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ARTICLES

UNEQUAL FUNDING COMPOUNDS TRAGEDY: FAILURES IN DEFENDING AGAINST SHAKEN BABY SYNDROME CHARGES

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“Jurors may not understand the science, but they can count [the experts].”¹

To date, thirty innocent people have been falsely convicted in the United States of assault or homicide of children in their care. The prosecution mechanism for achieving these wrongful convictions was the use of experts to testify to “shaken baby syndrome” or “abusive head trauma” (SBS/AHT). While it is axiomatic that no one should ever shake or abuse a child, these twin diagnoses lack scientific support and are little more than unproven hypotheses. Despite this absence of scientific support, prosecution experts have told juries that children suffered from intentional abuse that could not have been accidental or caused by alternate nontraumatic medical causes, and juries have convicted innocent parents and caregivers based on those assertions. The defense, on the other hand, has often struggled to present even one competing expert. These convictions were later overturned when defendants were able to present qualified experts to refute these hypothetical and dubious theories. But before that ultimate victory, individual lives and families were destroyed by wrongful incarceration.

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1. E-mail from Keith Findley, Professor, Univ. of Wis. L. Sch., to author (Sept. 5, 2023 15:56 PM CST) (on file with author) (recalling a conversation with Dr. John Plunket).

To prevent these miscarriages of justice, more funding for experts needs to be allocated to poor and middle-class defendants, where the prosecution’s case rests largely on medical causation. In addition, defense attorneys need to better understand how to request funding for experts in these specialized cases.

This Article reviews some of the innocence-based exoneration cases and their common themes, together with the scientific disputes about the theory of SBS/AHT. It also examines the critical need for defense experts, the constitutional right to experts, and the state laws that permit funding for experts for indigent defendants. It also provides suggestions for a better statutory scheme. Finally, the Article suggests that defense attorneys should request funding for experts to challenge the very legitimacy of expert testimony on SBS/AHT.

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INTRODUCTION

To date, there have been thirty innocent men and women exonerated in the United States who were originally convicted of assault or homicide, in cases involving infants and toddlers in their care.² In these cases, the mechanism of death was labeled “shaken baby syndrome” (SBS) or, later, “abusive head trauma” (AHT).³ An SBS/AHT diagnosis is given when a triad of injuries (subdural or subarachnoid hemorrhage, retinal hemorrhage, and brain injury) is present, even in the absence of other injuries to the child.⁴ This constellation of injuries is believed to result from a person shaking an infant or small child so hard that rotational forces on the child’s brain cause “shearing” or

2. NAT’L REGISTRY OF EXONERATIONS, UNIV. CAL. IRVINE NEWKIRK CTR. FOR SCI. & SOC’Y, UNIV. MICH. L. SCH. & MICH. STATE UNIV. COLL. L. [hereinafter NAT’L REGISTRY OF EXONERATIONS], <https://www.law.umich.edu/special/exoneration/Pages/detailist.aspx> [https://perma.cc/78D7-NSCX] (last visited Jan. 22, 2024) (filtering by the term “SBS” for Shaken Baby Syndrome). This number does not include others who were not criminally prosecuted but faced the loss of their children in child protection cases.

3. *See id.* The designation of SBS was changed to AHT in 2009, when the American Association of Pediatrics acknowledged the problematic nature of the term “shaken baby syndrome” and recognized the reality that *shaking alone may not be the sole cause of the triad*, but rather, it could be caused by other mechanisms, as well. Keith A. Findley, Patrick D. Barnes, David A. Moran & Waney Squier, *Shaken Baby Syndrome, Abusive Head Trauma, and Actual Innocence: Getting It Right*, 12 HOUS. J. HEALTH L. & POL’Y 209, 241 (2012).

4. Comm. on Child Abuse and Neglect, Am. Academy of Pediatrics, *Shaken Baby Syndrome: Inflicted Cerebral Trauma*, 92 PEDIATRICS 872, 872–74 (1993) [hereinafter Krugman et al.].

tearing injuries that rupture the bridging veins over the surface of the brain, causing subdural hemorrhage or bleeding.⁵ Of course, no one should ever shake an infant. However, as discussed extensively in Section II, scientific studies have not been able to replicate the level of shaking necessary to cause such injuries without also causing injuries to the child's neck.⁶ Further, these same brain injuries can be caused by accidental falls and several other naturally occurring medical complications.⁷ Support for the diagnosis of SBS/AHT is entirely lacking, yet juries frequently rely on it to convict innocent parents and caregivers.⁸

Even with this controversy in the field, approximately 2,000 new cases are diagnosed every year.⁹ There is no national database that tracks how many of these cases result in criminal charges each year, but one researcher, Susan Anthony, is trying to track this data in a systematic manner. She confirmed 140 new convictions for SBS/AHT allegations made in 2017, and 153 in 2018.¹⁰ However, her data is largely limited to cases that appear in the media.¹¹ In all of these cases, the government's case largely rested on expert opinions, provided by physicians, that the child suffered from abuse, and their death or injury could not be attributed to other causes, such as accident or other nontraumatic causes.¹² The government often called numerous highly specialized medical professionals to prove its case, but the defense struggled to present even one competing expert.¹³ In post-conviction litigation, however, where defendants were able to present well-qualified experts to refute the points made by the government's experts, their convictions were overturned.¹⁴ This could be for a variety of reasons: new understanding regarding the dubiousness of the diagnoses by the courts and attorneys; retraction of trial testimony by experts who previously testified for the prosecution; and/or willingness of defense experts to testify for free, or at low cost, in cases that have been vetted by innocence organizations.

5. *Id.*; Mary E. Case, Michael A. Graham, Tracey Corey Handy, Jeffrey M. Jentzen & James A. Montelcone, *Position Paper on Fatal Abusive Head Injuries in Infants and Young Children*, 22 AM. J. FORENSIC MED. & PATHOLOGY 112, 114 (2001).

6. *See infra* note 184 and accompanying text.

7. *See infra* note 188 and accompanying text.

8. *See infra* Section II.

9. Emily Bobrow, *The Debate over Shaken Baby Syndrome*, WALL ST. J. (June 16, 2022, 9:57 AM), <https://www.wsj.com/articles/the-debate-over-shaken-baby-syndrome-11655387830> [https://perma.cc/2M3A-SAMR].

10. Susan C. Anthony, SHAKEN BABY SYNDROME DATABASE (2020) (on file with author); This database is currently not accessible by the public. Ms. Anthony's data is based on cases she gathers through the media reports, and from experts and criminal justice professionals. She then follows those cases in the media and the court system to determine the case results. Of course, there are likely a significant number of cases that are charged which do not appear in the database, because they do not appear in the media and/or are handled by practitioners who do not connect with Ms. Anthony or because they do not include experts known to Ms. Anthony. To inquire about access, email the author. *See generally* Susan C. Anthony, *Shaken Baby Syndrome Resources*, <https://www.susancanthy.com/res/sbs/-sbs.html> [https://perma.cc/7XAR-TM26] (last visited Jan. 22, 2024).

11. *See supra* note 10.

12. *See infra* Section I.

13. *See infra* Section I.

14. *See infra* Section I.

But before that ultimate victory, individual lives were ruined, and entire families were destroyed by false accusations and wrongful incarceration. This Article argues that defense attorneys need to better understand how to request funding for experts in these highly specialized cases, and that more funding for experts needs to be allocated to poor and middle-class defendants who are accused of serious crimes against infants and toddlers, where the prosecution's case in chief rests largely on medical causation. Finally, this Article argues that once experts are provided to the defense, the defense must continue to challenge the validity of the SBS/AHT hypothesis by requesting pretrial *Daubert/Frye* hearings.

Although the focus of this Article is the need for experts in SBS/AHT cases, such cases are the proverbial canary in the coal mine. As science develops, it is being used more frequently in criminal prosecutions,¹⁵ but faulty forensic science has contributed to the wrongful convictions of 801 innocent men and women, or nearly 24% of all wrongfully convicted individuals.¹⁶ Some of these wrongful convictions occurred because jurors gave undue weight to evidence derived from imperfect analysis, and others occurred because of imprecise or exaggerated expert testimony.¹⁷ In order to combat such problems, defendants need access to experts in a variety of areas beyond SBS/AHT. Even in cases involving DNA testing, which is considered a reliable forensic tool, laboratories can make errors such as mislabeling samples or misinterpreting data.¹⁸ Significant changes in arson science have also led to the exoneration of innocent people, so access to quality defense experts who understand those changes to arson science is likewise necessary.¹⁹ In addition to experts with scientific expertise in areas like DNA, courts are more frequently permitting prosecution testimony from social science experts and modus operandi experts, in areas ranging from Munchausen syndrome by proxy and repressed memory syndrome, to gang violence and drug lab operations.²⁰

Quality defense experts are also needed in cases where the actual cause and manner of death are contested. This is similar to the issue in many SBS/AHT cases but is much broader. In the United States, medical death investigations are handled by a patchwork of coroners, medical examiners, and forensic pathologists.²¹ In some of those jurisdictions, criminal cases may be compromised by the lack of competent forensic pathology services and death investigations.²² This can occur for a variety of reasons, including lack of expertise and inadequate training to investigate a death scene and

15. Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 COLUM. L. REV. 1197, 1199 (1980)

16. NAT'L REGISTRY OF EXONERATIONS, *supra* note 2. As of September 6, 2023, there were 3,368 exonerations listed on the registry. Of those, 801 listed cases involved the use of faulty forensic science to secure the initial conviction. *See id.* (filtering by "F/MFE").

17. COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCI. CMTY., COMM. ON SCI. TECH. & L. & COMM. ON APPLIED & THEORETICAL STATS., NAT'L RSCH. COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 4 (2009) [hereinafter NRC, STRENGTHENING FORENSIC SCIENCE].

18. *Id.* at 47.

19. J.J. Lentini, *Fire Investigation: Historical Perspective and Recent Developments*, 31 FORENSIC SCI. REV. 37, 40 (2019).

20. Paul C. Giannelli, *Ake v. Oklahoma: The Right to Expert Assistance in a Post-Daubert, Post-DNA World*, 89 CORNELL L. REV. 1305, 1321–26 (2004).

21. NRC, STRENGTHENING FORENSIC SCIENCE, *supra* note 17, at 250.

22. *Id.*

conduct a forensic examination.²³ This lack of expertise can lead to very real consequences for criminal defendants.

For example, in Mississippi, Dr. Steven Hayne was performing a staggering 1,500–1,800 autopsies per year and gave dubious pro-prosecution testimony in several cases.²⁴ There are thousands of people in prison due, in part, to his autopsies and testimony.²⁵ His cases included diagnoses of SBS, as well as other causes of death.²⁶ In one case, Dr. Hayne documented information about organs he claimed to have removed during a particular autopsy when, in fact, such organs were never present, as they had been surgically removed prior to death.²⁷ In another he listed a deceased female infant as having a healthy prostate.²⁸ In another case, he inexplicably claimed to have examined the ovaries and uterus of a victim who was, in fact, anatomically male.²⁹ To support his findings, Dr. Hayne has testified about a nonexistent study and misrepresented another study, testifying that it said exactly the opposite of what the author had written.³⁰ Experts in forensic pathology are necessary to assist defendants in responding to incorrect or blatantly false testimony from prosecution witnesses.

This Article focuses on experts in SBS/AHT cases because it is the area in which the need is most acute, but the broader need for funding for defense experts in all areas of forensic science reaches far beyond the scope of this study. Moreover, funding for experts is part of a larger problem involving funding for the defense of indigent defendants, which has been a national struggle and a source of scholarly debate since the Supreme Court's 1963 decision in *Gideon v. Wainwright*.³¹

23. *Id.*

24. Radley Balko, *The Continuing Saga of Steven Hayne*, JACKSON FREE PRESS (Dec. 7, 2010, 1:57 PM), <https://www.jacksonfreepress.com/news/2010/dec/07/balko-the-continuing-saga-of-steven-hayne/> [https://perma.cc/35G6-KPC3].

25. Radley Balko, *New Case Again Demonstrates Duplicity of Embattled Mississippi Medical Examiner*, WASH. POST: THE WATCH (May 15, 2014, 1:07 PM), <https://www.washingtonpost.com/news/the-watch/wp/2014/05/15/new-case-again-demonstrates-duplicity-of-embattled-mississippi-medical-examiner> [https://perma.cc/Y2U8-J9V9].

26. Radley Balko, *Controversial Medical Examiner Backs Off 'Shaken Baby' Claim in Death Penalty Case*, WASH. POST: THE WATCH (Aug. 16, 2017, 3:15 PM), <https://www.washingtonpost.com/news/the-watch/wp/2017/08/16/controversial-medical-examiner-backs-off-shaken-baby-claim-in-death-penalty-case> [https://perma.cc/R7SE-9CW6].

27. RADLEY BALKO & TUCKER CARRINGTON, *THE CADAVER KING AND THE COUNTRY DENTIST* 249 (2018).

28. *Id.* at 248; STEVEN T. HAYNE, FINAL AUTOPSY REPORT AME# 1-E5-08, at 67 (2010) (autopsy of Kyllie Clark, whose name is misspelled as “Kylie”).

29. Balko, *supra* note 26.

30. *Id.*

31. 372 U.S. 335 (1963); *see also, e.g.*, Mary Sue Backus & Paul Marcus, *The Right to Counsel in Criminal Cases: Still a National Crisis?*, 86 GEO. WASH. L. REV. 1564 (2018); Stephen B. Bright & Sia M. Sanneh, *Fifty Years of Defiance and Resistance After Gideon v. Wainwright*, 122 YALE L.J. 2150 (2013); Richard Klein, *Civil Rights in Crisis: The Racial Impact of the Denial of the Sixth Amendment Right to Counsel*, 14 U. MD. L.J. RACE, RELIGION, GENDER & CLASS 163 (2014); Pamela Metzger & Andrew Guthrie Ferguson, *Defending Data*, 88 S. CALIF. L. REV. 1057 (2015); Victoria Nourse, *Gideon's Muted Trumpet*, 58 MD. L. REV. 1417 (1999); Ellen S. Podgor, *Gideon at 40: Facing the Crisis, Fulfilling the Promise*, 41 AM. CRIM. L. REV. 131 (2004); AD HOC COMM., 2017 REPORT OF THE AD HOC COMMITTEE TO REVIEW THE CRIMINAL JUSTICE ACT (2017).

In order to offer greater understanding of the devastation that results from wrongful convictions in SBS/AHT cases, Section I of this Article explores individual innocence cases where this miscarriage of justice has occurred and considers the common themes among those cases. Section II addresses the theories of SBS/AHT, as well as the disputes surrounding such theories within the pediatric and forensic communities, in order to shed light on the lack of scientific foundation for SBS/AHT diagnoses. Section III addresses the reasons why typical trial safeguards offer insufficient protection for a defendant in the absence of significant expert assistance. This includes analysis of trial courts' ongoing acceptance of the medical evidence when faced with *Daubert/Frye* challenges. It also examines why a defendant's constitutional guarantees, such as the right to confront witnesses and the prosecution's burden of proof beyond a reasonable doubt, are not enough to protect defendants. Finally, it considers the success of some defendants accused of SBS/AHT who did have access to experts at their trials. Section IV reviews case law developed around a defendant's constitutional right to expert assistance. To determine the best and worst statutory schemes currently available to provide experts to defendants, Section V examines the various statutes that permit funding for experts in criminal trials of indigent and low-income defendants. Finally, Section VI suggests that, under *Daubert/Frye* standards, attorneys must request funding for experts and continue to challenge the prosecution's expert testimony on SBS/AHT. The Article also includes recommendations for developing a better statutory scheme or court process to fund experts in these cases, in order to truly protect a defendant's right to due process.

I. THE INNOCENTS

LeeVester Brown was convicted of capital murder, in Mississippi, in the death of his six-month-old son, Le'Anthony.³² His wife experienced problems during her pregnancy, and Le'Anthony was born six-weeks premature.³³ On March 28, 2003, Mr. Brown was caring for Le'Anthony when he saw Le'Anthony had choked on some milk and was having difficulty breathing.³⁴ Mr. Brown and his wife drove to the hospital where, after several hours, Le'Anthony's pediatrician decided he needed to be flown to another facility.³⁵ While in flight, Le'Anthony died.³⁶ Dr. Steven Hayne performed the autopsy. He determined that the manner of death was homicide, and the cause of death was consistent with SBS.³⁷ As noted above, in the years that followed, significant problems with Dr. Hayne's credentials, methodology, and specious findings would become public knowledge.³⁸

32. Maurice Possley, *LeeVester Brown*, NAT'L REGISTRY OF EXONERATIONS [hereinafter *LeeVester Brown*], <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5996> [<https://perma.cc/LZK9-2F6E>] (last updated July 26, 2021).

33. *Brown v. State*, 152 So. 3d 1146, 1149 (Miss. 2014).

34. *Id.*

35. *Id.*

36. *Id.* at 1150.

37. *Id.*

38. *LeeVester Brown*, *supra* note 32. Conclusions by Dr. Hayne were also involved in the convictions of four other defendants who were ultimately exonerated. Radley Balko, *The Fifth Circuit Turns Its Back on a Huge Forensics Scandal in Mississippi*, WASH. POST: THE WATCH, (Feb. 28, 2014, 11:51 AM), <https://www.washingtonpost.com/news/the-watch/wp/2014/02/28/the-fifth-circuit-turns-its-back-on-a-huge-for-ensics-scandal-in-mississippi> [<https://perma.cc/32GB-VZ9Q>].

Mr. Brown was arrested based on Dr. Hayne's report.³⁹ With the help of family and friends, he was able to post bail and hire a private attorney, but he was unable to afford an expert who could evaluate Dr. Hayne's work and act as a defense witness.⁴⁰ Mr. Brown submitted an affidavit to the court attesting that he was indigent.⁴¹ The State argued that since Mr. Brown was able to hire an attorney and post bail, he was not entitled to funding for an expert and that such an expert would merely be on a "fishing expedition."⁴² The trial judge agreed with the State and denied funding for an expert, because he had not found Mr. Brown to be indigent.⁴³

At trial, Mr. Brown testified on his own behalf and presented three character witnesses, but no expert.⁴⁴ Mr. Brown was convicted of capital murder.⁴⁵ While serving his prison sentence, his direct appeal to the Mississippi Supreme Court was delayed for seven years as a result of his trial attorney's failure to file an appeal and also because of the death of a court reporter.⁴⁶ However, in 2014 the Mississippi Supreme Court overturned his conviction, holding that an expert was necessary to make his trial fundamentally fair and that the trial court had failed to properly consider Mr. Brown's request for expert funding.⁴⁷ Almost five months later, Mr. Brown was released on bond pending retrial.⁴⁸ The case against him was finally dismissed in 2018.⁴⁹

Mr. Brown's attorney at least tried to get funding for an expert. In Terry Ceasor's case, his trial attorney failed to even ask for funding for an expert after learning that Ceasor's family would be unable to pay for one.⁵⁰ Mr. Ceasor was charged with first-degree child abuse, based on the prosecution's theory that Mr. Ceasor had violently shaken or slammed his girlfriend's sixteen-month-old son, Brenden.⁵¹ Mr. Ceasor testified that on the day Brenden sustained his injuries, they were playing a game of "gotcha" on the couch, which involved Brenden running back and forth on the cushions while Mr. Ceasor crawled behind the sofa.⁵² When Brenden stopped playing to take a drink from his sippy cup, Mr. Ceasor left the room to use the bathroom.⁵³ While in the bathroom, he heard a thud and went back to the living room where he found Brenden

Dr. Hayne regularly testified he was board-certified although he failed his exams with the universally accepted certifying organization. *Id.* According to his own testimony, Dr. Hayne performed 1,200–1,800 autopsies per year, although the recommendation from the National Association of Medical Examiners is no more than 250, and he performed most of those autopsies in a funeral home rather than a medical lab. *Id.*

39. *Brown*, 152 So. 3d at 1150.

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.* at 1150–51.

44. *Id.* at 1158.

45. *Id.* at 1161.

46. *LeeVester Brown*, *supra* note 32.

47. *Brown*, 152 So. 3d at 1169.

48. *LeeVester Brown*, *supra* note 32.

49. *Id.*

50. *Ceasor v. Ocwieja*, 655 F. App'x 263, 274 (6th Cir. 2016).

51. *Id.* at 265.

52. *Id.* at 266–67.

53. *Id.*

unconscious and wedged between the couch and the coffee table.⁵⁴ Due to the apparent seriousness of the fall, Brenden was brought to the hospital immediately.⁵⁵

Brenden's attending physician and a hospital radiologist at Port Huron Hospital found Brenden had a subdural hematoma and subdural hemorrhage.⁵⁶ When Brendan was later transferred to Children's Hospital of Michigan, in Detroit, ophthalmology staff found he had retinal hemorrhages in both of his eyes.⁵⁷ These indicators form the triad of symptoms that form the basis for the theory of SBS/AHT.⁵⁸ At Mr. Ceasor's trial, the prosecution relied almost exclusively upon one of Brenden's attending physicians at the hospital, who had only spent twenty-five minutes with Brenden.⁵⁹ She testified that "the combination of subdural blood with retinal hemorrhage *is* child abuse. It is patently *demonic*. [It] [i]s diagnostic for child abuse."⁶⁰ This expert further testified that Brenden's injuries might be seen in a fall from a second-story window or a high-speed car crash, but not in a fall from a couch.⁶¹ This expert acknowledged that she had disregarded the admitting nurse's note that when Brenden was admitted, he had bruising on his forehead that was consistent with an accidental fall from a couch.⁶² The only evidence offered by the defense was Mr. Ceasor's testimony.⁶³

Prior to trial, Mr. Ceasor's trial attorney did consult with one expert.⁶⁴ After that consultation, the attorney told Mr. Ceasor that he owed \$1,500 for the expert consultation and would need to pay an additional \$10,000 to hire the expert to testify at trial.⁶⁵ When Mr. Ceasor told his attorney that neither he nor his family had any more money for the case, his attorney refused to look at other options for expert testimony including petitioning the court for expert fees due to Mr. Ceasor's indigency.⁶⁶

When Mr. Ceasor petitioned the state district court for a hearing on his attorney's ineffective assistance of counsel, he provided affidavits from four experts who could have testified at his trial: two forensic pathologists, a clinical neurosurgeon, and a biomedical engineer.⁶⁷ Taken together, their sworn testimony stated the lack of validation for the theory of SBS/AHT, asserted that the triad of symptoms was also seen in short fall cases and could occur from a variety of other causes, and explained that a child shaken as hard as would be required to sustain the triad would also have neck injuries or chest injuries from the gripping of the chest needed to cause such severe head

54. *Id.*

55. *See id.*

56. *Id.*

57. *Id.* at 268–69.

58. *See* Krugman et al., *supra* note 4, at 872–73; Case et al., *supra* note 5, at 114.

59. *See Ceasor*, 655 F. App'x at 269.

60. *Id.* (alterations in original) (emphasis added).

61. *Id.*

62. *Id.* at 270.

63. *Id.* at 270–71.

64. *Id.* at 273.

65. *Id.* at 273–74.

66. *Id.* at 274.

67. *Id.* at 273–74.

injuries through shaking.⁶⁸ The experts agreed that Brenden’s injuries were consistent with a short fall from a couch and inconsistent with abusive shaking.⁶⁹

The trial court denied Mr. Ceasor relief, and both the Michigan Court of Appeals and the Michigan Supreme Court denied him leave to appeal.⁷⁰ Mr. Ceasor then filed a second federal habeas petition in federal district court, where he was denied relief again and further denied a certificate of appealability.⁷¹ However, the U.S. Court of Appeals for the Sixth Circuit allowed his appeal. The appellate court held that his trial counsel was ineffective for failing to request funding for an expert and that Mr. Ceasor was prejudiced by that failure.⁷² After remand to the federal district court, the prosecution and defense agreed that the case should go back to the state district court for a hearing.⁷³ Once again, Mr. Ceasor was denied relief by the state district court, and the Michigan Court of Appeals affirmed its decision. This time, however, the Michigan Supreme Court reversed the court of appeals and remanded the case for a new trial based on trial counsel’s constitutionally deficient representation.⁷⁴ Ultimately, after twelve years of litigation, the government dismissed the case rather than retrying it in a proceeding where defense experts were available to testify.⁷⁵

Even if defense counsel is able to retain an expert, a single expert without the proper experience or qualifications may not be enough to counter the prosecution’s experts. Clarence Jones III served eighteen years in prison for the second-degree murder and child abuse of his seventy-two-day-old son, Collin, although—as in all of these cases—no murder had actually occurred.⁷⁶ He was convicted in 1999 under the theory of SBS.⁷⁷ The government presented four medical specialists who concluded that Collin’s death was the result of “violent shaking” and that the retinal hemorrhages seen in his eyes were pathognomonic⁷⁸ of “severe acceleration/deceleration shaking.”⁷⁹ Mr. Jones presented only one expert, a forensic pathologist, who testified that although *he initially thought he was reviewing a case of SBS*, once he looked at all of the medical problems that Collin had at such a young age, he “began to wonder if [he could] really separate the medical

68. *See id.*

69. *Id.*

70. *Id.* at 274.

71. *Id.* at 274–75.

72. *See id.* at 286.

73. Maurice Possley, *Terry Ceasor*, NAT’L REGISTRY OF EXONERATIONS, <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=6043> [<https://perma.cc/84HS-763S>] (last updated Dec. 18, 2023).

74. *Id.*

75. *Id.*

76. *See* Maurice Possley, *Clarence Jones III*, NAT’L REGISTRY OF EXONERATIONS [hereinafter *Clarence Jones III*], <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=6020> [<https://perma.cc/V4PF-VVZJ>] (last updated Aug. 3, 2023).

77. *See id.*

78. *Jones v. State*, No. 0087, 2021 WL 346552, at *3 n.10 (Md. Ct. Spec. App. Feb. 2, 2021) (“Pathognomonic is defined as ‘distinctively characteristic of a particular disease.’” (quoting MERRIAM-WEBSTER MEDICAL DICTIONARY (2020))).

79. *Clarence Jones III*, *supra* note 76.

problems from the pure traumatic part.”⁸⁰ He did not think he could.⁸¹ This was not very strong evidence coming from the defense’s sole expert—but it was the only expert testimony supporting Mr. Jones’ contention that he did not murder his son.⁸²

Seventeen years later, with the help of the Mid-Atlantic Innocence Project and representatives from two large law firms, Mr. Jones filed a 516-page writ of innocence based on shifting evidence related to the underlying determination of SBS.⁸³ In 2018, he was granted a hearing where he was able to present six highly specialized medical experts.⁸⁴ These experts presented evidence about the dearth of research supporting the theory of SBS—a lack of research that was known at the time of Mr. Jones’ trial—and new studies that supported other explanations for Collin’s condition.⁸⁵ The district court denied relief, holding:

[I]t is not the court’s place to “criticize, rebut, or refute decades of medical literature and practice [concerning SBS] [] particularly when the medical community has failed to do so,” the court denied Mr. Jones’s petition. The court found that the “newly discovered” cerebral edema evidence provided no “substantial or significant possibility” of a different result at trial.⁸⁶

Ultimately, the Court of Special Appeals of Maryland reversed the lower court and remanded because the court was “persuaded that, if a factfinder, be it jury or judge, would hear the competing professional medical opinions, there is a substantial or significant possibility of a different result.”⁸⁷ Another hearing was held at the trial court level, to determine next steps. The district court judge ruled that a new trial would not serve the interests of justice and dismissed the case.⁸⁸

Even in a much more recent conviction—when the dispute over the diagnosis of SBS/AHT was well known in the pediatric and forensic community—a mother and father were accused of child abuse, and their trial attorney failed to obtain an expert to contest the diagnosis.⁸⁹ In 2019, co-defendants Codie Lynn Stevens and Dane Krukowski were exonerated from a 2016 conviction for second-degree child abuse supposedly perpetrated against their son, Roegan.⁹⁰ In February 2015, the couple brought their son to the hospital when they feared he was having a seizure.⁹¹ Just two weeks earlier, two-month-old Roegan had slipped out of Mr. Krukowski’s hands during a bath and hit his head.⁹² Roegan had a bump on his head but appeared to be breathing normally.⁹³ He ate later

80. Jones v. State, 2021 WL 346552, at *4.

81. *Id.*

82. *See id.*

83. *Clarence Jones III*, *supra* note 76.

84. *See id.*

85. *See Jones*, 2021 WL 346552, at *6–7.

86. *Id.* at *9 (second and third alterations in original).

87. *Id.* at *20.

88. *Clarence Jones III*, *supra* note 76.

89. *See* Maurice Possley, *Dane Krukowski*, NAT’L REGISTRY OF EXONERATIONS [hereinafter *Dane Krukowski*], <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5905> [https://perma.cc/U3S8-FWH8] (last updated Feb. 1, 2021).

90. *See id.*

91. *Id.*

92. *People v. Krukowski*, Nos. 334320, 337120, 2019 WL 3519251, at *1 (Mich. Ct. App. Aug. 1, 2019).

93. *Id.*

that day, and was awake and acting normal the following day.⁹⁴ Roegan went to a regularly scheduled doctor's appointment the following day, where the pediatrician suggested that the parents take him to a chiropractor.⁹⁵ Roegan had three chiropractic appointments with adjustments at each one.⁹⁶ Three days after the final chiropractor visit, Roegan experienced persistent vomiting.⁹⁷ The following morning, he appeared to be having a seizure, so Ms. Stevens and Mr. Krukowski brought him to the emergency room, where a CT scan and MRI revealed brain bleeding.⁹⁸ He was transferred to pediatric intensive care, where the medical professionals observed brain bleeds, multiple rib fractures, ongoing seizure activity, and retinal hemorrhages, which they believed to have been caused by "non-accidental trauma."⁹⁹

At the couple's trial for second-degree child abuse, the prosecution called nine experts.¹⁰⁰ The defendants testified on their own behalf, but the defense called no other witnesses—expert or otherwise.¹⁰¹ In closing, the prosecutor told the jury that the prosecution didn't have to prove that the baby was shaken, noting that "the doctors said this is not accidental. This baby was abused. This is nonaccidental. This is child abuse."¹⁰² The couple was convicted and asked for a post-conviction hearing in order to make a record for their pending appeal to show that their attorney was ineffective for failing to obtain an expert to dispute the prosecution's evidence that Roegan had been shaken and failing to object to the shaking evidence as irrelevant and unfairly prejudicial.¹⁰³

At the post-conviction hearing, the defense presented two experts.¹⁰⁴ A forensic pathologist testified that the diagnosis of SBS/AHT is highly contested and that "SBS was nothing more than a 'hypothesis' that is 'increasingly challenged' in the scientific literature."¹⁰⁵ He further testified that Roegan's injuries resulted not from SBS/AHT but, rather, as a result of birth and delivery, his large head, the fall in the tub, and the chiropractic treatments.¹⁰⁶ An expert in biomechanical engineering testified that the injuries were likely from the short fall and that he saw no neck injuries or anything else that would lead him to believe Roegan's injuries were from SBS.¹⁰⁷ The trial attorney also testified that he did not object to the testimony regarding SBS/AHT because he did

94. *Id.*

95. *Id.* at *1–2.

96. *Id.* at *2.

97. *Id.*

98. *Id.*

99. *Id.*

100. *Id.* at *3.

101. *Id.*

102. Defendant-Appellee's Answer to Plaintiff-Appellant's Application for Leave to Appeal at 11, *Krukowski*, Nos. 334320, 337120, 2019 WL 3519251.

103. *Krukowski*, 2019 WL 3519251, at *3. Krukowski specifically requested a *Ginther* hearing which, in Michigan, is a post-conviction evidentiary hearing for adding facts to the trial record which will support the basis for an appeal. *People v. Ginther*, 212 N.W.2d 922, 925 (Mich. 1973).

104. See *Dane Krukowski*, *supra* note 89.

105. *Id.* (quoting testimony from forensic pathologist Karl A. Williams).

106. *Id.*

107. *Id.*

not think it was a “big deal.”¹⁰⁸ The trial court denied the motion for a new trial.¹⁰⁹ However, the Michigan Court of Appeals reversed the convictions and held that there was insufficient evidence to convict the couple under the theory chosen by the prosecutor.¹¹⁰ The court did not reach the issue of ineffective assistance of counsel.¹¹¹ Mr. Kurkowski and Ms. Stevens had spent more than three years in prison, and during that time, their son was raised in foster care.¹¹²

In all of these cases, the defendants were unable to adequately respond to the experts presented by the prosecution. In one case, the court denied funding.¹¹³ In another, the defense attorney did not know that he could ask for funding.¹¹⁴ In the third case, only one expert was called, and his testimony was equivocal, at best.¹¹⁵ Even in a recent case, when the dispute over SBS/AHT was well known in the legal community, the defense attorney did not think that objecting to such evidence was a “big deal.”¹¹⁶ Defense attorneys who handle SBS/AHT cases need to understand the dispute in the pediatric and forensic community, make detailed and comprehensive requests for funding under the appropriate statutes and laws, and challenge the admissibility of the SBS/AHT hypothesis under *Daubert/Frye*. Courts and legislatures need to be generous in funding experts in these types of cases, where the disputes over SBS/AHT and its diagnosis are extremely complex, and experts on both sides are needed to explain such disputes to the trier of fact.

Although many of the exoneration cases stem from older convictions, this problem continues today. As noted, SBS/AHT cases in the United States continue to be diagnosed at a rate of about 2,000 per year.¹¹⁷ In two recently litigated cases, the contrast is readily apparent. Torrie Vader was acquitted of criminal child abuse that she allegedly perpetrated against a child at her in-home daycare.¹¹⁸ It was alleged that she injured the child on July 16, 2021.¹¹⁹ However, at her 2023 trial, a board-certified pediatric neurologist testified that the child had a preexisting brain condition called hydrocephalus, an abnormal brain condition where a collection of blood or cerebral fluids puts significant pressure on the brain.¹²⁰ That case stands in stark contrast to the death penalty case of

108. *Id.* (quoting testimony from defense attorney Phillip Sturtz).

109. *Id.*

110. *See* *People v. Krukowski*, Nos. 334320, 337120, 2019 WL 3519251, at *5-6 (Mich. Ct. App. Aug. 1, 2019).

111. *See id.* at *3 n.5; *Dane Krukowski*, *supra* note 89.

112. *Dane Krukowski*, *supra* note 89.

113. *LeeVester Brown*, *supra* note 32.

114. *Ceasor v. Ocwieja*, 655 F. App'x 263, 287 (6th Cir. 2016).

115. *See Clarence Jones III*, *supra* note 76; *see also* *Jones v. State*, No. 0087, 2021 WL 346552, at *4 (Md. Ct. Spec. App. Feb. 2, 2021).

116. *Dane Krukowski*, *supra* note 89 (quoting testimony from defense attorney Phillip Sturtz).

117. *Bobrow*, *supra* note 9.

118. *Breaking: Not Guilty Verdict Reached in Baby Willow Trial*, WILLISTON HERALD (Jan. 11, 2023), https://www.willistonherald.com/breaking_news/breaking-not-guilty-verdict-reached-in-baby-willow-trial/article_b4ebd8c2-91fc-11ed-b581-0304233ac9fb.html [<https://perma.cc/Y2EW-ZB5B>].

119. *Id.*

120. *Kyara Brown, A Look into the Details of the Baby Willow Trial*, KXNEWS (Jan. 13, 2023, 7:34 AM CST), <https://www.kxnet.com/news/local-news/a-look-into-the-details-of-the-baby-willow-trial> [<https://perma.cc/59DC-K6VN>].

Robert Roberson, where the Texas Court of Criminal Appeals recently upheld his death sentence even after three experts testified in 2021 challenging his conviction for the death of his two-year-old daughter.¹²¹ Mr. Roberson has filed a petition before the U.S. Supreme Court, and five amicus briefs have been filed on his behalf by Concerned Physicians and Scientists, the Center for Integrity in Forensic Science, Witness to Innocence, the Innocence Project of Texas, and five retired federal judges.¹²²

II. THE HYPOTHESIS

In most SBS/AHT cases, prosecution experts rely on a triad of symptoms as indicators of SBS/AHT that are sometimes found in infants and young children even without any external injury: subdural hematomas (a collection of blood between the covering of the brain (dura) and the surface of the brain), retinal hemorrhages (bleeding in the retina of the eye), and encephalopathy (brain swelling or other dysfunction).¹²³ The underlying hypothesis that would come to be known as SBS was first posited by British neurosurgeon Dr. Norman Guthkelch in 1971.¹²⁴ Dr. Guthkelch studied thirteen cases of infants with subdural hematomas and found that five of those cases showed no external injury to the head of the baby.¹²⁵ Dr. Guthkelch hypothesized that the subdural hematomas in those infants without any sign of external injury could have been caused by shaking.¹²⁶ He likened what he observed to a study done by Dr. Ayub K. Ommaya in which monkeys were subjected to sudden acceleration forces.¹²⁷ Dr. Ommaya's paper on monkeys is the sole source of experimental data upon which the initial hypothetical shaking mechanism was based.¹²⁸

In 1972, the theory found further support in the United States when a pediatric radiologist, Dr. John Caffey, did a study of twenty-seven cases thought to have involved the shaking of an infant.¹²⁹ Dr. Caffey believed that "whiplash-shaking" was the cause of the symptoms he saw (subdural bleeding and retinal hemorrhages).¹³⁰ In addition to the whiplash-shaking injuries that Dr. Caffey believed a caregiver might use to correct a

121. *Ex parte* Roberson, No. WR-63,081-03, 2023 WL 151908, at *1–2 (Tex. Crim. App. Jan. 11, 2023); Pennylynn Webb & Stuart Whitaker, *Roberson Death Row Murder Conviction Upheld*, PALESTINE HERALD-PRESS (Jan. 11, 2023), https://www.palestineherald.com/news/roberson-death-row-murder-conviction-upheld/article_4a362cb6-9225-11ed-bbea-3b8afd871f3.html [<https://perma.cc/7CAR-P7FF>].

122. *Scientists, Physicians, Retired Federal Judges, and Innocence Groups File Amicus Briefs in Support of Robert Roberson, Texas Man Convicted and Sentenced to Death in "Shaken Baby Syndrome" Case*, DEATH PENALTY INFO. CTR. (June 15, 2023), <https://deathpenaltyinfo.org/news/scientists-physicians-retired-federal-judges-and-innocence-groups-file-amicus-briefs-in-support-of-robert-roberson-texas-man-convicted-and-sentenced-to-death-in-shaken-baby-syndrome-case> [<https://perma.cc/D59M-4USP>].

123. See Krugman et al., *supra* note 4, at 872–73; Case et al., *supra* note 5, at 114.

124. A.N. Guthkelch, *Infantile Subdural Haematoma and Its Relationship to Whiplash Injuries*, 2 BRIT. MED. J. 430, 430–31 (1971) [hereinafter Guthkelch, *Infantile Subdural Haematoma*].

125. *Id.*

126. *Id.* at 431.

127. *Id.*; see also Ayub K. Ommaya, Fred Faas & Philip Yarnell, *Whiplash Injury and Brain Damage: An Experimental Study*, 204 JAMA 285 (1968).

128. Ronald H. Uscinski, *Shaken Baby Syndrome: An Odyssey*, 46 NEUROLOGIA MEDICO-CHIRURGICA 57, 58 (2006) [hereinafter Uscinski, *Odyssey*].

129. See generally John Caffey, *On the Theory and Practice of Shaking Infants: Its Potential Residual Effects of Permanent Brain Damage and Mental Retardation*, 124 AM. J. DISEASES CHILD. 161 (1972).

130. *Id.* at 161.

misbehaving child, he also proposed that playful, innocent activities, like throwing a baby in the air or playing “horsey,” could cause whiplash-shaking injuries, as could a variety of common infant items and playground equipment.¹³¹ In his paper, Dr. Caffey asserted that the co-occurrence of subdural hemorrhage and retinal hemorrhage was indicative of inflicted trauma, even though it was previously acknowledged that they often occurred together in natural and congenital disease processes.¹³² Dr. Caffey suggested making parents and caregivers aware of the potential dangers of shaking an infant or child, even in an ordinary or casual way.¹³³

Based only on the case studies by Dr. Guthkelch and Dr. Caffey, as well as the experimental research by Dr. Ommaya in monkeys, the mechanism of shaking and the hypothesis of SBS gained widespread acceptance—even though almost no evidence supported its scientific validity.¹³⁴ Numerous articles claimed to accept and validate the hypothesis, and it was recognized in the medical community, based mainly on anecdotal reports and case studies.¹³⁵

In 1992, a three-year nationwide campaign to raise awareness about the now-dubbed “shaken baby syndrome” began.¹³⁶ In 1993, the American Academy of Pediatrics (AAP) published its first official statement on the triad.¹³⁷ It acknowledged the difficulty of identifying the syndrome and its extreme variability.¹³⁸ Nevertheless, the AAP reached a striking conclusion: “While physical abuse has in the past been a diagnosis of exclusion, data regarding and nature and frequency of head trauma consistently support a medical *presumption* of child abuse when a child younger than 1 year of age has intracranial injury.”¹³⁹

With those words, the AAP instructed physicians to assume that child abuse had occurred even absent any external injuries or other indicia of abuse. The exact mechanism that caused violent shaking to bring about the constellation of injuries that made up the triad (subdural or subarachnoid hemorrhage, retinal hemorrhage, and brain injury) was believed to be rotational forces from either impact or nonimpact mechanisms, like whiplash shaking, which produce sudden acceleration or deceleration to the head.¹⁴⁰ The AAP adopted Dr. Caffey’s hypothesis that a common result of shaking was the rupturing of bridging veins that connect the dura to the pia arachnoid, which caused subdural hemorrhage.¹⁴¹ Further, the authors asserted that although visible cerebral contusions were unusual, diffuse axonal injury (a type of traumatic brain injury) was likely frequent.¹⁴² However, the cranial cerebral injuries documented in these children

131. *Id.* at 165.

132. Waney Squier, *Shaken Baby Syndrome and Abusive Head Trauma*, in FORENSIC SCIENCE REFORM: PROTECTING THE INNOCENT 107, 112 (Wendy J. Koen & C. Michael Bowers eds., 2017).

133. Caffey, *supra* note 129, at 169.

134. *See* Uscinski, *Odyssey*, *supra* note 128, at 58.

135. *Id.*

136. DEBORAH TUERKHEIMER, FLAWED CONVICTIONS: “SHAKEN BABY SYNDROME” AND THE INERTIA OF INJUSTICE 4 (2014).

137. *Id.*

138. *See id.*

139. Krugman et al., *supra* note 4, at 872 (emphasis added).

140. Case et al., *supra* note 5, at 114.

141. *See* Krugman et al., *supra* note 4, at 872.

142. *Id.* at 873.

depended on the force of the shaking, whether there was impact in addition to shaking, and the time elapsed between the shaking and presentation for treatment.¹⁴³

The AAP also suggested that a large team of specialists should be included on the diagnostic team working with the child, including specialists in pediatric radiology, neurology, neurosurgery, and ophthalmology, as well as a pediatrician specializing in child abuse.¹⁴⁴ In areas where such a team of specialists was unavailable, a regional consultation network for child abuse cases should be developed.¹⁴⁵

Additionally, we have seen the creation of mandatory reporting of suspected abuse, along with the rise in multidisciplinary teams focused on investigation, increased child abuse specialization, and organizations that are designed to support child abuse expertise.¹⁴⁶ Because these teams of medical specialists worked closely with child protection workers and law enforcement, they may have been influenced in a way that led to biases.¹⁴⁷ These effects could be quite normal, like the desire to find a culprit or place blame on someone when a terrible tragedy occurs, but they could also be based on race and class. For instance, a study of over 3,000 infants admitted to thirty-nine pediatric hospitals for traumatic brain injuries between 2004 and 2008 raised concerns that black infants and infants who were publicly insured or uninsured (used as an indicator of lower socioeconomic status) were being overevaluated for possible abuse and subjected to unnecessary skeletal surveys (a series of X-rays done to the entire body).¹⁴⁸ In another study in which physicians were asked to review cases for potential child abuse, race did not appear to be a factor in the determination of potential child abuse, but reduced socioeconomic status was a factor in the determination of abuse.¹⁴⁹ In a review of data collected between 2010 and 2013 from eighteen participating sites of the Pediatric Brain Injury Research Network, researchers indicated that “minority race/ethnicity patients were twice as likely to be evaluated and reported for suspected AHT as white/non-Hispanic patients.”¹⁵⁰ Although the majority of cases showing this disparity came from just two participating sites, there was no plausible reason for the observed disparities beyond implicit (or even explicit) bias.¹⁵¹

In addition to race and class biases in child abuse diagnoses, financial motivations may also exist for the hospitals involved because they receive additional funding for the services provided by their doctors in these cases.¹⁵² For instance, hospitals may work

143. *Id.*

144. *Id.* at 874.

145. *Id.*

146. TUEKHEIMER, *supra* note 136, at 36.

147. *See id.* at 37.

148. Joanne N. Wood, Matthew Hall, Samantha Schilling, Ron Keren, Nandita Mitra & David M. Rubin, *Disparities in the Evaluation and Diagnosis of Abuse Among Infants with Traumatic Brain Injury*, 126 PEDIATRICS 408, 408–09 (2010).

149. Antoinette L. Laskey, Timothy E. Stump, Susan M. Perkins, Gregory D. Zimet, Steven J. Sherman & Stephen M. Downs, *Influence of Race and Socioeconomic Status on the Diagnosis of Child Abuse: A Randomized Study*, 160 J. PEDIATRICS 1003, 1005 (2012).

150. Kent P. Hymel, Antoinette L. Laskey, Kathryn R. Crowell, Ming Wang, Veronica Armijo-Garcia, Terra N. Frazier, Kelly S. Tieves, Robin Foster & Kerri Weeks, *Racial and Ethnic Disparities and Bias in the Evaluation and Reporting of Abusive Head Trauma*, 198 J. PEDIATRICS 137, 141 (2018).

151. *See id.* at 141–42.

152. *See Mohil v. Glick*, 842 F. Supp. 2d 1072, 1075 (N.D. Ill. 2012).

with various state-run agencies and receive money from those agencies in exchange for permitting/providing the expert review by their doctors, having those doctors report their findings to law enforcement and other state agencies, and providing expert testimony in legal proceedings.¹⁵³ Regardless of their motivation, even if altruistic, the testimony of medical professionals alone was being used to establish that a crime had occurred—even though the thorough research that should have supported the SBS/AHT hypothesis had not been done.¹⁵⁴ After 1990, criminal accusations and prosecutions of SBS against parents and caregivers started to skyrocket. Before 1990, only fifteen cases of alleged SBS had reached the appellate courts.¹⁵⁵ Between 1990 and 2000, there were over two hundred SBS cases that reached appellate courts, and between 2000 and 2010, there were more than eight hundred such SBS/AHT cases.¹⁵⁶

To this day, medical testimony alone is being used to establish the crime charged. Medical experts testified that shaking caused the death or injury, that the shaking was so violent that it showed the defendant's state of mind, and that the timing was such that the last person to care for the child was the person who must have done the shaking.¹⁵⁷ In a seminal study of eight hundred criminal cases between 1992 and 2012 that involved neuroscience, Professor Deborah Denno found that 286 of those cases concerned the use of neuroscience by the prosecutor to explain the victims' injuries.¹⁵⁸ Of those cases, 115 (40.21%) involved a diagnosis of SBS.¹⁵⁹ In her review, Professor Denno noted that although SBS was developed for medical care, it had been "hijacked by the legal system for the purpose of criminal prosecution."¹⁶⁰ The cases in her study shared three common characteristics:

- (1) the prosecution depends nearly entirely on an SBS diagnosis for its theory and argument, without which there would be no case or a case with a substantially lesser charge;
- (2) the prosecution focuses on proving that the defendant intended the shaking actions, as opposed to proving more accurate levels of *mens rea* such as recklessness or negligence or bringing no charge at all; and
- (3) the prosecution stresses a causal connection between the defendant's *mens rea* and *actus reus* even though such a connection is not warranted by either law or science.¹⁶¹

In these cases, the expert testimony provided evidence of both the act that caused the injury (*actus rea*) and the mental state of the alleged perpetrator (*mens rea*).

Experts have also overstated the reliability of their opinions by describing them in terms such as "100 percent" and "certain" even though SBS/AHT cannot be proven with

153. *Id.* at 1074–75.

154. See TUEKHEIMER, *supra* note 136, at 36–37.

155. *Id.* at 2.

156. *Id.*

157. *Id.* at 5.

158. Deborah W. Denno, *Concocting Criminal Intent*, 105 GEO. L.J. 323, 334 (2017).

159. *Id.* at 336–37.

160. *Id.* at 331.

161. *Id.*

absolute confidence.¹⁶² Such conclusory testimony by no means constitutes an evidence-based diagnosis.

One caregiver caught up in this nightmare was Audrey Edmunds, who was convicted of first-degree reckless homicide for the 1995 death of a seven-month-old girl whom she cared for at her in-home daycare.¹⁶³ At trial, Ms. Edmunds's defense was that the child could have been shaken by someone else, prior to being dropped off at daycare, and then had a lucid interval between the earlier shaking and the onset of seizures at Ms. Edmunds's home.¹⁶⁴

At trial, expert testimony was used to show that Ms. Edmunds exhibited an utter disregard for human life.¹⁶⁵

Natalie's injuries were extremely severe. For example, her retinas had been *torn* from the backs of her eyes and force similar to falling from a second story window had been applied to her. She could not have sustained the injuries she had with a little jiggling.¹⁶⁶

Also, as was typical in the 1990s, experts testified that the child's death could not have occurred accidentally:

The physicians who testified for the State said that her major injuries resulted from "extremely vigorous shaking" and as the result of "severe force," comparable to that exerted in an automobile accident or in falling from a second story window. There was no evidence that the severe injuries Natalie sustained could have been the result of an accident, rather than intentional, forceful conduct, directed specifically at Natalie.¹⁶⁷

Thus, in Ms. Edmunds's case, as in so many others,¹⁶⁸ experts established the cause of death and the mens rea necessary for the specific crime, identified the specific perpetrator (the last adult with the child), and excluded any possibility of an accidental fall or other cause.

During the prosecution's case in chief, the prosecution's experts testified that, after being shaken, the child would have had an immediate response and would not have appeared normal when dropped off at Ms. Edmunds's home.¹⁶⁹ Both of Natalie's parents testified Natalie was acting normally when dropped off at Ms. Edmund's home.¹⁷⁰ In her defense, Ms. Edmunds presented just one medical expert.¹⁷¹ That witness agreed with the prosecution's experts that the child was violently shaken but testified that the act of violent shaking could have occurred before the child arrived at Ms. Edmunds's home, with Natalie experiencing a "lucid interval" afterwards.¹⁷² To refute this argument, the

162. Mike Hixenbaugh & Keri Blakinger, *Do No Harm: A Devastating Diagnosis*, HOUS. CHRON. & NBC NEWS (Sept. 19, 2019), <https://www.nbcnews.com/news/us-news/devastating-diagnosis-doctors-trained-spot-child-abuse-can-save-lives-n1055746> [<https://perma.cc/F2WD-C4NN>].

163. *State v. Edmunds (Edmunds II)*, 746 N.W.2d 590, 592 (Wis. Ct. App. 2008).

164. *Id.*

165. *See State v. Edmunds (Edmunds I)*, 598 N.W.2d 290, 296 (Wis. Ct. App. 1999).

166. *Id.* (emphasis added).

167. *Id.* at 294.

168. TUERKHEIMER, *supra* note 136, at 5–6.

169. *Edmunds II*, 746 N.W.2d at 592.

170. *Id.*

171. *Id.*

172. *Id.*

prosecution called yet another expert in rebuttal to reiterate that “medical evidence established that Natalie was violently shaken immediately before reacting and could not have had a lucid interval.”¹⁷³

Thus, not only did the prosecution’s experts provide the mens rea for the crime, but they also established that Ms. Edmunds’s defense was not possible, thus repudiating the defense theory of the case. In fact, it is common for experts to testify that babies who suffered intracranial hemorrhage, brain injury, or death would be immediately symptomatic, eliminating the possibility of a lucid interval.¹⁷⁴ However, even though experts at Edmunds’s trial and in other cases testified that there could not be a lucid interval between the time the infant was injured and the onset of serious symptoms that would lead a caregiver to bring the child to a health care provider, the 1993 AAP paper actually indicated the opposite—that, in fact, *SBS may not be immediately identifiable*.¹⁷⁵

SBS/AHT is characterized as much by what is obscure or subtle as by what is immediately clinically identifiable. A shaken infant may suffer only mild ocular or cerebral trauma. The infant may have a history of poor feeding, vomiting, lethargy, and/or irritability occurring intermittently *for days or weeks* prior to the time of initial health care contact.¹⁷⁶

It was not until the 2001 publication of another paper, well after Ms. Edmunds’s trial, that the AAP changed its stance, proclaiming that “these clinical signs of shaken baby syndrome are immediate and identifiable as problematic even to parents who are not medically knowledgeable.”¹⁷⁷ This raises the question of what was truly known in the medical community at the time and whether expert witnesses were testifying in accordance with known scientific facts or were altering their testimony to fit the facts of the case proposed by the government.

In 2008, after spending well over a decade in prison, Ms. Edmunds was finally exonerated. At her post-conviction hearing, Ms. Edmunds was able to present six expert witnesses of her own, compared to only one at her trial, who testified that there was then a significant debate in the medical community about whether the symptoms exhibited by the child in the case were necessarily indicative of SBS/AHT and that there had been significant developments in the medical community since the time of her trial that called into question the diagnosis of SBS.¹⁷⁸ The Wisconsin Court of Appeals acknowledged that there was a real dispute in the medical community about the diagnosis of SBS, and Ms. Edmunds’s conviction was reversed.¹⁷⁹ What had changed in the intervening twelve years while Ms. Edmunds languished in prison?

173. *Id.* at 592–93.

174. RANDY PAPETTI, THE FORENSIC UNRELIABILITY OF THE SHAKEN BABY SYNDROME 60 n.191 (Christopher Milroy, ed., 2018).

175. *See* Krugman et al., *supra* note 4, at 872–73.

176. *Id.* at 872 (emphasis added).

177. Comm. on Child Abuse & Neglect, Am. Academy of Pediatrics, *Shaken Baby Syndrome: Rotational Cranial Injuries—Technical Report*, 108 PEDIATRICS 206, 207 (2001) [hereinafter Kairys et al.].

178. *See Edmunds II*, 746 N.W.2d at 593.

179. *Id.* at 598–99.

In 2001, Dr. Jennian Geddes, a neuropathologist, published two studies of the brains of infants who had allegedly died from abuse.¹⁸⁰ The results showed that the subdural hemorrhages found in these infants contained far less blood than would be expected if the bridging veins had ruptured, as was hypothesized in SBS/AHT cases.¹⁸¹ A review of the Geddes studies showed that, “[i]n many respects, the findings in these children were virtually indistinguishable from the findings in infants who had died natural deaths.”¹⁸² Further, there had yet to be, and never has been, a biomechanical study that shows that shaking an infant can cause the acceleration/deceleration force needed to cause the brain injuries seen in the infants who were allegedly shaken.¹⁸³ In fact, a number of studies showed that shaking generated biomechanical forces well below what would be required to cause the observed injuries.¹⁸⁴ In thirty years, there was not a single witnessed incident of a person shaking a healthy child and replicating the injuries that experts said supported the triad and, thus SBS.¹⁸⁵

In addition, new studies were conducted that debunked much of what had been previously believed to be true and was testified to by government experts. For instance, it now appeared that a lucid interval between the time of the injury and onset of symptoms could be as much as twenty-four hours or even longer.¹⁸⁶ The author of that study cautioned that “[e]nough variability in the interval between injury and the time of severe symptoms or presentation for medical care in fatally injured children exists to warrant circumspection in describing such an interval for investigators or triers of fact.”¹⁸⁷

In a different study on short falls, forensic pathologist Dr. John Plunkett studied eighteen witnessed short fall cases which resulted in the death of a child.¹⁸⁸ At the time of his study, Dr. Plunkett had been the laboratory director and pathologist at a regional hospital for twenty-three years.¹⁸⁹ He had testified on behalf of prosecutors and defendants, and had in fact diagnosed SBS in two cases.¹⁹⁰ However, when reviewing the case of a mother who said that she had witnessed the child fall off the couch, Dr. Plunkett started to consider that the symptoms said to be caused by lethal shaking and those caused by an innocent fall could be confused.¹⁹¹ He also considered the obvious fact that children wear helmets for many activities because low-level falls can injure a

180. See J.F. Geddes, A.K. Hackshaw, G.H. Vowles, C.D. Nickols & H.L. Whitwell, *Neuropathology of Inflicted Head Injury in Children* (pts. I-II), 124 BRAIN 1290, 1299 (2001); see also Findley et al., *supra* note 3, at 229 & n.66.

181. Geddes et al., *supra* note 180, at 1297; Findley et al., *supra* note 3, at 229–30, 229 n.67.

182. Findley et al., *supra* note 3, at 230 (citing Geddes et al., *supra* note 180, at 1305).

183. See generally Ronald H. Uscinski, *Shaken Baby Syndrome: Fundamental Questions*, 16 BRIT. J. NEUROSURGERY 217 (2002) [hereinafter Uscinski, *Fundamental Questions*].

184. PAPETTI, *supra* note 174, at 85–87.

185. Findley et al., *supra* note 3, at 237.

186. M.G.F. Gilliland, *Internal Duration Between Injury and Severe Symptoms in Nonaccidental Head Trauma in Infants and Young Children*, 43 J. FORENSIC SCIS. 723, 724 (1998).

187. *Id.*

188. John Plunkett, *Fatal Pediatric Head Injuries Caused by Short-Distance Falls*, 22 AM. J. FORENSIC MED. & PATHOLOGY 1, 2 (2001) [hereinafter Plunkett Study].

189. See Ronald N. Auer, *A Review of the Life of John Plunkett (1947–2018)*, FORENSIC SCI. INT’L: SYNERGY, no. 5, 2022, at 2.

190. *Id.*

191. *Id.*

child.¹⁹² Dr. Plunkett used the United States Consumer Product Safety Division database to locate and review witnessed short falls from playground equipment that resulted in the child's death.¹⁹³ In reviewing those cases, he found that "[a] fall from less than 3 meters (10 feet) in an infant or child may cause fatal head injury and may not cause immediate symptoms . . . [and he concluded that a] history by a caretaker that a child may have fallen cannot be dismissed."¹⁹⁴

Researchers have also used mechanical models of infants in an attempt to determine the level of force necessary to cause the intracranial injuries said to be the basis of SBS. In a 1987 study, using available data on scaled injury thresholds, researchers shook mechanical infant models to try to cause concussion and subdural hematoma, but they were unable to demonstrate the force required to cause intracranial injuries through manual shaking.¹⁹⁵ Two of the study authors conducted another study in 2002, and once again, they were unable to create the force necessary to cause intracranial injuries.¹⁹⁶

Also in 2002, Dr. Ommaya—whose work with monkeys was relied on by Dr. Caffey and Dr. Guthkelch—conducted a biomechanical review and found that a fall of only three feet produced a force ten times greater than shaking.¹⁹⁷ He also found that spontaneous rebleeds may occur and may explain the onset of symptoms of chronic (i.e., older as opposed to acute) subdural hematomas.¹⁹⁸ Finally, Dr. Ommaya found that the level of force required to cause retinal hemorrhage was unlikely to occur from shaking; instead, it would be more likely that injury to the cervical cord or spine would result before any intracranial injuries.¹⁹⁹

In 2005, a researcher conducted an injury biomechanics analysis to determine the amount of force needed to cause the injuries claimed to have been the result of SBS *and* what other injuries might occur in an infant at that level of force.²⁰⁰ Since an infant's neck is so fragile and the required force to cause the brain injuries seen in suspected SBS cases was so high, the study found there should be far more cervical spinal cord or brain stem injuries than are reported in SBS cases.²⁰¹ The study also found that the head velocity from a human manual shaking (as theorized by the SBS hypothesis) is "of the same order as free fall head velocity from a height of about 1 m[eter],"²⁰² a height similar to that of a short fall. The study suggested that a re-evaluation of the diagnostic criteria for SBS merited serious attention due to its social and legal implications.²⁰³

192. *Id.*

193. *Id.*; Plunkett Study, *supra* note 188, at 2.

194. Plunkett Study, *supra* note 188, at 10.

195. Uscinski, *Odyssey*, *supra* note 128, at 58–59 & 61 n.7 (citing Ann-Christine Duhaime, Thomas A. Gennarelli, Lawrence E. Thibault, Derek A. Bruce, Susan S. Margulies & Randall Wisner, *The Shaken Baby Syndrome: A Clinical, Pathological, and Biomechanical Study*, 66 J. NEUROSURGERY 409, 409–15 (1987)).

196. *Id.* at 59 & 61 n.17.

197. A.K. Ommaya, W. Goldsmith & L. Thibault, *Biomechanics and Neuropathology of Adult and Pediatric Head Injury*, 16 BRITISH J. NEUROSURGERY 220, 226 (2002).

198. *Id.* at 231–33.

199. *Id.* at 226–29.

200. Faris A. Bandak, *Shaken Baby Syndrome: A Biomechanics Analysis of Injury Mechanisms*, 151 FORENSIC SCI. INT'L 71, 71 (2005).

201. *Id.* at 78; Uscinski, *supra* note 128, at 58.

202. Bandak, *supra* note 200, at 78.

203. *See id.* at 79.

By focusing attention on the infant's neck, the study showed that the force needed to cause the brain injuries believed to occur from shaking would also necessarily cause cervical spinal cord or brainstem injuries, and in fact, those injuries occurred at a much lower level of shaking than were purportedly required for brain injury.²⁰⁴ It now seemed clear that the SBS hypothesis—manual shaking of an infant could cause intracranial injuries without any injuries to the neck of the infant—was based on a misinterpretation of Dr. Ommaya's monkey experiments, which were conducted for an entirely different purpose.²⁰⁵

Further, many conditions that may mimic the triad were being recognized and included in textbooks on AHT in infants.²⁰⁶ These include: birth trauma;²⁰⁷ congenital malformations;²⁰⁸ accidents;²⁰⁹ genetic and metabolic disorders;²¹⁰ hematological diseases and disorders of coagulation and clotting;²¹¹ infectious diseases;²¹² autoimmune and vasculitis conditions;²¹³ oncology;²¹⁴ exposure to toxins, poisons, and nutritional deficiencies;²¹⁵ and medical or surgical complications.²¹⁶ Under the old paradigm of SBS/AHT, if the medical provider observed the triad and there was no other acceptable explanation from the parent or caregiver, the triad was diagnostic of abuse. A new paradigm emerged that required cases to be evaluated using the same diagnostic criteria found in other complex areas of medicine.²¹⁷

Even with this paradigm shift, many studies continued to support the triad as being diagnostic of SBS, but most such studies are highly problematic due to circular reasoning.²¹⁸ However, the determinations of what cases fit in the SBS/AHT category are based on the accepted belief that SBS/AHT is a valid hypothesis.

[T]he mechanism of shaking and the so named syndrome gained immediate acceptance and enormously widespread popularity, with no real investigation or even question as to its scientific validity.

The stage was set; the shaking hypothesis rapidly engendered numerous articles purporting to accept or validate the hypothesis. Ratification within the medical community was based principally on anecdotal reports and case studies.²¹⁹

204. Uscinski, *supra* note 128, at 59.

205. *See id.* at 58.

206. Andrew P. Sirotnak, *Medical Disorders that Mimic Abusive Head Trauma*, in QUICK REFERENCE ABUSIVE HEAD TRAUMA 191, 191 (Lori D. Frasier, Kay Rauth-Farley, Randell Alexander & Robert N. Parrish, eds., 2007).

207. *Id.* at 194.

208. *Id.* at 195.

209. *Id.* at 198.

210. *Id.* at 200.

211. *Id.* at 203.

212. *Id.* at 206.

213. *Id.* at 208.

214. *Id.* at 209.

215. *Id.* at 211.

216. *Id.* at 211–13.

217. Findley et al., *supra* note 3, at 297–98.

218. *Id.* at 274.

219. *See* Uscinski, *Odyssey*, *supra* note 128, at 58.

Doctors assume that in the absence of a known medical explanation, subdural hemorrhages are caused by major trauma.²²⁰ If the parent or caregiver cannot provide an acceptable, natural medical condition or accidental cause for the hemorrhage, then the cause is assumed to be abuse.²²¹ Because physicians conducting the SBS/AHT studies need to determine which children were SBS/AHT victims—which children had suffered accidents and which had suffered from a naturally occurring medical condition—they rely on their judgment or develop criteria to categorize such cases.²²² However, if the study adopts the SBS/AHT hypothesis as true, it may “routinely classif[y] the children using SBS dogma.”²²³ Using this methodology, if an infant exhibits symptoms of the triad without presenting an acceptable explanation of an accident or existing medical condition, the case is classified as SBS/AHT, but if the infant presents without symptoms of the triad or there is an acceptable explanation for the major trauma, it is unlikely that the case would be categorized as an SBS/AHT case.²²⁴

In the face of such circular reasoning, or perhaps because of it, the National Association of Medical Examiners allowed its 2001 position paper on fatal abusive head injuries in infants to sunset and did not replace it.²²⁵ In 2009, the American Association of Pediatrics released a policy statement acknowledging the problematic nature of the term “shaken baby syndrome.”²²⁶ In the statement, the AAP recommended using the term “abusive head trauma,” in recognition of the reality that *shaking alone may not be the sole cause of the triad*, but rather, it could be caused by other mechanisms, as well.²²⁷ The AAP seemed to be dealing in pure semantics with this change in terminology, preferring not to distract from accountability: “Legal challenges to the term ‘shaken baby syndrome’ can distract from the more important questions of *accountability of the perpetrator* and/or the safety of the victim.”²²⁸

Since that time, Dr. Guthkelch, who originally articulated the shaken baby hypothesis, recognized the legal implications inherent in the terms “shaken baby syndrome” and “abusive head trauma”:

Of the several hundred syndromes in the medical literature, almost all are named either after their discoverer (e.g., Adie’s Syndrome) or for a prominent clinical feature (e.g., Stiff Man Syndrome). In contrast, the appellation shaken baby syndrome (SBS) asserts a unique etiology (shaking). It also implies intent since it is difficult to ‘accidentally’ shake a baby. A newer term, abusive head trauma (AHT), implies both mechanism (trauma) and intent (abusive).²²⁹

220. *Id.*

221. *Id.*

222. PAPERI, *supra* note 174, at 158.

223. *Id.*

224. *Id.* at 159 n.444.

225. Findley et al., *supra* note 3, at 240–41, 241 & n.111.

226. *Id.* at 241.

227. *See id.* at 240–41 & n.111.

228. Cindy W. Christian & Robert Block, *Abusive Head Trauma in Infants and Children*, 123 PEDIATRICS 1409, 1410 (2009) (emphasis added).

229. A.N. Guthkelch, *Problems of Infant Retino-Dural Hemorrhage with Minimal External Injury*, 12 HOUS. J. HEALTH L. & POL’Y 201, 202 (2012) [hereinafter Guthkelch, *Retino-Dural Hemorrhage*].

In addition to his recognition of the troubling use of language, Dr. Guthkelch was “frankly . . . disturbed that what [he] intended as a friendly suggestion for avoiding injury to children had become an excuse for imprisoning innocent parents.”²³⁰ After a review of the medical records in the criminal case of Drayton Witt, Dr. Guthkelch provided an affidavit that helped secure Mr. Witt’s exoneration.²³¹ Dr. Guthkelch then conducted a review of medical records in a series of other shaken baby convictions, as well as the medical literature, and concluded that the child abuse pediatricians had engaged in “dogmatic thinking” when they equated the triad to being synonymous with abuse.²³²

Dr. Guthkelch was still extremely troubled by child abuse, but he was also concerned that the medical community was ignoring significant evidence that in many cases of alleged SBS/AHT, no child abuse had in fact occurred:

While society is rightly shocked by any assault on its weakest members and demands retribution, there seem to have been instances in which both *medical science and the law have gone too far in hypothesizing and criminalizing alleged acts of violence in which the only evidence has been the presence of the classic triad or even just one or two of its elements*. Often, there seems to have been inadequate inquiry into the possibility that the picture resulted from natural causes. In reviewing cases where the alleged assailant has continued to proclaim his/her innocence, I have been struck by the high proportion of those in which there was a significant history of previous illness or of abnormalities of structure and function of the nervous system, suggesting that the problem was natural or congenital, rather than abusive. Yet these matters were hardly, if at all, considered in the medical reports.²³³

III. STANDARD TRIAL PROTECTIONS ARE NOT ENOUGH

Although defendants are in dire need of funding for experts to contradict the conclusory expert testimony about SBS/AHT, district courts may deny a defendant funding for experts in the belief that constitutional protections—such as the right to cross-examine witnesses, the prosecution’s burden of proof, and requirement of proof beyond a reasonable doubt—are sufficient to safeguard due process and a fair trial. The Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* discussed these rights to address the respondent’s concerns: “Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.”²³⁴ It should also be noted that *Daubert* was a civil case and, as such, required a lower standard of proof.

However, one of the most powerful tools a defendant might utilize *prior* to trial is to challenge scientific evidence the prosecution seeks to have admitted under the

230. Sue Luttner, *Dr. A. Norman Guthkelch Fought Injustice to the End*, CTR. FOR HEALTH JOURNALISM (Aug. 3, 2016), <https://centerforhealthjournalism.org/2016/08/03/dr-norman-guthkelch-fought-injustice-end> [<https://perma.cc/S79V-VGTN>].

231. *Id.*; Erica L. Lang, *Arizona’s Wrongfully Convicted Search for Justice and Find Hope from Behind Bars*, (March 4, 2016, 12:31 PM MST), <https://www.azcentral.com/story/news/local/phoenix/2016/03/04/arizonas-wrongfully-convicted-search-justice-and-find-hope-behind-bars/81318092/> [<https://perma.cc/SEQ5-GQWL>].

232. Lutter, *supra* note 230.

233. Guthkelch, *Retino-Dural Hemorrhage*, *supra* note 229, at 203–04 (emphasis added).

234. 509 U.S. 579, 596 (1993) (citing *Rock v. Arkansas*, 483 U.S. 44, 61 (1987)).

Daubert/Frye standards. Some states and the federal government apply the *Daubert* standard, established in 1993.²³⁵ Under *Daubert*, several factors must be considered when assessing admissibility: scientific methodology, peer review and publication, known or potential error rate, and general acceptance.²³⁶ The U.S. Supreme Court held that this was not an exhaustive list and that other factors could be considered when determining admissibility.²³⁷ Other states continue to use the 1923 *Frye* test, under which the evidence offered by the expert must only be sufficiently established to have gained general acceptance in the particular field to which it belongs.²³⁸

Even as the debate rages in the medical and legal communities regarding the validity of SBS/AHT determinations, courts regularly admit expert testimony regarding such theories and permit its presentation to the jury.²³⁹ In the first instance, it is the trial judge who “must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.”²⁴⁰ States and the federal government vary in their approach to determining the test for admission of expert testimony on SBS/AHT. Generally, courts find that expert testimony in the area of SBS/AHT is sufficiently reliable to meet both the *Daubert* standard²⁴¹ and the more lenient *Frye* standard.²⁴² Unfortunately, though, trial courts have a great deal of discretion in this area. When the trial court refuses to even grant a *Daubert/Frye* hearing, that decision is often upheld on appeal, so the scientifically unreliable diagnosis of SBS/AHT that was presented to the trier of fact cannot be sufficiently challenged on appeal.²⁴³ However, as discussed in Section VI, some courts are excluding proposed testimony by prosecution experts in this

235. Natalma (Tami) McKnew, Ted Pearce & Bruce S. Schaeffer, *Focused Expertise-Daubert in Franchise Litigation*, 41 FRANCHISE L.J. 1, 2 n.13 (2021) (noting that as of 2021, “it appears that Arkansas, Delaware, Louisiana, Maryland, Massachusetts, Mississippi, Michigan, Nebraska, Oklahoma, Texas, and Wyoming have adopted all three of the *Daubert* trilogy cases. Six states have adopted *Daubert* and *Kumho Tire* but not *Joiner*: Kentucky, Ohio, North Carolina, Rhode Island, South Dakota, and New Hampshire. Eight States have adopted *Daubert* (at least in part) but not *Kumho Tire* or *Joiner*: Alabama, Arkansas, Connecticut, Montana, New Mexico, Oregon, Vermont, and West Virginia. Six states, while not adopting *Daubert*, have utilized part of its holding to develop their own tests: Colorado, Hawaii, Indiana, Iowa, Maine, and Tennessee. Other non-*Frye* states that nonetheless reject *Daubert* are Georgia, Idaho, New Jersey, Nevada, North Dakota, South Carolina, Utah, Virginia, and Wisconsin. The following states continue to apply *Frye*: Alabama, Arizona, California, Washington DC, Florida, Illinois, Kansas, Michigan, Minnesota, New Jersey, and New York”).

236. *Daubert*, 509 U.S. at 593–94.

237. *Id.* at 593.

238. *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

239. *See supra* notes 10–13 and accompanying text.

240. *Daubert*, 509 U.S. at 589.

241. *See, e.g.*, *State v. Leibhart*, 662 N.W.2d 618, 628 (Neb. 2003); *State v. Vandemark*, No. CR.A. 04-01-0225, 2004 WL 2746157, at *4 (Del. Super. Ct. Nov. 19, 2004); *State v. Gaver*, No. 2015CA00204, 2016 WL 5610107, at *7 (Ohio Ct. App. Sept. 26, 2016); *Wolfe v. State*, 509 S.W.3d 325, 333 (Tex. Crim. App. 2017); *State v. Iceman*, No. M2016-00975-CCA-R3-CD, 2017 WL 4805118, at *7 (Tenn. Crim. App. Oct. 24, 2017).

242. *See, e.g.*, *People v. Snell*, No. 2-08-0949, 2011 WL 10088352, at *11 (Ill. App. Ct. Jan. 21, 2011); *Sissoko v. State*, 182 A.3d 874, 886 (Md. Ct. Spec. App. 2018); *People v. Schuit*, 67 N.E.3d 890, 916 (Ill. App. Ct. 2016).

243. *See Day v. State*, 303 P.3d 291, 297 (Okla. Crim. App. 2013); *State v. Milby*, No. CA2013-02-014, 2013 WL 5476805, at *4 (Ohio Ct. App. Sept. 30, 2013); *Hamilton v. Commonwealth*, 293 S.W.3d 413, 420 (Ky. Ct. App. 2009). Although in other cases, reviewing courts have excluded expert testimony following a *Daubert* hearing. *See infra* notes 420–28 and accompanying text.

area, in reliance on *Daubert* and *Frye*, so defense attorneys must continue to move that this testimony be excluded by utilizing the assistance of appropriate experts to challenge the basis of the SBS/AHT hypothesis.

It is critical that trial court judges fulfill their essential function as gatekeepers in a knowledgeable and unbiased manner. Emotions often run high in cases involving allegations of an infant abused at the hands of their caregiver, and these understandably strong emotions may result in more false convictions.²⁴⁴ However, many trial court judges feel they have not received adequate training in scientific methods and principles.²⁴⁵ In addition to the fact that judges do not feel they are adequately trained, a review of appellate decisions in state and federal criminal cases involving *Daubert* challenges reveals that district court judges show a distinct preference for expert evidence offered by prosecutors and disfavor expert testimony offered by defendants.²⁴⁶

Particularly in the area of SBS/AHT cases, with very few exceptions, defense motions to exclude expert testimony have failed.²⁴⁷ Putting defense counsel at an even greater disadvantage, once courts in a jurisdiction have decided to admit scientific evidence of a particular type in one case, that determination will advantage future reliability determinations among other courts in that jurisdiction.²⁴⁸ This is due to the precedential value established when the reliability of certain experts, and their beliefs about SBS, has been vetted in other courts of the jurisdiction.²⁴⁹ Nonetheless, the value of these precedential decisions may be changing, as discussed in Section VI.

Even in cases where a *Daubert* hearing is granted, a defense expert testifies, and the trial court agrees that prosecution testimony about SBS/AHT is unreliable and should not be presented to the jury, some appellate courts have reversed, finding that the “gate-keep[er] function of the court was never meant to supplant the adversarial trial process,” as the Kentucky Court of Appeals did in *Commonwealth v. Martin*.²⁵⁰ In another decision, a defendant’s conviction was overturned by the Mississippi Court of Appeals, because the expert testimony on SBS/AHT was so unreliable that it rendered portions of the testimony inadmissible under *Daubert*.²⁵¹ However, the Mississippi Supreme Court reversed that grant of a new trial, holding that the trial court performed its gatekeeper function appropriately and did not abuse its discretion.²⁵²

Even though the Mississippi Supreme Court felt that the Mississippi Court of Appeals went too far, it does not mean evidentiary challenges should not continue. As it becomes more and more apparent that the labels of SBS and AHT are not supported by

244. Findley et al., *supra* note 3, at 217 & nn.17–18.

245. Sophia I. Gatowski, Shirley A. Dobbin, James T. Richardson, Gerald P. Ginsburg, Mara L. Merlino & Veronica Dahir, *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 L. & HUM. BEHAV. 433, 442 (2001).

246. D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 ALB. L. REV. 99, 105–07 (2000).

247. TUERKHEIMER, *supra* note 136, at 202.

248. *See id.*

249. Wendy J. Koen, *Shaken Baby Syndrome*, in FORENSIC SCIENCE REFORM: PROTECTING THE INNOCENT 96, 100 (Wendy J. Koen & C. Michael Bowers eds., 2017).

250. *Commonwealth v. Martin*, 290 S.W.3d 59, 68 (Ky. Ct. App. 2008) (quoting *LP Matthews LLC v. Bath & Body Works, Inc.*, 458 F. Supp. 2d 198, 210 (D. Del. 2006)).

251. *Clark v. State*, 363 So. 3d 880 (Miss. Ct. App. 2019), *rev'd*, 315 So. 3d 987 (Miss. 2021).

252. *Clark*, 315 So. 3d at 995.

scientific evidence and lack the foundational reliability required by *Daubert*, such challenges are increasingly imperative. To be successful, defendants must have experts who can rebut the government's experts on every point of the triad and also provide an alternative diagnostic theory.

As noted above, when denying expert assistance, courts often point to the ability of defendants to vigorously cross-examine the prosecution's witnesses.²⁵³ However, defense attorneys are trained in law, not science. Generally, they do not have the scientific expertise needed to effectively cross-examine expert witnesses, particularly those who are highly specialized, like pediatric radiologists, pediatric ophthalmologists, and pediatric neurologists. To be truly effective in the cross-examination of an expert, a defense attorney needs their own expert(s) to review all of the medical evidence, including the child's past medical history and birth records, and provide advice and counsel.²⁵⁴ The very presence of an expert at counsel table may limit the content of what the expert on the stand is willing to testify to, since they know their testimony is being assessed for accuracy by a similarly qualified expert.²⁵⁵ In addition, experts are needed because jurors may see the expert as an unbiased professional,²⁵⁶ which may serve to counterbalance jury impressions of the defense attorney as less credible, since their job is to win on behalf of their client.

Further cross-examination of an expert is not a substitute for presenting competing experts who address each of the claims being made by the prosecution's witnesses. For the reasons above, jurors may disregard the defense's cross-examination of the prosecution's experts. Because jurors are told that nothing attorneys say is evidence, an attorney who attempts to cross-examine experts with studies and treatises in the area is at a distinct disadvantage. The prosecution expert can simply say she is not familiar with the study or disagrees with it, and the jury may decide not to consider it further—even if it is entered into evidence. Moreover, if a study or treatise is allowed into evidence and the jurors do consider it, but they do not have a scientific background or education in the area, they may not understand it without expert assistance. Even experts agree that it is unrealistic to expect that a defense attorney can uncover misleading or inadequate testimony through cross-examination alone.²⁵⁷

In cases where a defense attorney goes forward without an expert, even if this results from lack of funding, that attorney risks being ineffective, and, in fact, such claims of ineffective assistance of counsel are increasingly successful.²⁵⁸ However, considering

253. Giannelli, *supra* note 20, at 1356 n.326; *see also, e.g., Martin*, 290 S.W.3d at 68.

254. *See* Giannelli, *supra* note 20, at 1376.

255. *See id.* at 1377–79.

256. *See id.* at 1378.

257. *Id.* at 1377 & n.476 (citing Douglas M. Lucas, *The Ethical Responsibilities of the Forensic Scientist: Exploring the Limits*, 34 J. FORENSIC SCI. 719, 724 (1989)) (“[Ingraham] rejects, almost out of hand, the argument that the ‘searing test of a rigorous cross-examination’ is a sufficient safeguard in this context. He writes: ‘All that one can say to such an argument is that the lawyers who make it should know better, and, if they do know better, as they must if they are experienced trial lawyers, they should have more conscience than to perpetuate such a myth.’” (quoting Barton L. Ingraham, *The Ethics of Testimony: Conflicting Views on the Role of the Criminologist as Expert Witness*, in EXPERT WITNESSES 179, 183 (Patrick R. Anderson & L. Thomas Winfree, Jr. eds., 1987))).

258. *See, e.g., People v. Ackley*, 870 N.W.2d 858 (Mich. 2015); *Ex parte Briggs*, 187 S.W.3d 458 (Tex. Crim. App. 2005); *People v. Brown*, No. 337869, 2019 WL 3386459 (Mich. Ct. App. July 25, 2019);

the difficulty of establishing an ineffective assistance of counsel claim, reviewing courts may still affirm a guilty verdict where the defense failed to fully explore possible alternate causes or defenses. In order to determine that counsel was ineffective, the court must find that counsel's performance was deficient and that the defendant was prejudiced as a result of that deficiency.²⁵⁹ In the case of *Flick v. Warren*, the Sixth Circuit Court of Appeals upheld a lower court ruling that counsel was not ineffective for failing to investigate and call an expert to challenge the underlying scientific validity of SBS.²⁶⁰ The court declined to reach the merits of another claim—that counsel was ineffective for failing to investigate or cross-examine experts using studies regarding short falls by toddlers from forty inches—because Flick's attorney failed to bring this specific claim before the district court.²⁶¹

In *State v. Milby*, defense counsel failed to effectively attack deficiencies in the prosecution experts' testimony regarding retinal hemorrhages, lucid intervals, and short falls.²⁶² The court also refused to conduct a *Daubert* hearing on the reliability of expert testimony regarding SBS/AHT.²⁶³ On review, the Ohio Court of Appeals found that it had not yet been discredited, since prior courts had previously accepted the theory of SBS/AHT, even though disagreement was vigorous.²⁶⁴ The court also found that Milby's ineffective assistance of counsel claims were too speculative and failed to show that a different outcome was likely.²⁶⁵

Another important constitutional protection afforded to defendants is that the government bears the burden of proof in criminal prosecutions.²⁶⁶ There is a valid concern that jurors shift the burden of proof from the prosecution to the defendant caregivers in cases involving accusations of SBS/AHT.²⁶⁷ As noted above, emotions run high in such cases and may cause prosecutors to actually ask jurors to shift that burden of proof.²⁶⁸ This burden shifting is "made worse by the oft gruesome and heartbreaking nature of these cases."²⁶⁹ When prosecutors show tragic autopsy photos of an infant, that alone "will infuse juries and triers of fact with righteous anger and [the] need for retribution."²⁷⁰ Prosecutors may also have experts demonstrate how hard and for how

Commonwealth v. Epps, 53 N.E.3d 1247 (Mass. 2016); Commonwealth v. Millien, 50 N.E.3d 808 (Mass. 2016). In all but one of these cases, the defendant received a new trial based on their lawyers' ineffective assistance of counsel. In one case, *Epps*, the court held that counsel would have been ineffective for failing to retain an expert when the appeal was decided in 2016, and so a manifest injustice had occurred requiring a new trial.

259. Strickland v. Washington, 466 U.S. 668, 687 (1984) *superseded by statute*, Antiterrorism and Effective Death Penalty Act of 1996, Pub. L. No. 104-132, 110 Stat. 124.

260. 465 F. App'x 461, 464 (6th Cir. 2011).

261. *Id.*

262. *State v. Milby*, No. CA2013-02-014, 2013 WL 5476805, at *3–4 (Ohio Ct. App., Sept. 30, 2013).

263. *Id.*

264. *Id.* at *4 (citing *State v. Woodson*, No. 85727, 2005 WL 2789082, at ¶ 49 (Ohio Ct. App. Oct. 27, 2005)); *see also State v. Hendrex*, No. 2009-T-0091, 2010 WL 2489218, ¶ 49 (Ohio Ct. App., June 18, 2020); *Day v. Scott*, 303 P.3d 291, 296 (Okla. Crim. App. 2013).

265. *Milby*, 2013 WL 5476805, at *3–4.

266. *See Ronald J. Allen & Alex Stein, Evidence, Probability, and the Burden of Proof*, 55 ARIZ. L. REV. 557, 558–60 (2013).

267. Findley et al., *supra* note 3, at 285.

268. *See Dane Krukowski, supra* note 89.

269. Koen, *supra* note 249, at 102.

270. *Id.*

long the infant must have been shaken to further inflame the passions of the jury—even though no scientific research supports that demonstration.²⁷¹ In order to explain why the caregiver would do something so heinous, if the prosecutor cannot find some act of anger in the past, she may simply say that the defendant “snapped” due to the stressors in their life.²⁷²

Even if the defendant can show her own good character through witnesses, the jury may dismiss that evidence due to the testimony and assumptions made by the experts.²⁷³ Indeed, the prosecution’s medical experts are taught to presume child abuse when a child under one-year has intracranial pressure:²⁷⁴

This standard raises two concerns. First, it assumes that the medical findings are traumatic and that doctors are able to accurately assess the biomechanical plausibility of the event. Second, in explaining the findings, parents are at a considerable disadvantage since they typically lack medical expertise and do not know what elements of the history might be important. Unlike doctors, moreover, who are encouraged to change their diagnoses as they acquire new information, parents are not permitted to add to the history as they learn more about the findings since this is viewed as a “changing story” and confirmation of abuse. This is especially problematic since the medical personnel and police often insist that the initial history cannot account for the injuries and pressure the caretaker to search his or her memories for additional details or other possible explanations. When the caretaker attempts to comply, however, any new details or possible explanations are viewed as a “changing story” and confirmation of abuse. Often, this is a circle from which there is no escape.²⁷⁵

Given all of this, a parent or caregiver who does not have the medical expertise to review the child’s medical records, MRIs, and CT scans can hardly be expected to explain the scientific basis of what actually happened to the child. Yet SBS/AHT cases are one of the only types of cases in criminal law where an expert may be able to comment on the veracity of the defendant caretaker’s account of what happened.²⁷⁶ In fact, one prosecutor suggests that experts must comment upon discrepancies or falsehoods in the caretaker’s report of what happened to the child:

This represents one of the rare instances in which prosecutors can call an expert witness to offer an opinion on credibility, in effect testifying that the defendant has lied (or is lying at trial if he repeats the false history through testimony), and why that fact leads to a conclusion that the child was abused or the death is a homicide.²⁷⁷

Cases involving SBS/AHT represent one of the criminal justice system’s great failures in adequately addressing the influx of neuroscientific evidence into the

271. *Id.* at 103.

272. *Id.* at 104.

273. *Id.*

274. Krugman et al., *supra* note 4, at 872; Kairys et al., *supra* note 177, at 206.

275. Findley et al., *supra* note 3, at 285.

276. Brian K. Holmgren, *Prosecuting the Shaken Infant Case*, in *THE SHAKEN BABY SYNDROME: A MULTIDISCIPLINARY APPROACH* 275, 309 (Stephen Lazoritz & Vincent J. Palusci, eds., 2001).

277. *Id.*

courtroom, particularly when it involves determining a defendant's mental state.²⁷⁸ SBS/AHT cases thus illustrate the worst type of union between law and medicine.²⁷⁹

In light of the foregoing, the only way a defendant can hope for a fair trial is to have their own qualified experts review all of the medical records and scans, evaluate the defendant's factual account of what happened, and assess any alternate causes for the symptoms. Once this review is complete, defense experts are needed to provide testimony regarding such alternate causes and/or explain the problematic lack of research supporting the hypothesis of SBS/AHT. Although in a criminal case the burden of proof is on the prosecution and not on the defendant, it may be that the only way for defendants to protect themselves from a false conviction is to take on the burden of proof. This can be done by showing the jury the lack of scientific support for the SBS/AHT hypothesis or, failing that, the defendant can show that the SBS/AHT hypothesis is inapplicable to their particular case based on the medical records and history of the child.

More recent cases offer evidence that when defendants have adequate access to expert medical witnesses, they may be acquitted. In 2014, Adam Bruns was indicted by a grand jury in connection with the death his son, a three-month-old baby.²⁸⁰ Mr. Bruns was charged with second-degree murder, first-degree manslaughter, aggravated assault, and child abuse.²⁸¹ Mr. Bruns told investigators, during an interrogation, that while caring for his son, who "had been vomiting periodically for several days," he shook his son's head multiple times out of frustration.²⁸² Shortly after this shaking, Mr. Bruns noticed his son's eyes had rolled back in his head and he was unresponsive.²⁸³ An affidavit provided by law enforcement specified that medical tests showed that his son "had suffered a brain hemorrhage and severe retinal hemorrhages in both eyes."²⁸⁴

Mr. Bruns denied intentionally injuring his son and pled not guilty to all the counts.²⁸⁵ His counsel made a motion requesting funding for six experts to testify, which the court granted.²⁸⁶ These experts included a professor of engineering who specialized in chemical and biomedical engineering, a licensed pediatrician, a neurologist, a

278. Denno, *supra* note 153, at 329.

279. *Id.*

280. Assoc. Press, *SD Man Indicted in Connection with Baby's Death*, WASH. TIMES (Mar. 11, 2014), <https://www.washingtontimes.com/news/2014/mar/11/sd-man-indicted-in-connection-with-babys-death/> [<https://perma.cc/4C4Z-SY85>]; see also Chris Mueller, *Gregory Man Tells DCI He Shook Infant Son Before Death*, MITCHELL DAILY REPUBLIC (Mar. 11, 2014, 8:49 PM), <https://www.mitchellrepublic.com/news/gregory-man-tells-dci-he-shook-infant-son-before-death> [<https://perma.cc/VRY3-HF5K>].

281. Anna Jauhola, *Aunt of Abused, Killed Boy Hopes To Raise Awareness of Child Abuse*, MITCHELL DAILY REPUBLIC (Apr. 18, 2014, 7:50 PM), <https://www.mitchellrepublic.com/news/aunt-of-abused-killed-boy-hopes-to-raise-awareness-of-child-abuse> [<https://perma.cc/3GVZ-VHQW>].

282. Mueller, *supra* note 280.

283. *Id.*

284. *Id.*

285. Jake Shama, *Fall May Have Led to Boy's Death, Attorney Says*, MITCHELL DAILY REPUBLIC (June 24, 2016, 4:14 PM), <https://www.mitchellrepublic.com/news/fall-may-have-led-to-boys-death-attorney-says> [<https://perma.cc/739X-J3UU>].

286. *Id.*

neuropathologist, a pathologist, and an ophthalmologist.²⁸⁷ Mr. Bruns was acquitted by the jury after seven hours of deliberation.²⁸⁸

In 2016, John Kerr's eight-month-old daughter was found unresponsive with severe head trauma.²⁸⁹ Injuries also included bone fractures, brain injury, and swelling along her spine.²⁹⁰ The baby, however, had been seeing a pediatrician approximately once per month, following her birth due to a likely genetic condition affecting her growth, her bones, and her overall health.²⁹¹ Mr. Kerr was the sole caretaker of his daughter at the time of her injuries, so the state charged him with multiple counts, including attempted murder, first- and second-degree assault, first- and second-degree child abuse, and reckless endangerment.²⁹²

Mr. Kerr pled not guilty and opted for the judge to be the trier of fact.²⁹³ After five days of trial, the judge found Mr. Kerr not guilty on all counts.²⁹⁴ During the trial, the judge heard from both prosecution experts and defense experts.²⁹⁵ The state's experts consistently characterized the baby's condition as abusive head trauma.²⁹⁶ The defense presented four experts—an endocrinologist, the baby's then-current pediatrician, the baby's previous pediatrician, and a neurologist—who were able to prove that the baby's injuries were not caused by her father, and Mr. Kerr was acquitted.²⁹⁷

In a 2016 case, Carrie Heller called 911 when a six-month-old baby, for whom she was caring as a daycare provider, stopped breathing.²⁹⁸ During a police interrogation, Ms. Heller gave differing accounts of what happened with the baby, admitted to dropping the baby onto the hardwood floor, said the baby fell off the couch while having her diaper changed, and recalled her head being bumped with a highchair tray.²⁹⁹ Ms. Heller then claimed she shook the baby, which is when the infant exhibited seizure-like behaviors—her body stiffening and her eyes rolling back in her head.³⁰⁰ A pediatric care physician

287. *Id.*

288. Jake Shama, *Gregory Man Accused of Killing Infant Acquitted of All Charges*, MITCHELL DAILY REPUBLIC (Nov. 9, 2016, 6:49 PM), <https://www.mitchellrepublic.com/news/gregory-man-accused-of-killing-infant-acquitted-of-all-charges> [<https://perma.cc/H72N-HLJ5>].

289. Aaron Mushrush, *Maryland Father Found Not Guilty in the Attempted Murder of His Eight-Month Old Daughter*, WMDT (Oct. 3, 2018), <https://www.wmdt.com/2018/10/maryland-father-found-not-guilty-in-the-attempted-murder-of-his-eight-month-old-daughter/> [<https://perma.cc/97VN-X86B>].

290. See Transcript of Record, Judge's Verdict at 5–7, *State v. Kerr*, No. 22K16-0801 (Cir. Ct. for Wicomico Cnty., Md., Oct. 3, 2018).

291. *Id.* at 15–19.

292. See *id.* at 4, 22.

293. *Id.* at 3, 23; see also Mushrush, *supra* note 289. The WMDT article incorrectly states that a jury found Kerr not guilty. Kerr had a bench trial, not a jury trial. *Id.*

294. Transcript of Record, *supra* note 290, at 1, 3, 23.

295. *Id.* at 3, 10.

296. *Id.* at 3–4.

297. See *id.* at 10, 12, 15–19, 23.

298. *Cudahy Woman Faces Homicide Charge, Accused of Violently Shaking Infant that Later Died*, FOX 6 MILWAUKEE (Jan. 19, 2016, 5:09 PM), <https://www.fox6now.com/news/cudahy-woman-faces-homicide-charge-accused-of-violently-shaking-infant-that-later-died> [<https://perma.cc/K88B-DVJA>].

299. *Id.*

300. *Id.*

at the Children's Hospital of Wisconsin found the baby "had a skull fracture to the right side of the head, as well as subdural hemorrhaging and brain swelling."³⁰¹

Ms. Heller was charged with first-degree reckless homicide.³⁰² The defense called an expert in biomechanics, who testified that the infant's injuries could have come from a common household fall, and a neuroradiologist, who testified that the infant's MRI did not support the hospital pediatrician's conclusion that only abusive head trauma could have caused the child's injuries.³⁰³ After both sides put on their case, the jury deliberated for a little over two hours before finding Ms. Heller not guilty.³⁰⁴

Patricia Brant operated a daycare facility in Charleston, Illinois.³⁰⁵ In 2014, she was the only adult present at the daycare³⁰⁶ when a twenty-two-month-old child fell from his playpen.³⁰⁷ The child was sitting up but slumped over, his fists clenched; he was unresponsive and struggling to breathe.³⁰⁸ The emergency room doctor who first examined the child, however, believed the child's injuries were more serious than those that would have resulted from the described fall, as the child was unresponsive, his breathing was shallow, his heart rate was slow, and he had brain damage and retinal bleeding.³⁰⁹ The child fortunately lived, though he was disabled and would require 24-hour care.³¹⁰ The prosecution's experts found the child's injuries consistent with symptoms of SBS/AHT.³¹¹

Ms. Brant was subsequently charged with aggravated battery of a child.³¹² During the trial, her defense experts were a pathologist and biomedical engineer, who both testified that a fall was more likely to have caused the child's injuries than shaking.³¹³ The biomedical engineer conducted experiments of children falling from playpens to

301. *Id.*

302. *Id.*

303. Bruce Vielmetti, *Cudahy Day Care Owner Stands Trial in the Death of an Infant Who Was in Her Care*, MILWAUKEE J. SENTINEL (May 3, 2017, 1:46 PM), <https://www.jsonline.com/story/news/crime/2017/05/03/cudahy-day-care-owner-stands-trial-death-infant-who-her-care/101217554/> [<https://perma.cc/WA2N-3Y9J>].

304. Ashley Luthern, *Cudahy Babysitter Found Not Guilty in the Death of a 6-Month-Old Child in Her Care*, MILWAUKEE J. SENTINEL (May 5, 2017, 7:34 PM), <https://www.jsonline.com/story/news/crime/2017/05/05/cudahy-babysitter-found-not-guilty-death-6-month-old-child-her-care/101346042/> [<https://perma.cc/94SW-NL3P>].

305. Dave Fopay, *Brant Found Not Guilty*, J. GAZETTE & TIMES-COURIER (July 21, 2016) [hereinafter Fopay, *Brant Found Not Guilty*], http://jg-tc.com/news/local/brant-found-not-guilty/article_335e2510-4ea0-57c7-8d66-76da12a1476e.html [<https://perma.cc/4R7V-664T>].

306. *Id.*

307. Dave Fopay, *Fall Not Likely Cause of Child's Injuries, Doctor Says*, J. GAZETTE & TIMES-COURIER (Jul. 12, 2016) [hereinafter Fopay, *Fall Not Likely*], https://jg-tc.com/news/local/fall-not-likely-cause-of-child-s-injuries-doctor-says/article_ef18d271-188b-5276-aabf-1a11196d970.html [<https://perma.cc/S4WX-8ML5>].

308. Dave Fopay, *Boy's Injuries Were 'Classic for Shaken Baby Syndrome,' Doctor Says*, J. GAZETTE & TIMES-COURIER (Jul. 14, 2016) [hereinafter Fopay, *Boy's Injuries*], https://jg-tc.com/news/local/boy-s-injuries-were-classic-for-shaken-baby-syndrome-doctor/article_ff183640-2a69-5713-acf1-a949f2c54cbc.html [<https://perma.cc/269D-77FL>].

309. Fopay, *Fall Not Likely*, *supra* note 307.

310. Fopay, *Boy's Injuries*, *supra* note 308.

311. *Id.*

312. *Id.*

313. Fopay, *Brant Found Not guilty*, *supra* note 305.

demonstrate that such falls can create enough force for injuries like those exhibited by the child.³¹⁴ After eleven hours of deliberation, the jury found Ms. Brant not guilty.³¹⁵ The most important factor that all of these acquittals appear to have in common is the use of multiple defense experts to respond to the prosecution's experts.

IV. A DEFENDANT'S CONSTITUTIONAL RIGHT TO FUNDING

The United States Constitution guarantees a criminal defendant the right to due process of law, a right extended to state court defendants via the Fourteenth Amendment.³¹⁶ The U.S. Supreme Court held, in *Ake v. Oklahoma*, that due process mandates access to adequate investigative and expert services for criminal defendants.³¹⁷ Fundamental fairness requires indigent defendants to have "an adequate opportunity to present their claims fairly within the adversary system."³¹⁸ Under the Constitution, every defendant has the right to be treated with fundamental fairness and "afforded a meaningful opportunity to present a complete defense."³¹⁹ In order to present a complete defense, a defendant must be able to present witness testimony on their behalf.³²⁰ Above all, "a criminal trial is fundamentally unfair if the state proceeds against a [] defendant without making certain that he has access to the raw materials integral to the building of an effective defense," including reputable local experts who wish to assist the defense.³²¹

Ake involved a capital murder case where the defense requested funding from the court to hire a psychiatrist to provide testimony supporting an insanity defense.³²² Because Mr. Ake was indigent, he could not afford to hire his own expert, and the court rejected his funding request.³²³ The defense did not present a psychiatrist to offer mitigating evidence at the sentencing phase of the trial or rebut the State's experts regarding the future danger posed by Mr. Ake, and he was sentenced to death.³²⁴

When it overturned the case, the U.S. Supreme Court held that an indigent criminal defendant cannot be denied fundamental rights when his liberty is at stake:

This Court has long recognized that when a State brings its judicial power to bear on an indigent defendant in a criminal proceeding, it must take steps to assure that the defendant has a fair opportunity to present his defense. This elementary principle, grounded in significant part on the Fourteenth Amendment's due process guarantee of fundamental fairness, derives from the belief that justice cannot be equal where, simply as a result of his poverty,

314. *Id.*

315. *Id.*

316. See U.S. CONST. amend. V; *id.* amend. XIV, § 1. Criminal conviction deprives the defendant of a liberty interest, invoking due process requirements. See *Meachum v. Fano*, 427 U.S. 215, 224 (1976) ("[G]iven a valid conviction, the criminal defendant has been constitutionally deprived of his liberty.").

317. 470 U.S. 68, 80–84 (1985).

318. *Id.* at 77 (quoting *Ross v. Moffitt*, 417 U.S. 600, 612 (1974)).

319. *California v. Trombetta*, 467 U.S. 479, 485 (1984).

320. *Chambers v. Mississippi*, 410 U.S. 284, 294, 302 (1972).

321. *Ake*, 470 U.S. at 77.

322. *Id.* at 70–71.

323. *Id.* at 72.

324. *Id.* at 73.

a defendant is denied the opportunity to participate meaningfully in a judicial proceeding in which his liberty is at stake.³²⁵

The Court then went on to enumerate several rights of indigent defendants that had been established over the course of the prior thirty years.³²⁶

In *Ake*, the Court undertook a due process analysis and enumerated three factors relevant to determining whether the expert was necessary: (1) the private interest that would be affected by the action of the state, (2) the governmental interest that would be affected if the safeguard was provided, and finally, (3) the probable value of the safeguard that is being requested and the risk of erroneous deprivation of the affected interest if the safeguard is not provided.³²⁷ The Court found that Mr. Ake had a compelling interest in receiving the assistance of an expert, because his life and liberty were at stake.³²⁸ The Court also found that the financial burden on the government was not too great, and that

[a]t the same time, it is difficult to identify any interest of the State, other than that in its economy, that weighs against recognition of this right. The State's interest in prevailing at trial—unlike that of a private litigant—is necessarily tempered by its interest in the fair and accurate adjudication of criminal cases. Thus, also unlike a private litigant, a State may not legitimately assert an interest in maintenance of a strategic advantage over the defense, if the result of that advantage is to cast a pall on the accuracy of the verdict obtained.³²⁹

Finally, the Court held that in cases where a defendant's mental condition is at issue, the defendant should be allowed the safeguard of an expert psychiatrist to avoid a deprivation of liberty.³³⁰

However, *Ake* involved a capital case where the defense request was for a single psychiatrist. In a 2020 Ninth Circuit Court of Appeals decision citing *Caldwell v. Mississippi*, the court affirmed a lower court's denial of funding for a defendant to hire an investigator, noting that the U.S. Supreme Court has yet to determine whether indigent defendants are entitled to nonpsychiatric experts.³³¹ Similar requests have been denied in a number of other cases involving a defense request for expert funding.³³²

325. *Id.* at 76.

326. *Id.* (“[T]his Court has held that an indigent defendant may not be required to pay a fee before filing a notice of appeal of his conviction, *Burns v. Ohio*, 360 U.S. 252 (1959), that an indigent defendant is entitled to the assistance of counsel at trial, *Gideon v. Wainwright*, 372 U.S. 335 (1963), and on his first direct appeal as of right, *Douglas v. California*, 372 U.S. 353 (1963), and that such assistance must be effective. See *Evitts v. Lucey*, 469 U.S. 387 (1985); *Strickland v. Washington*, 466 U.S. 668 (1984); *McMann v. Richardson*, 397 U.S. 759, 771, n.14 (1970).”).

327. *Id.* at 77 (citing *Little v. Streater*, 452 U.S. 1, 6 (1981)); see also *Mathews v. Eldridge*, 424 U.S. 319, 335 (1976).

328. *Ake*, 470 U.S. at 77–78.

329. *Id.* at 79.

330. *Id.* at 82.

331. *Tiffany v. Legrand*, 816 F. App'x 207, 208 (9th Cir. 2020) (citing *Caldwell v. Mississippi*, 472 U.S. 320, 323 n.1 (1985)) (“[T]he question [remains] open as to ‘what if any showing’ would entitle an indigent defendant to non-psychiatric assistance as a matter of federal constitutional law.”).

332. See, e.g., *United States v. Rodriguez-Felix*, 450 F.3d 1117, 1122 (10th Cir. 2006) (affirming trial court's refusal to admit, and to pay for, defense expert testimony on the reliability of eyewitness identification); *Wogenstahl v. Mitchell*, 668 F.3d 307, 340 (6th Cir. 2012) (affirming denial of funding for a mitigation expert

The situation is marginally better in cases involving SBS/AHT. Some appellate courts and state supreme courts are overturning convictions and remanding cases where funding for a necessary defense expert was disallowed.³³³ However, keep in mind that when all of these cases were overturned, the defendant was either already convicted and in prison or a parent's rights had already been terminated, so the remedy came after tremendous loss to the individual.

Like LeeVester Brown, discussed previously in Section I, Jason Isham was also denied funding for an expert.³³⁴ Mr. Isham was convicted of felonious child abuse against his two-year-old son.³³⁵ The State presented three medical experts at trial.³³⁶ A defense request for funding to retain two experts was denied.³³⁷ In 2015, the Mississippi Supreme Court reversed the conviction, holding that under its then-recent decision in *Brown*,³³⁸ Isham was denied due process of law under the Fourteenth Amendment to the United States Constitution and under Article 3, Section 14 of the Mississippi Constitution.³³⁹

In a 2016 termination of parental rights case based on a determination of SBS/AHT, the State called four physicians, including an ophthalmologist and a pediatric neuroradiologist, all from the hospital where the child was treated.³⁴⁰ The Michigan Court of Appeals held that

[a]bsent expert assistance, respondents' lawyers could not capably question or undermine the brain-imaging evidence, which formed an essential part of petitioner's case. . . . Realistically, without expert assistance, respondents' counsel had no serviceable tools to assist them in fairly evaluating the strengths and weaknesses of petitioner's medical evidence, or in advancing a different hypothesis.³⁴¹

In *Ex parte Henderson*, a 2012 capital case involving the death of a child while in his babysitter's care, the court considered whether the defendant had intentionally abused the child or whether his death could have been caused by an accidental short fall.³⁴² Ultimately, after a hearing on remand, the defendant was granted a new trial.³⁴³ At the remand hearing, she was able to present six expert witnesses who testified that the child's death could have been caused by an accidental short fall.³⁴⁴

In a 2015 case from Delaware involving the supposed murder of a three-month-old infant at the hands of her father, five experts, including a pediatric neuroradiologist,

and an independent psychiatric expert); *State v. Breitenbach*, 483 P.3d 448, 458 (Kan. 2021) (affirming the lower court's denial of funding for a DNA expert), *cert. denied*, 142 S. Ct. 225 (2021).

333. *See, e.g.*, *Brown v. State*, 152 So. 3d 1146, 1169 (Miss. 2014).

334. *Isham v. State*, 161 So. 3d 1076, 1077 (Miss. 2015).

335. *Id.*

336. *Id.* at 1079.

337. *Id.*

338. *Brown v. State*, 152 So. 3d 1146, 1169 (Miss. 2014). Brown waited eight years to receive his exoneration because of delays in his appeals. *Id.* at 1171.

339. *Isham*, 161 So. 3d at 1085.

340. *In re Yarbrough*, 885 N.W.2d 878, 882–83 (Mich. Ct. App. 2016).

341. *Id.* at 889.

342. 384 S.W.3d 833, 833–34 (Tex. Crim. App. 2012).

343. *Id.* at 834.

344. *Id.* at 833–34.

testified against the defendant at trial.³⁴⁵ Prior to trial, the defense counsel tried to obtain funding and guidance from the public defender's office to obtain an expert.³⁴⁶ Defense counsel found one expert to review the medical records who was ultimately discharged by the public defender's office because the costs were too high.³⁴⁷ Defense counsel found another expert that would only charge \$1,000, but that expert was not used, as he agreed with the prosecution regarding the cause of death of the child.³⁴⁸ Defense counsel learned that the less expensive expert was a poor choice for this case and requested a continuance to discuss the case with another expert, but that request was denied.³⁴⁹ After trial and appeal, the defendant was able to obtain experts to assist him in the post-conviction process.³⁵⁰ In granting a new trial, the court stated, "In what is, to this Court, an incredibly frustrating state of affairs, postconviction counsel obtained funds trial counsel was unable to obtain in order to retain two experts"³⁵¹

Though all of these defendants were ultimately able to obtain expert assistance, it came only after being convicted and imprisoned for abuse or murder or after losing their parental rights. Not only is this an unspeakable tragedy for the defendant, but it also represents a great expense, in both time and money, to the government. Further, in those cases involving a child victim who was not related to the defendant—as in the *Henderson* case above—the family members of the deceased are faced with a misdiagnosis and the ongoing courtroom battles surrounding their loved one's death, instead of pursuing, and perhaps finding, closure. If the defense had the necessary experts to meet the prosecution's case in the first place, such unnecessary litigation and anguish could be avoided.

V. CURRENT MODELS OF GOVERNMENT FUNDING FOR EXPERTS

As noted throughout this Article, defendants need to have the same access to experts that the State has in order to present the jury with the inherent flaws of SBS/AHT theory and to provide alternate, noncriminal causes of the triad of injuries.

The government has easy access to experts. "This does not mean that prosecutors never have problems securing experts . . . [but] they have an overwhelming advantage when compared to defense counsel."³⁵² The hospital physicians and specialists who treated the child will be subpoenaed to testify at trial, whether they wish to or not. The government also has access to specialized doctors, known as child abuse pediatricians (CAPs).³⁵³ By law, all doctors are required to report child abuse, but CAPs work to investigate whether child abuse occurred in the first place.³⁵⁴ These CAPs are now in place in almost every major children's hospital in the country and work closely with child

345. *State v. Gallaway*, No. 1012003724, 2015 WL 4460992, at *1–2, *4 (Del. Super. Ct. July 16, 2015).

346. *Id.* at *2–3. It is unclear from the record whether defendant's counsel was a public defender, a contract attorney with the public defender's office, or other assigned counsel. *Id.*

347. *Id.* at *3.

348. *Id.* at *3–4.

349. *Id.*

350. *Id.* at *4.

351. *Id.*

352. Giannelli, *supra* note 20, at 1331.

353. Hixenbaugh & Blakinger, *supra* note 162.

354. *Id.*

protection agencies and law enforcement officials, by providing expert reports and trial testimony to support prosecution of parents and caregivers.³⁵⁵

Since child abuse pediatric teams are a medical subspecialty that generally loses money for the hospital, they are often funded by government grants.³⁵⁶ In Texas, the state provides over \$5 million in annual grants to support the work of CAPs, “deputizing them to review cases on behalf of child welfare investigators.”³⁵⁷ In Connecticut, Yale School of Medicine operates its child abuse center with a grant from the Connecticut Department of Children and Families of approximately \$763,000 per year, through which the Yale School of Medicine receives funding for two full-time child abuse pediatricians.³⁵⁸ In Michigan, the child abuse pediatrician program receives funding from the state public health department.³⁵⁹ In Virginia, child abuse pediatric teams receive funding from state criminal justice agencies.³⁶⁰ In Illinois, governmental funding for the child abuse pediatrician and their team comes from the government-funded Multidisciplinary Pediatric Education and Evaluation Consortium.³⁶¹

If the child abuse team is tasked with finding child abuse and is funded by the government to do so, is it not incentivized to make findings accordingly? For insurance purposes, medical billing is coded in increasingly specific ways that may not allow for a family physician or other treating doctor to include nontreatment time spent on a suspected child abuse case, such as time spent working with law enforcement, child protective services, or a government prosecutor.³⁶² On the other hand, as discussed above, a child abuse team may be more insulated from these concerns because instead of relying solely on insurance, it receives additional funding through the government and charitable foundations.³⁶³ In order to receive that funding, child abuse teams must show the need for that funding by finding cases of child abuse. In other words, if a child abuse team found few instances of child abuse, would funding be made available for that subspecialty?

In addition to financial incentives, there is the possibility of bias as child abuse pediatricians and their staff work to assist child abuse investigations by providing useful information to law enforcement and state child protection agencies.³⁶⁴ “[C]hild abuse pediatricians who work extensively with lawyers may stray into a legal advocacy approach without being fully aware that their own ethical canons expressly require them *not* to assume an advocacy position.”³⁶⁵ Several instances of this type of advocacy have

355. *Id.*

356. *Id.*

357. *Id.*

358. SCOPE OF SERVICES, CONTRACT PERFORMANCE, BUDGET, REPORTS & OTHER PROGRAM-SPECIFIC PROVISIONS, DEP’T OF CHILD. & FAMS. 2 (Jan. 24, 2022) (on file with author). The contract was obtained by attorney Rachael Levine through a Freedom of Information Act Request. *Rachael M. Levine, Esq.*, LEVINE LITIG., <https://www.levinelit.com/about-5> [<https://perma.cc/DYH8-P6H8>] (last visited Jan. 22, 2024).

359. Hixenbaugh & Blakinger, *supra* note 162.

360. *Id.*

361. GEORGE J. BARRY & DIANE L. REDLEAF, FAM. DEF. CTR., MEDICAL ETHICS CONCERNS IN PHYSICAL CHILD ABUSE INVESTIGATIONS: A CRITICAL PERSPECTIVE 76 n.45 (2014).

362. *See* BARRY & REDLEAF, *supra* note 361, at 76.

363. *Id.*

364. *See id.* at 59.

365. *Id.* at 55.

been documented.³⁶⁶ These include a doctor recommending to a judge that a child should not be returned to her parents because the doctor did not trust the parents, and another doctor who testified at trial after a child had been placed in foster care that “[s]he’s an abused child, and now she’s safe.”³⁶⁷

Even with their easy access to experts, prosecutors may try to prevent the defense from presenting its own experts to the jury. They may argue, under *Daubert/Frye*, that experts who call into question the SBS/AHT theory or propose other causes of the triad are presenting evidence that is not sufficiently premised on the facts of the case or is not an accepted medical practice.³⁶⁸ In order to overcome this challenge, defendants must have access to well-qualified medical experts who are versed in the problems of SBS/AHT and who can address prosecution accusations at a *Daubert/Frye* hearing, by presenting the appropriate research or lack thereof. Prosecutors may also argue that the prejudicial value of the expert testimony or its potential to confuse the jury should lead the trial court to exclude defense expert testimony.³⁶⁹ However, presenting these experts to the court in a pretrial setting, such as a *Daubert/Frye* hearing, can give the court a deeper understanding of the conflict surrounding these theories. If the judge understands the problems underlying the SBS/AHT theory, she may be more willing to grant a motion for the defense under *Daubert/Frye* and not exclude defense expert testimony from the trial.

However, well-qualified experts are expensive. Medical examiners and pathologists can charge as much as \$400 per hour for review of medical records, report writing, and consultation, and may charge \$4,000 to \$5,400, plus expenses, to travel and testify.³⁷⁰ Other specialists, like pediatric ophthalmologists, pediatric neurologists, and neuroradiologists, charge less, but their fees may still be \$200 to \$300 per hour for records review, report writing, and consultation, and between \$1,000 and \$3,000, plus expenses, to travel and testify.³⁷¹

Of course, if a defendant has enough money, she can retain any experts she chooses. But what happens if the defendant is indigent or has a low income? There are a number of state and federal statutes that attempt to provide funding for expert and investigative assistance to indigent defendants.³⁷² However, these statutes tend to set indigency, as courts do for public defender services, at 125% of the poverty rate.³⁷³ In the forty-eight contiguous states, in 2022, a defendant living in a single-person household making more than \$16,988 a year would not qualify for funding for an expert.³⁷⁴ Given the rates for

366. See Hixenbaugh & Blakinger, *supra* note 162.

367. *Id.*

368. See Holmgren, *supra* note 276, at 293.

369. *Id.* at 294.

370. Based on emails to author from three different experts in the field when asked to provide costs for their service. The experts requested to remain anonymous, but redacted versions of these emails can be obtained from author.

371. *Id.*

372. See Giannelli, *supra* note 20, at 1332.

373. *Frequently Asked Questions*, AM. BAR ASS’N, https://www.americanbar.org/groups/legal_services/flh-home/flh-faq/ [https://perma.cc/4KJT-V6B5] (last visited Jan. 4, 2024).

374. *2022 Poverty Guidelines: 48 Contiguous States*, OFF. ASSISTANT SEC’Y FOR PLAN. & EVALUATION (Jan. 12, 2022), <https://aspe.hhs.gov/sites/default/files/documents/4b515876c4674466423975826ac57583/Guidelines-2022.pdf> [https://perma.cc/6ATH-Q6ZF].

expert services above, even a defendant who made 200% of the established poverty rate—\$33,976—would find it very difficult to cover the cost of a single expert, let alone three or four.

VI. RECOMMENDATIONS TO PREVENT FUTURE WRONGFUL CONVICTIONS

Courts and legislatures should make funding more readily available in SBS/AHT cases. In most states and for federal prosecutions, there are statutes in place that require the government to provide funding for indigent defendants to obtain services beyond legal counsel.³⁷⁵ Most of these statutes specify that funding may be used for experts or investigation.³⁷⁶ The defendant must make the funding request to the trial court, which determines whether and how much funding will be provided in advance of the trial or, in some cases, funding statutes provide a limited amount of funding without prior authorization by the court and allow for additional funding upon the defense's request and the court's approval.³⁷⁷

Forty-five states, the District of Columbia, and the federal government have such statutes.³⁷⁸ Of those, twenty-nine states and the federal government specify that the funding can be used for experts.³⁷⁹ Nine states, the District of Columbia, and the federal

375. *50 State Survey: Indigent Expert Funds*, UNIV. ST. THOMAS SCH. L. (2022) [hereinafter *50 State Survey*], <https://> This survey was created by Niki Catlin, Research Librarian with St. Thomas Law, and supporting students. *See, e.g.*, ALA. CODE § 15-12-21(e) (West 2024); ALASKA STAT. ANN. § 18.85.100(a) (West 2024); ARIZ. REV. STAT. ANN. § 13-4013(B)–(C) (West 2024); ARK. CODE ANN. § 16-87-212(a) (West 2024); CAL. PENAL CODE § 987.9(a)–(c) (West 2024); COLO. REV. STAT. ANN. §§ 18-1-403, 21-1-106 (West 2024); CONN. GEN. STAT. ANN. § 51-292 (West 2024); DEL. CRIM. R. CT. COM. PL. 44(e)(4); D.C. CODE ANN. § 11-2605(a)–(c) (West 2024); FLA. STAT. ANN. § 29.006(3) (West 2024); HAW. REV. STAT. ANN. § 802-7 (West 2024); 725 ILL. COMP. STAT. ANN. 5/113-3(d) (West 2024); IOWA CODE ANN. § 815.11(1) (West 2024); KAN. STAT. ANN. § 22-4508 (West 2024); ME. UNIF. R. CRIM. P. 44C; MINN. STAT. ANN. § 611.21(a)–(b) (West 2024); MISS. CODE ANN. § 99-18-17(1) (West 2024); MO. ANN. STAT. § 600.086(6) (West 2024) (*see* WILLIAM A. KNOX, CRIMINAL PRACTICE AND PROCEDURE, § 18:6 (3d ed. 2023)); NEV. REV. STAT. ANN. § 7.135(1) (West 2024); N.H. REV. STAT. ANN. § 604-A:6 (West 2024); N.J. STAT. ANN. § 2B:24-6(a) (West 2024); N.Y. COUNTY LAW § 722-c (McKinney 2023); N.C. GEN. STAT. ANN. § 7A-454 (West 2024); N.D. CENT. CODE ANN. § 29-07-01.1(1) (West 2024); OHIO REV. CODE ANN. § 2929.024(A) (West 2024); OKLA. STAT. tit. 19 § 138.8 (West 2024); OR. REV. STAT. ANN. § 135.055(3)(a) (West 2024); S.C. CODE ANN. § 16-3-26(C)(1), (D) (West 2024); S.D. CODIFIED LAWS § 23A-14-3 (West 2024); TENN. CODE ANN. § 40-14-207(b) (West 2024); TEX. CODE CRIM. PROC. ANN. art. 26.05(d) (West 2024); UTAH CODE ANN. § 78B-22-102(6) (West 2024); VA. CODE ANN. § 19.2-266.4(A)–(B) (West 2024); WASH. REV. CODE ANN. § 10.101.060(1)(a)(v) (West 2024); W. VA. CODE ANN. § 29-21-13a(k) (West 2024); WYO. STAT. ANN. § 7-11-402(a)–(b) (West 2024); 18 U.S.C. § 3006A(a).

376. For instance, Alabama, Arizona, Arkansas, California, Delaware, District of Columbia, Florida, Hawaii, Illinois, Kansas, Maine, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, and the federal government. *See supra* note 375 for statutes and procedural rules.

377. For instance, Alabama (approval for expenses over \$300 requires trial court approval), Delaware (funds are limited without prior authorization by the court), District of Columbia (funds are limited without prior authorization by the court), and the federal government (funds are limited without prior authorization by the court). *See supra* note 375 for statutes and procedural rules.

378. *See 50 State Survey, supra* note 375.

379. For instance, Alabama, Arizona, Arkansas, California, Delaware, District of Columbia, Florida, Hawaii, Illinois, Kansas, Maine, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, and the federal government. *See supra* note 375 for statutes and procedural rules.

government put a limit on the amount of funding that can be provided, with most capping fees at under \$1,500.³⁸⁰ However, there are outliers. South Carolina allows for up to \$20,000 for expert fees, while Illinois has a maximum of only \$250 and the statute specifies that state-funded compensation for experts cannot exceed that cost.³⁸¹ Most statutes allow additional funding with court authorization.³⁸²

Another difficulty faced by defendants in SBS/AHT cases is the variability of what is required by different state statutes in order to obtain funding. Some state statutes are fairly detailed with respect to the funding request process, while others lack detail and guidance, leading to a lack of certainty and potential delays in obtaining funds. More specificity in funding statutes can help defendants understand the process and hopefully work through it more quickly. For instance, most states require prior authorization.³⁸³ Many statutes also provide the standard that a court should consider when deciding whether to authorize funds, which is generally a determination of whether the services of the expert(s) are reasonably necessary for an adequate defense.³⁸⁴ Several states allow the request to be made *ex parte*.³⁸⁵ Some states will only allow funding if the defendant is represented by a public defender.³⁸⁶ One state, Minnesota, specifies income limits for funding eligibility.³⁸⁷ A couple of states only allow for funding in certain types of prosecutions, such as capital cases or murders.³⁸⁸

Four states—Indiana, Maryland, Pennsylvania, and Rhode Island—do not have statutes but have state-specific case law that addresses funding for experts in cases involving indigent defendants.³⁸⁹ In all four states, much like the statutes discussed

380. For instance, Alabama (\$300), Delaware (\$200 without prior authorization), District of Columbia (\$375 without prior authorization, \$750 with prior authorization), Illinois (\$250), Minnesota (\$1,000 per service), New Hampshire (\$300), New York (\$3,000), South Carolina (\$20,000), West Virginia (\$2,500), and the federal government (\$800 without prior authorization, \$2,400 with prior authorization). See *supra* note 375 for statutes and procedural rules.

381. See *supra* note 375 for South Carolina and Illinois statutes.

382. For instance, Delaware, the District of Columbia, and the federal government. See *supra* note 375 for statutes and procedural rules.

383. For instance, Alabama, Arizona, Arkansas, California, Delaware, District of Columbia, Florida, Hawaii, Illinois, Maine, Mississippi, Missouri, Nevada, New Jersey, North Carolina, Ohio, Oklahoma, Oregon, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, and the federal government. See *supra* note 375 for statutes and procedural rules.

384. For instance, Arizona, Delaware, District of Columbia, Hawaii, Kansas, Minnesota, Nevada, New Hampshire, North Dakota, South Carolina, Wyoming, and the federal government. See *supra* note 375 for statutes and procedural rules.

385. For instance, Arizona, Delaware, District of Columbia, Hawaii, Kansas, Minnesota, Nevada, New Hampshire, North Dakota, South Carolina, Wyoming, and the federal government. See *supra* note 375 for statutes and procedural rules.

386. For instance, Arkansas, Colorado, Connecticut, Delaware, Florida, Hawaii, Illinois, Iowa, New Jersey, South Dakota, and Washington. See *supra* note 375 for statutes and procedural rules.

387. See *supra* note 375 for Minnesota's statute.

388. For instance, Ohio and Tennessee. See *supra* note 375 for statutes.

389. These states are Indiana, see *Beauchamp v. State*, 788 N.E.2d 881, 886 (Ind. Ct. App. 2003); *Bottom v. State*, No. 20A-CR-2105, 2021 WL 3574197, at *4 (Ind. Ct. App. Aug. 13, 2021); Maryland, see *Collins v. State*, 288 A.2d 221, 224 (Md. Ct. Spec. App. 1972); *Moore v. State*, 889 A.2d 325, 367 (Md. 2005); Pennsylvania, see *Commonwealth v. Konias*, 136 A.3d 1014, 1019 (Pa. Super. Ct. 2016); *Commonwealth v. Colon*, 230 A.3d 368, 377 (Pa. Super. Ct. 2020); *Commonwealth v. Wholaver*, 989 A.2d 883, 895–96 (Pa. 2010); and Rhode Island, see *State v. Day*, 898 A.2d 698, 706–07 (R.I. 2006).

above, funding for experts is allowed, and the determination of who is funded and how much money will be allocated is left to the discretion of the trial court.³⁹⁰

A review of statutes and case law brings to light several important factors to be considered in developing model legislation for expert funding. As discussed above, cases involving SBS/AHT, in which the prosecution's case is built on the testimony of various medical experts all claiming that a child was abused, require specific, well-qualified defense experts to counter each of the prosecution's experts and thus ensure an adequate defense.³⁹¹ In such prosecutions, defense experts will be more expensive and more necessary than in almost any other type of case in our criminal justice system.³⁹² Statutes and trial courts need to account for this and permit significantly higher caps for cases involving allegations of SBS/AHT. Funding for defense experts should not be limited to murder cases, as it is under Ohio law,³⁹³ but must be made available in all criminal prosecutions where questionable forensic science is at issue.

Courts and court rules should permit motions for funding to be filed and heard on an ex parte basis. Indigent defendants should not be required to share their trial strategy with opposing counsel in order to obtain expert assistance. Consider the following illustrative example posited by student Justin Shane: a hair found on a victim's body does not match the victim's hair color, so the prosecution decides not to test it.³⁹⁴ The defendant decides to ask the court for funding to have an expert analyze the hair.³⁹⁵ If this is done in open court, the prosecutor will know of the request.³⁹⁶ If the prosecutor never receives a report on the findings of the expert, as would be required by discovery if the expert will testify at trial, the prosecution may decide to have the hair tested on the assumption that testing was unfavorable to the defense.³⁹⁷ Thus, the defendant would have been forced to share a potential avenue of defense to their own detriment.³⁹⁸ This puts defendants in the position of perhaps forgoing certain defenses because of the concern that the prosecution may obtain information it is not entitled to have.³⁹⁹ If the defense were allowed to proceed on an ex parte basis, trial strategy and work product would remain unknown to the prosecutor—as it should.⁴⁰⁰

Funding should be made available for defendants who meet income guidelines, regardless of whether they are using a public defender or have private counsel, and income guidelines should be higher for more complex cases, such as SBS/AHT. In *State v. Schoonmaker*, a New Mexico case similar to LeeVester Brown's, Jake Schoonmaker's family was able to get the funds needed to hire a private attorney even though he would

390. See, e.g., *Beauchamp*, 788 N.E.2d at 886; *Bottom*, 2021 WL 3574197, at *3; *Collins*, 288 A.2d at 224; *Moore*, 889 A.2d at 367–69; *Konias*, 136 A.3d at 1019–21; *Colon*, 230 A.3d at 377–78; *Wholaver*, 989 A.2d at 895; *Day*, 898 A.2d at 706–07.

391. See *supra* notes 280–315 and accompanying text.

392. See *supra* notes 280–315, 370 and accompanying text.

393. OHIO REV. CODE ANN. § 2929.024(A) (West 2024).

394. Justin B. Shane, Note, *Money Talks: An Indigent Defendant's Right to an Ex Parte Hearing for Expert Funding*, 17 CAP. DEF. J. 347, 354 (2005).

395. *Id.*

396. *Id.*

397. *Id.*

398. See *id.*

399. See *id.* at 348.

400. *Id.*

have qualified for the public defender.⁴⁰¹ Mr. Schoonmaker was caring for the child of a woman he was dating when the baby allegedly rolled off of the couch.⁴⁰² The child had been born five weeks premature and spent additional time in the hospital after his initial discharge.⁴⁰³ After the fall, the child was brought to the hospital, where tests showed the child suffered a severe subdural hematoma, retinal hemorrhages, and a brain injury resulting in total blindness.⁴⁰⁴ Mr. Schoonmaker was charged with two felony counts of child abuse, but the court was unwilling to provide the funding he needed to hire his own experts—in fact, the prosecution required payment to make its own experts available for an interview with defense counsel.⁴⁰⁵ After the defense was denied expert funding, counsel sought to have Mr. Schoonmaker declared indigent.⁴⁰⁶ If Mr. Schoonmaker was declared indigent, then he would be eligible for a public defender; this, in turn, would make him eligible for fees to hire experts.⁴⁰⁷ When the judge denied that motion, defense counsel sought to withdraw, but that motion was denied as well.⁴⁰⁸

At his first trial, Mr. Schoonmaker was acquitted on two counts of intentional child abuse, but the jury could not reach a consensus on the remaining two counts of negligent child abuse, so a mistrial as to those two counts was declared.⁴⁰⁹ At his second trial on the two remaining counts, he was convicted and sentenced to eighteen years in prison.⁴¹⁰ He did not have his own expert at either trial, but before the second trial, the court allowed the defense to conduct thirty-minute interviews with four of the government's six experts, at no cost.⁴¹¹ However, Mr. Schoonmaker never received records from or interviewed the government expert pediatrician and pediatric ophthalmologist, because both experts demanded payment.⁴¹²

On appeal, Mr. Schoonmaker argued that either the district court erred by failing to allow counsel to withdraw or his counsel was “per se” ineffective for failing to withdraw.⁴¹³ The New Mexico Supreme Court held that Mr. Schoonmaker was deprived of effective assistance of counsel, because the court failed to grant his attorney's request to withdraw.⁴¹⁴ The court did note that some other states allowed an indigent defendant to be represented by private counsel but still obtain funding from the state for necessary experts.⁴¹⁵ In this case, there was actually no dispute regarding disagreement in the medical community about lucid intervals and short falls, or even whether the defendant needed expert assistance; instead, the dispute in this situation was only about whether

401. 176 P.3d 1105, 1107–08 (N.M. 2008), *overruled on other grounds*, State v. Consaul, 332 P.3d 850 (N.M. 2014).

402. *Id.*

403. *Id.*

404. *Id.* at 1108.

405. *Id.*

406. *Id.*

407. *See id.*

408. *Id.* at 1109.

409. *Id.* at 1110.

410. *Id.* at 1111.

411. *Id.* at 1110–11.

412. *Id.* at 1111.

413. *Id.* at 1112.

414. *Id.* at 1108.

415. *Id.* at 1115–16.

the government should be required to pay for the necessary defense experts where the defendant had private counsel.⁴¹⁶

Schoonmaker thus highlights another problem that needs to be addressed by legislatures and trial courts. Prosecution experts may require payment to meet with defense counsel. In such cases, legislatures and trial courts must either require prosecution experts to meet with defense attorneys prior to trial without charge, or the prosecution expert's fee must be provided to the defense (in addition to funding for defense experts), in order to vindicate a defendant's right to present a complete defense.

However, as is clear from the cases discussed in this Article, defense attorneys must also prepare detailed and accurate filings with strong arguments in order to secure funding, particularly when the cost of experts—and the risk of not being able to pay for them—is so high. Although Indiana is one of the states that does not have a funding statute, its supreme court developed a list of factors for trial courts to consider when granting funds for defense experts. It serves as a good example of considerations defense attorneys must weigh: (1) whether the proposed expert's services concern an issue which is generally regarded to be within the common experience of the average person or one for which expert opinion would be necessary, (2) whether the requested services could be performed by counsel, (3) whether the proposed expert could demonstrate that which the defendant desires from the expert, (4) whether the purpose for the expert appears to be exploratory only, (5) whether the expert services will go toward answering a substantial question or simply an ancillary one, (6) the seriousness of the charge(s) and the severity of the possible penalty, (7) the complexity of the case, (8) whether the State is relying upon an expert and expending substantial resources on the case, (9) whether a defendant with monetary resources would choose to hire such an expert, (10) the cost of the expert services, (11) the timeliness of the defendant's request, (12) whether the defendant's request is made in good faith, (13) whether the expert's testimony would be admissible at trial, and (14) whether there is cumulative evidence of the defendant's guilt.⁴¹⁷

Applying these factors to a request for funding in cases involving SBS/AHT, it is likely that the Indiana Supreme Court would favor granting funds for defense experts in SBS/AHT cases. The knowledge and experience that qualified medical experts can bring is not within the common knowledge or experience of most jurors. Defense counsel does not have this experience or knowledge, so they cannot perform this work themselves. The proposed experts, if qualified in the appropriate field, can determine what is necessary for the defense's case. Such expert review would not be merely exploratory, considering the degree of dispute in the medical community about SBS/AHT. The question to be answered is the key question of the case: what was the cause of the child's death?

SBS/AHT cases involve serious charges of murder and assault, and substantial penalties accompany a conviction, including the possibility of life in prison or even the death penalty.⁴¹⁸ Additionally, these cases are extraordinarily complicated, and the

416. *See id.* at 1114.

417. *Scott v. State*, 593 N.E.2d 198, 200–01 (Ind. 1992).

418. *See, e.g., Schoonmaker*, 176 P.3d at 1105.

government typically relies on several experts for its case in chief.⁴¹⁹ A sound argument can therefore be made that any defendant of means would hire high-quality experts to address any claims proffered by the prosecution's experts. As noted earlier, there is often very little other evidence of the defendant's guilt beyond the testimony of medical experts.

Significant arguments may need to be made by the defense to the court in order to justify the significant cost of the experts. As discussed previously, the government is likely to call several experts from a variety of medical specialties.⁴²⁰ The defense must respond with experts in the same or similar specialty areas, as well as with experts experienced in other areas, including, for example, biomechanical engineering.⁴²¹ A general practitioner or even a pediatrician will not have the same knowledge as a pediatric neurologist or a pediatric ophthalmologist. Defense counsel should consider getting written cost estimates from experts with whom she intends to consult, to show the court the actual cost of hiring these types of specialists. In making their funding request, the defense will also need to address the necessity of experts in different areas of specialization, to match the specialized experts the government will present. The defendant should make this request to the court at the earliest possible time, as experts will need time to review the records, and the defense will need time to prepare based on their reports.

Once a defendant has succeeded in obtaining funding for well-qualified experts, consideration must be given to making a *Daubert/Frye* challenge in response to the evidence the prosecutor seeks to present. Under *Daubert*, the challenged expert testimony must be supported by "appropriate validation" and must be based on "principles and methodology, not on the conclusions that they generate."⁴²² Although the *Frye* test only requires general acceptance within the relevant expert community, making exclusion of the proffered testimony more difficult for the defense, the defense must still attempt to challenge that general acceptance by showing disagreement with that community.⁴²³ With rare exceptions, courts have traditionally allowed prosecution expert testimony regarding the SBS/AHT hypothesis under both the *Daubert* and *Frye* standards.⁴²⁴ The Denno neuroscience study included thirty cases in which the defendant challenged expert testimony on appeal.⁴²⁵ Eight of those cases were SBS cases that had also undergone *Daubert/Frye* challenges prior to trial and lost.⁴²⁶ All of these cases were upheld on appeal.⁴²⁷ It appears that appellate courts have traditionally affirmed a district court's admission of expert testimony regarding SBS and reversed a district court that holds that the same evidence does not meet the *Daubert/Frye* standards.⁴²⁸

419. *See id.*

420. *See supra* note 144 and accompanying text.

421. *See supra* notes 280–315 and accompanying text.

422. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 590, 595 (1993).

423. *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

424. *See TUEKHEIMER, supra* note 136, at 202 nn.31–33.

425. Denno, *supra* note 158, at 367; *see also supra* notes 158–161.

426. Denno, *supra* note 158, at 363.

427. *Id.* at 368.

428. *Id.*

However, even if the issue has been previously litigated and the SBS/AHT hypothesis withstood the challenge, with well-qualified defense expert testimony undercutting the SBS/AHT hypothesis, a defendant may be able to refute the hypothesis altogether, or at least certain aspects of it. Before admitting testimony about the triad, courts must be mindful that the mere fact of a medical diagnosis—particularly from an expert who did not treat the victim—does not necessarily make the diagnosis admissible under court rules.⁴²⁹

Even if these *Daubert/Frye* challenges are unsuccessful, they will expose the lack of empirical support for the hypothesis of SBS/AHT, further educate the trial court about the lack of scientific foundation underpinning an SBS/AHT diagnosis, and develop the record for appeal. Further, a trial court decision to deny a *Daubert/Frye* hearing can still be reversed on appeal, particularly if the court also denied funding for an expert to testify at such a hearing.⁴³⁰ As the dispute within the relevant communities of experts continues, there are trial courts that have excluded testimony regarding SBS/AHT.⁴³¹ In a 2022 New Jersey case, *State v. Nieves*, the district court barred any testimony regarding AHT/SBS.⁴³² The court wrote,

The danger to be avoided here is influencing jurors through confident and confirmatory responses cloaked in the language of science or medicine, and which are responses provided by witnesses qualified by the court as “experts” who, in the end, testify without being able to identify the testing mechanisms to support their conclusions as reliable because there are none.⁴³³

The court was also concerned about how jurors would interpret the word “certainty” in the phrase “to a reasonable degree of medical certainty” and the interplay between that phrase and the requirement of proof beyond a reasonable doubt.⁴³⁴ The court went on to conclude that the State failed to prove that the science behind AHT is reliable enough to implicate the defendant in abusive conduct and, thus, would be excluded.⁴³⁵

429. Elizabeth A. Walker, *Shaken Baby Syndrome: Daubert and MRE 702's Failure To Exclude Unreliable Scientific Evidence and the Need for Reform*, 210 MIL. L. REV. 1, 35 (2011).

430. See *Hamilton v. Commonwealth*, 293 S.W.3d 413, 422 (Ky. Ct. App. 2009); *McDonald v. State*, 101 So. 3d 914, 917 (Fla. Dist. Ct. App. 2012) (reversing for trial court’s failure to provide for an expert when a *Frye* hearing was necessary); *State v. Erika D. (In re Interest of Elijah P.)*, 891 N.W.2d 330, 349–50 (Neb. Ct. App. 2017) (reversing because, despite holding a *Daubert* hearing, the juvenile court failed to explain its reasoning in finding the expert reliable, abdicating its gatekeeping duty).

431. Decision of the Court, *State v. Nieves*, Indictment No. 17-06-00785 (N.J. Super. Ct. Crim. Div. Jan. 7, 2020) [hereinafter Order, *State v. Nieves*]; Findings of Fact and Conclusions of Law Regarding Defendant’s Motion To Exclude Expert Testimony, *State v. Blount*, No. D-1-DC-17-100160 (167th Jud. Dist. Ct. of Travis Cnty., Tex. Dec. 7, 2020) [hereinafter Order, *State v. Blount*]; Order Granting Defendant’s Amended Motion in Limine To Exclude Any Testimony Regarding Shaken Baby Syndrome or in the Alternative Request for a *Frye* Hearing, *State v. Johnson*, No. 15-CF-018630-A (13th Jud. Cir. Ct. for Hillsborough Cnty., Fla. Oct. 17, 2018); Order, *State v. Hyatt*, No. 06M7-CR00016-02 (Cir. Ct. of Shelby Cnty., Mo. Nov. 5, 2007); Order and Opinion Re: *Daubert* Hearing, *Commonwealth v. Davis*, No. 04-CR-205 (Commw. of Ky. Greenup Cir. Ct. Apr. 17, 2006).

432. Order, *State v. Nieves*, *supra* note 431.

433. *Id.* at 74.

434. *Id.*

435. *Id.*

In its 2020 *Texas v. Blount* decision, the trial court quoted the Texas Public Policy Foundation, a conservative think tank,⁴³⁶ and wrote the following in support of the exclusion of specific areas of testimony in an SBS/AHT case:

Most disturbing, however, is the apparent eagerness of child abuse pediatricians to take on an advocacy role and offer a legal opinion as though it were settled science. Ultimately, whether or not a child was abused is a legal question for the courts to answer. While the opinions of medical professionals can be helpful to the courts in determining the likelihood that a child's injuries were the result of abuse, medical professionals testifying in court must be careful not to [sic] overstep by offering an opinion that is outside of their area of expertise. A child abuse pediatrician stating unequivocally that "this is abuse" from his or her clinical perspective, to say nothing of taking the extra leap of recommending the removal of the child, is unfairly prejudicial as it gives a false air of scientific fact to a legal concept.⁴³⁷

A review of exoneration cases also yields several post-conviction case holdings that the SBS/AHT hypothesis upon which those wrongful convictions were based is unreliable. Tonia Miller spent eighteen years in prison for the murder of her infant daughter.⁴³⁸ At Ms. Miller's trial, a forensic pathologist, Dr. Brian Hunter, characterized the infant's death as AHT.⁴³⁹ However, at her 2020 post-conviction hearing, Dr. Hunter acknowledged that, based on his training at the time of the initial trial, that if the triad of symptoms were present, that would steer him toward a diagnosis of SBS/AHT.⁴⁴⁰ In addition, Ms. Miller presented testimony from four experts, and the judge concluded that this constituted new evidence of unreliability that had been unavailable in 2003.⁴⁴¹

In the case of Codie Lynn Stevens and Dane Krukowski, discussed previously, Ms. Stevens and Mr. Krukowski spent nearly four years in prison for allegedly abusing their infant son.⁴⁴² At an evidentiary hearing on their motion for post-conviction relief, the Chief Medical Examiner for Allegheny County, Pennsylvania, testified that SBS "is the most contentious debate in forensic pathology" and that SBS was nothing more than a "hypothesis" that is "increasingly challenged" in the scientific literature.⁴⁴³ The Michigan Court of Appeals ordered that the couple be acquitted.⁴⁴⁴

436. Order, *State v. Blount*, *supra* note 431, at 16.

437. *Id.*

438. *People v. Miller (Miller II)*, No. 346321, 2020 WL 4554873, at *1 (Mich. Ct. App. Aug. 6, 2020); *see also* Ken Otterbourg, *Tonia Miller*, NAT'L REGISTRY OF EXONERATIONS, <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=6030> [https://perma.cc/G3H4-HXJJ] (last updated Jan. 11, 2023).

439. *People v. Miller (Miller I)*, No. 249412, 2004 WL 2534367, at *2 (Mich. Ct. App. Nov. 9, 2004).

440. *People v. Miller (Miller III)*, No. 346321, 2021 WL 1326733, at *2 (Mich. Ct. App. Apr. 8, 2021).

441. *Id.*

442. Maurice Possley, *Codie Lynn Stevens*, NAT'L REGISTRY OF EXONERATIONS, <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5906> [https://perma.cc/DV4X-WZZ3] (last updated Feb. 1, 2021); *see also supra* notes 90–112 and accompanying text.

443. *Id.*

444. *Id.*

Finally, in the case of Drayton Witt, who spent twelve years in prison for the murder of his girlfriend's son, Dr. A. Norman Guthkelch, who originated the SBS hypothesis, admitted that aspects of SBS were now "open to serious doubt."⁴⁴⁵

CONCLUSION

Given the absence of research studies supporting the SBS/AHT hypothesis and the number of wrongful convictions that have occurred because of it, the criminal justice system must proceed very cautiously when these cases are charged. Prosecutors have ethical duties as ministers of justice, so they must consider the unreliability of the SBS/AHT diagnosis when making charges.⁴⁴⁶ If they feel compelled to charge the defendant, prosecutors need to interrogate their own experts about the lack of scientific support underlying the theory and look for other possible causes of the child's injuries. Prosecutors should fully support defense requests for funding to cover expert costs, assist the defense in obtaining all needed medical records, and also support *Daubert/Frye* hearings—even in jurisdictions that have already accepted SBS/AHT diagnoses. Taking these steps, prosecutors can help prevent the injustice of wrongfully convicting innocent parents and caregivers.

Courts must grant necessary funding for the defense to contest each expert that will be presented by the prosecution both at a *Daubert/Frye* hearing and at trial. At a *Daubert/Frye* hearing, courts must look very carefully at these cases and assess the support for expert testimony anew in each case even if the jurisdiction has accepted the SBS/AHT hypothesis in the past. There is now ample support for the exclusion of testimony regarding the hypothesis of SBS/AHT. If a court does decide to allow a case to proceed to trial, defense must have ample time and funds to find the experts needed to adequately refute the government's case.

Finally, defense attorneys must understand how to effectively argue for expert funding, while courts and legislatures must understand the need for experts in this area. Only in this way can wrongful SBS/AHT convictions be avoided, thereby preventing innocent parents and caregivers from spending years wrongfully incarcerated. Further, this need for experts extends well beyond SBS/AHT cases.

445. See Maurice Possley, *Drayton Witt*, NAT'L REGISTRY OF EXONERATIONS, <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=4043> [https://perma.cc/2TUF-2GAM] (last updated Nov. 1, 2012); see also *supra* note 231 and accompanying text.

446. See generally MODEL RULES OF PRO. CONDUCT r. 3.8 (AM. BAR ASS'N 1983).