I would need to use. How long it would take and then the safety of the environment around it. How to best administrate and then also to protect for the individuals who are witnessing the execution.
Q. So you did not know the answers to those questions?
A. I didn't know the answer to those questions and I didn't know how to go to find

answers to those questions.
Q. So it's fair to say you did not consult anyone else in trying to determine the answers to those questions?
A. I talked generally. We have a health and safety unit and I mentioned the OSHA regulations. I generally talked to them, you know, where would be the guidance on, if you were introducing a lethal gas into the workplace about ventilation and things, so they directed me there. But like I said, I wouldn't know who to talk to. It didn't seem to fall in any specific expertise.
Q. And because you couldn't find somebody with that specific expertise to answer those questions those questions generally remained unanswered?
A. I had not been directed to do anything more than that. Like I said, it was just me thinking personally so that I could be prepared, so. I mean to be candid, no, I didn't go out and try to find answers to those questions.
Q. Did you report -- I don't want to say findings, because it sounds like you didn't necessarily make any findings, but did you report that you had undertaken this research and had these

questions to the director of the Department of Corrections?
A. No, I didn't. I didn't provide any specific detailed report on my information to the director.
Q. Did you provide any update on your research to any of your other supervisors?
A. No. Nobody had asked me to do that research. I had taken it upon myself.
Q. And aside from that research that you just discussed, have you undertaken any -- did you undertake any other efforts to evaluate the feasibility of using lethal gas in the state of Missouri?
A. I don't recall anything other than what I have just discussed.
Q. Am I correct that you were undertaking this work when you were general counsel of the Department of Corrections?
A. That's correct.
Q. And in 2014 you were no longer the general counsel, is that right?
A. 2000 -- yes, that's correct.
Q. Did you share any of this information with the individual who succeeded you?

A. Yes, I think we discussed generally lethal gas. I'm not sure the level of detail but it would have been some detail.
Q. Why did you discuss lethal gas with your successor?
A. He was taking my role and I felt that the general counsel for the Department of Corrections should have some knowledge especially of a method that was listed in the statute, so I kind of explained to him what I had done and the walls that I had hit.
Q. What else did you and -- who is the individual that followed you as the general counsel?
A. Richard Williams.
Q. What else did you and Mr. Williams discuss regarding lethal gas?
A. That would have been it. It would not have been a -- well, I take -- I don't recall when this lawsuit was filed so there may have been a discussion that Mr. Bucklew was alleging or requesting lethal gas. That would have been the only other conversation.
Q. So you discussed it in connection with your conversations with Mr. Williams relating

to Mr. Bucklew's lawsuit?
A. To the litigation.
Q. And it was -- because it was your understanding that Mr. Bucklew was alleging that lethal injection would pose a significant harm to his health in violation of his 8th Amendment rights, is that correct?
A. That is my understanding of his allegations.
Q. Okay. And did you have that conversation with Mr. Williams because you were considering whether lethal gas was a viable alternative?
A. No.
Q. Is that because you just did not know whether lethal gas could be a viable alternative?
A. No. That conversation was about the litigation, that it had been filed, you know, a review of the litigation.
Q. After you became deputy general counsel did you do any other investigation or research relating to lethal gas?
A. I may have read some articles about, I mentioned those two states, and again timelines are difficult, but those two states doing reports