APPENDIX A

NOTICE: NOT FOR OFFICIAL PUBLICATION. UNDER ARIZONA RULE OF THE SUPREME COURT 111(c), THIS DECISION IS NOT PRECEDENTIAL AND MAY BE CITED ONLY AS AUTHORIZED BY RULE.

IN THE
ARIZONA COURT OF APPEALS
DIVISION ONE

STATE OF ARIZONA, *Respondent,*

v.

CHENE MANLEY, *Petitioner.*

No. 1 CA-CR 15-0741 PRPC
FILED 10-26-2017

Petition for Review from the
Superior Court in Maricopa County
No. CR1996-012553
The Honorable Jose S. Padilla, Judge

REVIEW GRANTED; RELIEF DENIED

COUNSEL

Maricopa County Attorney's Office, Phoenix
By Diane Meloche
Counsel for Respondent

The Ferragut Law Firm PC, Phoenix
By Ulises A. Ferragut, Jr.
Counsel for Petitioner

MEMORANDUM DECISION

Chief Judge Samuel A. Thumma delivered the decision of the court in which Presiding Judge Peter B. Swann and Judge Maria Elena Cruz joined.

THUMMA, Chief Judge:

¶ **1** Petitioner Chene Manley seeks review of the superior court's order denying her petition for post-conviction relief, filed pursuant to Arizona Rule of Criminal Procedure 32.1 (2017).[1] Absent an abuse of discretion or error of law, this court will not disturb a superior court's ruling on a petition for post-conviction relief. *State v. Gutierrez*, 229 Ariz. 573, 577 ¶ 19 (2012). Because Manley has shown no such error, this court grants review but denies relief.

¶ **2** In March 1999, a jury found Manley guilty of first degree murder, a Class 1 felony and a dangerous offense; second degree burglary, a Class 3 felony; Kidnapping, a Class 2 felony; and theft, a Class 4 felony, each committed in November 1996. The superior court imposed concurrent prison sentences, the longest being

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[1] Absent material revisions after the relevant dates, statutes and rules cited refer to the current version unless otherwise indicated.

natural life for the murder conviction. On direct appeal, this court affirmed the convictions and sentences.

¶ **3** In March 2001, days after the mandate on her direct appeal issued, Manley timely filed a notice of post-conviction relief. The superior court then appointed counsel for Manley and, after searching the record, counsel found no tenable issue to submit to the court. Manley was then allowed to proceed as a self-represented litigant and given a deadline to file her own petition. When she failed to file a petition by the deadline, the superior court summarily dismissed her notice of post-conviction relief. In 2004, this court denied Manley's petition for review.

¶ **4** In 2015, Manley filed another notice of post-conviction relief, raising claims of newly discovered evidence and a significant change in the law, and requested that counsel be appointed. *See* Ariz. R. Crim. P. 32.1(e), (g). The court denied Manley's request for court-appointed counsel, summarily dismissed the notice and Manley's timely petition for review with this court followed.

¶ **5** Manley's newly discovered evidence claim was based on her congenital neurological condition, Chiari Malformation, that was diagnosed in 2014. According to her 2015 notice of post-conviction relief, Manley suffered from the condition's symptoms, including "emotional and impulse-control problems," at the time she committed the offenses and at trial. "[P]resent[ing] the court with evidence for the first time does not mean that such evidence is 'newly discovered.'" *State v.*

Mata, 185 Ariz. 319, 333 (1996). "Newly-discovered material facts alleged as grounds for postconviction relief are facts which come to light after the trial *and which could not have been discovered and produced at trial through reasonable diligence.*" *State v. Dogan*, 150 Ariz. 595, 600 (App. 1986) (emphasis added). A petitioner's medical condition diagnosed after a conviction may qualify as newly discovered evidence for Rule 32 purposes if the condition existed at the time of the offense but was not diagnosable because the condition was not medically recognized at the time of trial. *State v. Bilke*, 162 Ariz. 51, 53-54 (1989).

¶ **6** Although Manley asserted in her notice that she suffered from the medical condition at the time of the offenses, she did not allege that the condition was not discoverable earlier. Stated differently, Manley failed to assert that Chiari Malformation was not a recognized medical condition at the time of her 1999 trial and sentencing. Instead, Manley claimed she "could not bring this matter to the attention of the Court before [she filed the 2015 notice] because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections." Moreover, in the 2015 notice, Manley admits that she "is not . . . at this point[] able to provide the Court with all the facts and research how and why her Chiari Malformation constitutes newly discovered material facts under the law." This admission further evidences the failure of the 2015 notice to satisfy the requirement that, despite due diligence,

Manley was unable to procure a diagnosis of Chiari Malformation before she was tried and sentenced. *See State v. Turner*, 92 Ariz. 214, 221 (1962) (noting, in considering a newly-discovered evidence argument on a motion for new trial, that the defendant "must show by affidavit or testimony in court, that due diligence was used to ascertain and produce the evidence in time for use at his trial. He must account for his failure to produce the evidence by stating explicitly the details of his efforts to ascertain and procure it."). Consequently, the superior court properly dismissed Manley's newly discovered evidence claim. *See* Ariz. R. Crim. P. 32.2(b) ("If the specific exception and meritorious reasons do not appear substantiating the claim and indicating why the claim was not stated in the previous petition or in a timely manner, the notice shall be summarily dismissed.").

¶ **7** The superior court also properly dismissed Manley's claim that a significant change in the law probably would have affected her sentences. Manley summarily asserted that her medical condition "necessary[ily] implicat[es] . . . the prohibition on cruel and unusual punishment," citing *Miller v. Alabama*, 567 U.S. 460 (2012) and *Graham v. Florida*, 560 U.S. 48 (2010). Manley provided no analysis of those cases or application of them in support of her claim for relief. Moreover, both *Miller* and *Graham* addressed constitutional limits on sentencing juvenile offenders. *Alabama*, 567 U.S. at 479; *Graham*, 560 U.S. at 75. Manley was 18 years old at the time of the offenses;

accordingly, because she was not a juvenile, *Miller* and *Graham* are inapposite.

¶ **8** Manley's petition for review argues she "is entitled to present the Superior Court with arguments supporting post conviction relief on the basis of truly significant new developments in medical research on the wide ranging effects of the condition she had from birth." The superior court proceedings that are the subject of this review provided Manley with just such an opportunity. Moreover, Manley did not argue in superior court that advances in medical research constituted newly discovered evidence and a petition for review may not present issues not first presented to the trial court. *State v. Bortz*, 169 Ariz. 575, 577-78 (App. 1991); Ariz. R. Crim. P. 32.9(c)(1)(ii). Finally, although claiming a right to court-appointed counsel for her 2015 notice, Manley does not provide any authority supporting that claim. *See* Ariz. R. Crim. P. 32.9(c)(1)(ii) & (iv).

¶ **9** For these reasons, this court grants review but denies relief.

[SEAL]

AMY M. WOOD • Clerk of the Court
FILED: AA

APPENDIX B

CHENE DEVONNE MANLEY # 144981
Arizona Department of Corrections
Perryville Complex, Santa Cruz Unit
P.O. Box 3200
Goodyear, Arizona 85395

In Propria Persona

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

IN AND FOR THE COUNTY OF MARICOPA

STATE OF ARIZONA,	**CR1996-012553**
Plaintiff,	**NOTICE OF POST CONVICTION RELIEF**
-vs-	
CHENE DEVONNE MANLEY,	(Filed May 11, 2015)
Defendant.	

1. Defendant's name and prison number (if any):

   Chene Devonne Manley # 144981

2. Defendant's address:

   ASPC-Perryville, Santa Cruz Unit
   P.O. Box 3200
   Goodyear, Arizona 85395

3. A) Defendant was convicted of the following crimes:[1]

Count 1 Burglary, 2nd Degree, Class 3 felony, ND/NR
Count 2 Kidnapping, Class 2 felony, D/NR
Count 3 Murder, First Degree, Class 1 felony, D/NR
Count 5 Theft, Class 4 felony, ND/NR

B) Defendant was sentenced on **03/19/1998**, to **a Natural Life sentence on Count 3, with other sentences running concurrently (7 years on Count 1; 21 years on Count 2; and 2 years on Count 4)**, commencing on **03/19/1998**, following a:

Trial by: ☒ Jury ☐ Judge without a Jury

Plea of: ☐ Guilty ☐ No Contest

Probation Revocation: ☐ Admission ☐ Violation Hearing in the Superior Court of **Maricopa** County with the Honorable Judge **Peter T. DeAngelo** presiding.

4. Defendant has taken the following actions to secure relief from his convictions or sentences:

A) Direct Appeal ☒ Yes ☐ No
B) Previous Rule 32 Proceedings: ☒ Yes ☐ No

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[1] There was a direct verdict of not guilty for Count 4, Aggravated Robbery.

5. Defendant was represented by the following lawyers at: (provide name of counsel and counsel's address, if known)

Trial or change of plea:	**Dan Patterson & Bruce Peterson**
Sentencing hearing:	**Dan Patterson**
Appeal (if any):	**James Kemp**
Previous Rule 32 Proceedings:	**James Kemp**

6. Defendant is presently represented by a lawyer: ☐ Yes ☒ No (if yes, provide name and address).

   If no, does the defendant request the court to appoint a lawyer for this proceeding? ☒ Yes ☐ No

7. Respond to this section only if this is an untimely notice or the defendant has filed a previous Rule 32 petition in this case.

   A) Is a claim pursuant to Rule 32.1(d), (e), (f), (g) or (h) being raised in this petition? ☒ Yes ☐ No

   B) If yes, state the specific exception:

   a. The defendant is being held in custody after the sentence imposed has expired.

   ☒ **b.** ***"Newly discovered material facts probably exist and such facts probably would have changed the verdict or sentence."*** **Rule 32.1(e), Ariz.R.Crim.P.**

   c. The defendant's failure to file a timely notice of post-conviction relief or notice of appeal was without fault on the defendant's part.

   ☒ **d.** ***"There has been a significant change in the law that if determined to apply to defendant's case would probably***

overturn the defendant's conviction or sentence." **Rule 32.1(g), Ariz.R.Crim.P.**

e. Facts exist which establish by clear and convincing evidence that the defendant is actually innocent.

C) State the facts that support the claim and the reasons for not raising the claim in the previous petition or in a timely manner.

NEWLY DISCOVERED MATERIAL FACTS

Petitioner suffered from a congenital condition which progressively affects all aspects of her life, including physically, psychologically, emotionally, and rationally, and this condition existed at the time of the offense, at the time of trial, at the time of sentence, at the time of direct appeal, and at the time of prior post conviction relief action. Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections (ADC). The condition is called Chiari Malformation, and was discovered when Petitioner was sent by the ADC medical services provider for an MRI, as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions.

Essentially, Petitioner's condition consists of extreme and progressive pressure on the brain as a result of her cranium being too

small; and the brain's ability to function normally is severely impaired by the pressure. As a consequence, Petitioner suffers from a host of medical problems such as uncontrollable high blood pressure, wildly erratic swings in endocrine gland function, thyroid problems, excessive weight gain and all its associated problems, psychological problems, emotional and impulse-control problems, and an inability to rationally direct and react to the stresses of ordinary life, let alone highly-stressful circumstances including incarceration.

Petitioner is currently scheduled for decompression neurosurgery to partially relieve the pressure, which hopefully will contribute to resolving some of the numerous physical and medical conditions she currently is being treated for; and the surgery also hopefully will allow her to partially regain mental, psychological, and emotional balance in her life.

As mentioned, the condition is called Chiari Malformation, and was discovered when Petitioner was sent for an MRI as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions. With the assistance of her family, Petitioner has initiated research into Chiari Malformation, its causes, effects, and treatment, not only for the purpose of presenting the information to the Court as newly discovered material evidence, but also for the purpose of understanding her own behavior

from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life.

Petitioner has attached to this Notice of Post Conviction Relief certain documents from her ADC medical records and items discussing the effects of Chiari Malformation. *See* Attachments 1-6 (listed below):

Attachment 1, Portions of ADC Medical Records (7 pages);

Attachment 2, *Chiara Malformation,* Mayfield Clinic (the Mayfield Clinic is a U.S. treatment and research center specializing in chiara malformation) (5 pages);

Attachment 3, *Tas-Specific and General Cognitive Effects in Chiari Malformation Type I,* Allen PA, Houston JR, Pollock JW, Buzzelli C, Li X, *et al.* (2014) PloS ONE 9(4); e94884. Doi:10.1371 /journal.pone. 0094844 (www.plone.org) (11 pages) (open-access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited) (11 pages);

Attachment 4, Article referencing published case study, *i.e., Chiari Causes Psychotic Episode*, May 31, 2007 (1 page);

Attachment 5, *Psychotic and Major Neurocognitive Disorder Secondary to Arnold-Chiari Type II Malformation,* Psychiatria Danubina, 2014: Vol 26, No. 3, pp. 291-293, Department of Consultation-Liaison Psychiatry, University Hospital Zurich, Zurich, Switzerland (3 pages); and

Attachment 6, *Cognitive Impairment and Psychopathology in Patients with Pituitary diseases,* Netherlands Journal of Medicine (6 pages).

Petitioner is not, however, at this point, able to provide the Court with all the facts and research that demonstrates how and why her Chiari Malformation constitutes newly discovered material facts under the law. Petitioner thus requires appointment of counsel to assist her in meeting her burden under the Arizona Rules of Criminal Procedure. Petitioner asserts that she is entitled to appointment of counsel for this purpose under the Due Process Clause of the Fourteenth Amendment to the United States Constitution and under Art. II, Sec. 4 of the Constitution of the State of Arizona. Petitioner believes that she has made a substantial showing of entitlement under Rule 32.1(e), Rule 32.2(b), and under Rule 32.4(c)(2) (second sentence).

Petitioner respectfully requests the Court accept her untimely Notice of Post Conviction Relief asserting a claim of newly

discovered material evidence; and to appoint counsel for the purpose of assisting her in presenting in detail to the Court the full scope of the effect of this condition that previously was unknown to her or her family.

SIGNIFICANT CHANGE IN THE LAW

Petitioner also asserts a claim for post conviction relief pursuant to a significant change in the law, as a corollary to Petitioner's claim of newly discovered material facts arising from discovery of her congenital condition of chiari malformation. Petitioner asserts this claim based upon the necessary implications of her congenital chiari malformation for purposes of the prohibition on cruel and unusual punishment contained in the Eighth Amendment to the United States Constitution and in Art. II, Sec. 15 of the Constitution of the State of Arizona.[2]

Petitioner asserts that the recent decisions of the United States Supreme Court in *Miller v. Alabama*, ___ U.S. ___, 132 S.Ct. 2455 (2012 and *Graham v. Florida*, 560 U.S. 48, 130

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[2] In addition, Petitioner contends that the particulars of this case present a [sic] "*compelling reasons*" to interpret **Art. II, § 15** of the **Arizona Constitution** as prohibiting cruel and unusual punishment differently from the federal constitution's **Eighth Amendment**, thus calling for independent evaluation of Petitioner's state constitutional claim apart from the Court's evaluation of her federal constitutional claim. *See* ***State v. Davis***, 206 Ariz. 377, ¶ 12, 79 P.3d 64, 67-68 (2003).

S.Ct. 2011 (2010) call for this Court to take into account the implications of Petitioner's chiari malformation for purposes of the sentencing determination in this case. These implication [sic] **can be fully and adequately articulated to the Court within the context *of Miller* and *Gregg* only with the assistance of appointed counsel.**

The cruel and unusual punishment prohibition embodied in the Eighth Amendment and in Art. II, Sec. 15 of the Constitution of the State of Arizona *(see* footnote 2, *supra)*, is not confined merely to barbarous methods that were generally outlawed in the eighteenth century, but rather is to be interpreted in a flexible and dynamic manner, *see Gregg*, 428 U.S., at 171, 96 S. Ct., at 2924 (1976), and the prohibition must draw its meaning from the evolving standards of decency which mark the progress of a maturing society, *see id.*, 428 U.S., at 173, 96 S. Ct., at 2925.

I AM REQUESTING POST-CONVICTION RELIEF. I UNDERSTAND THAT I MUST INCLUDE IN MY PETITION EVERY GROUND FOR RELIEF WHICH IS KNOWN AND WHICH HAS NOT BEEN RAISED AND DECIDED PREVIOUSLY. I ALSO UNDERSTAND THAT FAILURE TO RAISE ANY KNOWN GROUND FOR RELIEF IN MY PETITION WILL PROHIBIT ME FROM RAISING IT AT ANY FUTURE DATE.

Date 5/7/15 Defendant /s/ Chene D. Manley
CHENE DEVONNE MANLEY

STATEMENT OF FILING AND SERVICE

Original and/or Copies of the foregoing Notice of Post Conviction Relief filed/served as noted below, this 7 day of May, 2015:

Michael K. Jeanes, Clerk, Maricopa County Superior Court, 201 West Jefferson Street, Phoenix, AZ 85003 (**Original,** along with two additional copies for conforming and return to Petitioner in the enclosed pre-addressed envelope, first class postage affixed; and

Honorable Bruce Cohen, Rule 32 Management Unit, Maricopa County Superior Court, 201 West Jefferson Street, Phoenix, AZ 85003 (One Copy).

by: /s/ Chene D. Manley
CHENE DEVONNE MANLEY

ATTACHMENT 1

Patient: MANLEY, CHENE D.

A NOTES: None

Chronic Care Clinic Assessment

Has the MPL been updated? ☐ Y ☐ N

Rev. #:526

P APPT SCHEDULED: Provider – Follow Up Care
WITH: Unknown, Unknown ON: 01/21/2015
AT: 05:15:00 AM
Consultation Request: Off-site Clinic

Service Type: Priority: Routine
NOTES: None

Chronic Care Clinic Plan

Management goals for this patient (justification needed if you deviate from protocol):

Change meds: ☐ N ☐ Y (see orders)

Rev. #:526

E NOTES: None

Chronic Care Clinic Patient Education

Education (correctional adaptation):
☐ Diet/Nutrition ☐ Smoking ☐ Med Info
☐ Exercise

PIFs to patient:

Rev #: 526

H/S MH Status: Previously received MH services
STAFF: Rodriguez, Rumaldo

ADC #: 144981 Inmate Name: MANLEY, CHENE D.
ENCOUNTER DATE: 11/06/2014 TIME: 03:10:02 PM DURATION: minutes TYPE: Provider – Chronic Care LOCATION: ASPC-PV SANTA CRUZ [B03] SETTING: Clinic

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S NOTES: chronic care visit . . . IM has new diagnosis of Chiari malformation (per MRI report 10/3/14) that needs evaluation

Chronic Care Clinic Subjective

History:

Risk factors: Obesity: ☐ Y ☐ N
Alcohol: ☐ Y ☐ N Family history of heart disease: ☐ Y ☐ N

Smoker: ☐ Rare/None ☐ Current ☐ Former

Amount/Length: ☐ Less than 10 pk yrs
☐ 10-20 pk yrs ☐ More than 20 pk yrs

Diseases: CAD: ☐ Y ☐ N ☐ PVD: ☐ Y ☐ N
CVA: ☐ Y ☐ N ☐ CRD: ☐ Y ☐ N
Hx DKA: ☐ Y ☐ N ☐ N/A Other:

Last eye exam date: **Retinopathy**: ☐ Y ☐ N
Problems with vision: ☐ Y ☐ N

Pulmonary: Age of onset:
Frequency of inhaler use:

Last attack:

Prior hospitalization for asthma: ☐ Y ☐ N

History of intubation: ☐ Y ☐ N

Prior corticosteroids: ☐ Y ☐ N

Aggravating factors for asthma:
☐ Change in season ☐ Pollen ☐ Exercise
☐ Dust ☐ Cold ☐ Other:

Night time awakenings with asthma within the last 30 days:

Seizures: Type: ☐ Generalized Tonic Clonic (Grand Mal) ☐ Complex(partial)
☐ Absence(Petit Mal)

Approximate date of first seizure:

Date of last seizure:

Frequency:

Seizure related to: ☐ Alcohol ☐ Drug use
☐ Head injury ☐ Other:

Infectious diseases:

Infectious disease Hx: History of men having sex with men: ☐ Y ☐ N
Needle sharing: ☐ Y ☐ N

Injectable drug use: ☐ Y ☐ N
Blood Transfusion before 1990: ☐ Y ☐ N

Alcohol Abuse: ☐ Y ☐ N
Nasal drug use: ☐ Y ☐ N Cough: ☐ Y ☐ N

Night sweats: ☐ Y ☐ N Fever: ☐ Y ☐ N
Headaches: ☐ Y ☐ N

Dysphagia/Odynophagia: ☐ Y ☐ N
Diarrhea: ☐ Y ☐ N Neurologic Change: ☐ Y ☐ N

Visual Disturbance: ☐ Y ☐ N
PPD Conversion: ☐ Y ☐ N

Incomplete previous TB Rx: ☐ Y ☐ N
Recent exposure to Active TB: ☐ Y ☐ N
Recent weight loss/cachexia: ☐ N ☐ Y

Other complaints: ☐ N ☐ Y:

O NOTES: None

Chronic Care Clinic Objective

HEENT: Nystagmus (SZ): ☐ N ☐ Y
GingivalHyperplasia (SZ): ☐ N ☐ Y
Ataxia: ☐ N ☐ Y

Eyes: Conjunctiva pale: ☐ N ☐ Y
Sclera icteric: ☐ N ☐ Y

Neck: Carotid bruit (Optional less than 50/ Required greater than 50): ☐ Y ☐ N
Thyroid NL: ☐ Y ☐ N
Cervical lymph nodes NL: ☐ Y ☐ N

Heart: Regular Rhythm: ☐ Y ☐ N
Murmur Present: ☐ Y ☐ N
Gallop: ☐ Y ☐ N

Lungs: Wheezing: ☐ Y ☐ N Rales: ☐ Y ☐ N
Rhonchi: ☐ Y ☐ N Other:

Abdomen: Tenderness: ☐ Y ☐ N
Mass: ☐ Y ☐ N
Hepatomegaly: ☐ Y ☐ N
Bowel Sounds: ☐ Y ☐ N
Soft: ☐ Y ☐ N
Splenomegaly: ☐ Y ☐ N

Ext: Pedal pulse palpable: ☐ Y ☐ N
Peripheral edema: ☐ Y ☐ N
Foot exam unremarkable: ☐ Y ☐ N

Neuro: Motor deficits: ☐ Y ☐ N

Sensory deficits ☐ Y ☐ N

Monofilament testing: ☐ Y ☐ N ☐ NA

Skin:

Spine:

Additional findings/description of fundi if visualized:

Studies: ☐ Ordered at this visit ☐ Review of previously completed with patient

Annual Lab/Immunizations: ☐ LFT ☐ TSH ☐ Flu ☐ Pneumo (5 years)

A RELATED PROBLEM: Other Diagnosis: Other Diagnosis Cardiac dysrhythmia NOS [427.9]

Other Diagnosis: Other Diagnosis Compression of brain [348.4]

Other Diagnosis: Other Diagnosis Heartburn [787.1]

DIAGNOSIS: 348.4 – Compression of brain
427.9 – Cardiac dysrhythmia NOS
787.1 – Heartburn

NOTES:

1. Chiari malformation – MRI done 10/3/2014; needs evaluation and grading; IM is symptomatic with eye and visual problems, headache, dizzyness and LOC per IM
2. HTN – BP well controlled
3. Tachyarrythmia – stable at this time
4. obesity

Chronic Care Clinic Assessment

Has the MPL been updated? ☐ Y ☐ N

Rev. #:526

P DRUG PRESCRIPTION: Famotidine/20 MG
VERBAL BY: Reres, Jeffrey
EFFECTIVE DT: 11/06/2014 RT: PO DOSE: 1
STRENGTH: 20 MG METHOD: Unit Dose
FREQ: BID FOR: 30 DAYS EXPIRATION
DATE: 05/05/2015 REFILLS: 5 STATUS: Order Accepted at Pharmacy Vendor (SC)

NOTES:

1. reviewed meds and allergies
2. reviewed labs and vitals
3. reviewed recent imaging studies
4. Recommend neurology consult to evaluate Chiari malformation and recommend treatment course
5. add famatidine 20mg BID

Chronic Care Clinic Plan

Management goals for this patient (Justification needed if you deviate from protocol):
Change meds: ☐ N ☐ Y (see orders)

Rev. #:526

E NOTES: None

Chronic Care Clinic Patient Education

Education (correctional adaptation):
☐ Diet/Nutrition ☐ Smoking ☐ Med Info
☐ Exercise
PIFs to patient:

Rev. #:526

H/S MH Status: Previously received MH services
STAFF: Reres, Jeffrey
ADC #: 144981 Inmate Name: MANLEY, CHENE D.

ENCOUNTER DATE: 11/06/2014 TIME: 02:18:39 PM DURATION: minutes TYPE: Provider Review
LOCATION: ASPC-PV SANTA CRUZ [B03]
SETTING: Clinic

S NOTES: Spoke with Dr. Heller by phone, opthalmologist on phone and described what I saw on my exam and let him know about MRI findings. His impression was that there is nothing to be done about abberant EOM movements that I described.

Chronic Care Clinic Subjective

History:
Risk factors: Obesity: ☐ Y ☐ N Alcohol: ☐ Y ☐ N Family history of heart disease: ☐ Y ☐ N
Smoker: ☐ Rare/None ☐ Current ☐ Former
Amount/Length: ☐ Less than 10 pk yrs ☐ 10-20 pk yrs ☐ More than 20 pk yrs

Diseases: CAD: ☐ Y ☐ N ☐ PVD: ☐ Y ☐ N

CVA: ☐ Y ☐ N ☐ CRD: ☐ Y ☐ N

Hx DKA: ☐ Y ☐ N ☐ N/A Other:

Last eye exam date: **Retinopathy**: ☐ Y ☐ N
Problems with vision: ☐ Y ☐ N

Pulmonary: Age of onset:
Frequency of inhaler use:

Last attack:

Prior hospitalization for asthma: ☐ Y ☐ N

History of intubation: ☐ Y ☐ N

Prior corticosteroids: ☐ Y ☐ N

Aggravating factors for asthma:
☐ Change in season ☐ Pollen ☐ Exercise
☐ Dust ☐ Cold ☐ Other:

Night time awakenings with asthma within the last 30 days:

Seizures: Type: ☐ Generalized Tonic Clonic (Grand Mal) ☐ Complex(partial)
☐ Absence(Petit Mal)

Approximate date of first seizure:

Date of last seizure:

Frequency:

Seizure related to: ☐ Alcohol ☐ Drug use
☐ Head injury ☐ Other:

Infectious diseases:

Infectious disease Hx: History of men having sex with men: ☐ Y ☐ N
Needle sharing: ☐ Y ☐ N

Injectable drug use: ☐ Y ☐ N
Blood Transfusion before 1990: ☐ Y ☐ N

Alcohol Abuse: ☐ Y ☐ N
Nasal drug use: ☐ Y ☐ N Cough: ☐ Y ☐ N

Night sweats: ☐ Y ☐ N Fever: ☐ Y ☐ N
Headaches: ☐ Y ☐ N

Dysphagia/Odynophagia: ☐ Y ☐ N
Diarrhea: ☐ Y ☐ N Neurologic Change: ☐ Y ☐ N

Visual Disturbance: ☐ Y ☐ N
PPD Conversion: ☐ Y ☐ N

Incomplete previous TB Rx: ☐ Y ☐ N
Recent exposure to Active TB: ☐ Y ☐ N
Recent weight loss/cachexia: ☐ N ☐ Y

Other complaints: ☐ N ☐ Y:

ATTACHMENT 2

MAYFIELD CLINIC *for Brain & Spine*

Chiari I malformation

Overview

Chiari I malformation is a condition in which the bony space enclosing the lower part of the brain is smaller than normal. Crowding causes the cerebeller tonsils to push through the skull and down into the spinal canal. The herniated tonsils block the normal flow of cerebrospinal fluid (CSF). Instead of moving in an easy, pulsating movement through this opening, the fluid begins to force its way through—like a water hammer—pushing the tonsils down even farther and exerting pressure on the brainstem and spinal cord. Symptoms may not appear until late childhood or adulthood, causing severe headache, neck pain, dizziness, numbness in the hands, and sleep problems.

Treatment options depend on the type of malformation and severity of symptoms. If symptoms are mild, regular monitoring and medications can be effective. If symptoms are severe or worsening, surgery may be recommended to remove a part of the skull bone and create space for the cerebellum and brainstem.

Of the several types of Chiari malformations, Chiari I is the most common and affects both children and adults. Chiari II occurs with the birth defect myelomeningocele. Chiari types III and IV are rare but severe herniations that affect infants.

For more indepth information about Chiari and syringomyelia treatments, visit our Chiari Center.

Anatomy of Chiari & CSF system

Cerebrospinal fluid (CSF) is a clear, watery substance that flows within and around the brain and spinal cord to help cushion it from injury. This fluid is produced inside the ventricles by the choroid plexus and is constantly being absorbed and replenished. The CSF flows through the ventricles and out into the space between the brain and skull (subarachnoid space) and down into the spinal canal (Fig. 1). As the heart beats, CSF flows into the brain. This is normally balanced by CSF then flowing from the brain into the spinal compartment. In a Chiari malformation, this balanced flow is disrupted. The obstructed CSF begins to force its way like a water hammer through the foramen magnum. Pushing the tonsils down even farther, it exerts pressure on the brainstem. The increasing pressure compromises normal functions of the brain and/or spinal cord and a myriad of symptoms occur. Excess CSF can collect and enlarge either the ventricles in the brain (hydrocephalus), or form a cyst in the spinal cord (syringomyelia).

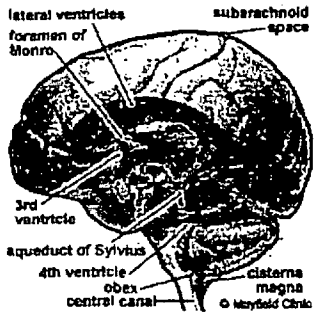

Figure 1. Cerebrospinal fluid (CSF) circulates through the ventricles inside the brain to the subarachnoid spaces surrounding the brain and spinal cord.

The cerebellum is located under the brain in the posterior fossa. Its function is to coordinate muscle movements, maintain posture, and balance. The cerebellum is also involved in cognitive functions (e.g., attention, language), memory, and learning. In people with Chiari, the cerebellar tonsils are stretched as they push through the foramen magnum.

What is a Chiari I malformation?

The condition begins with the underdevelopment of the fetal skull forming during pregnancy. During childhood, the brain continues to grow and the skull hardens. However, the small size or shape of the Chiari skull is mismatched to the size of the brain. Thus, a crowding of the brainstem, cerebellum, and tonsils occurs. Crowding pushes the tonsils out of the skull through the opening (foramen magnum) where the spinal cord exits (Fig. 2). Herniation of the cerebellar

tonsils can extend several millimeters below the foramen magnum. The tonsils put pressure on the brainstem and spinal cord, block CSF flow, and result in the Chiari signs and symptoms. Sometimes a fluid-filled cyst (syrinx) develops within the spinal cord.

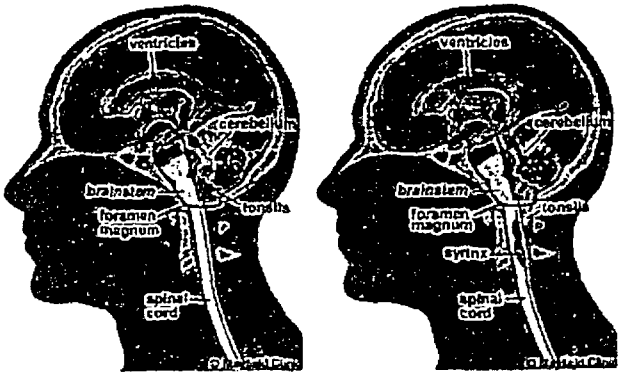

Figure 2. Normal anatomy of the cerebellum (left). Chiari I malformation (right). With the size of the posterior fossa too small, the cerebellar tonsils may herniate through the skull into the spinal canal. The tonsils block the flow of CSF (blue) and may cause fluid buildup inside the spinal cord, called a syrinx.

Syringomyelia, hydrocephalus, and other complications. When cerebrospinal fluid (CSF) flow is obstructed and collects within the spinal canal, it can eventually form a syrinx. This condition, called syringomyelia, damages the spinal cord. The compressed nerve fibers inside the cord cause a wide variety of symptoms. Problems affect the arms or legs, or affect feeling, strength, or balance. Syringomyelia affects about 65% of patients with Chiari I malformation[1].

In some cases, the CSF collects within the ventricles of the brain (hydrocephalus); this condition may require placement of a shunt to divert this excess fluid. Bony abnormalities, which affect about 25% of patients, can include basilar invagination, scoliosis, and cranial cervical instability.

What are the symptoms?

Chiari I symptoms vary from person to person and are not necessarily related to the size of tonsillar herniation. Some people with large herniations have no symptoms (asymptomatic). Yet others with small herniations have severe symptoms. When symptoms are present, they are often vague or nonspecific. As a result, the diagnosis of Chiari is often delayed until more severe symptoms occur or after current symptoms persist for some time. Symptoms are caused by disruption of the CSF flow and compression of nervous tissues.

Because the brainstem is responsible for most body functions, Chiari causes all kinds of strange symptoms. People may experience symptoms that range from headache to irritable bowel. The five most common symptoms are:

1. Pressure-like headaches at the back of the skull that worsen with physical strain or coughing; often with neck pain
2. Hoarseness or swallowing problems
3. Sleep apnea

4. Weakness or numbness in an extremity
5. Balance problems

People with Chiari I often develop symptoms during their teen or early adult years. The disorder is also seen in young children and older adults. In some cases, a head or neck injury from a car accident or sports injury triggers the onset of symptoms.

Table 1. Common symptoms of Chiari I and syringomyelia.

Chiari I	Syringomyelia
Pressure-like headaches at back of skull	Headaches (due to Chiari malformation)
Headaches worsen with coughing, sneezing	Loss of sensitivity, especially to hot and cold
Neck and shoulder pain	Muscle weakness and spasticity
Ringing or buzzing in the ear (tinnitus)	Numbness in hands and feet
Dizziness, vertigo	Pain in neck, arms and back
Trouble walking (gait), imbalance	Loss of bowel and bladder control
Difficulty swallowing, gagging	Scoliosis
Facial pain, numbness, or tingling	

Hoarseness, change in voice	
Snoring / sleep apnea	
Fatigue / insomnia	
Problems with memory / concentration	
Nervousness / anxiety / depression	
Trouble speaking, word finding	
Blurred or double vision	
Jerking eye movements (nystagmus)	
Difficulty tracking or following objects	
Irregular heart beat	
Black out spells / syncope	

Patients with Chiari I malformations often develop symptoms during their teen or early adult years. Less often, the disorder is seen in young children and older adults. In some cases, trauma triggers the onset of symptoms.

The symptoms are complex, progressing over time. Because of this complexity, the condition is often misdiagnosed. At times, Chiari I malformation is mistaken for fibromyalgia, migraine headaches, sinus disease,

multiple sclerosis, and other complex disorders of the nervous system. Some patients have waited for years before an accurate diagnosis is made. Accurate diagnosis and plan of treatment is important before the patient's nervous system suffers permanent injury.

What are the causes?

Bony abnormalities occur during embryonic development in patients affected by Chiari. In Chiari I, the posterior fossa may be smaller than normal. If too small, the effects can be crowding of the brainstem and cerebellum, as well as herniation of the tonsils through the foramen magnum.

Ehlers-Danlos syndrome (EDS) is a connective tissue disorder that may increase the incidence and severity of Chiari. EDS causes joint hypermobility and loose/unstable joints.

Scoliosis is a curvature of the spine. There is a high rate of scoliosis associated with Chiari and syringomyelia, especially in children.

Who is affected?

Chiari I is seen on MRI scans in people of all ages. Its incidence was earlier estimated to affect 1 in every 1,000 births. Now with increasing use of diagnostic imaging, Chiari may be far more common. Patients typically seek medical attention in their 20s and 30s. Three times more women than men are affected. Genetic studies show that Chiari may cluster in some families.

How is a diagnosis made?

The complex symptoms of Chiari I malformation can mimic other diseases—often leading to misdiagnosis and delay in treatment. At times, Chiari I is mistaken for fibromyalgia, chronic fatigue syndrome, migraine, multiple sclerosis, mental disorder, depression, sinus disease, trigeminal neuralgia, or other neurologic disorders.

There is no specific test to confirm Chiari. Rather, a diagnosis is made by assessment of the patient's symptoms, neurological exam, and MRI findings (i.e., tonsillar herniation, bone deformity, CSF blockage, syrinx). A complete medical history and physical exam can determine if your symptoms are related to Chiari or another problem.

A neurological exam detects problems with cranial nerves such as gag reflex, facial numbness, hoarseness, double vision, tremors, and vision problems. You may be asked to see an eye (ophthalmologist) or ear (otolaryngologist) specialist, or to undergo a sleep evaluation. Your doctor will order one or more imaging studies to confirm the diagnosis. These include:

Your doctor will order one or more imaging studies to confirm the diagnosis. These include:

> Magnetic resonance imaging (MRI) scan is a noninvasive test used to evaluate the brain, spinal cord, and surrounding CSF. MRI can identify the extent of cerebellar herniation (Fig. 3). The herniation may reach to the level of the first two vertebra (C1 or C2) of the

cervical spine. Herniation of the tonsils is often measured in millimeters (mm) below the foramen magnum. The classic definition of Chiari I is herniation greater than 5mm below the foramen magnum. However, the size of herniation seen on MRI does not closely correlate with symptoms. Someone without herniation may have severe symptoms while another with 20-mm herniation may have no symptoms. MRI of the spine can detect abnormal accumulations of CSF within the spinal cord (Fig 4). This fluid-filled cavity (syrinx) is surrounded by stretched tissues of the spinal cord.

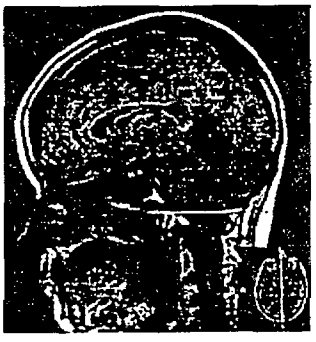

Figure 3. An MRI of the brain shows the cerebellar tonsils (arrow) herniating through the foramen magnum (yellow line).

Figure 4. An MRI of the neck shows a collection of CSF in the spinal cord (yellow arrows) called a syrinx.

Cine MRI is a special MRI study used to observe cerebrospinal fluid (CSF) flow. With each heartbeat, CSF is forced out of the ventricle of the brain, into the cisterna magna, and down the spinal canal. When the heart relaxes, the CSF flow reverses. The movie-like cine MRI captures the fluid movement (Fig. 5). The test can determine if, and by how much, a Chiari is blocking the back-and-forth flow of CSF between the brain and spine.

[Movie Omitted]

Figure 5. A cine MRI movie shows the flow of CSF fluid (white) is blocked by the herniated tonsils in the foramen magnum.

Computed tomography (CT) scan is used to view the bony skull base and spinal column. It can detect thickened bone or previous trauma.

X-rays of the neck may be taken in flexion and extension to view the bony vertebrae. These images can help your doctor identify any instability at the craniocervical area.

What treatments are available?

Treatment options vary depending on the severity of symptoms, the extent of tonsil herniation, and the presence of other conditions such as syringomyelia.

Observation (watch and wait)

Monitoring by regular check-ups and periodic MRI scans may be recommended for those with mild or no symptoms. Headache can be relieved with anti-inflammatory or pain-relieving drugs. Minimize neck strain in daily activities and while sleeping; use a good pillow. Avoid injury or manipulation of the neck as it can make the herniation worse or aggravate the spinal cord. Patients should closely monitor their symptoms. If symptoms worsen or if new ones develop, consult with a neurosurgeon who is a Chiari expert.

Surgery

Surgery is advised for those with moderate to severe symptoms or with a syrinx. The goals of surgery are to

stop or control the progression of symptoms caused by herniation of the cerebellar tonsils, and relieve compression of the brainstem. The surgery takes about 2 to 3 hours. Recovery in the hospital usually lasts 2 to 4 days. During posterior fossa decompression surgery, removal of bone (craniectomy) at the back of the skull and spine widens the foramen magnum. The surgeon opens the dura overlying the tonsils and sews a dura patch to expand the space, similar to letting out the waistband on a pair of pants (Fig. 5). After surgery, symptoms related to the blockage of CSF should decease as flow normalizes.

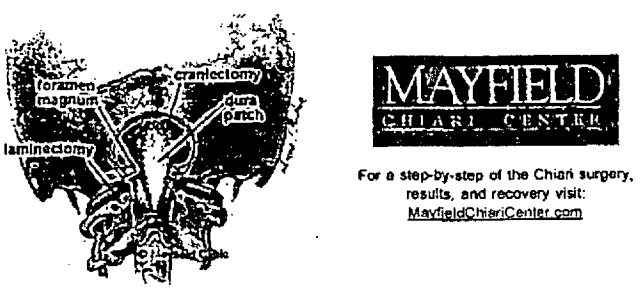

Figure 6. Posterior fossa

Figure 6. Posterior fossa decompression surgery removes bone and creates more space for the brainstem and cerebellum. The dura is opened and a patch is sewn to enlarge the CSF pace.

Clinical trials

Clinical trials are research studies in which new treatments—drugs, diagnostics, procedures, and other therapies—are tested in people to see if they are safe and effective. Research is always being conducted to

improve the standard of medical care. Information about current clinical trials, including eligibility, protocol, and locations, are found on the Web. Studies can be sponsored by the National Institutes of Health (see clinicaltrials.gov) as well as private industry and pharmaceutical companies (see www.centerwatch.com).

Sources & links

If you have questions, please contact the Mayfield Chiari Center at 800-325-7787 or 513-221-1100.

Links

American Syringomyelia Alliance Project

Conquer Chiari

Sources

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Glossary

cerebrospinal fluid (CSF): a clear fluid produced by the choroid plexus in the ventricles of the brain. CSF

bathes the brain and spinal cord, giving them support and buoyancy to protect from injury.

craniectomy: surgical removal of a portion of the skull.

dura mater: the outer protective covering of the brain.

hydrocephalus: an abnormal build-up of cerebrospinal fluid usually caused by a blockage of the ventricular system of the brain. Increased intracranial pressure can compress and damage brain tissue.

syringomyelia: a chronic progressive disease of the spinal cord caused by an obstruction of normal cerebrospinal fluid (CSF) flow that redirects the fluid into the spinal cord to form a syrinx.

syrinx: a cavity filled with cerebrospinal fluid (CSF) that expands and elongates over time, destroying the center of the spinal cord.

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updated > 2.2013

reviewed by > John M. Tew, MD and Nancy McMahon, RN, Mayfield Clinic/University of Cincinnati Department of Neurosurgery, Ohio.

ATTACHMENT 3

Task-Specific and General Cognitive Effects in Chiari Malformation Type I

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Abstract

Objective: Our objective was to use episodic memory and executive function tests to determine whether or not Chiari Malformation Type I (CM) patients experience cognitive dysfunction.

Background: CM is a neurological syndrome in which the cerebellum descends into the cervical spine causing neural compression, severe headaches, neck pain, and number of other physical symptoms. While primarily a disorder of the cervico-medullary junction, both clinicians and researchers have suspected deficits in higher-level cognitive function.

Design and Methods: We tested 24 CM patients who had undergone decompression neurosurgery and 24 age- and education-matched controls on measures of immediate and delayed episodic memory, as well as three measures of executive function.

Results: The CM group showed performance decrements relative to the controls in response inhibition (Stroop interference), working memory computational speed (Ospan), and processing speed (automated digit symbol substitution task), but group differences in recall did not reach statistical significance. After statistical control for depression and anxiety scores, the group effects for working memory and processing speed were eliminated, but not for response inhibition. This response inhibition difference was not due to overall general slowing for the CM group, either, because when controls' data were transformed using the linear function fit to all of the reaction time tasks, the interaction with group remained statistically significant. Furthermore, there was a multivariate group effect for all of the response time measures and immediate and delayed recall after statistical control of depression and anxiety scores.

Conclusion: These results suggest that CM patients with decompression surgery exhibit cognitive dysfunction compared to age- and education-matched controls. While some of these results may be related to anxiety and depression (likely proxies for chronic pain), response inhibition effects, in particular, as well as a general cognitive deficit persisted even after control for anxiety and decompression.

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Introduction

Chiari Malformation Type I (CM), affecting approximately 300,000 individuals in the USA, is approximately as common as multiple sclerosis (MS).[1,2] CM is a clinical syndrome in which the cerebellar tonsils are displaced/descend by 5 mm or greater caudal to the foramen magnum [3,4] (Figure 1). Even though neuroimaging technologies have led to the improvement of anatomical diagnoses, little is known about the incidence of cognitive symptoms, if any, associated with this syndrome.

While headache and neck pain are the most common symptoms in CM [5], CM patients also may show motoric and cognitive symptoms [3,6], although studies using precise tests of these potential cognitive deficits are uncommon. Cognitive deficits in CM may result from direct injury of cerebellar [7–12] or brainstem [13] systems, or from less direct effects based on anxiety and depression which are commonly seen in CM patients with chronic pain [14–19]. In the present study, anxiety and depression were also measured and used as covariates. Note that this argument does require certain assumptions. For example, general pain as an illness is more prevalent than anxiety and

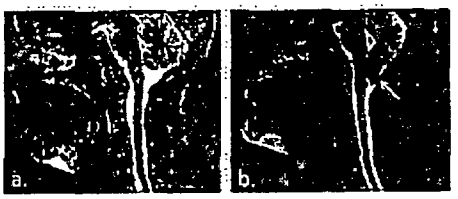

Figure 1. T2-weighted mid-sagittal MRI scan of (a) a healthy subject (b) and Chiari Type I malformation patient with arrow indicating location of tonsiliar herniation through the foramen magnum and an asterisk indicating the medullary (brainstem) compression.
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depression taken together, although some, but not all, patients with pain end up developing anxiety/depression. However, if we can show that anxiety and depression are significantly correlated with pain in CM patients, then it seems reasonable to use this as a starting place for separating pain-related and other predictors of potential cognitive deficits in CM. However, if group differences (CM vs. controls) in cognition persist after depression and anxiety are covaried out, then other causes of observed cognitive deficit(s) will need to be considered.

We hypothesize that CM patients will show executive dysfunction and episodic memory deficits relative to age- and education-matched controls. However, because both fiber-tract damage and chronic pain models of cognitive dysfunction involve similar brain areas (the cerebellum and the prefrontal cortex), it is difficult to separate fiber-tract damage in CM from chronic pain effects.

Evidence for Cognitive Deficits in Chiari Malformation

Our present hypothesis is that the downward herniation of the cerebellar tonsils (and/or their cardiac-cycle-based compression of the medulla) result either in direct pressure-related structural damage to the regional neural circuitry and/or cause dysfunction by generating chronic disorders such as pain. We further hypothesize that such damage to the cerebellum and its afferent/efferent circuits can result in cognitive deficits in executive function and episodic memory [12–20]. However, published evidence for cognitive deficits resulting from CM is surprisingly limited even though such deficits are hinted at in Yassari and Frim [6].

Kumar et al. [3] reported a neuroimaging study using diffusion tensor imaging (DTI) and intelligence testing on 10 CM patients and 10 controls. Kumar et al. observed that CM patients exhibited decreased fractional anisotropy (or FA) in the genu, splenium, fornix, and cingulum (areas of the brain that connect the limbic system to the medial temporal lobes). Given this location of decreased white-matter integrity, one might expect a CM-related deficit in episodic memory. Kumar et al. also observed cognitive deficits on the picture connection test, digit symbol, block design, picture arrangement, and 5-object assembly test (Wechsler Adult Intelligence Scale, or WAIS), as well as the Trail-Making B test, but no tests of episodic memory were administered. Kumar et al. also did not assess depression and anxiety, and as noted earlier, these variables are correlated with chronic pain that is a key symptom of CM

patients. Thus, the present study was conducted to extend the Kumar et al. study to a new set of cognitive tasks to further test for cognitive dysfunction in CM.

Issues in the Diagnosis of Chiari Malformation Type I

Additionally, it is not clear whether the Kumar et al. [3] CM patients had undergone decompression surgery or were candidates for such a procedure. Because there have been no previous "comprehensive" tests of cognitive dysfunction in Chiari I Malformation that included measures of episodic memory and response inhibition, we felt that it was important in the present study that we obtain a conclusive diagnosis on CM. This is because diagnosis of CM is still somewhat ambiguous—even though it typically requires a 5 mm decension of the cerebellar tonsils into the cervical spinal canal, many neurologists and neurosurgeons also require observable symptoms, such as headache, and that there also be MRI evidence of CSF blockage and medulary compression.

One of the most direct methods to optimize the likelihood that an individual really does have conclusive CM is to select participants who have undergone posterior cranial fossa decompression surgery. CM can first present during childhood or adulthood, although pediatric-onset CM may show differences from adult-onset CM, both age groups frequently receive the same surgical intervention called craniospinal decompression surgery [21]. This surgery entails bone removal in

the posterior cranial fossa, to varying degrees, along with the upper arch of the C1, and sometimes the C2, vertebrae. The objective is to restore space at the craniospinal junction in order to relieve the direct pressure on the brain stem and cerebellum. However, one consequence of this method is that the surgical procedure itself (rather than CM) could potentially result in cognitive dysfunction. However, most neurosurgeons feel that this procedure tends to alleviate symptoms associated with CM (e.g., headache), so it is likely that our present approach is a more conservative test of cognitive dysfunction in CM than using pre-decompression-surgery participants. An added benefit to the present approach is that if we were to use candidates for decompression surgery (who have not yet had surgery), patients' anxiety and/or depression might have been elevated due to the uncertainty of imminent neurosurgery. Thus, we decided that the optimal method for a comprehensive test of cognitive dysfunction in CM should use individuals who have already undergone decompresion surgery (at least six months prior to cognitive testing).

The Present Study

The present study examined the cognitive performances of CM patients who had undergone decompression surgery in addition to a sample of age- and education-matched, healthy controls. A secondary goal of this study was to use statistical control methods to distinguish between measures of anxiety and depression (likely related to chronic pain), and fiber-tract

damage accounts of cognitive symptoms. To assess cognitive performance, we used a variation of the Rey Auditory Verbal Learning Test (RAVLT; a test of immediate and delayed episodic memory) using non-timed written responses and three computerized measures of executive function: an automated digit symbol substitution task [22] (a measure of processing speed with some memory load), a Stroop interference task [23] (a measure of response inhibition), and the Operation Span task (or Ospan, a measure of working memory) [24] using timed, button-press responses from a computer keyboard. To assess anxiety, depression, and stress levels in all participants, we used the 21-item, self-report Depression Anxiety and Stress Scale (DASS21) [25]. To directly assess self-reported head and neck pain in CM patients, we used the self-report Neck Pain Disability Index Questionnaire [26].

Methods

Ethics Statement

The present study was approved by the University of Akron Institutional Review Board (Akron, Ohio) and all participants (or their guardians) provided written informed consent.

Participants

Twenty-four CM patients (22 females, 2 males) who had undergone decompression surgery (age range: 15–59 years, mean age=38.6 years, mean education= 14.6 years) and 24 age- and education-matched

controls (15 females, 9 males; age range: 15–56 years, mean age=39.2 years, mean education=15.1 years) participated in the present study. There were no group differences in either age, $F(1, 46)=.03$, $p=.86$, or in years of education, $F(1, 46)=.50$, $p=.48$.

We selected post-decompression CM patients in order to assess potential cognitive deficits in more severe cases. All of these CM participants had considerable MRI evidence of cerebellar herniation below the foramen magnum in addition to being symptomatic with headache, dizziness and/or balance issues. In order to make sure that postoperative recovery was not contributing to the present results, we required at least a six-month interval between decompression surgery and participation in the present study. Approximately 80% of pre-decompression surgery CM patients experience severe headaches [5–6], and many of these patients are given opiate-based analgesics (e.g., Vicodin). However, because such analgesics can have an effect on cognition and/or contribute to ongoing headache in the long run, we limited participation in the present study of post-decompression participants to individuals who used just anti-inflammatories (NSAIDs) and acetaminophen (no opiate-based analgesics). In selecting post-decompression CM patients, though, we understand that we may have underestimated some CM cognitive deficits secondary to recovery.

Tasks and Procedure

Participants were tested individually on a computer and completed all of the tasks in one session. Each session began with immediate recall, followed by the digit symbol, Stroop, and working memory tasks assessing executive function. Finally, participants then completed the delayed recall task, followed by the depression, anxiety, and stress paper-and-pencil assessments. In addition, the CM patients but not the controls completed a pain and disability survey after the other tasks. The total testing time was approximately one hour.

RAVLT. To assess performance on episodic memory recall [27], we used a modified version of the Rey Auditory Verbal Learning Test [28]. Participants were presented orally the 15 words individually (approximately one second per word) and were asked to recall the words immediately after the first presentation of all of the words (the immediate recall) and also to recall the words 40 minutes later (the delayed recall) after the participants had completed the three executive function tasks. Participants wrote down their responses for both the immediate and delayed recall tasks, so the dependent variable was the number of written correct responses.

Stroop Test. Performance on the Stroop task has commonly been used as one indicator of frontal-lobe function measuring inhibitory control [29,30]. Specifically, it is important to note that the Stroop task is a measure of prepotent response inhibition [31]. The

resent Stroop test [32] involved the presentation of a single color word on a computer monitor (either "RED," "BLUE," "GREEN," or "PURPLE"). Words could be printed either in a color that matched the word (congruent trial) or in a different color than the word (incongruent trial). Participants were asked to identify the word or identify the color in which the word was printed. Responses for the four response alternatives were collected through the use of computer keys (the "1," "2," "3," and "4" keys). Reaction and accuracy served as the dependent variables. There were 20 practice trials and 96 experimental trials (48 "word meaning" trials and 48 "color" trials: 24 congruent and 24 incongruent of each).

Ospan Test. Working memory is the cognitive system that allows individuals to temporarily hold information in memory and to manipulate this information [33]. The Ospan test [24] is one of the most widely used measures of working memory capacity that includes both short-term memory maintenance (remembering sequences of letter string from 3–7 letters in length) as well as manipulation of math problems. However, it should be noted that the Ospan task has also been commonly used to measure fluid intelligence, which has been found to be correlated with the Raven's Progressive Matrices and mentally rotated blocks [24]. However, as noted in Unsworth et al. (2005, Figure 2) [24], fluid intelligence and working memory capacity (as measured by the Ospan task) form separate latent factors in structural equation models, implying that working memory capacity forms a separate

construct from fluid intelligence. Thus, it is reasonable to assume that the Ospan task is a separate measure of working memory capacity independent of fluid intelligence.

There were 75 letters and 75 math problems in the presently used automated Ospan task based on Unsworth et al [24]. In the present study we report absolute Ospan scores and a measure of mean RT for the mental arithmetic solution time (the "working" portion of working memory), as well as accuracy of math computations.

Digit Symbol Substitution Task. We used a computer-administered version of the digit symbol substitution task [22]. Across the top of the computer screen, nine digits (from 0–9) were presented in a key along with nine symbols. Each digit was associated with a given symbol. In each trial, a single digit-symbol pair was presented directly below the middle of the key. Participants were instructed to respond whether the present pair was correct or incorrect. There were a total of 72 experimental trials.

We used SAS (Version 9.3) and SPSS (IBM SPSS Version 20) software to analyze the present results.

Results

For the RAVLT analysis, we had a 2 (group: CM vs. controls) x2 (retention interval: immediate vs. delayed recall) mixed design in which group was measured across participants and retention interval was

measured within participants. The main effect of group approached significance, $F(1, 46)=3.46$, $p=.07$, $\eta_P^2=.07$ (words recalled: CM group=6.00, Control group=7.04, and there was a main effect of retention interval, $F(1, 46)=67.26$, $p<.0001$, $\eta_P^2=.60$ (immediate recall=7.44 words, delayed recall=5.60 words), but group did not interact with retention interval ($p=.71$) (see Figure 2).

For the digit symbol substitution task [22], a measure of processing speed, we compared means across group for response time (RT, in milliseconds) and accuracy (in mean percent error). There was a main effect of group for RT, $F(1, 46)=4.95$, $p=.03$, $\eta_P^2=.097$, (CM=1767 ms, controls=1544 ms) (Figure 3), but there was no main effect for accuracy ($p=.80$).

The Ospan task [24] is a set of measures of working memory capacity. There was a main effect of group for math computation RT, $F(1, 46)=13.05$, $p<.001$, $\eta_P^2=.18$, indicating that the CM

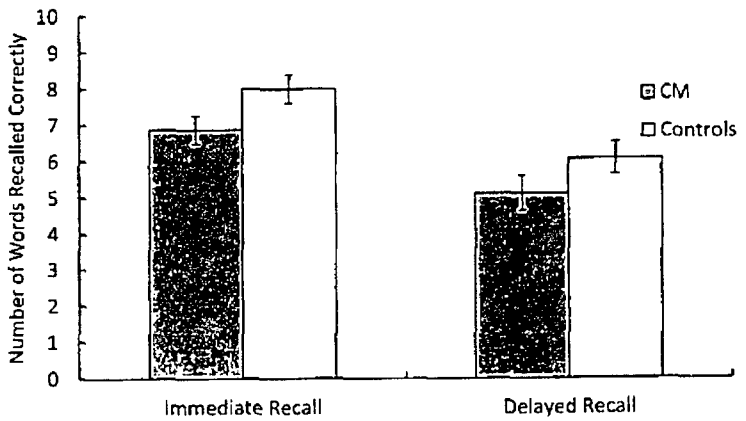
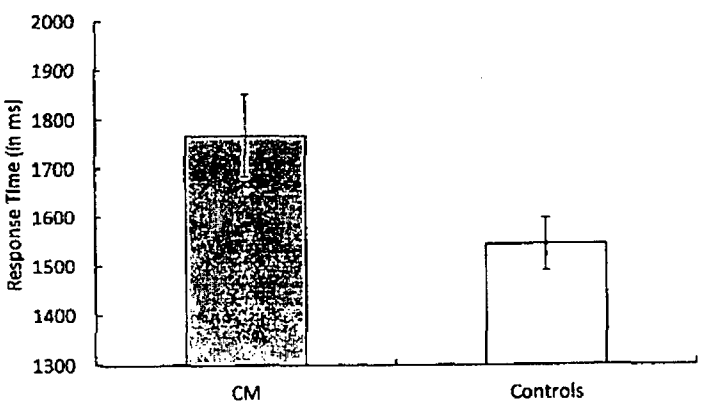


Figure 2. The mean total number of words correctly recalled in the immediate and delayed recall conditions for the Chiari Patients (CM) and Controls. Error bars represent the standard errors of the means.

doi:10.1371/journal.pone.0094844.g002

Panel A:



Panel B:

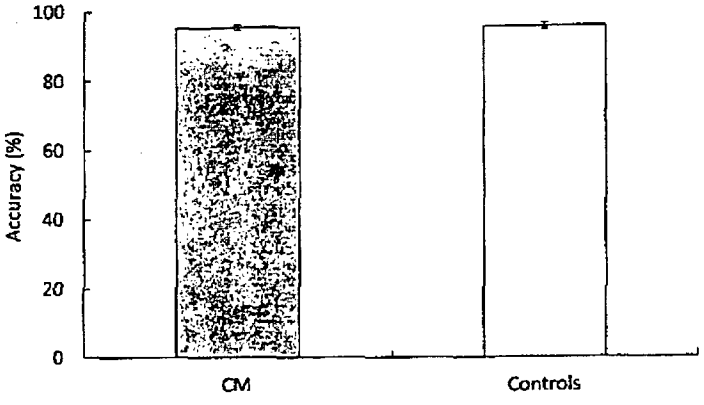
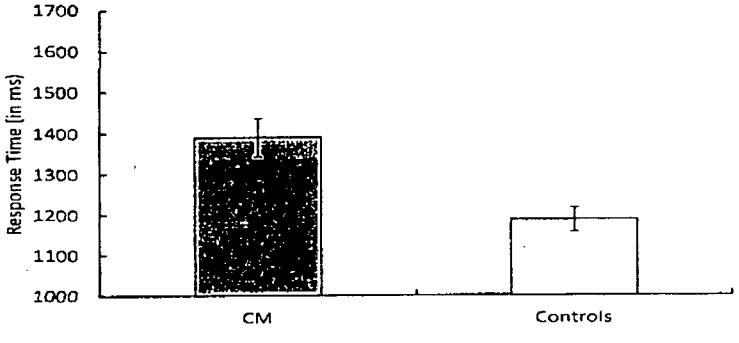


Figure 3. The mean response time (Panel A) and accuracy (Panel B) in digit symbol substitution task for the Chiari Patients (CM) and Controls. Errors bars represent the standard errors of the means.

doi:10.1371/journal.pone.0094844.g003

Panel A



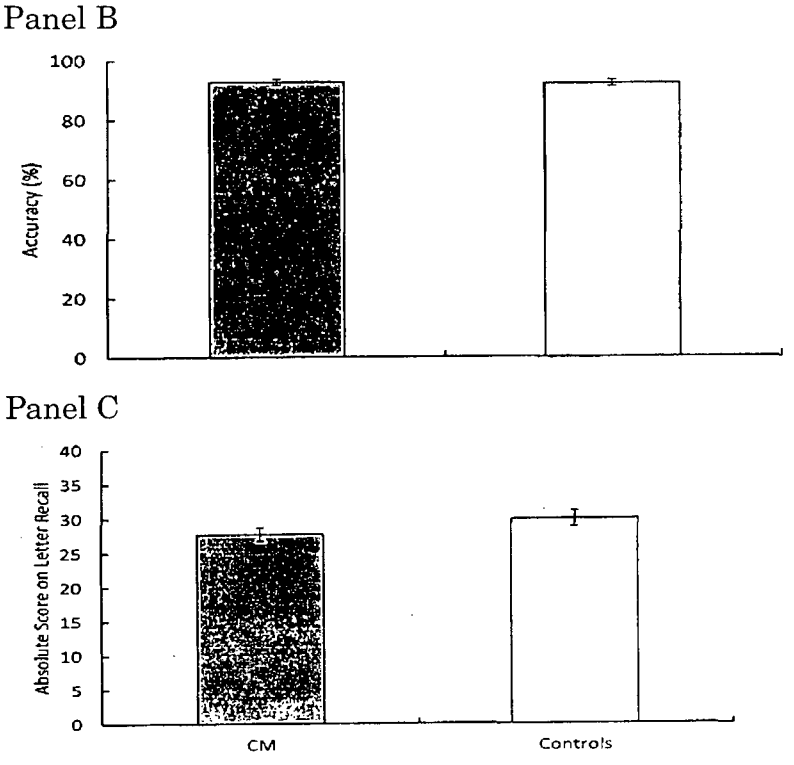


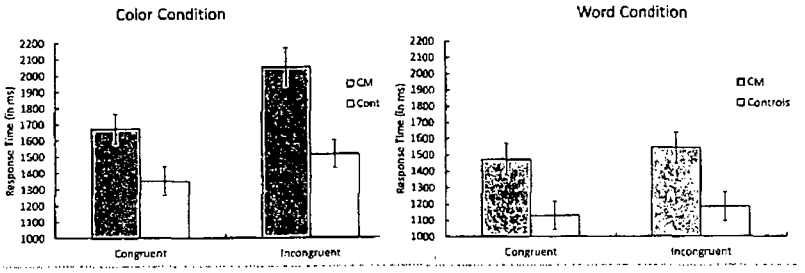
Figure 4. The mean response time (Panel A) and accuracy (Panel B) in Automated Operation Span (Ospan) computation time and accuracy as well as the total number of letters correctly recalled (Ospan Absolute Score; Panel C) for the Chiari Patients (CM) and Controls. Errors bars represent the standard errors of the means.
doi:10.1371/journal.pone.0094844.g004

group was significantly slower in computing the answers to math problems than were the controls (CM group=1389 ms, controls=1186 ms) (Figure 4). There was no effect of group for computational accuracy

(p=.69). Also, there was no group effect for the total number of correctly recalled letter sequences (p=.68).

The Stroop task is a measure of response inhibition [23,31]. A 2 (group; a between-subject variable) x2 (task type: color vs. word; a within-subject variable) x2 (congruency: congruent vs. incongruent; a within-subject variable) mixed analysis of variance (ANOVA) was used to analyze the Stroop data. For RT, there were main effects for group, $F(1, 46)=11.58$, $p<.01$, $\eta_P^2=.25$ (CM=1685 ms, controls=1293 ms), task type, $F(1, 46)=28.21$, $p<.0001$, $\eta_P^2=.06$ (color=1646 ms, word=1332 ms), and congruency, $F(1, 46)=46.22$, $p<.0001$, $\eta_P^2=.50$ (congruent=1406 ms, incongruent=1572 ms). The key finding was a Group x Task Type x Congruency interaction, $F(1, 46)=5.65$, $p<.05$, $\eta_P^2=.11$, that occurred because the CM group showed a relatively larger congruency effect for the color condition (376 ms) versus the word condition (71 ms), relative to the control group for the color condition (162 ms) versus the word condition (54 ms) (Figure 5). To confirm this interpretation, we ran separate analyses for the Group x Congruency simple effects by task type. The Group x Congruency interaction was significant for color type, $F(1, 46)=12.17$, $p=.001$; but this interaction was not significant for word type, $F<1.0$.

Panel A



Panel B

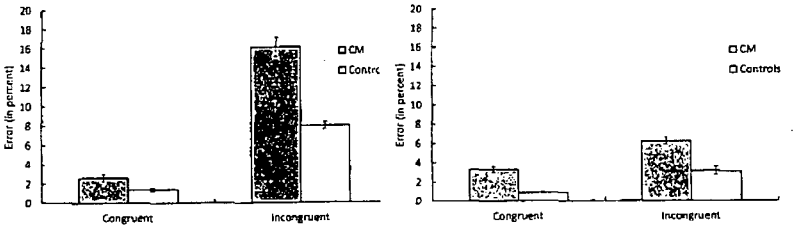


Figure 5. The mean response time (Panel A) and percent error (Panel B) in Stroop task (Color vs. Word) as function of congruency between color and word (congruent vs. incongruent) for the Chiari Patients (CM) and Controls. Error bars represent the standard errors of the means.
doi:10.1371/journal.pone.0094844.g005

No effects in the accuracy analysis for the Stroop data reached significance (all p's>.05).

Generalized Slowing Analyses for the Stroop Task

The observed slower responses for the CM group compared to the control group could be due to generalized slowing, such as psychomotor speed, rather than

to task-specific slowing [34]. Madden, Pierce and Allen (1992) [35] reported a method that can be used to examine this possibility. First, one needs to find the best-fitting linear equation for $RT_{CM}=mRT_{controls}+b$ (reaction time, or RT, for CM patients should be a linear combination of controls' RT). Because we collected RT data from three different tasks (Stroop, Ospan, and Digit Symbol), in order to consider true general slowing rather than task-specific slowing, we needed to compute the linear slowing function for all three tasks. For the present tasks, this best fitting linear slowing function was $RT_{CM}=(1.16)RT_{controls}+120$ ms, $R^2=.76$. The next step was to transform the controls' RT data from the Stroop task using this linear function. This procedure will eliminate the main effect for group [35], and if task-related slowing is generalized, then the Group x Color Type x Task Type interaction for the Stroop task will also be eliminated [35]. However, if the task-specific slowing for the Stroop task goes beyond that predicted by general slowing, then this three-way interaction should remain statistically significant even after the controls' data are transformed into "generalized" replicas of CM patients' data [35]. When we transformed the controls' RT data for the Stroop task using the aforementioned generalized slowing equation and then added the non-transformed CM patients' data, the main effect for group was no longer significant, $F(1, 46)=.28$. $p=.60$. However, the Group x Color Type x Task Type interaction remained statistically significant, $F(1, 46)=4.31$, $p=.0435$. Using the same logic as Madden et al. [35], we can conclude that the present Stroop response inhibition results for Chiari patients

relative to controls cannot be accounted for by generalized slowing. Instead, it appears that these results are primarily due to task-specific slowing.

Depression, Anxiety, and Pain Analyses

Chiari patients, even after decompression surgery, still frequently experience severe headaches. To assess neck pain disability (including headache), we tested just the CM group on the Neck Pain Disability Index Questionnaire [26] (because individuals in the control group would typically score zero). Using the scoring criteria proposed by Fairbanks et al. [26], the present Chiari sample had a percent disability score of 47% (substantial disability due to neck and head pain). Next, we correlated the CM group's pain score with the DASS21 [25] scores (see Table 1 for correlation matrix). Pain and depression ($r=.51$, $p=.01$, $r^2=.26$), as well as pain and anxiety ($r=.56$, $p=.006$, $r^2=.31$) were significantly correlated, but pain and stress were not ($r=.32$, $p=.12$, $r^2=.10$). This indicates that pain, depression, and anxiety (but not stress) scores were significantly related in CM patients.

The next step was to correlate depression, anxiety, and pain scores for CM patients with immediate recall, digit symbol RT (DSRT), Ospan computation RT, and Stroop congruency effects for the color condition (i.e., the four cognitive variables that showed statistically significant group differences). The correlation matrix for these analyses is presented in Table 1. Depression, anxiety, and pain all showed significant correlations

with DSRT and Ospan computational RT, but not with Stroop congruency effects for the color condition or immediate recall. These results suggest that pain scores, depression, and anxiety in the CM group were significantly related to DSRT and working memory computational RT performance, but not with response inhibition (Stroop) or immediate recall performance.

Table 1. Correlation Matrix (Pearson's r) for Just Chiari Malformation Patients (N = 24) for Depression, Anxiety, Stress, Pain, Digit Symbol RT, Ospan RT, the Stroop Congruity Effect for Color, and Immediate Recall.

	Depression	***Anxiety***	***Stress***	***Pain***	***DSRT***	***OspanRT***	***StroopRT***
Depression							
Anxiety	.67*						
Stress	.52*	.49*					
Pain	.51*	.56*	.32				
DSRT	.66*	.52*	.04	.56*			
OspanRT	.46*	.48*	.08	.46*	.66*		
StroopRT	.10	.11	.08	.34	.58*	.55*	
Immediate Recall	−.09	−.01	−.17	−.37	.006	.201	.04

* $p<.05$

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We also compared depression, anxiety, and stress levels across groups (i.e., all 48 participants—not just the 24 CM patients' data) using the DASS21 scale data. The CM group showed significantly higher scores in depression (CM group=6.5, controls=2.6), $F(1, 46)=8.48$, $p<01$, $\eta_P^2=.16$, anxiety (CM group=8.6, controls=1.8), $F(1, 46)=31.79$, $p<.0001$, $\eta_P^2=.41$, and stress (CM group=9.2, controls=5.3), $F(1, 46)=8.35$, $p<.01$, $\eta_P^2=.15$. The present results showing that CM patients show symptoms of depression and anxiety are consistent with the findings of Mueller and Oro [36] who screened a much larger sample of CM patients for symptoms and observed that CM patients showed increases in depression and anxiety.

Because neck and head pain were correlated with cognitive performance in CM patients, and with depression ($r=.51$) and anxiety ($r=.56$), we conducted an analysis of covariance (ANCOVA) on the four measures showing significant effects for groups (or interactions with group) in the earlier ANOVAs (see Table 2). For the digit symbol substitution task, $F(1, 44)=.086$, $p=.77$, $\eta_P^2=.002$, the Ospan RT task, $F(1, 44)=2.46$, $p=.12$, $\eta_P^2=.05$, and the immediate recall task, $F(1, 44)=1.83$, $p=.18$, $\eta_P^2=.087$, the main effects of group were no longer significant when depression and anxiety were entered as covariates. However, the Group x Task Type x Congruency interaction for the Stroop analysis remained significant, $F(1, 44)=6.69$, $p<.02$, $\eta_P^2=13$, even after depression and anxiety were entered as covariates. These results suggest that variables correlated with chronic pain (i.e., anxiety and depression) accounted for all cognitive deficits in CM except for response inhibition (Stroop) effects.

Multivariate Analyses

Because we have reported results from four different tasks (Stroop, Ospan, Digit Symbol, and episodic memory: immediate and delayed recall), an important issue to consider is whether Chiari patients showed an "overall" cognitive deficit relative to age- and education-matched controls. One way to test for this possibility is to use latency scores from the Stroop, Ospan (math computational speed), and Digit Symbol tasks, and recall data from the memory tasks as dependent variables, and to use group as the independent variable and conduct a multivariate analysis of variance, or MANOVA. When we conducted this MANOVA, the multivariate effect of group was significant, Wilks' Lambda=.58, p=.004. In the univariate "step-down" analyses, all of the dependent variables were statistically significant except for delayed recall. These results indicate that the composite cognitive dependent variable in the present study varied across group. That is, Chiari patients performed significantly more poorly than controls did on global cognitive function. However, in the present study, we also need to consider the effects of anxiety and depression. In particular, was there a multivariate effect of group even after the effects of anxiety and depression are covaried out? The answer to this question is "yes." Namely, the multivariate analysis of covariance, or MANCOVA showed a statistically significant multivariate effect of group even when anxiety and depression were entered as covariates, Wilks' Lambda=.654, p=.031.

Table 2. Correlation Matrix (Pearson's r) for Chiari Malformation Patients and Controls (N = 48) for Depression, Anxiety, Stress, Digit Symbol RT, Ospan RT, the Stroop Congruity Effect for Color, and Immediate Recall.

	Depression	Anxiety	Stress	Processing Speed	Working Memory	Inhibitory Control
Depression						
Anxiety	.73*					
Stress	.62*	.57*				
Processing Speed	.56*	.49*	.23			
Working Memory	.39*	.50*	.17	.56*		
Stroop RT	.21	.34*	.17	.43*	.47*	
Immediate Recall	−.17	−.22	−.03	−.08	−.24	−.02

* $p<.05$.

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Discussion

We assessed cognitive performance in CM patients with a firm diagnosis of CM who had undergone decompression surgery (minimum six months prior to testing in the present study). Little is known about the cognitive consequences of CM except for one study by Kumar et al. [3]. In an attempt to gain a more thorough understanding of the cognitive consequences of CM, we measured group differences between CM patients and age- and education-matched controls in response inhibition (Stroop), working memory (Ospan computational speed), processing speed (Digit/Symbol task), and episodic memory performance (modified RAVLT). The present results provide evidence that CM patients showed deficits in response inhibition, working memory speed, and processing speed relative to age- and education-matched controls. Also, CM patients showed deficits in episodic recall that approached statistical significance.

Cognitive Deficits in CM

With regard to working memory, CM patients did show significantly slower computational responses (Ospan RT) than controls, but group differences for this variable were eliminated when we statistically controlled for depression and anxiety scores as covariates—suggesting that group differences in working memory speed may be accounted for by chronic pain. Processing speed showed similar results—CM patients showed significantly slower digit symbol RT (DSRT) than did controls, but, again, group differences in

processing speed were eliminated when we statistically controlled for anxiety and depression effects. On the other hand, response inhibition deficits (as measured by Stroop interference effects) in the CM group persisted even after statistical control of anxiety and depression effects. Furthermore, this color congruency effect was not significantly correlated with pain, depression, or anxiety in the CM group (see Table 1). This appears to be a response inhibition deficit [31].

Response inhibition, a type of attentional guidance [37], is related to selective attention. Human observers focus on information relevant to a task (in the Stroop task, "which response do I select?"), but must filter out (inhibit) non-relevant response information. Thus, a strong emphasis is placed on inhibitory control so that individuals can operate efficiently within this limited-capacity attentional system. Inhibitory control processing is typically associated with the dorsolateral prefrontal cortex and the anterior cingulate cortex [23] as well as areas of the parietal cortex—the frontoparietal attentional pathway [38]. However, it is known that CM is most commonly associated with damage to the cerebellum and brainstem [5], so it seems to suggest that performance deficits associated with the prefrontal cortex would be present. Could it be, then, that the response inhibition component of the Stroop task [31] is actually related to the cerebellar and/or brainstem damage in CM? We cannot conclusively answer this question in the present study because it did not include neuroimaging analyses (e.g., DTI-based tractography or fMRI-based functional connectivity) that

would allow an examination of the integrity of fiber tracts connecting the cerebellum and/or brainstem to the front-parietal attentional pathway. However, Hesselmann, Flandin, and Dehaene (2011) [38] did report an fMRI/Event-Related Potential (ERP) study on a task known to have a response selection locus—the psychological refractory period (or PRP) paradigm. When they subtracted single-task from dual-task performance, they found significant activation for just the dual-task (PRP) component in the left middle and superior frontal gyrus areas—essentially Brodmann's area 46—part of the dorsolateral prefrontal cortex. Furthermore, when the fMRI subtracted data (i.e., the task component known to be related to response selection—of which a critical component is response inhibition) were synchronized with the ERP (P3) data, Broadmann's area 46 and areas in the parietal cortex were activated. These results showing that a task known to have a response selection/inhibition locus (the PRP effect) activated the fronto-parietal (or dorsal) attentional pathway suggest that response inhibition shares the same attentional pathway known to affect stimulus selection. This provides inductive evidence that the present response inhibition (Stroop) deficit observed in individuals diagnosed with CM might be associated with a prefrontal cortex deficit, although additional neuroimaging support for this CM assertion is needed to confirm the present hypothesis because there is evidence that the relationship between individual neuropsychological test data and specific brain regions is not necessarily specific [39].

What is not clear from the present study, though, is why CM patients showed specific deficits in response inhibition (Stroop interference), even when the effects of anxiety and depression were statistically controlled for, but not in working memory or processing speed—two other measures of executive function. Perhaps the most parsimonious interpretation is that response inhibition is more closely related to motoric processing known to be associated with cerebellar function (although response inhibition is an attentional process rather than a motoric process, per se) or reflexive processing known to be associated with medullary function. On the other hand, working memory and processing speed do not appear to be as closely associated with cerebellar and/or brainstem function as is response inhibition [8]. A more direct test of this issue would be to assess CM patients on both response inhibition and distractor interference tasks (e.g., an Eriksen flanker task) [31]. If CM patients showed performance decrements on both tasks, then this would provide evidence of a more general executive function deficit. On the other hand, if CM patients showed a deficit on the response inhibition task, but not on the distractor interference task, then this would provide evidence of a more specific deficit perhaps more localized at the cerebellar and/or brainstem level. Thus, while there is good reason to believe that response selection/inhibition, at least as measured by the psychological refractory period effect, shows a clear prefrontal attentional effect [38], it could be that response inhibition is also closely linked to cerebellar and/or medullary processing.

Another issue germane to the seemingly larger Stroop effects for CM patients than for controls is whether this effect was the result of generalized slowing in CM patients. To test for this possibility, we transformed the controls' data using the slowing function taken from the CM patients' data [34], which were then analyzed with the untransformed data from the CM patients. In this analysis, we still observed the Groups x Color Type x Task Type interaction. According to Madden et al. [35], these results suggest that the group-related differences are specific to a given task—not the result of generalized slowing across all tasks (in this case, Stroop, Ospan working memory, and automated digit/symbol). Thus, the presently observed larger response inhibition effects for CM patients relative to controls are the result of task-specific effects.

Episodic Memory Effects in CM?

Episodic memory is defined as contextual memory (events associated with time-, space-, or emotion-based contexts [27,40]. We observed marginally poorer episodic recall in individuals diagnosed with CM than in controls in a modified version of the RAVLT [28]. However, the group effect for recall was eliminated after statistical control for anxiety and depression effects. This suggests that the marginally significant group effects in recall were associated with a variable related to anxiety and depression—likely chronic pain.

Multivariate Effects

Given that all of the cognitive deficits other than the Stroop (response inhibition) effect were eliminated, an important issue to address is whether there was an "overall" cognitive deficit—especially after the effects of anxiety and depression (thought to index chronic pain effects in CM) were controlled. We addressed this issue using MANOVA and MANCOVA analyses. When all of the reaction time and memory recall data were included as dependent variables, and group (CM vs. controls) was included as an independent variable, the resulting MANOVA showed that the main effect of group was significant. However, this multivariate effect for group (i.e., that CM patients showed an overall cognitive performance deficit relative to age- and education-matched controls) could have been the result of anxiety and depression effects. To test for this possibility, we also conducted a multivariate analysis on group while including anxiety and depression as covariates. The resulting MANCOVA showed that the main effect of group remained statistically significant even after we controlled for anxiety and depression. Consequently, an overall cognitive deficit in CM patients was observed that cannot be explained by increased anxiety and depression levels in CM patients.

Locus of the Cognitive Effects

As illustrated in Figure 6, there are several possible causes of the presently observed cognitive dysfunction in the CM group relative to the controls. The two

broad categories are: compression injury (e.g., chronic compression from CM or acute decompression from surgery-based injury) and non-specific (e.g., chronic pain). Also, the cognitive deficits observed for the CM group in the present study may have been the result of cerebellar tonsillar injury. However, most of the observable cerebellar damage in CM is done to the floculonodular lobe of the cerebellum (i.e., the caudal portion), and altered CSF pressure (cardiac-induced and/or through coughing or Valsalva maneuvers) may also damage other portions of the cerebellum that have known connections with the prefrontal cortex [7–12], however this is speculative. Another likely possibility of fiber-tract damage affecting prefrontal cortex (the area associated with executive function) is the medulla. As illustrated in Figure 1 (in the CM MRI), the cerebellum descends and impacts the brainstem (i.e., the medulla is compressed) in CM. Thus, it could be that brainstem damage rather than cerebellar damage is the culprit of potential fiber tract damage to other portions of the brain—such as the prefrontal cortex—resulting in executive dysfunction, or more diffuse cognitive deficits that indirectly affect executive function. There is evidence of fiber-tract connections between the brainstem and prefrontal cortex [13]. Also, it is known that there are medullary projections to the reticular activating system, the limbic system, and ultimately to the prefrontal cortex [41]. Thus, whether it is based on a cerebellar or a brainstem origin (or both), there are known fiber-tract pathways that link these areas to the prefrontal cortex (associated with executive function).

Limitations

We choose to test decompressed CM patients knowing that this might result in an underestimate of cognitive deficits due to recovery. Alternatively, there may also be a small chance of surgically induced trauma to the already Chiari-compressed area. As a result, some of the deficits seen may have occurred from surgical cerebellar injury rather than CM-based cerebellar compression (see Figure 6). In this event, it remains true that injury to the Chiari cerebellum would be responsible for the higher-level cognitive effects. In addition, a decompressed sample of CM patients was used to lessen pre-operative anxiety effects and to better insure a conclusive CM diagnosis. Previous studies [42] have demonstrated intraoperative sensorimotor (auditory evoked potentials) improvement within CM patients. This observation supports the idea that the use of post-decompression CM patients is a reasonable strategy because improved, rather than poorer information processing resulted from the decompression procedure.

This study employed statistical control to partial out the effects of anxiety and depression rather than using experimental control. While experimental control is always preferred, it is impractical if not impossible for this patient population. In addition, adult-diagnosed CM patients are largely female, but our CM patient group may have a relatively greater number of female participants than male (22 vs. 2) than is typical of adult CM (probably at least 70% female). We did have more males in the control group (9) than in in the

CM group (2), but this was because we used a "yoked" control group when possible. That is, we used spouses or other relatives when possible as controls.

Conclusion

We provided evidence in this study that CM patients showed poorer cognitive performance on reaction time tasks (working memory, inhibitory control, and processing speed) compared to age- and education-matched controls, but that there were no group differences observed in episodic memory. These results are consistent with both a general cognitive deficit and a specific deficit associated with response (Stroop) inhibition in CM. The locus of the observed response inhibition effect has frequently been associated with prefrontal, executive function [29,30]. However, the present finding that this response inhibition effect remained statistically significant even after statistical control of anxiety and depression effects, as well as general slowing, whereas other known executive function tasks such as working memory and processing speed were not, provides another potential explanation. For example, it suggests that the observed response inhibition deficit may be more influenced by known areas of damage in CM—namely the brainstem and cerebellum. It is important to note, though, that brain-imaging evidence for localized brain damage in CM for areas other than the cerebellum or brainstem (e.g., the prefrontal cortex) is needed to confirm this speculation. So far, Kumar et al. [3] have provided the only evidence of white-matter integrity losses (based

on DTI data) in CM with a relatively small sample size, so more evidence is needed to confirm this possibility.

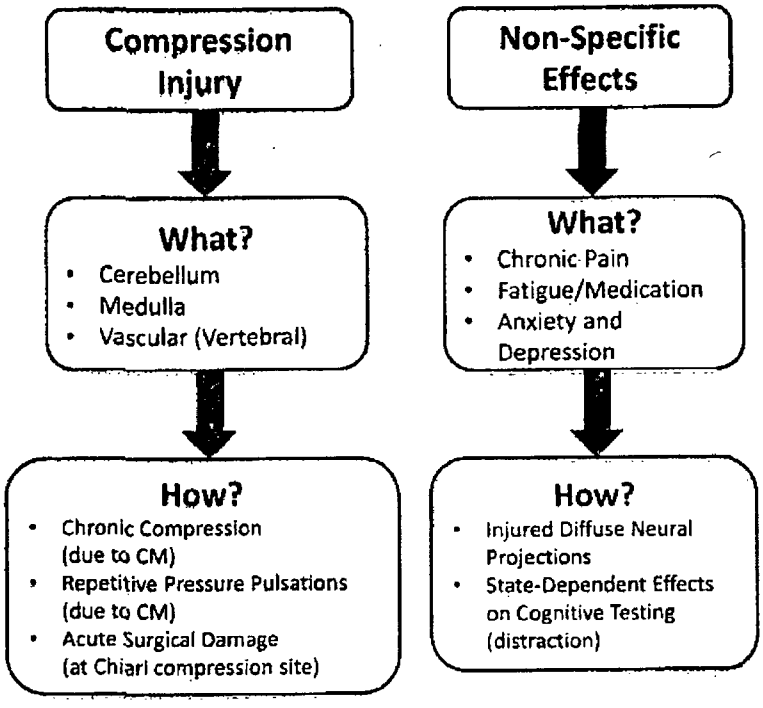

Figure 6. A flow diagram of Chiari I Malformation compression injury and non-specific effects is presented. Under "What," the anatomical areas or types of non-specific effects are presented. Under "How," the type of injury or state-dependent effect is presented.
doi:10.1371/journal.pone.0094844.g006

Finally, while there were task-specific group differences observed for response inhibition, we also observed a multivariate effect of group for all the reaction

time tasks and the two episodic memory tasks, and this effect remained significant after statistical control of anxiety and depression. These MANOVA and MANCOVA results suggest that there is also a "global" cognitive deficit in CM.

Acknowledgments

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Author Contributions

Conceived and designed the experiments: PAA BAM FL JM MGL JRH JWP. Performed the experiments: JRH JWP CB XL AKH PAA. Analyzed the data: PAA BAM FL JRH. Contributed reagents/materials/analysis tools: PAA ML JM. Wrote the paper: PAA BAM FL MGL JM ML JRH CB JWP. XL AKH.

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ATTACHMENT 4

Case Study: Chiari Causes Psychotic Episode

Case Studies is a feature designed to highlight interesting patient cases reported in the research. Given the lack of knowledge about CM/SM, much of the published research comes in the form of case studies – doctors describing one or two patients they have seen and treated – as opposed to rigorous scientific studies. While this type of publication doesn't advance the scientific cause as much, it does give us a window into some of the issues surrounding CM/SM, including lasting side effects and related conditions. And hopefully, some of our readers will say, "Hey, that's just like me!" and know they are not alone in what they are going through.

May 31, 2007

Authors: Ilankovic et al.
University/Hospital: University Clinical Center, Belgrade Serbia and Montenegro
Journal: Psychiatria Danubina 2006

Introduction: Although it has not been researched extensively, most experts believe that Chiari can cause neuropsychological problems, such as depression and trouble with memory and thinking. In addition, one study found that Chiari patients showed abnormal EEG brain activity, even with mild symptoms.

Patient 1: 30 year old woman who suffered from 4 acute, psychotic episodes in the previous three years. The episodes were accompanied by altered consciousness, confusion, disorientation, agitation and insomnia

and each episode occurred either during her premenstrual or menstrual period and included epileptic type events. She also showed signs of cranial nerve involvement and reported ringing in the ears. There was no history of infection or head injury which could explain the psychotic episodes and repeated drug and alcohol tests were negative. An EEG showed some irregular brain brain activity and an MRI finally showed a Chiari malformation. The doctors chose to treat the woman with a number of drugs to control her psychotic behavior and epileptic episodes. They also prescribed diuretics and had her restrict her water and salt intake (it appeared that she was only symptomatic due to swelling from water retention). The woman recovered from her episodes after a few days each time and did not remember them.

Authors' Discussion: The authors stress that Chiari can neuropsychological symptoms that vary from person to person and can be intermittent in nature.

Editor's Discussion: This case highlights yet again how varied the symptoms of Chiari can be and is, hopefully, an extreme example of the neuropsychological effects that can accompany the compression and CSF disruption. Undrestanding the neuropsychological impact of Chiari, both cognitive and emotional is critical to improving the experiences and outcomes of patients.

—Rick Labuda

cerebellar tonsils – portion of the cerebellum located at the bottom, so named because of their shape

cerebellum – part of the brain located at the bottom of the skull, near the opening to the spinal area; important for muscle control, movement, and balance

cerebrospinal fluid (CSF) – clear liquid which surrounds, and protects, the brain and spinal cord

Chiari malformation – condition where the cerebellar tonsils are displaced out of the skull area into the spinal area, causing compression of brain tissue and disruption of CSF flow

magnetic resonance imaging (MRI) – diagnostic test which uses a large magnet to create images of internal body parts

psychosis – a general term for a state of mind in which thinking becomes irrational and disturbed; can be characterized by hallucinations and delusions

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ATTACHMENT 5

Psychiatria Danubina, 2014; Vol. 26, No. 3, pp 291-293
 Case report

PSYCHOTIC AND MAJOR NEUROCOGNITIVE DISORDER SECONDARY TO ARNOLD-CHIARI TYPE II MALFORMATION

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14.5.2014;	14.8.2014;	23.8.2014

* * *

INTRODUCTION

Arnold-Chiari malformations (ACM) represent a constellation of related congenital anomalies at the base of the brain. ACM is a very rare disorder with displacement of the cerebellar tonsils caudally into the foramen magnum. To date, the cause of this malformation is unknown, however, there is some evidence for a defect of the paraxial mesoderm resulting in a shallow posterior cranial fossa and brainstem as well as herniation through the foramen magnum (Caldwell et al. 2009).

ACM is characterized by four subtypes. A) type I represents a herniation of the cerebellar tonsils into the foramen magnum, B) type II is associated with a myelomeningocele and hydrocephalus, herniation not only of the tonsils, but also the vermis, fourth

ventricle, and pons. Morphologically, aqueductal stenosis, hydromelia and cortical dysplasia occur. C) type III is characterized by an encephalocele, the descent of both cerebellum and brainstem into the spine and internal sac, and D) type IV is associated with cerebellar atrophy (Caldwell et al. 2009).

There are many somatic complications caused by ACM such as a pain, motor deficits, hand muscular atrophy, lower cranial palsy, cerebellar ataxia, nystagmus, sensory deficits, dysphagia, and dysphonia (Caldwell et al. 2009). In addition, psychiatric comorbidities such as anxiety and mood disorders occur and affect the functioning and quality of life (Bakim et al. 2013, Mestres et al. 2012). To date, only two case reports describe the association with psychosis (Del Casale et al. 2012, Ilankovic et al. 2006) and only one case mentions a secondary major neurocognitive disorder (Mahgoub et al. 2012).

CASE REPORT

Mr B. is a 34-year-old Caucasian male with ACM type II, internal ventriculoperitoneal (VP) shunt, paraparesis of the lower extremity who was admitted to the burn-unit of the University Hospital Zurich after suffering from II-III degree burns of 21% of the body surface. He was wheelchair-bound, required substantial assistance and resided at a nursing home for the disabled. He had set himself deliberately on fire.

On admission, the patient was not able to interact due to his physical condition. Initial laboratory studies

revealed an anemia and evidence for infection. The hemoglobin was 72 g/l, hematocrit 0.22 l/l, leukocytes were 15.9 G/l with 12.3 G/l neutrophiles. The C-reactive protein (CRP) was elevated with a value of 73. Electrolytes, liver function tests, thyroid function tests, and cerebral spinal fluid were all within normal limits. The ECG was normal and a cranial computed tomography (CT) scan confirmed the ACM type II with descended cerebellar tonsils, medullary kinking, and tectal beaking. The VP shunt was on the right, frontotemporally, the anterior horn of the left ventricle collapsed, the outer liquor space expanded due to the collapsed ventricular system, and a hypodense area right parietal-occipitally of unknown etiology noted.

Mr. B's psychiatric medications were lamotrigine 200mg daily, valproate 900mg daily and quetiapine 200mg daily.

During the course of management, the patient developed multiple infections, renal insufficiency and delirium which remitted. Once baseline was reached again, challenges in management arose due to his limitations and erratic behavior and a 1:1 was indicated throughout the course of hospitalization.

Past psychiatric history

Mr. B's. early years were unremarkable except for the physical limitations caused by the ACM. He was wheelchair-bound due to his lower extremity paresis, however, reached all milestones of development and was independent in the activities of daily living. His

intellectual development was truly remarkable. He graduated from high school and qualified among the best for college.

However, in his adolescence the family noted episodes of being self-preoccupied, living detached in his own world, unable to interact indicating dissociation. In these states he displayed depersonalization – not being himself – and derealization – perceiving his environment in an altered way. The reality testing remained mostly intact, the symptoms caused significant distress and impairment in functioning, as well were not attributed to a substance or other medical condition and not attributed to another mental disorder. At the age of eighteen, episodes of aggressive outbursts and uncontrollable behavior occurred, which the family primarily attributed to puberty. Then in his twenties, these behavioral disturbances developed into frank psychosis and the previous behavioral disturbances were identified as prodromal psychosis. Mr. B. showed erratic, disorganized behavior, had paranoid delusions of others pursuing and harassing him, wanting to steal from him and he was not able to distinguish whether the television set was talking to him or not. In addition, he heard various, imperative voices. He met three out of five DSM 5-criteria (APA 2013) for a psychotic disorder. Taking into account the severe pre-morbid brain pathology with multiple shunt complications which required revisions, recurrent episodes of hydrocephalus, the psychosis was attributed to the congenital brain anomaly and secondary complications. Overall, the patient was hospitalized more than thirty times, the hospitalizations added up to more

than three years of his life. A long psychiatric career with eventually more than thirty hospitalizations, equaling more than three years in total and administration of most common typical and atypical antipsychotics, as well as mood stabilizers followed.

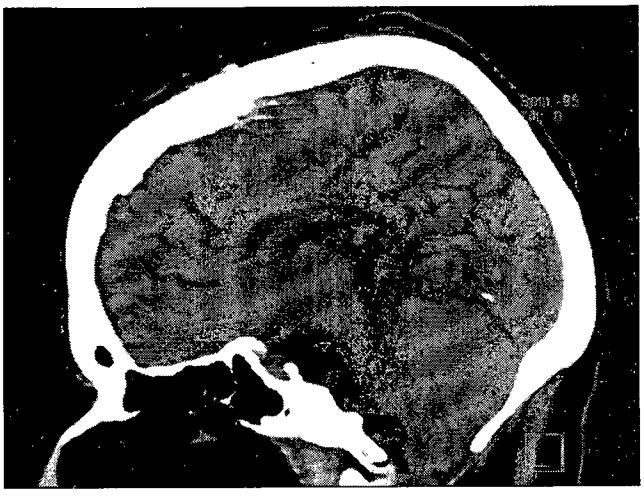

Figure 1. Sagittal cranial CT scan of ACM-II malformation

Mr B. continued to display depersonalization/derealization disorder episodes in which suicidal behavior became apparent such as attempting to access train tracks with his wheelchair or setting himself on fire. After these episodes ended, he usually felt guilty and shameful.

Although several attempts were made, the mother was able to handle the patient at home. For the last eight years he lived in various nursing homes and residences for the disabled, often being banned from them due to his erratic, uncontrollable, and self-endangering behavior. Within the last three years, his cognition and

functional ability further declined. Progressive deficits in attention, concentration, executive function, memory, and apraxia evolved indicative of a major neurocognitive disorder. These deficits did not occur in the context of another mental illness, but were caused by the ACM-II, recurrent VP-shunt obstructions and episodes of hydrocephalus and met DSM-5 criteria for a major neuropsychiatric disorder secondary to this congenital brain anomaly. As a consequence, he required assistance in most activities of daily living. Most recently, the patient developed more severe dysarthria which made communication even more difficult.

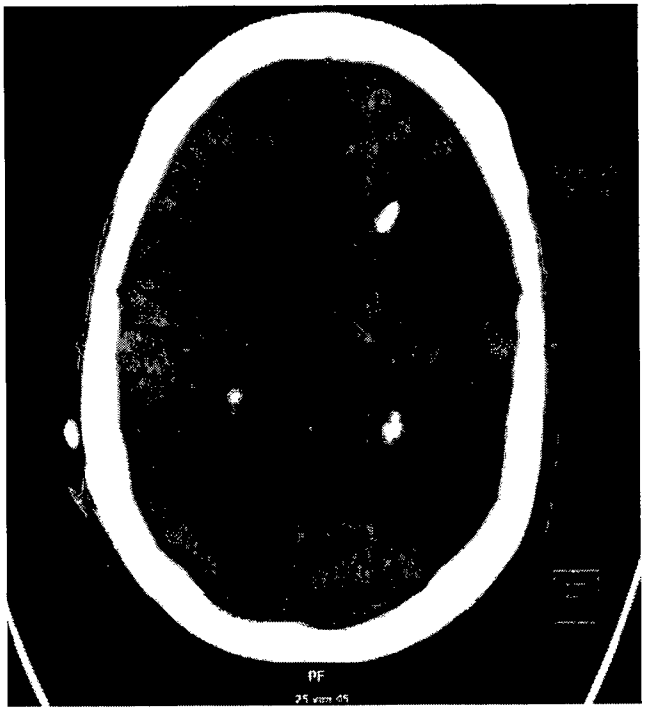

Figure 2. Transverse cranial CT scan of ACM-II malformation

DISCUSSION

This case represents several rare psychiatric comorbidities in the context of ACM-II. Although the functional and intellectual development was remarkable at first, a depersonalization-derealization disorder developed in the teenager years. Starting from the age of eighteen, a psychotic disorder and subsequently from the age of thirty on, a major neurocognitive disorder evolved.

Although age and presentation were characteristic of a schizophrenic illness, the severe cerebral malformation, ACM-II complicated by recurrent VP-shunt obstructions and episodes of hydrocephalus, classified this psychosis and subsequent major neurocognitive disorder as secondary to this medical condition. Within making differential diagnoses (First 2014), in the first two steps malingering or factitious disorder and substance-related etiologies had to be ruled out and were clearly not present in this case. In the next step, a direct effect of a general medical condition causing psychiatric symptoms had to be evaluated. From a differential diagnoses perspective this was the most difficult and challenging step as symptoms of a psychiatric disorder may be similar or identical to those caused by a medical condition. In this case, the ACM-II, recurrent episodes of *hydrocephalus secondary to VP-shunt obstructions* preceded the onset of psychiatric symptoms. The course of psychiatric illness, at first presenting with depersonalization-derealization disorder, second with a psychotic disorder and at last with a major neurocognitive disorder

represented an unusual course of psychiatric illness, which was not typical of a schizophrenic or major neurocognitive illness, in particular, taking into account the age at onset of the neurocognitive disorder. Thus, in particular the psychotic and major neurocognitive disorder encountered in this case, had to be attributed to ACM-II and its complicated course.

CONCLUSION

This is the first case report of an ACM-II anomaly with secondary psychotic and major neurocognitive disorder. So far, only two other cases of psychotic symptomatology (Del Casale et al. 2012, Ilankovic et al. 2006) and one case of dementia have been reported in the context of an ACM-I (Mahgoub et al. 2012). Among the cases with psychotic symptomatology, a psychosis risk syndrome with comorbid panic disorder was identified in the context of cannabis use and compression of the locus coeruleus (Del Casale et al. 2012) and recurrent psychotic episodes were attributed to epileptiform activities (Ilankovic et al. 2006). Thus, this is the first case of a psychotic and major neurocognitive disorder secondary to ACM-II complicated by recurrent VP-shunt obstructions and episodes of hydrocephalus.

Acknowledgements: None.

Conflict of interest: None to declare.

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ATTACHMENT 6

The Netherlands Journal of Medicine

REVIEW

Cognitive impairment and psychopathology in patients with pituitary diseases

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ABSTRACT

Patients who are considered to have been successfully treated for pituitary disease because they are in long-term remission of functioning or non-functioning macroadenomas, still report reduced quality of life and persistent morbidity and have (slightly) increased mortality. it is likely that the causes are multi-factorial, including intrinsic imperfections of surgical or endocrine replacement therapy, but also of persistent effects of hormone excess on the central nervous system affecting personality and behaviour. In agreement, recent studies demonstrate that patients in long-term remission for acromegaly and Cushing's disease have a higher prevalence of *psychopathology and more maladaptive personality traits*, display different and less effective coping strategies, and experience more negative illness perceptions. these new findings are intriguing in view of the general impairments in health-related quality of life, suggesting that the effects of previous hormone excess on the central nervous system can be long-lasting and to a certain extent even be irreversible. this review aims to address the effects of the treatment of pituitary disease on quality of life and neuropsychological functioning. Further research is needed to gain more insight into irreversibility of hormone excess syndromes. However, since coping strategies are altered, it is tempting to speculate that quality of life might be improved by targeted interventions.

KEYWORDS

Cognition, psychopathology, Cushing, acromegaly, pituitary adenoma

INTRODUCTION

Pituitary adenomas are neuroendocrine tumours. Neuroendocrine tumours represent a heterogeneous group of tumours that also include carcinoid tumours, non-carcinoid tumours of the gastrointestinal tract (such as insulinomas and gastrinomas), tumours of the autonomic nervous system (paragangliomas, pheochromocytomas), and medullary thyroid carcinoma.[1] Neuroendocrine tumours usually retain the characteristics of the original endocrine tissue, and thus often produce hormones and express hormone receptors. In addition, they grow slowly and often exhibit a specific genetic pattern. Functioning pituitary tumours cause the clinical syndromes of acromegaly (growth hormone (GH)), Cushing's disease (ACTH), prolactinoma (prolactin) and secondary hyperthyroidism (thyroid-stimulating hormone) *due to pathological secretion of the specific hormone*. Approximately 50% of pituitary tumours are not endocrine active: the so-called non-functioning macroadenomas (NFMAs). Although pituitary adenomas are benign tumours, they can cause serious morbidity due to overproduction of pituitary hormones and/or due to local mass effects resulting in pituitary insufficiency and optic chiasm compression. The treatment of pituitary adenomas includes transsphenoidal surgery, medical therapy (e.g. with somatostatin analogues, GH receptor antagonists or

dopamine agonists), and/or radiotherapy.[2,3] However, despite curative treatment of these adenomas *per se*, multiple physical and psychological symptoms may persist even when long-term remission has *been present for many years. In this review, we will address* the short- and long-term psychological consequences of pituitary adenomas in the Leiden cohort of patients who were in long-term remission after surgical cure but appeared to have persistent impairments in quality of life.

TREATMENT OF PITUITARY ADENOMAS: THE HISTORICAL PERSPECTIVE

Pituitary adenomas, especially Cushing's disease, result in severe comorbidity and highly increased mortality when left untreated.[4] Although surgical tumour removal was introduced by Harvey Cushing in the beginning of the 20th century, morbidity and mortality remained very high in this period. However, with the introduction of the microscopic transsphenoidal technique in the 1970s, surgical morbidity and mortality reduced dramatically (to below 1%). Nowadays, surgical treatment is the cornerstone of treatment for patients with pituitary adenomas.[2] Remission rates induced by transsphenoidal pituitary surgery in referral centres amounted to 50 to 70% for macroadenomas and 80 to 90% for microadenomas.[5]

The most important side effect of surgical treatment is new pituitary insufficiency, developing in 10 to 15% of patients. However, many patients with NFA, up to 90%, and 10 to 50% of patients with functioning

adenomas already have deficits preoperatively, some of which can be resolved after onset of cure (i.e. hypogonadism).[6-8]

When surgery does not lead to remission, radiotherapy or medical treatment, such as somatostatin analogues, dopamine *agonists or pegvisomant, are available for functioning tumours*. Depending on the disease, medical treatment has a more or less prominent role. For prolactinoma, dopamine agonists are the treatment of choice. For acromegaly, somatostatin analogues are either first or second choice, followed by pegvisomant if needed, reserving radiotherapy for selected cases. For Cushing's disease, either reoperation or irradiation are secondary treatment options. New developments suggest Pasireotide as potential treatment for Cushing's disease.

Hormone insufficiency is diagnosed by dynamic testing and hormone deficits are replaced if necessary using hormone replacement therapy, including GH, usually resulting in dramatic improvement in quality of life and symptoms. However, quality of life fails to normalise in the long term, and we do not yet exactly know why this is the case. Intrinsic imperfections of endocrine replacement therapy is one possibility but potential long-lasting effects of hormones on the central nervous system affecting personality and behaviour has not been considered until recently, although psychological disturbances had already been reported in patients with pituitary adenomas 100 years ago.[9] However, now that the final outcome is expected to be

nearly normal health, the focus on an unsatisfactory degree of remission has regained much attention.[10]

MORTALITY IN OPTIMALLY TREATED PATIENTS

In the Leiden cohort of patients treated for pituitary adenomas, we addressed the long-term consequences of these diseases and their treatment. Based on these clinical observations, the question arose whether remission in the long term equals cure. If that were the case, mortality would have to be normal and as well as disease-related morbidity, in this case with a focus on the long-term mental sequellae. A Kaplan-Meier Survival Curve can best illustrate mortality. In the Leiden series of patients who were treated by a single neurosurgical procedure by the same neurosurgeon for either acromegaly, Cushing's disease or NFA, we documented the number of observed deaths and compared these with the expected number of deaths obtained from the Dutch population.[11] This obtained standardised mortality ratio was 1.24 for NFA, indicating a 24% increased death rate. For acromegaly, the standard mortality ratio was 1.32, whereas for Cushing's disease the increase in mortality was even significantly higher: 80%. These observations point towards long-lasting hormone-specific effects, especially of cortisol overexposure, on mortality, despite long-term remission.

PITUITARY HORMONES, THE STRESS RESPONSE AND BEHAVIOUR

When focusing on mental sequelae in endocrine disease, it is crucial to realise that from an evolutionary point of view, a normal stress response is a prerequisite for normal adaptive behaviour.[12] The main mediator of the stress response is cortisol (or corticosterone in rodents). When an individual is exposed to a stressor, changes occur rapidly within seconds to minutes through stimulation of the sympathetic nervous system and cortisol secretion. In addition, the stress response is characterised by slower changes (that occur within minutes to hours) via stimulation of both the mineralocorticoid and glucocorticoid receptors in the central nervous system. In the end, all these changes occur only with the purpose to induce the required behavioural adaptations in order to enable the individual to adequately cope with the stressor. However, when a stressor becomes chronic, a so-called vulnerable phenotype develops that is characterised by neurodegenerative changes and cognitive impairment.[12]

It is not surprising that Cushing's disease, which can be considered the clinical human monosymptomatic equivalent for severe chronic stress, is associated with behavioural abnormalities. In addition, patients with NFA can be considered to be a model for the consequences of pituitary insufficiency *per se*, because of the high rate of hypopituitarism present in these patients. In this respect it is intriguing that one of the most potent physiological stressors is hypoglycaemia. During an insulin tolerance test (ITT), the induction of

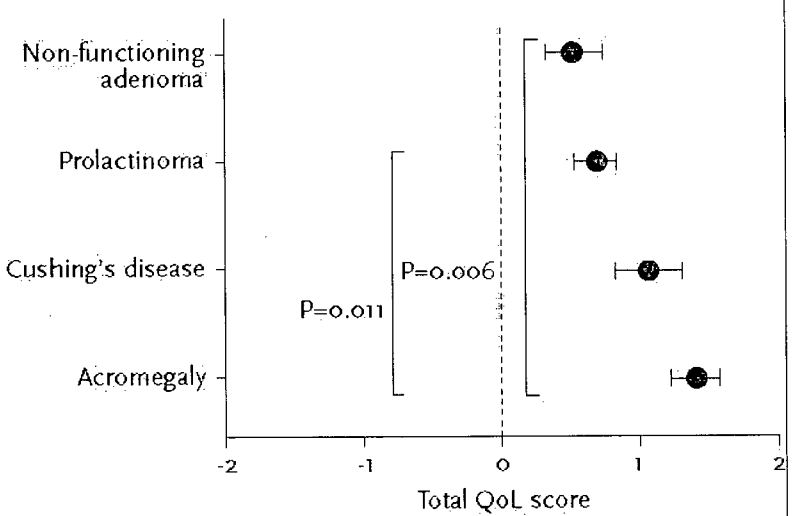
hypoglycaemia is able to evoke all classical features of the stress response characterised by catecholamines and cortisol secretion. The insulin-induced hypoglycaemia test, however, is also a very potent stimulator of GH secretion, and is therefore considered to be the golden standard test for the diagnosis of cortisol and GH deficiency.[13,14] Thus, by definition, patients with cortisol and GH excess or deficiency cannot exhibit a normal stress response, and are likely to represent human models for the effects of impaired stress responsiveness on psychopathology and cognitive function.

QUALITY OF LIFE AND PSYCHOLOGICAL FUNCTIONING

In the last decade, quality of life (QoL) was evaluated in the Leiden cohort of patients with pituitary adenomas using general health-related questionnaires both in untreated and treated disease. These studies demonstrated that QoL generally improves after treatment, but also that QoL remains impaired even after successful treatment, with disease-specific features (*figure 1*).[15-18] It appeared that patients treated for acromegaly were most impaired in QoL, when compared with patients treated for Cushing's disease, prolactinoma or patients treated for NFA.[19] However, these results were obtained using general health questionnaires and not disease-specific ones. Specifically, patients treated for acromegaly predominantly reported impairment in physical performance and an increase in bodily pain, whereas patients treated for Cushing's disease also reported impairments in physical functioning.

In addition, these QoL studies revealed psychological impairments on various quality of life questionnaires, both in general health and disease-specific questionnaires. As stated previously, the QoL questionnaires are not designed for an in-depth assessment of psychological functioning. Whereas the biological effects of cortisol and GH excess on psychological functioning have been reported in several studies in untreated Cushing's disease and acromegaly and in some studies after short-term remission,[20] it was unknown if, and to which extent, cognitive dysfunction and psychopathology was present in these patients in the long term.

Figure 1. *Quality of life in pituitary adenomas*



Adapted from Van der Klaauw et al., 2008.[19]

PSYCHOLOGICAL FUNCTIONING IN CUSHING'S DISEASE

In agreement with the crucial role of cortisol in the regulation of the stress response, patients with active Cushing's disease do manifest cognitive impairments, especially in the memory domain. In addition, psychopathology and maladaptive personality traits are often observed during the active phase of Cushing's disease. Previous studies reported impairments in memory, visual and spatial information, reasoning, verbal learning, and language performance.[21-24] Structures important in cognitive functioning, such as the hippocampus and cerebral cortex, are rich in glucocorticoid receptors and are therefore particularly vulnerable to the cortisol excess present in Cushing's disease.[12,23,25] A large number of studies in humans and animal models have documented that prolonged, increased endogenous or exogenous exposure to glucocorticoids may have long-lasting adverse effects on behavioural and cognitive functions, due to functional and, over time, structural alterations in specific brain target areas.[26,27] A limited numbers of studies that have reported the effects of treatment indicate that significant improvements in both physical and psychiatric symptoms occur within the first year after successful surgery.[20]

PSYCHOLOGICAL FUNCTIONING IN ACROMEGALY

GH and IGF-I receptors are widely distributed throughout the central nervous system, including the limbic system and the frontal lobe.[28,29] In accordance,

impaired cognitive function and maladaptive personality have also been documented in patients with active acromegaly.[30-32] In addition, substitution of GH-deficient patients with recombinant human GH resulted in a rapid and sustained amelioration of cognitive functioning and general well being.[33,34] However, in active acromegaly, many of the systemic changes induced by GH and/or IGF-I excess, such as arthropathy and cardiac valvulopathy, are not completely reversed upon successful treatment of acromegaly,[35,36] which may also be true for the effects of GH and/or IGF-I on the central nervous system. For instance, 36% of the patients that were considered cured from acromegaly showed elevated scores for anxiety and depression.[15]

ADDITIONAL OBSERVATIONS AND MISCLASSIFICATIONS OF PSYCHOPATHOLOGY IN PITUITARY PATIENTS

Pituitary disease and/or its treatment can affect mood and personality changes by disrupting the connections between the prefrontal cortex with other limbic structures, thereby impairing the behavioural control exerted by the prefrontal cortex on the limbic system.[37] The literature reports on such anecdotal cases, for instance by Weitzner *et al.*[38] who reported on patients with pituitary disease and apathy syndrome, patients who had previously been incorrectly classified as having major depressive disorder and had been treated accordingly with antidepressants for a long period of time. This, together with our general impression that

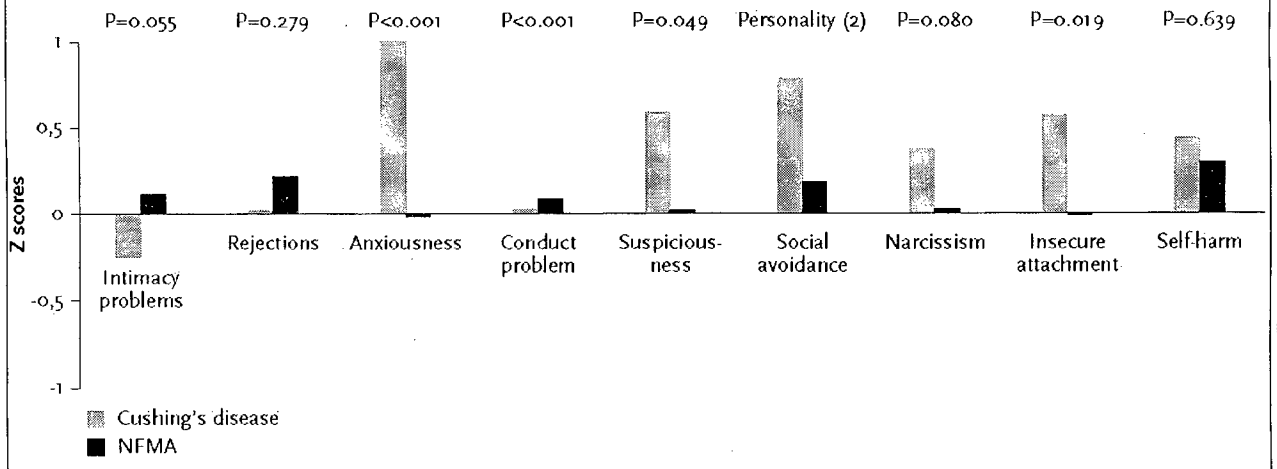
patients treated for Cushing's disease behave differently when compared with patients treated for other pituitary adenomas, we hypothesised that hormone-specific effects may be long-lasting or even be irreversible.

COGNITIVE FUNCTION AND PSYCHOPATHOLOGY DURING LONG-TERM FOLLOW-UP

Specifically, we hypothesised that patients with a long-term cure of both Cushing's disease and acromegaly showed cognitive dysfunction, persistent psychopathology and maladaptive personality traits. For this purpose, we studied patients cured of Cushing's disease and of acromegaly and *age- and gender-matched controls*. In addition, we included patients treated for non-functioning pituitary macroadenomas (NFMA) and additional controls, matched to these patients for age and gender. The cognitive evaluation consisted of multiple tests, which evaluated global cognitive functioning, memory, and executive functioning. In patients treated for Cushing's disease, cognitive function, reflecting memory and executive functions, was impaired despite long-term remission.[39] These findings were not replicated in patients successfully treated for acromegaly.[40] We than decided to extend these observations and asked patients and controls to complete questionnaires focusing on frequently occurring psychiatric symptoms in somatic illness including the Apathy Scale, Irritability Scale, Hospital Anxiety and Depression Scale (HADS), and Mood and Anxiety

Symptoms Questionnaire short-form (MASQ-30). Personality was assessed using the Dimensional Assessment of Personality Pathology short-form (DAPP). After a mean remission duration of 13 years for both Cushing's disease and acromegaly, patients cured from Cushing's disease (compared with matched controls) scored significantly worse on virtually all questionnaires. Compared with NFMA patients, patients treated for Cushing's disease scored worse on apathy, irritability, negative affect and lack of positive effect, somatic arousal, and 11 out of 18 subscales of the personality scales.[41] Patients cured of acromegaly (compared with matched controls) scored significantly worse on virtually all *psychopathology questionnaires* and on several subscales of the personality scales. These differences, although less accentuated, were also found when the patients cured of acromegaly were compared with NFMA patients.[40] In patients with prolactinomas, the impaired quality of life *despite long-term biochemical control with dopamine* agonists (and no surgical intervention!) is intriguing, because the current challenges in these patients relate to intrinsic imperfections of long-term medical treatment, and the fact that the disease recurs in the majority of the patients after withdrawal of dopamine agonist treatment.[42] In agreement, others have now replicated our findings of altered personality profile, also in patients with prolactinomas.[43]

Figure 2. *Personality traits in patients treated for Cushing's disease and patients treated for non-functioning pituitary adenomas (NFMA)*



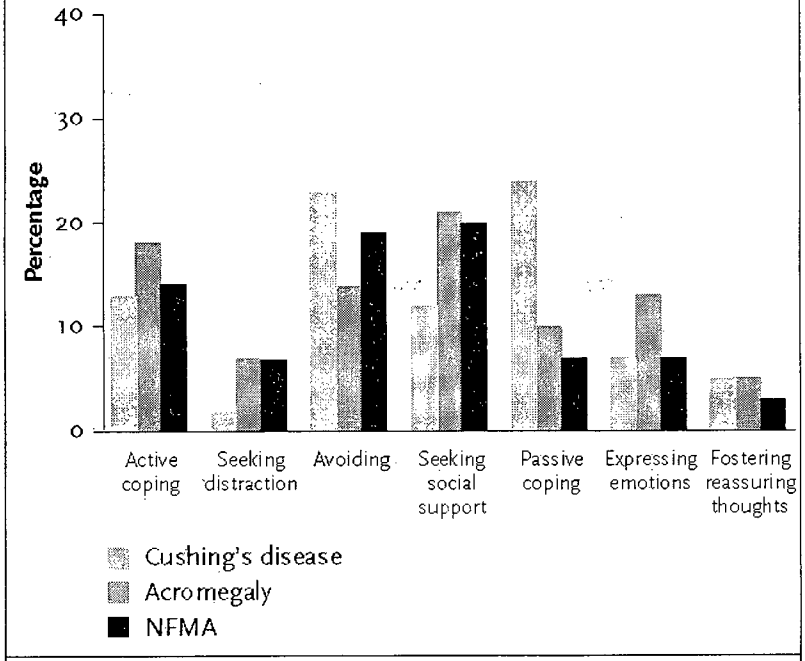
The zero Z score represents the scores for the healthy matched control subjects. adapted from Tiemensma et al.[42]

COPING AND ILLNESS PERCEPTIONS

Previous studies in other (chronic) diseases have indicated that QoL and psychological factors, such as illness perceptions and psychopathology, are related. Coping strategies may affect quality of life that is impaired in patients treated for pituitary adenomas. Additionally, illness perceptions pertain to the pattern of beliefs patients develop about their illness. Illness perceptions are also determinants of quality of life (QoL), but factors contributing to persisting impaired QoL after treatment for pituitary disease remain largely unknown. Therefore, coping strategies and illness perceptions, as potentially modifiable psychological factors, were explored in relation to QoL in patients after long-term remission of pituitary disease. In the first study,[44] patients treated for Cushing's disease, for acromegaly and for NFMA, were compared with three reference populations: an a-select sample from the Dutch population, patients with chronic pain, and patients receiving primary care psychology services. Furthermore, the three patient groups were compared with each other. The Utrecht Coping List assessed coping strategies. Patients with pituitary adenomas (when compared with the a-select sample) reported less active coping, sought less social support, and reported more avoidant coping. In contrast, patients treated for pituitary adenomas reported somewhat better coping strategies than patients with chronic pain and those with psychological disease. When patients with different pituitary adenomas were compared, patients treated for Cushing's disease sought

more social support than patients treated for NFMA. Thus, patients treated for pituitary adenomas display different and less effective coping strategies compared with healthy controls.[44]

Figure 3. *Different personality traits result in different coping strategies*



Adapted from Tiemensma et al.[19]

Illness perceptions were evaluated using the Illness Perception Questionnaire (IPQ)-Revised, and QoL was measured using the physical symptom checklist, EuroQoL-5D (EQ-5D), and the CushingQoL. Reference data were derived from recent studies and included patients with vestibular schwannoma, acute or chronic pain, and chronic obstructive pulmonary disease

(COPD). Illness perceptions strongly correlated with QoL. Patients with either acromegaly or CS had negative illness perceptions compared with patients with vestibular schwannoma and patients with acute pain, and also reported more illness-related complaints.[45, 46] There were also some differences in illness perceptions between patients with CS and patients with chronic pain and patients with COPD, but there was no distinct pattern. Noteworthy, patients after remission of acromegaly had a good understanding of their disease, but they experienced a lack of personal control and were not likely to seek medical care.[46]

CONCLUSION

Patients who are considered to be successfully treated for pituitary disease show a higher prevalence of psychopathology and more maladaptive personality traits, suggesting that the effects of previous glucocorticoid and GH excess on the central nervous system can be long lasting and even irreversible. The additional observations that patients treated for pituitary adenomas also display different and less effective coping strategies and experience more negative illness perceptions are intriguing in view of the general impairments in health-related quality of life. It is tempting to speculate that quality of life might be improved by targeted interventions that could help to stimulate patients to use a more active coping strategy and to seek social support instead of an avoiding coping strategy, and by addressing illness perceptions, for example, by a self-management intervention program.

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APPENDIX C

SUPERIOR COURT OF ARIZONA
MARICOPA COUNTY

CR 1996-012553	08/18/2015
HONORABLE JOSE S. PADILLA	CLERK OF THE COURT A. Beery Deputy
STATE OF ARIZONA	DIANE M MELOCHE
v.	
CHENE DEVONNE MANLEY (A)	CHENE DEVONNE MANLEY #144981 ASPC PERRYVILLE/SANTA PO BOX 3200 GOODYEAR AZ 85395
	COURT ADMIN-CRIMINAL-PCR

RULE 32 PROCEEDING DISMISSED

(Filed Aug. 20, 2015)

Pending before the Court is Defendant's Notice of Post-Conviction Relief filed on May 11, 2015. This is Defendant's third Notice of Post-Conviction Relief; as such, it is successive. For the reasons that follow, the Court will dismiss Defendant's Rule 32 proceeding.

A jury convicted Defendant of (1) one count of second-degree burglary, a class 3 felony; (2) one count of kidnapping, a class 2 dangerous felony; (3) one count of first-degree murder, a class 1 dangerous felony; and (4) one count of theft, a class 4 felony. On May 28, 1999,

the Court entered judgment and sentenced Defendant to a natural life term of imprisonment for the murder count. In addition, the Court imposed concurrent terms of 7 years for burglary, 21 years for kidnapping, and 2 years for theft. The Arizona Court of Appeals affirmed the convictions and sentences on direct appeal and issued its mandate on March 22, 2001. This Court dismissed Defendant's previous Rule 32 proceedings on April 16, 2002 and July 10, 2002, respectively.

A. Rule 32.1(e)

When a notice of post-conviction relief is successive or untimely, the defendant bears the burden of alleging specific claims and supporting those clams with sufficient facts. Ariz. R. Crim. P. 32.2(b), 32.4(a). In her submission, Defendant contends that there are newly discovered material facts which probably would have changed the outcome in her case pursuant to Arizona Rule of Criminal Procedure 32.1(e). (Notice at 2-4) To be entitled to post-conviction relief based on newly discovered evidence, the defendant must show that the evidence was discovered after trial although existed before trial; the evidence could not have been discovered and produced at trial or on appeal through reasonable diligence; the evidence is neither solely cumulative nor impeaching; the evidence is material; and the evidence probably would have changed the verdict or sentence. *State v. Saenz*, 197 Ariz. 487, 489, ¶ 7, 4 P.3d 1030, 1032 (App. 2000); *see also* Ariz. R. Crim. P. 32.1(e).

Defendant submits records indicating that she received a diagnosis of Chiari Malformation in 2014 following an MRI exam. (Attachment 1) Other proffered evidence on which Defendant bases this clam consists of (1) a Mayfield Clinic definition of Chiari Malformation dated April 21, 2015; (2) a one-page synopsis of a 2007 study finding one Chiari patient with psychotic behavior; and (3) scholarly articles on the condition published in 2012 and 2014, respectively. (Attachments 2-5) Defendant concedes that she is "not . . . able to provide the Court with all the facts and research that demonstrates how and why her Chiari Malformation constitutes newly discovered material facts under the law." (Notice at 4) Moreover, her evidence is based on technology and research developed during the 16 years since Defendant's sentencing. Because this evidence did not exist at the time of sentencing, it does not qualify as "newly discovered evidence" that would entitle Defendant to relief under Rule *32. See State v. Sanchez*, 200 Ariz. 163, 166-67, ¶ 11, 24 P.3d 610, 613-14 (App. 2001); *see also State v. Guthrie*, 111 Ariz. 471, 473, 532 P.2d 862, 864 (1975) ("Rule 32.1(e) has not expanded the law to relieve appellant from the consequences of a sentence because of facts arising after the judgment of conviction and sentencing.").

B. Rule 32.1(g)

Defendant also contends that there has been a significant change in the law that, if applied retroactively to her case, would probably affect the outcome in accordance with Arizona Rule of Criminal Procedure

32.1(g). (Notice at 4-5) Defendant invokes the United States Supreme Court's decision in *Miller v. Alabama*, ___ U.S. ___, 132 S Ct. 2455 (2012). In *Miller*, the Supreme Court determined that mandatory life sentences without the possibility of parole violated the Eighth Amendment when applied to defendants who were under eighteen years old at the time of their crimes. *Id.* at 2469, 2475. A sentencing court must take into account "an offender's age and the wealth of characteristics and circumstances attendant to it." *Id.* at 2467. The Court declined to address whether the Eighth Amendment imposes "a categorical bar on life without parole for juveniles, or at least for those 14 and younger." *Id.* at 2469. *Miller* does not apply here because the defendant was 18 at the time she committed her offenses. Nor does *Miller* "call for this Court to take into account the implications of Petitioner's Chiari malformation for purposes of the sentencing determination in this case." (*Id.* at 4)

In short, Defendant's Notice of Post-Conviction Relief does not state any claims for which Rule 32 can provide relief. When a notice is untimely or successive, the defendant has the burden of alleging specific clams, supporting those claims with specific facts, and explaining the reasons for the untimely filing. Ariz. R. Crim. P. 32.4(a), 32.2(b). Defendant has failed to meet that burden. The Court finds that no purpose would be served by further proceedings or appointment of counsel. Accordingly,

IT IS ORDERED dismissing Defendant's Rule 32 proceeding pursuant to Arizona Rule of Criminal Procedure 32.2(b).

DATED: 8/18/2015

/S/ HON. JOSE PADILLA

JOSE PADILLA
JUDGE OF THE SUPERIOR COURT

APPENDIX D

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IN THE COURT OF APPEALS

STATE OF ARIZONA

DIVISION ONE

STATE OF ARIZONA, Plaintiff/Respondent, -vs- CHENE DEVONNE MANLEY, Defendant/Petitioner.	No. 1 CA-CR 15 _____ PRPC Maricopa County Superior Court No. CR1996-012553 **PETITION FOR REVIEW TO COURT OF APPEALS FROM DENIAL OF NOTICE OF POST CONVICTION RELIEF *in re:* NEWLY DISCOVERED MATERIAL EVIDENCE**

COMES NOW Defendant/Petitioner **Chene DeVonne Manley**, by and through undersigned counsel, pursuant to **(1) Rule 32.9(c)(2), Ariz.R.Crim.P.; (2)** the Superior Court's **10/21/2015 Minute Entry Order** granting extension to November 23, 2015; **(3)** the 5th, 6th, and **14th Amendments** to the **United States Constitution;** and **(4) art. II,** § 4 of the Constitution of the State of Arizona; and hereby submits her Petition for Review, requesting the Court of Appeals to review the attached decision of the Honorable Jose S. Padilla **08/20/2015 Minute Entry Order (PR Attachment A)** summarily dismissing the **05/11/2015 Notice of Post Conviction Relief** that was filed by Petitioner *in propria persona*, which **(a)** asserted a claim of newly discovered material evidence (of a previously undiscovered congenital condition), **(b)** (presented cogent reasons why the claim had never before been asserted in any previous petition, and **(c)** requested appointment of counsel to assist Petitioner in demonstrating the merits of her claim for post conviction relief.

RESPECTFULLY SUBMITTED this 5th day of November, 2015.

THE FERRAGUT LAW FIRM, P.C.

/s/_____
Ulises A. Ferragut, Jr.
Attorney for Defendant/Petitioner Chene Manley

MEMORANDUM OF POINTS AND AUTHORITIES

I. INTRODUCTION

This Petition for Review arises from the summary denial of Petitioner's 05/11/2015 Notice of Post Conviction Relief (hereinafter, "**05/11/2015 NPCR**") involving circumstances, claims, and facts which, at the time of filing, called for appointment of counsel, full briefing, and an evidentiary hearing. *See* Superior Court Order of summary denial, at **PR_Attachment A**.[1] It is important at the outset to make a clear distinction between Petitioner's challenge to the summary denial of her Notice of Post Conviction Relief and the actual merits of the claim of newly discovered material evidence. This Court does not have jurisdiction to address the merits of Petitioner's claim of newly discovered material evidence, because the merits of her claim have not been fully presented to and considered by the Superior Court, and therefore is not currently before this Court. The question before this Court is whether due process of law prohibited the Superior Court from summary dismissal of the Notice, given the actual content of the Notice and the express terms of the rule governing claims of newly discovered material evidence.

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[1] Petitioner uses "**PR_Attachment A**" rather than simply "**Attachment A**" because the Superior Court Notice of Post Conviction Relief had six (6) attachments, labeled "Attachment 1. *etc.*, through Attachment 6. If Petitioner had been permitted to submit a formal Petition for Post Conviction Relief, the Petition would have made reference to Exhibits rather than attachments.

II. ISSUES PRESENTED FOR REVIEW

1. Did the Superior Court abuse its discretion and violate Petitioner's right to due process of law under **Rule 32.1(e), Ariz.R.Crim.P., A.R.S. Const., art. II,** § 4 and **U.S. Const., 14th Amendment,** by summarily dismissing Petitioner's *pro se* Notice of Post Conviction Relief which presented, to the best of her ability as an unrepresented indigent petitioner, a claim of newly discovered material evidence? *See* **PR_Attachment A,** second paragraph.

2. Did the Superior Court abuse its discretion by summarily dismissing Petitioner's *pro se* Notice of PCR despite the fact that the Notice expressly presented **(1)** the substance of the specific exception to preclusion, **(2)** meritorious reasons substantiating the claim, and **(3)** indicating why the claim was not stated in any previous petition or in a timely manner? *See* **05/13/2015 NPCR,** at pages 2-5 (*i.e.,* answering Form Item #7.C.).

3. Did the Superior Court abuse its discretion by denying appointment of counsel for an unrepresented and indigent petitioner, where **(1)** assistance of counsel was essential to the development and presentation of the critical aspects of the claim of newly discovered material evidence, where **(2)** Petitioner had just been informed of a diagnosis by medical professionals of a serious medical condition that had existed since birth but which had not been diagnosed until many years after her incarceration, and where **(3)** the connection between the newly diagnosed medical condition and Petitioner's history of problems – social,

developmental, educational, personal, psychological, and criminal – needed to be professionally investigated and articulated to the Court for consideration? *See* **05/13/2015 NPCR,** at pages 2-3, especially **Attachment 1** (to 05/11/2015 NPCR) (portions of ADC Medical Records).

4. Did the Superior Court abuse its discretion by applying the tests for newly discovered material evidence not to the newly discovered condition that had existed since birth, but rather to the "*technology and research developed during the 16 years since Defendant's sentencing[, which] . . . did not exist at the time of sentencing,* and thus ruling that "*it does not qualify as 'newly discovered evidence'*"? *See* **PR_Attachment A,** second paragraph.

5. Did the Superior Court abuse its discretion by basing its summary dismissal of Petitioner's *pro se* Notice of Post Conviction Relief on the basis of its citation to ***State v. Sanchez,*** 200 Ariz. 163, 166-67, ¶ 11, 24 P.3d 610, 613-14 (App. 2001); and ***State v. Guthrie,*** 111 Ariz. 471, 473, 532 P.2d 862, 864 (1975)? *See* **PR_Attachment A,** second paragraph.

6. Did the Superior Court abuse its discretion by incorrectly applying the applicable standard of review for claims of newly discovered material evidence? *See* **PR_Attachment A.**

III. FACTS MATERIAL TO DETERMINATION OF ISSUES PRESENTED FOR REVIEW

1. Many years after her incarceration in this case number, Petitioner was diagnosed with a serious congenital neurological condition. The condition has existed since birth, but no medical professional had previously diagnosed the condition, despite a lifetime of medical, physical, emotional, and behavioral problems that plagued her entire life. *See* **05/11/2015 NPCR,** especially **NPCR_Attachment 1,** which consists of a portion of Arizona Department of Corrections Medical Records. Neither Petitioner nor her family had ever previously known of or even suspected the existence of this medical condition.

2. Upon **(a)** learning of the newly diagnosed but pre-existing neurological condition and **(b)** learning that it was a congenital condition – *i.e.* a condition existent at time of birth – Petitioner informed her mother, who began to investigate the condition. Upon learning from her mother that the newly discovered neurological condition was responsible for causing the types of medical, physical, emotional, and behavioral problems that had plagued Petitioner during her life – significantly increasing following puberty and during her adolescent years – Petitioner filed, *in propria persona*, a Notice of Post Conviction Relief; and asked for appointment of counsel to assist her with developing the merits of the claim of newly discovered material evidence. *See* **05/11/2015 NPCR**.

3. Petitioner's Notice of Post Conviction Relief included attachments demonstrating that the congenital medical condition had only recently been diagnosed in her case and that the effects of the congenital neurological condition included medical, physical, emotional, and behavioral problems, *see* **05/11/2015 NPCR** and its attachments **(NPCR Attachment 1** through **NPCR Attachment 6),** and the Notice included the following statements:

> **Petitioner suffered from a congenital condition which progressively affects all aspects of her life, including physically, psychologically, emotionally, and rationally, and this condition existed at the time of the offense, at the time of trial, at the time of sentence, at the time of direct appeal, and at the time of prior post conviction relief action. Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections (ADC). The condition is called Chiari Malformation, and was discovered when Petitioner was sent by the ADC medical services provider for an MRI, as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions.**
>
> **Essentially, Petitioner's condition consists of extreme and progressive pressure on the brain as a result of her cranium being too**

small; and the brain's ability to function normally is severely impaired by the pressure. As a consequence, Petitioner suffers from a host of medical problems such as uncontrollable high blood pressure, wildly erratic swings in endocrine gland function, thyroid problems, excessive weight gain and all its associated problems, psychological problems, emotional and impulse-control problems, and an inability to rationally direct and react to the stresses of ordinary life, let alone highly-stressful circumstances including incarceration.

Petitioner is currently scheduled for decompression neurosurgery to partially relieve the pressure, which hopefully will contribute to resolving some of the numerous physical and medical conditions she currently is being treated for; and the surgery also hopefully will allow her to partially regain mental, psychological, and emotional balance in her life.

As mentioned, the condition is called Chiari Malformation, and was discovered when Petitioner was sent for an MRI as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions. With the assistance of her family, Petitioner has initiated research into Chiari Malformation, its causes, effects, and treatment, not only for the purpose of presenting the information to the Court as newly discovered material evidence, but also for the purpose of understanding her own behavior

from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life.

Petitioner is not, however, at this point, able to provide the Court with all the facts and research that demonstrates how and why her Chiari Malformation constitutes newly discovered material facts under the law. Petitioner thus requires appointment of counsel to assist her in meeting her burden under the Arizona Rules of Criminal Procedure. Petitioner asserts that she is entitled to appointment of counsel for this purpose under the Due Process Clause of the Fourteenth Amendment to the United States Constitution and under Art. II, Sec. 4 of the Constitution of the State of Arizona. Petitioner believes that she has made a substantial showing of entitlement under Rule 32.1(e), Rule 32.2(b), and under Rule 32.4(c)(2) (second sentence).

Petitioner respectfully requests the Court accept her untimely Notice of Post Conviction Relief asserting a claim of newly discovered material evidence; and to appoint counsel for the purpose of assisting her in presenting in detail to the Court the full scope of the effect of this condition that previously was unknown to her or her family.

05/13/2015 NPCR, at pages 2-5 (*i.e.*, answer to NPCR Form Item #7.C.).[2]

4. On 07/28/2015 – 78 days after the filing of Petitioner's *pro per* Notice of PCR – Petitioner filed a Request for Status of Case, because the Maricopa County Superior Court Rule 32 Management Unit had not processed her **05/11/2015 NPCR** (*i.e.*, the Superior Court had not issued an order acknowledging receipt of the Notice of PCR, had not appointed counsel, had not set a time frame for the filing of a Petition, etc.).

5. On 08/06/2015, 8 days after the filing of the request for case status and 86 days from the filing of the **05/11/2015 NPCR,** the Rule 32 Management Unit issued a Minute Entry Order assigning the case to the Honorable Jose Padilla. No reason was provided for either the delay or the fact that the Rule 32 Management Unit did not process the Notice in the same manner as other Notices. *See* **08/06/2015 Minute Entry Order**.

6. On 08/20/2015, 101 days from the filing of the Notice and 15 days from the case being assigned out of the Rule 32 Management Unit, Judge Padilla issued a Minute Entry Order summarily dismissing the *pro per* Notice of Post Conviction Relief. *See* **PR-Attachment A (08/20/2015 Minute Entry Order)**. Judge Padilla's order stated as follows:

---

[2] Petitioner had brain decompression surgery in May, 2015, which relieved some but not all of the effects of the condition. Some effects are irreversible and relief for other effects must be obtained by treatment over long periods of time.

Pending before the Court is Defendant's Notice of Post-Conviction Relief filed on May 11, 2015. This is Defendant's third Notice of Post-Conviction Relief; as such, it is successive. For the reasons that follow, the Court will dismiss Defendant's Rule 32 proceeding.

A jury convicted Defendant of (1) one count of second-degree burglary, a class 3 felony; (2) one count of kidnapping, a class 2 dangerous felony; (3) one count of first-degree murder, a class 1 dangerous felony; and (4) one count of theft, a class 4 felony. On May 28, 1999, the Court entered judgment and sentenced Defendant to a natural life term of imprisonment for the murder count. In addition, the Court imposed concurrent terms of 7 years for burglary, 21 years for kidnapping, and 2 years for theft. The Arizona Court of Appeals affirmed the convictions and sentences on direct appeal and issued its mandate on March 22, 2001. This Court dismissed Defendant's previous Rule 32 proceedings on April 16, 2002 and July 10, 2002, respectively.

A. Rule 32.1(e)

When a notice of post-conviction relief is successive or untimely, the defendant bears the burden of alleging specific claims and supporting those claims with sufficient facts. Ariz. R. Crim. P. 32.2(b), 32.4(a). In her submission, Defendant contends that there are newly discovered material facts which probably would have changed the outcome in her case pursuant to Arizona Rule of Criminal Procedure 32.1(e). (Notice at 2-4) To be entitled to post-conviction relief based on newly

discovered evidence, the defendant must show that the evidence was discovered after trial although existed before trial; the evidence could not have been discovered and produced at trial or on appeal through reasonable diligence; the evidence is neither solely cumulative nor impeaching; the evidence is material; and the evidence probably would have changed the verdict or sentence. State v. Saenz, 197 Ariz. 487, 489, ¶ 7, 4 P.3d 1030, 1032 (App. 2000); see also Ariz. R. Crim. P. 32.1(e).

Defendant submits records indicating that she received a diagnosis of Chiari Malformation in 2014 following an MRI exam. (Attachment 1) Other proffered evidence on which Defendant bases this claim consists of (1) a Mayfield Clinic definition of Chiari Malformation dated April 21, 2015; (2) a one-page synopsis of a 2007 study finding one Chiari patient with psychotic behavior; and (3) scholarly articles on the condition published in 2012 and 2014, respectively. (Attachments 2-5) Defendant concedes that she is "not . . . able to provide the Court with all the facts and research that demonstrates how and why her Chiari Malformation constitutes newly discovered material facts under the law." (Notice at 4) Moreover, her evidence is based on technology and research developed during the 16 years since Defendant's sentencing. Because this evidence did not exist at the time of sentencing, it does not qualify as "*newly discovered evidence*" that would entitle Defendant to relief under Rule 32. *See State v. Sanchez*, 200 Ariz. 163, 166-67, ¶ 11, 24 P.3d 610, 613-14 (App. 2001); *see also State v. Guthrie*, 111 Ariz. 471, 473, 532 P.2d 862, 864 (1975) ("*Rule 32.1(e) has not expanded the law to relieve*

appellant from the consequences of a sentence because of facts arising after the judgment of conviction and sentencing.").

B. Rule 32.1(g)

Defendant also contends that there has been a significant change in the law that, if applied retroactively to her case, would probably affect the outcome in accordance with Arizona Rule of Criminal Procedure 32.1(g). (Notice at 4-5) Defendant invokes the United States Supreme Court's decision in *Miller v. Alabama*, ___ U.S. ___, 132 S. Ct. 2455 (2012). In *Miller*, the Supreme Court determined that mandatory life sentences without the possibility of parole violated the Eighth Amendment when applied to defendants who were under eighteen years old at the time of their crimes. Id. at 2469, 2475. A sentencing court must take into account "*an offender's age and the wealth of characteristics and circumstances attendant to it.*" Id. at 2467. The Court declined to address whether the Eighth Amendment imposes "*a categorical bar on life without parole for juveniles, or at least for those 14 and younger.*" Id. at 2469. *Miller* does not apply here because the defendant was 18 at the time she committed her offenses. Nor does *Miller* "call for this Court to take into account the implications of Petitioner's Chiari malformation for purposes of the sentencing determination in this case." (Id. at 4)

In short, Defendant's Notice of Post-Conviction Relief does not state any claims for which Rule 32 can provide relief. When a notice is untimely or successive, the defendant has the

> burden of alleging specific claims, supporting those claims with specific facts, and explaining the reasons for the untimely filing. Ariz. R. Crim. P. 32.4(a), 32.2(b). Defendant has failed to meet that burden. The Court finds that no purpose would be served by further proceedings or appointment of counsel. Accordingly,
>
> **IT IS ORDERED** dismissing Defendant's Rule 32 proceeding pursuant to Arizona Rule of Criminal Procedure 32.2(b).

PR-Attachment A (08/20/2015 Minute Entry Order) (bold print in original).

7. Through her mother, Petitioner obtained private counsel, who requested an extension of time for filing a Petition for Review. *See* **09/22/2015 Motion for Extension of Time**.

8. On October 21, 2015, Judge Padilla granted Petitioner an extension to November 23, 2015. *See* **10/21/2015 Minute Entry Order**.

IV. REASONS WHY THE PETITION SHOULD BE GRANTED

A. Applicable Standards of Review

Appellate courts reviewing the denial of post conviction relief apply an abuse of discretion standard. ***State v. Cook***, 177 Ariz. 595, 870 P.2d 413 (App.1993, Div.1); ***State v. Rosales***, 205 Ariz. 86, 66 P.3d 1263 (App.2003, Div.2); ***State v. Schurz***, 176 Ariz. 46, 57, 859 P.2d 156 (1993); ***State v. Amaya-Ruiz***, 166 Ariz.

152, 180, 800 P.2d 1260 (1990); ***State v. Watton,*** 164 Ariz. 323, 325, 793 P.2d 80, 82 (1990) (review of a trial court's summary dismissal of a petition for post conviction relief is for an abuse of discretion). Constitutional and legal issues, however, are reviewed *de novo.* ***State v. Moody,*** 208 Ariz. 424, 445, 94 P.3d 1119 (2004) (*en banc*), citing ***State v. Davolt,*** 207 Ariz. 191, 201, ¶ 21, 84 P.3d 456, 466 (2004); and ***State v. Cook,*** *supra.* A trial court abuses its discretion when it commits an error of law. ***State v. West,*** 224 Ariz. 575, ¶ 8, 233 P.3d 1154, 1156 (App.2010).

B. The Requirements of Rule 32.2(a) & (b), Ariz.R.Crim.P., for Untimely or Successive Petitions for Post Conviction Relief

Because Petitioner previously filed a Petition for Post Conviction Relief, the current, successive, petition is subject to the provisions of **Rule 32.2(a) and Rule 32.2(b), Ariz.R.Crim.P.,** which expressly provide as follows:

> a. Preclusion. A defendant shall be precluded from relief under this rule based upon any ground:
>
> (1) Raisable on direct appeal under Rule 31 or on post-trial motion under Rule 24;
>
> (2) Finally adjudicated on the merits on appeal or in any previous collateral proceeding;

> (3) That has been waived at trial, on appeal, or in any previous collateral proceeding.
>
> b. **Exceptions. Rule 32.2(a) shall not apply to claims for relief based on Rules 32.1**(d), **(e),** (f), (g) and (h). **When a claim under Rules 32.1**(d), **(e),** (f), (g) and (h) **is to be raised in a successive or untimely post-conviction relief proceeding, the notice of post-conviction relief must set forth the substance of the specific exception and the reasons for not raising the claim in the previous petition or in a timely manner.** If the specific exception and meritorious reasons do not appear substantiating the claim and indicating why the claim was not stated in the previous petition or in a timely manner, the notice shall be summarily dismissed.

Rule 32.2(a) & (b), Ariz.R.Crim.P. (emphasis by bold print added).

Petitioner's current Notice of Post Conviction Relief presented a claim under **Rule 32.1(e), Ariz.R.Crim.P.,** (newly discovered material facts) which expressly provides as follows:

> e. Newly discovered material facts probably exist and such facts probably would have changed the verdict or sentence. Newly discovered material facts exist if:
>
> (1) The newly discovered material facts were discovered after the trial.

> (2) The defendant exercised due diligence in securing the newly discovered material facts.
>
> (3) The newly discovered material facts are not merely cumulative or used solely for impeachment, unless the impeachment evidence substantially undermines testimony which was of critical significance at trial such that the evidence probably would have changed the verdict or sentence.

Rule 32.1(e), Ariz.R.Crim.P.

C. Critical Feature of Rule 32.1(e), Ariz.R.Crim.P., That Must Be Taken Into Account

It is important for the Court to take special notice of a critical feature of the governing rule, which is that a claim under **Rule 32.1(e), Ariz.R.Crim.P.,** is a claim that "***newly discovered material facts probably exist and such facts probably would have changed the verdict or sentence***" – not that newly discovered material facts **DO EXIST,** just that newly discovered material facts **PROBABLY EXIST.** The reason for the distinction is clear from the difference between a **NOTICE** of post conviction relief and a **PETITION** for post conviction relief. The Notice is to make the trial court aware of the *type* of claim that is being asserted, whereas the Petition is to *prove up* the claim.

D. Formal Process for Determination of Facts Underlying Claim for Post Conviction Relief

As previously stated, **Rule 32.1(e)** provides that a defendant may seek relief if newly-discovered material facts exist, which, if introduced, might have affected the verdict, finding, or sentence. A defendant is entitled to an evidentiary hearing on an allegation of newly-discovered evidence if the defendant presents a "*colorable claim.*" ***State v. D'Ambrosio,*** 156 Ariz. 71, 73, 750 P.2d 14, 16 (1988); *see also* ***State v. Fisher,*** 141 Ariz. 227, 250-51, 686 P.2d 750, 773-74, *cert. denied*, 469 U.S. 1066 (1984). Moreover, the facts underlying a claim for relief that is outside the record of the prior proceedings are to be determined by the trial court at a special proceeding created for that specific purpose, namely, an evidentiary hearing, which is governed by the provisions of **Rule 32.8, Ariz.R.Crim.P.,** which provides as follows:

> a. Evidentiary Hearing. The defendant shall be entitled to a hearing to determine issues of material fact, with the right to be present and to subpoena witnesses. If facilities are available, the court may, in its discretion, order the hearing to be held at the place where the defendant is confined, giving at least 15 days notice to the officer in charge of the confinement facility. In superior court, the hearing shall be recorded.
>
> b. Evidence. The rules of evidence applicable in criminal proceedings shall apply, except

> that the defendant may be called to testify at the hearing.
>
> c. Burden of Proof. The defendant shall have the burden of proving the allegations of fact by a preponderance of the evidence. If a constitutional defect is proven, the state shall have the burden of proving that the defect was harmless beyond a reasonable doubt.

Rule 32.8, Ariz.R.Crim.P.

The Arizona Supreme Court has emphasized the process for resolving claims that are based on facts not of record in prior proceedings. ***State v. Robbins,*** 166 Ariz. 531, 532, 803 P.2d 942 (App. 1991,Div.1) (holding that the Rule 32 process is available for examination and expansion of the record to determine factual basis for a claim). The Supreme Court has held that, where doubts exist, the PCR court should first permit the defendant to raise the relevant issues, then conduct an evidentiary hearing, formally resolve the matter, and make a record for review:

> One of the purposes of a Rule 32 proceeding "*is to furnish an evidentiary forum for the establishment of facts underlying a claim for relief when such facts have not previously been established of record.*" *State v. Scrivner*, 132 Ariz. 52, 54, 643 P.2d 1022, 1024 (App. 1982); see also *State v. Cabrera*, 114 Ariz. 233, 236, 560 P.2d 417, 420 (1977); *State v. Bell*, 23 Ariz.App. 169, 171, 531 P.2d 545, 547 (1975).

State v. Watton, 164 Ariz. 323, 328, 793 P.2d 80, 85, (1990) (underlining added).

The ***Walton*** Court went on to state:

> A defendant is entitled to an evidentiary hearing when he presents **a colorable claim, that is a claim which, if defendant's allegations are true, might have changed the outcome.** *State v. Schrock*, 149 Ariz. 433, 441, 719 P.2d 1049, 1057 (1986). **When doubts exist, *"a hearing should be held to allow the defendant to raise the relevant issues, to resolve the matter, and to make a record for review."*** Id.

State v. Watton, 164 Ariz., at 328, 793 P.2d, at 85 (1990) (bold print added).

When, as here, a Petitioner presents a colorable claim for post conviction relief, there is a constitutional due process entitlement to an evidentiary hearing, and summary dismissal is impermissible. ***State v. Jenkins,*** 193 Ariz. 115, 118, 970 P.2d 947 (App.1998,Div.1); ***Donald,*** *supra*, 198 Ariz., at 411, 10 P.3d, at 1198. Following ***Townsend v. Sain,*** 372 U.S. 293 (1963) (holding that post conviction relief petitioners are constitutionally entitled to evidentiary hearings to determine the facts underlying their claims for relief), the Arizona Supreme Court issued an opinion interpreting the portion of **Rule 32.6, Ariz.R.Crim.P.,** concerning summary disposition versus mandatory evidentiary hearings. The Arizona Supreme Court defined a *"colorable claim"* (*i.e.,* one in which an

evidentiary hearing was required by **Rule 32.6, Ariz.R.Crim.P.)** as follows: *"To be colorable, a claim has to have the appearance of validity, i.e., if the defendant's allegations are taken as true, would they change the verdict?"* ***State v. Richmond,*** 114 Ariz. 186, 194, 560 P.2d 41, 49 (1976), *cert. denied*, 433 U.S. 915 (1977). Later, the Arizona Supreme Court modified the definition of a colorable claim to be one that, if taken as true, might have changed the outcome. ***State v. Runningeagle,*** 176 Ariz. 59, 63, 859 P.2d 169, 173 (1993) ***("The defendant is entitled to an evidentiary hearing only when he presents a colorable claim – one that, if the allegations are true, might have changed the outcome.").***

Importantly, one purpose of an evidentiary hearing is addressed to subsequent review, *i.e.*, *"Rule 32 not only provides a procedure through which a defendant may be heard, but also ensures a record from which reviewing courts can determine whether the facts support petitioner's claim for relief"* ***Canion v. Cole,*** 210 Ariz. 598, 600, 115 P.3d 1261, 1263 (2005). Accordingly, a court abuses its discretion if it denies post conviction relief based on factual determination that was conducted in the absence of an evidentiary hearing.

E. The Superior Court's Legal Analysis of What Constitutes Newly Discovered Material Evidence in this Case Conflates the Material Fact (Discovery of the Pre-Existing Medical Condition (Chiari Malformation) With the Progressively Developing Scientific Understanding of the Effects of the Medical Condition

Judge Padilla ruled that:

> [Petitioner's] evidence is based on technology and research developed during the 16 years since Defendant's sentencing. Because this evidence did not exist at the time of sentencing, it does not qualify as "*newly discovered evidence*" that would entitle Defendant to relief under Rule 32. *See State v. Sanchez*, 200 Ariz. 163, 166-67, ¶ 11, 24 P.3d 610, 613-14 (App. 2001); *see also State v. Guthrie*, 111 Ariz. 471, 473, 532 P.2d 862, 864 (1975) ("*Rule 32.1(e) has not expanded the law to relieve appellant from the consequences of a sentence because of facts arising after the judgment of conviction and sentencing.*").

PR_Attachment A, at page 2, end of second full paragraph.

Judge Padilla confused the newly discovered material evidence (*i.e.*, the post-incarceration diagnosis of a pre-existing medical condition) with the scientific evidence that potentially can demonstrate the connection between the pre-existing condition and the difference

in sentencing outcome that probably would have occurred if the sentencing court had been aware of the medical condition at the time the court determined the appropriate sentence to impose. These are two completely different types of evidence. The fact of the pre-existing medical condition that probably would have mitigated her sentencing is quite distinct from the scientific evidence that potentially can explain Petitioner's behavior.

F. The Superior Court Abused Its Discretion and Constitutionally Erred When It Dismissed the Notice of PCR On the Ground That the Progressively Developing Medical Research Information Underlying Petitioner's Claim of Newly Discovered Evidence Did Not Exist at the Time of Petitioner's Sentencing

What Petitioner sought to present in a formal Petition for Post Conviction Relief is not proof of a newly developed condition, but rather modern medical scientific discoveries that explain why she behaved as she did at the time of her offense and sentencing and why she was less culpable than the sentencing court perceived her to be at that time. These scientific discoveries would tend to show that because of the unrecognized and untreated effects of the pre-existing medical condition from which she suffered, her level of culpability was mis-perceived to be significantly greater than in fact it was. This is necessarily the case because, given surgery to relieve the progressive and

ultimately fatal pressure on her brain and treatment for the associated physical, emotional, hormonal, and psychological manifestations of the condition, Petitioner's impulsivity, recklessness and amenability to treatment and rehabilitation than the sentencing court then understood.

Consequently, Petitioner cannot, consistent with due process, be denied all opportunity to demonstrate under **Rule 32.1(e), Ariz.R.Crim.P.,** and the 5th, 6th, and **14th Amendments** to the **United States Constitution and A.R.S. Const. art. II, § 4,** that the newly discovered material fact of her pre-existing and newly discovered medical condition probably would have changed the sentencing determination from Natural Life to Life With Possibility of Release After Service of Not Less Than 25 Calendar Years.

The information that was available to the sentencing court was fundamentally inadequate (as well as deficient and inaccurate) and that information constituted a flawed indicator of Petitioner's future amenability and capacity to conforming her conduct to law-abiding behavior. Petitioner submits that the accuracy of information available to a sentencing court is a critical feature of due process of law. The Watton Court stated:

> [P]ublic policy . . . mandates a fair sentencing process. Arizona courts have long held that a court must tailor the sentence based on complete and accurate information. *State v. Clabourne*, 142 Ariz. 335, 346, 690 P.2d 54, 65 (1984); *State v. Fenton*, 86 Ariz. 111, 119, 341

> P.2d 237, 242 (1959), *cert. denied*, 361 U.S. 877 . . . , (1959); *State v. Gayman*, 127 Ariz. 600, 602, 623 P.2d 30, 32 (App.1981); *see also State v. Grier*, 146 Ariz. 511, 515, 707 P.2d 309, 313 (1985). The primary source of information at sentencing usually is the presentence report, which contains a broad range of information about a defendant and serves a key function in the sentencing process. *See* A.R.S. § 12-253(4).

State v. Watton, 164 Ariz., at 327-28, 793 P.2d, at 84-85.

The ***Watton*** Court went on to point out the importance of the connection between the determination of sentence and the information available to the sentencing court:

> The sentencing process is designed to assist the court in intelligently exercising its discretion based on complete and accurate information. Anything that inhibits a court's or a probation officer's access to information undermines the truth-seeking function of the judicial process and threatens the adversary system. A judge cannot fashion an appropriate sentence for a particular defendant if relevant information, whether in aggravation or mitigation, is withheld. Anything that prevents a probation officer or a sentencing judge from obtaining relevant and accurate information therefore hampers the proper exercise of the court's discretion. *State v. Thurston*, 781 P.2d 1296, 1300 (Utah App.1989); *see also State v. Prentiss*, 163 Ariz. 81, 86, 786 P.2d

> 932, 937 (1989) ("*Any rule which inhibits a lawyer at sentencing from revealing, recommending, alleging or discussing mitigating circumstances with that judge fosters injustice.*")
>
> * * *
>
> One of the most important elements of the criminal justice system is just and informed sentencing by a trial court furnished with all relevant sentencing data.

State v. Watton, 164 Ariz., at 328, 793 P.2d, at 85.

While the comments cited and quoted above were made within the context of plea agreements and held that plea agreements could not be used to restrict either the defense or the Court's ability to utilize information relevant to the sentencing determination, Petitioner submits that the same principles apply to sentencing information arising from newly discovered material evidence of a pre-existing condition that bears directly upon the sentencing process. Indeed, that is precisely why newly discovered material evidence may constitute a viable claim under post conviction relief procedures.

Petitioner asserts that advances in medical research can now explain puzzling features of her personality that led her down the road to criminality and that led the sentencing court to conclude when she was age 18 that a natural life sentence was appropriate. Petitioner and her defense counsel at the time of sentencing were unable to satisfactorily explain those

features in 1998. Petitioner's situation is analogous to that of Vietnam veterans and other trauma survivors who did not at the time of their seemingly inexplicable conduct understand that in fact they suffered from post-traumatic stress disorder or "PTSD," *e.g.*, ***State v. Bilke,*** 162 Ariz. 51, 781 P.2d 28 (1989); ***State v. Jensen,*** 153 Ariz. 171, 174, 735 P.2d 781 (1987); and ***Henry v. Industrial Com'n,*** 157 Ariz. 67, 69-70, 754 P.2d 1342 (1988). Additionally, in other cases, while evolving scientific information was not used to explain misconduct, the Court of Appeals has allowed it as mitigation evidence entitling defendants to re-sentencing where they have been able to show that at the time of original sentencing they suffered from undiagnosed acquired immunodeficiency syndrome or "AIDS," *e.g.*, ***State v. Cooper,*** 166 Ariz. 126, 129, 800 P.2d 992 (App.1990); ***State v. Ellevan,*** 179 Ariz. 382, 880 P.2d 139 (App.1994).

The ***Bilke*** and ***Cooper*** lines of cases stand for the proposition that new discoveries providing increased understanding of pre-existing psychological, physical, and medical conditions constitute newly discovered evidence within the meaning of **Rule 32.1(e).** If Petitioner claimed, for example, that since her conviction, an MRI scan showed she had a previously undetected brain tumor that drove her to violence, that surely would have qualified as newly discovered evidence admissible at sentencing under ***Bilke, Jensen,*** and ***Henry.*** The fact that Petitioner's new evidence dealt with a pre-existing brain condition that occurred even prior to birth and became more pronounced and more

debilitating upon puberty should not detract from her ability to present that evidence at a re-sentencing. The Notice of Post Conviction Relief in this case raises colorable claims that entitle Petitioner to full briefing and an evidentiary hearing.[3]

The Superior Court's citation to ***State v. Sanchez,*** 200 Ariz. 163, 24 P.3d 610 (App.2001), is particularly telling. In ***Sanchez,*** the appellate court held that a change in blood alcohol testing procedure intended to *improve reliability* could not reasonably be interpreted as an admission that the prior procedure was *necessarily unreliable.* ***Sanchez*** is inapplicable to the facts of this case. The Superior Court's other citation, to ***State v. Guthrie,*** 111 Ariz. 471, 473, 532 P.2d 862, 864 (1975), is even less applicable. In ***Guthrie,*** the defendant filed a petition for postconviction relief requesting the court to reconsider its prison sentence on the basis of a newly-written probation report showing subsequent rehabilitation that allegedly justified probation instead of prison. The trial court ruled it lacked jurisdiction to hear the petition, and accordingly ordered that the petition be denied. ***Guthrie*** is totally inapplicable to the facts and claims asserted in the Notice of PCR in this case.

The Arizona Supreme Court has held that the purpose of Rule 32 post conviction relief is to correct error where "*. . . justice has run its course but yet gone awry.*"

---

[3] As mentioned previously, a colorable claim is one, which if its allegations are true, might have changed the result in a case. ***State v. Puls,*** 176 Ariz. 273, 860 P.2d 1326 (App. 1993).

State v. Carriger, 143 Ariz. 142, 146, 692 P.2d 991 (1984), *cert. denied*, 471 U.S. 1111, quoting ***State v. McFord***, 132 Ariz. 132, 133, 644 P.2d 286 (App. 1982). In this case, if the Superior Court ruling on the Notice of PCR is effectively able to box Petitioner out of showing what modern science has learned about her newly discovered congenital neurological condition, then that goal of post conviction relief – correcting justice that has gone awry – in her case will never be reached. She asserts, however, that this Court should correct that injustice.

G. Scientific Studies Listed in the Notice of PCR Support the Claim of Newly Discovered Material Evidence and Petitioner is Entitled to Full PCR Briefing Regarding Why the Information Probably Would Have Made A Difference in the Sentencing Determination

The Notice of PCR in this case presented six attachments supporting her claim for resentencing under **Rule 32.1(e), Ariz.R.Crim.P.,** and Petitioner is constitutionally entitled to full PCR briefing in order to present the Superior Court with information regarding why the information probably would have made a difference in the sentencing determination. The Notice of PCR included the following:

> **Petitioner has attached to this Notice of Post Conviction Relief certain documents from her ADC medical records and items**

discussing the effects of Chiari Malformation. *See* Attachments 1-6 (listed below):

> ***Attachment 1*, Portions of ADC Medical Records (7 pages);**
>
> ***Attachment 2*, *Chiari Malformation*, Mayfield Clinic (the Mayfield Clinic is a U.S. treatment and research center specializing in Chiari malformation) (5 pages);**
>
> ***Attachment 3*, *Task–Specific and General Cognitive Effects in Chiari Malformation Type I*, Allen PA, Houston JR, Pollock JW, Buzzelli C, Li X, *et al.* (2014) PloS ONE 9(4); e94884. Doi:10.1371/journal.pone. 0094844 (www.plone.org) (11 pages) (open-access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited) (11 pages);**
>
> ***Attachment 4*, Article referencing published case study, *i.e.*, *Chiari Causes Psychotic Episode*, May 31, 2007 (1 page);**
>
> ***Attachment 5*, *Psychotic and Major Neurocognitive Disorder Secondary to Arnold-Chiari Type II Malformation*, Psychiatria Danubina, 2014: Vol 26, No. 3, pp. 291-293, Department of Consultation-Liaison Psychiatry, University Hospital Zurich, Zurich, Switzerland (3 pages); and**

> ***Attachment 6, Cognitive Impairment and Psychopathology in Patients with Pituitary diseases,*** **Netherlands Journal of Medicine (6 pages).**
>
> **Petitioner is not, however, at this point, able to provide the Court with all the facts and research that demonstrates how and why her Chiari Malformation constitutes newly discovered material facts under the law. Petitioner thus requires appointment of counsel to assist her in meeting her burden under the Arizona Rules of Criminal Procedure. Petitioner asserts that she is entitled to appointment of counsel for this purpose under the Due Process Clause of the Fourteenth Amendment to the United States Constitution and under Art. II, Sec. 4 of the Constitution of the State of Arizona. Petitioner believes that she has made a substantial showing of entitlement under Rule 32.1(e), Rule 32.2(b), and under Rule 32.4(c)(2) (second sentence).**
>
> **Petitioner respectfully requests the Court accept her untimely Notice of Post Conviction Relief asserting a claim of newly discovered material evidence; and to appoint counsel for the purpose of assisting her in presenting in detail to the Court the full scope of the effect of this condition that previously was unknown to her or her family.**

05/13/2015 NPCR, at pages 2-5 (*i.e.*, answer to NPCR Form Item #7.C.).

Petitioner asserts she is entitled to present the Superior Court with arguments supporting post conviction relief on the basis of truly significant new developments in medical research on the wide ranging effects of the condition she had from birth. These scientific advances have led to an enhanced understanding of Chiari Malformation, and the information probably would have changed Petitioner's sentence if the condition and information had been available to the sentencing court in 1998.

H. Petitioner's Notice of PCR Included a Potential Claim for Post Conviction Relief Based on a Significant Change in the Law

Petitioner's Notice included a secondary claim particularly relevant to post conviction relief based on a change in the law, which, if determined to be applicable to her case, might have changed the outcome. The Notice stated:

> *SIGNIFICANT CHANGE IN THE LAW*
>
> **Petitioner also asserts a claim for post conviction relief pursuant to a significant change in the law, as a corollary to Petitioner's claim of newly discovered material facts arising from discovery of her congenital condition of chiari malformation. Petitioner asserts this claim based upon the necessary implications of her congenital chiari malformation for purposes of the**

prohibition on cruel and unusual punishment contained in the Eighth Amendment to the United States Constitution and in Art. II, Sec. 15 of the Constitution of the State of Arizona.[4]

Petitioner asserts that the recent decisions of the United States Supreme Court in *Miller v. Alabama*, ___ U.S.___, 132 S.Ct. 2455 (2012 and *Graham v. Florida*, 560 U.S. 48, 130 S.Ct. 2011 (2010) call for this Court to take into account the implications of Petitioner's chiari malformation for purposes of the sentencing determination in this case. These implication can be fully and adequately articulated to the Court within the context of *Miller* and *Gregg* only with the assistance of appointed counsel.

The cruel and unusual punishment prohibition embodied in the Eighth Amendment and in Art. II, Sec. 15 of the Constitution of the State of Arizona (*see* footnote 2, *supra*), is not confined merely to barbarous methods that were generally outlawed in the eighteenth century, but rather is to be interpreted in a flexible and dynamic manner, *see Gregg*, 428 U.S., at 171, 96 S. Ct., at 2924 (1976), and

---

[4] In addition, Petitioner contends that the particulars of this case present *"compelling reasons"* to interpret **Art. II, § 15** of the **Arizona Constitution** as prohibiting cruel and unusual punishment differently from the federal constitution's **Eighth Amendment,** thus calling for independent evaluation of Petitioner's state constitutional claim apart from the Court's evaluation of her federal constitutional claim. *See* ***State v. Davis,*** 206 Ariz. 377, ¶ 12, 79 P.3d 64, 67-68 (2003).

> **the prohibition must draw its meaning from the evolving standards of decency which mark the progress of a maturing society, *see id.*, 428 U.S., at 173, 96 S. Ct., at 2925.**

This secondary claim is necessarily grounded in presentation of the primary claim under newly discovered material evidence. This claim should be briefed, as well.

CONCLUSION

WHEREFORE, based upon the foregoing, Petitioner contends she is entitled to full post conviction relief briefing, in which she can present the newly discovered material facts and supporting scientific research information relevant to sentencing. Although Petitioner contends his [sic] allegations are indisputably true, he [sic] is entitled to full briefing for an opportunity to develop them and flesh them out.

RESPECTFULLY SUBMITTED this 5th day of November, 2015.

THE FERRAGUT LAW FIRM, P.C.

Ulises A. Ferragut, Jr.
Attorney for Defendant/Petitioner Chene Manley

SUPERIOR COURT OF ARIZONA
MARICOPA COUNTY

CR 1996-012553	10/21/2015
HONORABLE JOSE S. PADILLA	CLERK OF THE COURT A. Beery Deputy
STATE OF ARIZONA	DIANE M MELOCHE
v.	ULISES FERRAGUT JR.
CHENE DEVONNE MANLEY (A)	

MINUTE ENTRY

(Filed Oct. 22, 2015)

This Court is in receipt of Defendant's Motion for Extension of Time for Filing Petition for Review to Court of Appeals.

IT IS ORDERED granting the motion and extending the deadline to November 23, 2015.

APPENDIX E

Ulises A. Ferragut, Jr.
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IN THE COURT OF APPEALS

STATE OF ARIZONA

DIVISION ONE

STATE OF ARIZONA, Plaintiff/Respondent, -vs- CHENE DEVONNE MANLEY, Defendant/Petitioner.	No. 1 CA-CR 15-0741 PRPC Maricopa County Superior Court No. CR1996-012553 **SUPPLEMENTAL CITATION OF LEGAL AUTHORITY**

COMES NOW Defendant/Petitioner **Chene DeVonne Manley**, by and through undersigned counsel, pursuant to the **6th** and **14th Amendments** to the **United States Constitution**; and **art. II,** § **4** of the **Constitution of the State of Arizona**; and hereby provides the Court and the State with the following supplemental citation of legal authority.

The Arizona Supreme Court recently issued its formal Opinion in ***State v. Amaral***, 2016 WL 423761 ___ Ariz. ___, ___ P.3d ___ (Feb 4, 2016) (currently, only the Westlaw citation is available). In ***Amaral***, the Supreme Court clarified two matters relevant to the case now before this Court.

First, The ***Amaral*** Court made a ruling that supplements **Argument F** of the defendant's Petition for Review, at pp. 14-18 (*i.e.,* "***The Superior Court Abused Its Discretion and Constitutionally Erred When It Dismissed the Notice of PCR On the Ground That the Progressively Developing Medical Research Information Underlying Petitioner's Claim of Newly Discovered Evidence Did Not Exist at the Time of Petitioner's Sentencing***" (bold print in original).

The ***Amaral*** Court stated that:

> The court of appeals is correct that the scientific advancements had yet to be discovered. **But it is the condition, not the scientific understanding of the condition, that needs to exist at the time of sentencing.** *See Bilke*, 162 Ariz. at 53,781 P.2d at 30. Bilke's PTSD qualified as newly discovered evidence because the advancement of knowledge permitted the diagnosis of a previously existing—but unrecognized—condition.

Amaral, *supra*, at ¶ 19 (emphasis by bold print added).

Second, the ***Amaral*** Court stated, "*[W]e clarify the standard for entitlement to a Rule 32.8(a) evidentiary*

hearing on claims made under Rule 32.1(e). A defendant is entitled to relief if 'newly discovered material facts probably exist and such facts ***probably would*** *have changed the verdict or sentence.'"* (emphasis by bold print added). ***Amaral***, at ¶¶ 10-11 (correcting and rejecting prior precedent that used the phrase, "***might*** *have changed the outcome*"). The defendant cited this Court to one of the prior cases using "*might*," at page 17, note 3, of the defendant's Petition for Review; and therefore the Petition needed to be updated with the Arizona Supreme Court's clarification of the law regarding what constitutes a colorable claim.

These two legal propositions, as clarified by the ***Amaral*** Court, should be considered in the disposition of the defendant's Petition for Review from the Superior Court's summary denial of the Notice of Post Conviction Relief in this case.

RESPECTFULLY SUBMITTED this 17th day of March, 2016.

THE FERRAGUT LAW FIRM, P.C.

/s/
Ulises A. Ferragut, Jr.
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Petitioner Chene Manley

APPENDIX F

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IN THE COURT OF APPEALS

STATE OF ARIZONA

DIVISION ONE

STATE OF ARIZONA, Plaintiff/Respondent, -vs- CHENE DEVONNE MANLEY, Defendant/Petitioner.	No. 1 CA-CR 15-0741 PRPC Maricopa County Superior Court No. CR1996-012553 **MOTION FOR RECONSIDERATION OF MEMORANDUM DECISION GRANTING REVIEW AND DENYING RELIEF *in re*: NEWLY DISCOVERED MATERIAL EVIDENCE**

COMES NOW Defendant/Petitioner **Chene DeVonne Manley,** by and through undersigned counsel,

pursuant to **(1) Rule 32.9(g), Ariz.R.Crim.P., (2)** the **14th Amendment** to the **United States Constitution,** and **(3) art. II,** § 4 of the **Constitution of the State of Arizona**, and hereby submits this Motion for Reconsideration of the Court of Appeals **10/26/2017 Memorandum Decision**, which found no abuse of discretion or error of law regarding Maricopa County Superior Court Judge Jose S. Padilla's **08/20/2015 Minute Entry Order** summarily dismissing Petitioner's *pro se* **05/11/2015 Notice of Post Conviction Relief** asserting a claim of newly discovered material evidence of a previously undiscovered congenital condition. Petitioner presented the Superior Court with cogent reasons why the claim had never before been asserted in any previous petition, and requested appointment of counsel to assist the untrained and indigent Petitioner in demonstrating the merits of her claim for relief.

RESPECTFULLY SUBMITTED this ___ day of December, 2017.

THE FERRAGUT LAW FIRM, P.C.

/s/ _____
Ulises A. Ferragut, Jr.
Attorney for Defendant/
Petitioner Chene Manley

MEMORANDUM OF POINTS AND AUTHORITIES

I. THE MEMORANDUM DECISION GRANTING REVIEW BUT DENYING RELIEF IS BASED UPON MULTIPLE ERRORS

A. The Court of Appeals Erred in its Analysis of Whether a Medical Condition Diagnosed after Conviction and Sentencing May Qualify as Newly Discovered Evidence Under for [sic] Rule 32

The Court of Appeals cited ***State v. Bilke***, 162 Ariz. 5, 761 P2d 28 (1989) for the proposition that *"A petitioner's medical condition diagnosed after a conviction may qualify as newly discovered evidence for Rule 32 purposes if the condition existed at the time of the offense but was not diagnosable because the condition was not medically recognized at the time of trial." See* **10/26/2017 Memorandum Decision**, at final sentence of ¶ 5.

The Court of Appeals read the ***Bilke*** decision too narrowly. In concluding that the defendant met the requirements for newly discovered material evidence, the ***Bilke*** Court's actual reasoning is extraordinarily commensurate with the claim asserted in the *pro se* Notice of PCR filed in this case. The ***Bilke*** Court stated:

> Defendant easily meets the first requirement that the evidence be newly-discovered; his PTSD was not diagnosed until well after his trial and was not a recognized mental

> condition at the time of his trial. **Like the *Henry* case, while defendant may have been aware that his mental condition was not stable, he was not aware that he suffered from PTSD.** Second, defendant was diligent in pursuing this remedy. He brought his condition to the court's attention shortly after its diagnosis. Third, the evidence was not merely cumulative or impeaching. Fourth, the evidence is relevant to sentencing. The mental condition and impaired capacity of a defendant are commonly considered in arriving at sentencing decisions. They can shed considerable light on why a defendant committed the acts and what an appropriate sentence would be. Finally, the fifth element has been met.
>
> Our review of the evidence persuades us that, had it been available at the time of sentencing, it might well have altered the sentence imposed. **Had the sentencing judge been aware that a mental disease known as post-traumatic stress disorder existed, that defendant suffered from it as a direct result of his outstanding military service in Vietnam, and that the disorder was a causative factor leading to the commission of the crimes, he might well have sentenced defendant differently.**

State v. Bilke, 162 Ariz. 5, 53, 761 P2d 28, 30 (1989) (emphasis by bold print added).

There is only one difference between the substance of the Bilke decision and the circumstances of this case now at bar, namely, that Petitioner's congenital

medical condition was a medically-recognized but rare condition and was not diagnosed throughout her entire life until she was seen by a specialist while serving her natural life sentence. Other than that, the cases are remarkably similar.

Petitioner's Notice of PCR stated that her condition—Chiari Malformation, first diagnosed after her trial and sentencing, while she was serving her sentence in the Arizona Department of Corrections—affected numerous physical and psychological effects:

> Petitioner suffered from a congenital condition which progressively affects all aspects of her life, including physically, psychologically, emotionally, and rationally, and this condition existed at the time of the offense, at the time of trial, at the time of sentence, at the time of direct appeal, and at the time of prior post conviction relief action. Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections (ADC). The condition is called Chiari Malformation, and was discovered when Petitioner was sent by the ADC medical services provider for an MRI, as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions.

05/11/2015 Notice of Post Conviction Relief, at page 2, Item 7 C), first sentence of first paragraph.

The Notice indicated that the defendant and her family was aware of numerous physical and psychological problems, but none of the diagnoses and treatments that were focused on the symptoms ever succeeded in addressing the problems because the observable symptoms were secondary effects of the undiagnosed primary condition—neither she nor her family were aware that she suffered from Chiari Malformation.

> [T]he condition is called Chiari Malformation, and was discovered when Petitioner was sent for an MRI as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions. With the assistance of her family, Petitioner has initiated research into Chiari Malformation, its causes, effects, and treatment, not only for the purpose of presenting the information to the Court as newly discovered material evidence, **but also for the purpose of understanding her own behavior from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life**.

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C), fourth paragraph (emphasis by bold print added).

The Notice indicated that the defendant was diligent in pursuing the Rule 32 process upon learning of the condition. She brought her condition to the court's attention shortly after its diagnosis.

> Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections (ADC). The condition is called Chiari Malformation, and was discovered when Petitioner was sent by the ADC medical services provider for an MRI, as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions.

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C), second and third sentence of first paragraph. Petitioner included portions of the ADC medical records indicating that on 01/21/2015 she was scheduled for follow-up care based on an MRI completed on 10/03/2014. During and following that follow-up care, Petitioner learned of the congenital condition and learned of general implications that the condition could not only explain numerous physical symptoms and conditions that had repeatedly failed to be corrected by the medical treatment prescribed over the years, but also that the condition had emotional and psychological effects. Petitioner informed her mother, who began to research the previously undiagnosed condition and obtained pertinent medical reports on the condition. Upon realizing the implications of the condition, Petitioner filed a *pro se* Notice of Post Conviction Relief, asking for appointment of counsel to assist her with presenting a full-fledged Petition for Post

Conviction Relief presenting a claim of newly discovered material evidence.

The Notice indicated that the newly discovered medical condition was not merely cumulative or impeaching:

> Essentially, Petitioner's condition consists of extreme and progressive pressure on the brain as a result of her cranium being too small; and the brain's ability to function normally is severely impaired by the pressure. As a consequence, Petitioner suffers from a host of medical problems such as uncontrollable high blood pressure, wildly erratic swings in endocrine gland function, thyroid problems, excessive weight gain and all its associated problems, **psychological problems, emotional and impulse-control problems, and an inability to rationally direct and react to the stresses of ordinary life**. . . .

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C), second paragraph (emphasis by bold print added).

The Notice indicated that the newly discovered medical condition was relevant to sentencing, since *"the mental condition and impaired capacity of a defendant are commonly considered in arriving at sentencing decisions . . .* [and] *can shed considerable light on why a defendant committed the acts and what an appropriate sentence would be" (a la **Bilke**, supra)*:

> As mentioned, the condition is called Chiari Malformation, and was discovered

> when Petitioner was sent for an MRI as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions. With the assistance of her family, Petitioner has initiated research into Chiari Malformation, its causes, effects, and treatment, **not only for the purpose of presenting the information to the Court as newly discovered material evidence, but also for the purpose of understanding her own behavior from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life**.

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C), fourth paragraph (emphasis by bold print added).

With regard to the fifth element, Petitioner was fundamentally unable to perform the legal and medical research to obtain all the information that would need to be provided to an expert who could render a professional opinion as to the probable causes and effects of the progressive condition with respect to Petitioner's criminal history within the context of her newly discovered medical history, thus providing the sentencing court with information that could not have been obtained or provided previously. Petitioner has need of an expert to let the sentencing judge understand that a congenital and progressive medical condition with psychological ramifications existed, that defendant suffered from it from birth onward, and that

the condition was a causative factor in the commission of the defendant's crimes, so that the information could be taken into consideration in making the determination about the appropriate sentence to be imposed—in particular about whether to sentence the defendant to life with the possibility of parole or to impose the sentence of natural life.

B. The *Bilke* Decision Does Not State, Nor Does it Imply, That the Only Medical Condition That is Diagnosed After Conviction That Can Qualify as Newly Discovered Evidence for Rule 32 Purposes Is When the Condition Existed at the Time of the Offense But Was Not Diagnosable Because the Condition Was Not Medically Recognized at the Time of Trial

The Court of Appeals read the ***Bilke*** decision too narrowly. The Supreme Court held that one type of medical condition—one not medically recognized at time of trial—qualifies as newly discovered material evidence, but did not indicate in any manner that it was the only type of medical condition that could so qualify. The Court of Appeals decision is grounded in an unacceptably narrow interpretation of ***Bilke***.

C. The Court of Appeals Decision Is Grounded in an Unacceptably Narrow Interpretation That Is at Odds with the Language of the Governing Rule Itself

The governing rule, **Rule 32.1(e), Ariz.R.Crim.P.**, expressly provides as follows:

> e. Newly discovered material facts probably exist and such facts probably would have changed the verdict or sentence. Newly discovered material facts exist if:
>
> (1) The newly discovered material facts were discovered after the trial.
>
> (2) The defendant exercised due diligence in securing the newly discovered material facts.
>
> (3) The newly discovered material facts are not merely cumulative or used solely for impeachment, unless the impeachment evidence substantially undermines testimony which was of critical significance at trial such that the evidence probably would have changed the verdict or sentence.

Rule 32.1(e), Ariz.R.Crim.P.

The Court of Appeals misused ***Bilke*** to put an unacceptable gloss on the Rule that undermines the basic purpose of the rule itself. Petitioner met every condition for filing a Notice of PCR for newly discovered material evidence and requesting appointment of counsel to perform the research essential to demonstrate

entitlement to relief. She was and is indigent. She was confined in prison. She was unable to act as an attorney would act to obtain all the medical, behavioral, and criminal records which an expert could review to make a professional judgment as to whether the newly discovered medical condition contributed in a significant way to the crimes for which she was sentenced.

D. The Court of Appeals Decision Was Partially Based upon Pure Speculation Regarding Reasonable Diligence on the Part of Trial Counsel Within the Context of Chiari Malformation

"Newly-discovered material facts alleged as grounds for postconviction relief are facts which come to light after the trial and which could not have been discovered and produced at trial through reasonable diligence." ***State v. Dogan***, 150 Ariz. 595, 600 (App.1986). Here, the Court of Appeals ruled that:

> Although Manley asserted in her notice that she suffered from the medical condition at the time of the offenses, she did not allege that the condition was not discoverable earlier. Stated differently, Manley failed to assert that Chiari Malformation was not a recognized medical condition at the time of her 1999 trial and sentencing. Instead, Manley claimed she "could not bring this matter to the attention of the Court before [she filed the 2015 notice] because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was

> diagnosed by the medical services provided by the Arizona Department of Corrections." Moreover, in the 2015 notice, Manley admits that she "is not . . . at this point[] able to provide the Court with all the facts and research how and why her Chiari Malformation constitutes newly discovered material facts under the law." This admission further evidences the failure of the 2015 notice to satisfy the requirement that, despite due diligence, Manley was unable to procure a diagnosis of Chiari Malformation before she was tried and sentenced.

10/26/2017 Memorandum Decision, at page 3, ¶ 6.

This analysis presumes, first, that the medical condition has to have been one not recognized by the medical community at time of trial. This is incorrect, as demonstrated previously in this Motion. The analysis also presumes, second, that because if it was a recognized medical condition, reasonable diligence would have been able to discover it. This is also incorrect. Petitioner's family went far beyond any form of "reasonable diligence" in seeking answers to her physical, behavioral, and psychological difficulties throughout her life and no one was able to diagnose Chiari Malformation as the underlying cause. Given that, it is fundamentally unreasonable and illogical to conclude that trial counsel could have discovered the condition with reasonable diligence. Even extraordinary diligence had failed to identify the condition.

E. With Regard to Petitioner's Eighth Amendment Claim for Relief, the Court of Appeals Misunderstood the Claim

The Court of Appeals ruled that *"Manley was 18 years old at the time of the offenses; accordingly, because she was not a juvenile, Miller and Graham are inapposite."* **10/26/2017 Memorandum Decision**, at final sentence of ¶ 7.

The Court of Appeals misunderstood Petitioner's argument. Petitioner claims that, analogizing the psychological and behavioral effects of Chiari Malformation to the arguments accepted and announced in ***Miller v. Alabama***, 567 U.S. 460 (2012) and ***Graham v. Florida***, 560 U.S. 48 (2010), she is constitutionally entitled to have a new sentencing hearing at which the court will be able to take into account the previously unavailable and unknown information in determining whether to impose a natural life sentence. In this regard, Petitioner contends that the particulars of this case present *"compelling reasons"* to interpret **Art. II, § 15** of the **Arizona Constitution** as prohibiting cruel and unusual punishment differently from the federal constitution's **Eighth Amendment,** thus calling for independent evaluation of Petitioner's state constitutional claim apart from the Court's evaluation of her federal constitutional claim. *See* ***State v. Davis***, 206 Ariz. 377, ¶ 12, 79 P.3d 64, 67-68 (2003).

CONCLUSION

WHEREFORE, based upon the foregoing, Petitioner contends she is entitled to full post conviction relief briefing, in which she can present the newly discovered material facts and supporting scientific research information relevant to sentencing. Although Petitioner contends her allegations are indisputably true, she is entitled to full briefing for an opportunity to develop them and flesh them out.

RESPECTFULLY SUBMITTED this ___ day of December, 2017.

THE FERRAGUT LAW FIRM, P.C.

/s/
Ulises A. Ferragut, Jr.
Attorney for Defendant/
Petitioner Chene Manley

APPENDIX G

IN THE
COURT OF APPEALS
STATE OF ARIZONA
DIVISION ONE

STATE OF ARIZONA Respondent. v. CHENE MANLEY, Petitioner.	)	Court of Appeals Division One No. 1 CA-CR 15-0741 PRPC Maricopa County Superior Court No. CR1996-012553

ORDER DENYING MOTION TO RECONSIDER

(Filed Dec. 21, 2017)

The court has considered Petitioner's Motion to Reconsider. After consideration,

IT IS ORDERED denying Petitioner's Motion to Reconsider.

/S/
SAMUEL A. THUMMA, Chief Judge

A copy of the foregoing
was sent to:

Diane Meloche
Ulises A Ferragut Jr.

APPENDIX H

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ARIZONA SUPREME COURT

STATE OF ARIZONA, Plaintiff/Respondent, -vs- CHENE DEVONNE MANLEY, Defendant/Petitioner.	No. Court of Appeals Division One Case No. 1 CA-CR 15-0741 PRPC Maricopa County Superior Court No. CR1996-012553 **PETITION FOR REVIEW**

Defendant/Petitioner **Chene DeVonne Manley**, through undersigned counsel, pursuant to **(1) Rule 32.9(g) and Rule 31.21, Ariz.R.Crim.P., (2)** the **14th Amendment** to the **United States Constitution**, and **(3) art. II,** § **4** of the **Constitution of the State of Arizona**, hereby submits her Petition, seeking review of the Court of Appeals **10/26/2017 Memorandum Decision**, which found no abuse of discretion or

error of law regarding Maricopa County Superior Court Judge Jose S. Padilla's **08/20/2015 Minute Entry Order** summarily dismissing Petitioner's *pro se* **05/11/2015 Notice of Post Conviction Relief** asserting a claim of newly discovered material evidence of a previously undiscovered congenital condition;[1] and the Court of Appeals **12/21/2017 Order** denying reconsideration (copy of Memorandum Decision, appellate court Order and Superior Court Order provided as **Attachment A**).

RESPECTFULLY SUBMITTED this 11th day of January, 2018.

THE FERRAGUT LAW FIRM, P.C.

/s/
Ulises A. Ferragut, Jr.
Attorney for Defendant/
Petitioner Chene Manley

MEMORANDUM OF POINTS AND AUTHORITIES

I. INTRODUCTION

This Petition for Review arises from the summary denial of Petitioner's 05/11/2015 Notice of Post

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[1] Acting without assistance of counsel, Petitioner presented the Superior Court with cogent reasons why the claim had never before been asserted in any previous petition, and requested appointment of counsel to assist the untrained and indigent Petitioner in demonstrating the merits of her claim for relief.

Conviction Relief involving circumstances, claims, and facts which, at the time of filing, called for appointment of counsel, full briefing, and an evidentiary hearing. *See* Superior Court **08/20/2015 Minute Entry Order**.[2]

II. ISSUES PRESENTED FOR REVIEW

Did the Court of Appeals abuse its discretion and violate Petitioner's right to due process of law under **Rule 32.1(e), Ariz.R.Crim.P., A.R.S. Const., art. II, § 4** and **U.S. Const., 14th Amendment**,

1. By reading ***State v. Bilke***, 162 Ariz. 5, 761 P2d 28 (1989), far too narrowly and without due consideration of the express language of the governing rule?

2. By failing to apply ***State v. Amaral,*** 239 Ariz. 217, 368 P.3d 926(2016) to correct the Superior Court's erroneous interpretation of what constitutes newly discovered material evidence within the context of a medical condition?

3. By failing to take into account the express terms of **Rule 32.1(e), Ariz.R.Crim.P.**, the governing rule itself?

(4) By misreading of Petitioner's **Eighth Amendment** / change in the law claim?

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[2] **08/20/2015 Minute Entry Order** found at **Attachment A**, pp. 6-8.

III. FACTS MATERIAL TO DETERMINATION OF ISSUES PRESENTED FOR REVIEW

1. Many years after her incarceration in this case number, Petitioner was diagnosed with a serious congenital neurological condition. The condition has existed since birth, but no medical professional had previously diagnosed the condition, despite a lifetime of medical, physical, emotional, and behavioral problems that plagued her entire life. *See* **05/11/2015 NPCR**, especially **NPCR_Attachment 1**, which consists of a portion of Arizona Department of Corrections Medical Records. Neither Petitioner nor her family had ever previously known of or even suspected the existence of this medical condition.

2. Upon **(a)** learning of the newly diagnosed but pre-existing neurological condition and **(b)** learning that it was a congenital condition—*i.e.* a condition existent at time of birth—Petitioner informed her mother, who began to investigate the condition. Upon learning from her mother that the newly discovered neurological condition was responsible for causing the types of medical, physical, emotional, and behavioral problems that had plagued Petitioner during her life—significantly increasing following puberty and during her adolescent years—Petitioner filed, *in propria persona*, a Notice of Post Conviction Relief; and asked for appointment of counsel to assist her with developing the merits of the claim of newly discovered material evidence. *See* **05/11/2015 NPCR**.

3. Petitioner's Notice of Post Conviction Relief included attachments demonstrating that the congenital medical condition had only recently been diagnosed in her case and that the effects of the congenital neurological condition included medical, physical, emotional, and behavioral problems, *see* **05/11/2015 NPCR** and its attachments (**NPCR Attachment 1** through **NPCR Attachment 6**).

4. On 08/20/2015, Judge Padilla issued a Minute Entry Order summarily dismissing the *pro per* Notice of Post Conviction Relief. *See* **PR-Attachment A (08/20/2015 Minute Entry Order)**.

IV. REASONS WHY THE PETITION SHOULD BE GRANTED

A. Applicable Standards of Review

Appellate courts reviewing the denial of post conviction relief apply an abuse of discretion standard. ***State v. Schurz***, 176 Ariz. 46, 57, 859 P.2d 156 (1993); ***State v. Amaya-Ruiz***, 166 Ariz. 152, 180, 800 P.2d 1260 (1990); ***State v. Watton***, 164 Ariz. 323, 325, 793 P.2d 80, 82 (1990). Constitutional and legal issues, however, are reviewed *de novo*. ***State v. Moody***, 208 Ariz. 424, 445, 94 P.3d 1119 (2004) (*en banc*), citing ***State v. Davolt***, 207 Ariz. 191, 201, ¶ 21, 84 P.3d 456, 466 (2004). A trial court abuses its discretion when it commits an error of law. ***State v. West***, 224 Ariz. 575, ¶ 8, 233 P.3d 1154, 1156 (App.2010).

B. The Court of Appeals Committed Four Errors

The Court of Appeals decision regarding the claim of newly discovered material evidence was based upon a misreading of **(1)** ***State v. Bilke***, 162 Ariz. 5, 761 P2d 28 (1989), **(2)** ***State v. Amaral***, 239 Ariz. 217, 368 P.3d 926(2016), and **(3)** the express terms of **Rule 32.1(e), Ariz.R.Crim.P.**, the governing rule itself; the Court of Appeals decision regarding the **Eighth Amendment** / change in the law claim was based upon **(4)** a misreading of Petitioner's claim itself. Based upon these four errors, this Court should grant review of this Petition for Relief and clarify those matters for courts addressing such matters in the future.

1. The Court of Appeals misread *State v. Bilke, supra*

The Court of Appeals erred in its analysis of whether a medical condition diagnosed after conviction and sentencing may qualify as newly discovered evidence under **Rule 32.1(e), Ariz.R.Crim.P.**, the governing rule itself. The Court of Appeals cited ***State v. Bilke***, 162 Ariz. 5, 53-54, 761 P2d 28 (1989) for the proposition that a medical condition diagnosed after a conviction may qualify as newly discovered evidence if the condition existed at the time of the offense but was not diagnosable *"because the condition was not medically recognized at the time of trial." See* **10/26/2017 Memorandum Decision**, at final sentence of ¶ 5.

The Court of Appeals read the ***Bilke*** decision far too narrowly and without due consideration of the express language of the governing rule. In ***Bilke***, the conclusion that Mr. Bilke met the requirements for newly discovered material evidence was based upon an analysis that clearly is reasonably applicable to the claim asserted in the case at bar, in the defendant's *pro se* Notice of PCR.

There is only one difference between the substance of the ***Bilke*** decision and the circumstances of this case, namely, that Petitioner's congenital medical condition was medically-recognized but not diagnosed throughout her entire life until she was seen by a specialist while serving her natural life sentence. Other than that, the cases are demonstrably similar. Importantly, that ***Bilke's*** PTSD was not a recognized mental condition at the time of his trial was a FACT to be taken into consideration in determining whether his claim met the terms of the governing rule, not a LEGAL PREREQUISITE. The rule requires that *"(e) newly discovered material facts probably exist and those facts probably would have changed the verdict or sentence. Newly discovered material facts exist if: (1) the facts were discovered after the trial or sentencing; (2) the defendant exercised due diligence in discovering these facts; and (3) the newly discovered facts are material and not merely cumulative or used solely for impeachment, unless the impeachment evidence substantially undermines testimony that was of critical significance such that the evidence probably would have changed*

the verdict or sentence." **Rule 32.1(e), Ariz.R.Crim.P.** (underlining added).

There is absolutely nothing in the express language of the rule that implies in any way that the fact of ***Bilke*** PTSD's not having been a medically recognized decision at the time of sentencing was either critical or essential to the ultimate ***Bilke*** ruling. The ***Bilke*** decision does not state, nor does it imply, that the *only* medical condition that is diagnosed after conviction that can qualify as newly discovered evidence for **Rule 32** purposes is when the condition existed at the time of the offense but was not diagnosable because the condition was not medically recognized at the time of trial It is axiomatic that if the medical condition was medically recognized at the time of sentencing, then the crucial question is one of due diligence. The Court of Appeals decision is grounded in an unacceptably narrow interpretation of ***Bilke***.

2. The Court of Appeals Failed to Address *State v. Amaral, supra*

The Court of Appeals utterly failed to address and correct the Superior Court's gross misunderstanding of what constitutes newly discovered material evidence, a matter directly addressed in ***Amaral***, *supra*. The Superior Court dismissed the **05/11/2015 Notice of Post Conviction Relief** regarding a previously undiscovered congenital condition on the ground that:

> Moreover, her evidence is based on technology and research developed during the 16 years

> since Defendant's sentencing. Because this evidence did not exist at the time of sentencing, it does not qualify as "newly discovered evidence" that would entitle Defendant to relief under Rule 32.

08/20/2015 Minute Entry Order, at page 2, middle of first full paragraph).[3]

This Court recently [sic] this issue, in ***State v. Amaral***, 239 Ariz. 217, 368 P.3d 926(2016), holding that:

> The court of appeals is correct that the scientific advancements had yet to be discovered. **But it is the condition, not the scientific understanding of the condition, that needs to exist at the time of sentencing.** *See Bilke*, 162 Ariz. at 53,781 P.2d at 30. Bilke's PTSD qualified as newly discovered evidence because the advancement of knowledge permitted the diagnosis of a previously existing—but unrecognized—condition.

Amaral, *supra*, at ¶ 19 (bold print added).

The Superior Court ruling was grossly in error and needs to formally be corrected.

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[3] **08/20/2015 Minute Entry Order** found at **Attachment A**, pp. 6-8.

3. The Court of Appeals Failed to Adhere to the Express Terms of the Governing Rule, Rule 32.1(e), Ariz.R.Crim.P.

The Court of Appeals misapplied ***Bilke*** to put an unacceptable gloss on the Rule that effectively undermines the basic purpose of the rule itself. Petitioner met every condition for filing a Notice of PCR for newly discovered material evidence and requesting appointment of counsel to perform the research essential to demonstrate entitlement to relief. She was and is indigent. She was confined in prison. She was unable to act as an attorney would act to obtain all the medical, behavioral, and criminal records which an expert could review to make a professional judgment that the newly discovered medical condition contributed in a significant way to the crimes for which she was sentenced.

Petitioner's Notice of PCR stated that her condition affected numerous physical and psychological effects:

> Petitioner suffered from a congenital condition which progressively affects all aspects of her life, including physically, psychologically, emotionally, and rationally, and this condition existed at the time of the offense, at the time of trial, at the time of sentence, at the time of direct appeal, and at the time of prior post conviction relief action. Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services

> provided by the Arizona Department of Corrections (ADC).

05/11/2015 Notice of Post Conviction Relief, at page 2, Item 7 (C).

The Notice indicated that the defendant and her family were aware of numerous physical and psychological problems, but none of the diagnoses and treatments that were focused on the symptoms ever succeeded in addressing the problems, for the reason that the observable symptoms were secondary effects of the undiagnosed primary condition—neither the defendant nor her family were aware that she suffered from Chiari Malformation.

> [T]he condition is called Chiari Malformation, and was discovered when Petitioner was sent for an MRI as a diagnostic tool to investigate possible causes of Petitioner's various symptoms and conditions. With the assistance of her family, Petitioner has initiated research into Chiari Malformation, its causes, effects, and treatment, not only for the purpose of presenting the information to the Court as newly discovered material evidence, **but also for the purpose of understanding her own behavior from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life**.

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C), 4th Paragraph.

The Notice addressed due diligence, indicating that the defendant was diligent in pursuing the Rule 32 process upon learning of the condition. The defendant brought her previously undiagnosed condition to the court's attention shortly after learning of the diagnosis:

> Petitioner could not bring this matter to the attention of the Court before this point in time because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections (ADC).

05/11/2015 Notice of Post Conviction Relief, at page 3, Item 7 C).

Petitioner included portions of the ADC medical records indicating that on 01/21/2015 she was scheduled for follow-up care based on an MRI completed on 10/03/2014. During and following that follow-up care, Petitioner learned of the congenital condition and learned of general implications that the condition could not only explain numerous physical symptoms and conditions that had repeatedly failed to be corrected by the medical treatment prescribed over the years, but also that the condition had emotional and psychological effects. Petitioner informed her mother, who began to research the previously undiagnosed condition and obtained pertinent medical reports on the condition. Upon realizing the implications of the condition, Petitioner filed a *pro se* **Notice of Post Conviction Relief**, asking for appointment of counsel to

assist her with presenting a full-fledged Petition for Post Conviction Relief presenting a claim of newly discovered material evidence.

The Notice indicated that the newly discovered medical condition was not merely cumulative or impeaching:

> Essentially, Petitioner's condition consists of extreme and progressive pressure on the brain as a result of her cranium being too small; and the brain's ability to function normally is severely impaired by the pressure. As a consequence, Petitioner suffers from a host of medical problems such as uncontrollable high blood pressure, wildly erratic swings in endocrine gland function, thyroid problems, excessive weight gain and all its associated problems, **psychological problems, emotional and impulse-control problems, and an inability to rationally direct and react to the stresses of ordinary life**. . . .

05/11/2015 Notice of Post Conviction Relief, at p. 3, Item 7 C) (bold print added).

The Notice indicated that the newly discovered medical condition was quite relevant to sentencing (*"the mental condition and impaired capacity of a defendant are commonly considered in arriving at sentencing decisions . . .* [and] *can shed considerable light on why a defendant committed the acts and what an appropriate sentence would be" a la* ***Bilke,*** *supra*):

> With the assistance of her family, Petitioner has initiated research into Chiari

> Malformation, its causes, effects, and treatment, **not only for the purpose of presenting the information to the Court as newly discovered material evidence, but also for the purpose of understanding her own behavior from childhood forward, including criminal acts, medical problems, and numerous (and erratic) psychological difficulties she has experienced throughout her life.**

05/11/2015 Notice of Post Conviction Relief, at p. 3, Item 7 C) (bold print added).

With regard to the fifth element of the rule, Petitioner was fundamentally unable to perform the legal and medical research to obtain all the information that would need to be provided to an expert who could render a professional opinion as to the probable causes and effects of the progressive condition with respect to Petitioner's criminal history within the context of her newly discovered medical history, thus providing the sentencing court with information that could not have been obtained or provided previously. Petitioner has need of an expert to let the sentencing judge understand that a congenital and progressive medical condition with psychological ramifications existed, that defendant suffered from it from birth onward, and that the condition was a causative factor in the commission of the defendant's crimes, so that the information could be taken into consideration in making the determination about the appropriate sentence to be imposed—in particular about whether to sentence the defendant to

life with the possibility of parole or to impose the sentence of natural life.

With regard to the issue of due diligence, the Court of Appeals ruled that:

> Although Manley asserted in her notice that she suffered from the medical condition at the time of the offenses, she did not allege that the condition was not discoverable earlier. Stated differently, Manley failed to assert that Chiari Malformation was not a recognized medical condition at the time of her 1999 trial and sentencing. Instead, Manley claimed she "could not bring this matter to the attention of the Court before [she filed the 2015 notice] because Petitioner was wholly unaware of her condition, as were all members of her family, until the condition was diagnosed by the medical services provided by the Arizona Department of Corrections." Moreover, in the 2015 notice, Manley admits that she "is not . . . at this point[] able to provide the Court with all the facts and research how and why her Chiari Malformation constitutes newly discovered material facts under the law." This admission further evidences the failure of the 2015 notice to satisfy the requirement that, despite due diligence, Manley was unable to procure a diagnosis of Chiari Malformation before she was tried and sentenced.

10/26/2017 Memorandum Decision, at page 3, ¶ 6.[4]

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[4] **10/26/2017 Memorandum Decision** found at **Attachment A**, PP. 1-4.

This analysis presumes, first, that the medical condition has to have been one not recognized by the medical community at time of trial. This is incorrect, as demonstrated. The analysis also presumes, second, that because if it was a recognized medical condition, reasonable diligence would have been able to discover it. This is also incorrect. Petitioner's family went far beyond any form of "reasonable diligence" in seeking answers to her physical, behavioral, and psychological difficulties throughout her life and no one was able to diagnose Chiari Malformation as the underlying cause. Given that, it is fundamentally unreasonable and illogical to conclude that trial counsel could have discovered the condition with reasonable diligence. Even extraordinary diligence had failed to identify the condition. *"Newly-discovered material facts alleged as grounds for postconviction relief are facts which come to light after the trial and which could not have been discovered and produced at trial through reasonable diligence."* ***State v. Dogan***, 150 Ariz. 595, 600 (App.1986).

4. The Court of Appeals Misunderstood Petitioner's Eighth Amendment / Change in the Law Claim

The Court of Appeals ruled that *"Manley was 18 years old at the time of the offenses; accordingly, because she was not a juvenile, Miller and Graham are inapposite."* **10/26/2017 Memorandum Decision**, at final sentence of ¶ 7.[5]

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[5] **Memorandum Decision** found at **Attachment A**, pp. 1-4.

Petitioner asserted a claim for post conviction relief pursuant to a significant change in the law, as a corollary to Petitioner's claim of newly discovered material facts arising from discovery of her congenital condition of Chiari Malformation. Petitioner asserted this claim based upon the necessary implications of her congenital Chiari Malformation condition with respect to the prohibition on cruel and unusual punishment contained in the **Eighth Amendment** to the **United States Constitution** and in **Art. II, Sec. 15** of the **Constitution of the State of Arizona**.

Petitioner asserts that the recent decisions of the United States Supreme Court in ***Miller v. Alabama***, 567 U.S. 460, 132 S.Ct. 2455 (2012) and ***Graham v. Florida***, 560 U.S. 48, 130 S.Ct. 2011 (2010) call for this Court to take into account the implications of Petitioner's Chiari Malformation for purposes of the sentencing determination in this case, within the context of social and behavioral effects reasonably understood to be beyond the ordinary limits of self-regulation. These implications can be fully and adequately articulated to the Court within the context of ***Miller*** and ***Graham*** only with the assistance of appointed counsel.

The Court of Appeals misunderstood Petitioner's argument. Petitioner claims that, analogizing the psychological and behavioral effects of Chiari Malformation to the arguments accepted and announced in ***Miller***, *supra*, and ***Graham***, *supra*, she is constitutionally entitled to have a new sentencing hearing at which the court will be able to take into account the previously unavailable and unknown information in determining

whether to impose a natural life sentence. In this regard, Petitioner contends that the particulars of this case present "*compelling reasons*" to interpret **Art. II, § 15** of the **Arizona Constitution** as prohibiting cruel and unusual punishment differently from the federal constitution's **Eighth Amendment**, thus calling for independent evaluation of Petitioner's state constitutional claim apart from the Court's evaluation of her federal constitutional claim. *See* ***State v. Davis***, 206 Ariz. 377, ¶ 12, 79 P.3d 64, 67-68 (2003).

CONCLUSION

WHEREFORE, based upon the foregoing, Petitioner contends she is entitled to full post conviction relief briefing, in which she can present the newly discovered material facts and supporting scientific research information relevant to sentencing.

Although Petitioner contends her allegations are indisputably true, she is entitled to full briefing for an opportunity to develop them and flesh them out.

RESPECTFULLY SUBMITTED this 11th day of January, 2018.

THE FERRAGUT LAW FIRM, P.C.

/s/
Ulises A. Ferragut, Jr.
Attorney for Defendant/
Petitioner Chene Manley

APPENDIX I

[SEAL]

SCOTT BALES
CHIEF JUSTICE

JANET JOHNSON
CLERK OF THE COURT

Supreme Court
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July 3, 2018

RE: STATE OF ARIZONA v CHENE MANLEY
Arizona Supreme Court No. CR-18-0020-PR
Court of Appeals, Division One No. 1 CA-CR 15-0741 PRPC
Maricopa County Superior Court No. CR1996-012553

GREETINGS:

The following action was taken by the Supreme Court of the State of Arizona on July 3, 2018, in regard to the above-referenced cause:

ORDERED: Petition for Review = DENIED.

Janet Johnson, Clerk

TO:
Joseph T Maziarz
Diane Meloche
Ulises A Ferragut Jr.
Chene Manley, ADOC 144981,
Arizona State Prison,
Perryville—Santa Cruz Unit
Amy M Wood
bp