STATE OF MICHIGAN
IN THE MICHIGAN SUPREME COURT

PEOPLE OF THE STATE OF MICHIGAN,

Plaintiff-Appellee,

-v-

MILTON LEE LEMONS,

Defendant-Appellant.

Supreme Court No. 163939
Court of Appeals No. 348277
Trial Court No. 06-004818-01-FC

SUPPLEMENTAL BRIEF OF *AMICI CURIAE* THE INNOCENCE PROJECT AND THE CENTER FOR INTEGRITY IN FORENSIC SCIENCES, IN SUPPORT OF DEFENDANT-APPELLANT'S APPLICATION FOR LEAVE TO APPEAL

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INTEREST OF AMICI CURIAE

The Innocence Project, Inc. ("Innocence Project") was established nearly 30 years ago, in 1992, to provide *pro bono* representation to individuals who may be able to prove their actual innocence through the development of a post-conviction record. To date, the work of the Innocence Project, together with affiliated organizations, has led to the exoneration of hundreds of people who never committed the offenses for which they had been convicted, as demonstrated by post-conviction DNA testing.[1] In addition to providing *pro bono* post-conviction legal services, the Innocence Project works to prevent future miscarriages of justice. Relying on data compiled over nearly three decades of exonerations, the Innocence Project has identified the chief risk factors for wrongful convictions—including false confessions and the misapplication of forensic science, both at issue in this case—and advocates to legislatively or administratively remediate those risk factors. The Innocence Project also participates in cases in various stages of litigation—on a consult or co-counsel basis or, as here, as amicus curiae—where the outcome of an issue in dispute may create precedent that either significantly aggravates or significantly mitigates one or more risks of wrongful conviction.

The Center for Integrity in Forensic Sciences, Inc. ("CIFS") is a national nonprofit organization incorporated in Wisconsin. CIFS is the first nationwide non-profit organization in the United States to focus exclusively on strengthening forensic science in order to improve the reliability of criminal prosecutions. To accomplish these goals, CIFS focuses on policy analysis,

[1] The National Registry of Exonerations (NRE) has tracked 570 total DNA exonerations nationwide. National Registry of Exonerations (NRE), *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed Feb 9, 2023). To date, the Innocence Project has been directly involved in the litigation of 196 of those DNA exonerations. See Innocence Project, *Explore the Numbers: Innocence Project's Impact* <https://innocenceproject.org/exonerations-data> (accessed Feb 10, 2023) (noting that the Innocence Project has participated in *194* DNA exonerations; the Innocence Project website has not yet been updated to reflect two additional exonerations that occurred in early 2023).

direct representation of those wronged by the admission of faulty forensic evidence, continuing legal education, and experiential education of tomorrow's lawyers and scientists.

This case involves two of the leading causes of wrongful conviction: flawed forensics and unreliable confession evidence. The work of the Innocence Project, CIFS, and other related organizations has demonstrated that flawed forensic evidence has been a contributing factor in *more than half* of all wrongful convictions overturned by DNA evidence, as tracked by the Innocence Project,[2] see Innocence Project, *Overturning Wrongful Convictions Involving Misapplied Forensics* <https://innocenceproject.org/overturning-wrongful-convictions-involving-flawed-forensics/> (accessed Feb 7, 2023), and that nearly one third of all wrongful convictions overturned by DNA evidence involved a "confession" from an innocent person who falsely incriminated themselves, Innocence Project, *DNA Exonerations in the United States* <https://www.innocenceproject.org/dna-exonerations-in-the-united-states/> (accessed Dec 22, 2023). Indeed, there are over 100 documented exonerations nationwide in which *both* a false confession and faulty forensic expert testimony contributed to the underlying wrongful conviction. NRE, *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed Feb 9, 2023).

Here, after a bench trial in 2006, Appellant Milton Lemons (hereinafter Ms. Lemons[3]) was convicted of first-degree murder for allegedly "shaking" her infant daughter, purportedly causing "Shaken Baby Syndrome" (hereinafter "SBS")—a diagnosis that no longer enjoys general acceptance in the relevant scientific community.[4] In 2016, Ms. Lemons filed a motion for

[2] When accounting for both DNA and non-DNA exonerations, flawed forensic evidence has been a contributing factor in 23% of the nation's wrongful convictions. See NRE, *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed Feb 9, 2023).

[3] Milton Lemons identifies as female and will accordingly be referred to as "Ms. Lemons" with pronouns reflecting her gender identity.

[4] See, e.g., Findley, *Examining Shaken Baby Syndrome Convictions in Light of New Medical Scientific Research*, 37 Okla City U L Rev 221 (2012) at 230; *infra* Section I C.

relief from judgment based upon newly discovered evidence that the State's theory of her daughter's death by "shaking" was invalid; that the child's death was possibly the result of accidental choking or other non-abuse causes; and, significantly, that the State's medical examiner who testified at her 2006 trial that the child died of SBS as a result of intentional, forceful shaking, has since recanted that testimony, and averred that today, he would not deem the child's death a homicide. Although acknowledging that Ms. Lemons presented newly discovered, favorable evidence casting doubt on the SBS diagnosis, the Court of Appeals affirmed the trial court's denial of relief, upholding the trial court's preclusion of the expert biomechanical engineering testimony proffered to demonstrate the invalidity of the SBS diagnosis, and holding that the new scientific evidence, including the expert's recantation, had only limited value in light of Ms. Lemons's confession to "shaking."

As organizations that work to ensure that unreliable evidence is not improperly relied upon to convict the innocent or uphold wrongful convictions, amici have a compelling interest in urging this Court to reverse the ruling below and, in so doing, hold that biomechanical expert testimony—which is founded upon reliable science and exposes the errors of SBS diagnoses—is admissible in relevant cases, and that confession evidence is not a bar to relief, particularly where, as here, the newly discovered evidence undermines the very substance of the confession itself.

INTRODUCTION AND SUMMARY OF THE ARGUMENT

The work of the Innocence Project, CIFS, and other organizations has revealed that, beginning in the 1970s, parents and caregivers have repeatedly been wrongfully convicted of child abuse and homicide based on expert testimony regarding "Shaken Baby Syndrome" or "Abusive Head Trauma" (SBS/AHT). SBS/AHT is the unproven, and now largely discredited, hypothesis that a child who exhibits a specific "triad" of symptoms—subdural hematoma or hemorrhage (bleeding in the brain); retinal hemorrhage (bleeding in the eye); and encephalopathy (neurological impairment)—has been abused by intentional physical shaking.[5] SBS/AHT proponents make this perilous diagnosis largely based on this "triad," with or without related medical findings that physicians have deemed to be "indicia" of abuse, such as bruises, fractures, and the physician's personal assessments of the caregiver's honesty. Not only are these "indicia" not standardized, and so can be used to support a finding of abusive shaking in an ad hoc and unsupported manner, but a review of the available research and data reveals no reliable scientific study validating the hypothesis that shaking alone can even cause them.[6] Rather, accidents can and do cause all of these medical findings, as can a wide variety of nontraumatic medical conditions, including genetic disorders, bleeding disorders, infection, and choking.

[5] Amici understand that some providers now claim that they do not use this triad of medical findings to diagnose SBS/AHT. Whether or not this is true, it represents a significant change from the testimony given in this case. Furthermore, even if physicians now claim to rely on findings outside of the triad, the reality remains that the triad comprises the core features of any SBS/AHT determination.

[6] Swedish Agency for Health Technology Assessment and Assessment of Social Services, *Traumatic Shaking: The Role of the Triad in Medical Investigations of Suspected Traumatic Shaking—A Systematic Review* (2016) [hereinafter SBU Assessment] <https://www.sbu.se/255e> (accessed Feb 9, 2023) at 5 (concluding, after a systematic review of the relevant literature, that there is "limited scientific evidence that the triad and therefore its components can be associated with traumatic shaking (low quality evidence)" and "insufficient scientific evidence on which to assess the diagnostic accuracy of the triad in identifying traumatic shaking (very low quality evidence)").

As explored further *infra*, SBS/AHT is not a valid or reliable medical diagnosis.[7] Indeed, to date, there have been thirty[8] documented exonerations of innocent caregivers who were wrongfully convicted of causing the death of a child by "shaking." See NRE, *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed Jan 30, 2023). A substantial portion (one-fifth) of those thirty exonerations occurred in the state of Michigan. *Id*. And in thirteen percent of those thirty cases, the caregivers had, like Ms. Lemons, "confessed" to having shaken the child victims. *Id*.

As this Court acknowledged in *Ackley*, people facing charges based on this controversial diagnosis must be able to confront the evidence against them with expert scientific evidence. See *People v Ackley*, 497 Mich 381; 870 NW2d 858 (2015). As such, Ms. Lemons's proffered biomechanical expert—whose testimony was offered to rebut the fundamental presumption of the SBS/AHT diagnosis, that it is even *possible* to cause the triad through shaking, alone—should have been admitted and considered by the courts below.

Moreover, the Court's reliance on Ms. Lemons's confession to uphold the conviction—despite a recantation by the State's medical examiner and the new evidence casting doubt upon the SBS diagnosis in this case—failed to acknowledge that the evidence undermining the diagnosis of shaking necessarily undermined her "confession" to the same. Moreover, when

[7] Indeed, in light of the invalidity of SBS/AHT diagnoses, amici submit that expert testimony opining that a child was killed by SBS/AHT does not meet the requisite evidentiary standards of MRE 702 and *Daubert*, and thus should be deemed categorically inadmissible. Amici acknowledge that whether SBS testimony can satisfy the *Daubert* and MRE 702 standard is not squarely at issue in this case, and thus will not address the issue herein, but would be happy to supplement the instant brief in this regard, upon the Court's request.

[8] This number, shocking in its own right, is likely an undercount of SBS/AHT wrongful convictions because many overturned convictions in this area are not counted as true "exonerations." As in many other types of wrongful convictions, individuals accused of crimes related to SBS/AHT are often enticed into plea agreements to secure releases from custody or to avoid the uncertainty of a new trial. See, e.g., Varn, *Pinellas Daycare Owner Once Convicted in Baby's Death Set Free After Guilty Plea*, Tampa Bay Times (Oct 15, 2021) <https://www.tampabay.com/news/crime/2021/10/15/pinellas-daycare-owner-once-convicted-in-babys-death-set-free-after-guilty-plea/> (accessed Feb 9, 2023); Daytona Beach News Journal, *Unchallenged but Faulty Forensic Evidence Opens the Door for the Worst Kind of Injustice* (Jan 13, 2021) <https://www.news-journalonline.com/story/opinion/editorials/2021/01/13/unchallenged-but-faulty-forensic-evidence-opens-door-injustice/6638966002/> (accessed Feb 9, 2023).

analyzed in light of modern social science, it is evident that Ms. Lemons's confession was elicited in a manner that placed her at risk of providing a false confession and was itself the product of an interrogation that relied upon the triad and related medical findings and opinions, both to induce the confession and to provide Ms. Lemons with the factual details needed to make it conform to the medical "diagnosis." Additionally, recent social science instructs that false confessions can cause a snowball effect: they have a powerfully biasing impact on forensic examiners and other criminal justice actors who are aware of the confession and who—however well-intentioned—cannot help but evaluate subsequent evidence in light of the (false) confession. This bias created by a false confession raises the risk that a false confession will result in the collection of additional false evidence of guilt and, ultimately, the wrongful conviction of an innocent person. Thus, the unreliable confession casts the whole slate of investigative evidence in doubt.

To ensure that innocent people who are wrongfully accused or convicted based upon unscientific, outdated medical testimony have a meaningful mechanism by which to challenge their convictions with reliable scientific research, amici urge this Court to reverse the decision below and hold that: (1) expert biomechanical testimony is relevant and admissible in a case challenging an SBS/AHT diagnosis; and (2) confession evidence does not bar an otherwise meritorious claim for relief based on newly discovered evidence.

STATEMENT OF FACTS AND PROCEDURAL HISTORY

Amici hereby incorporate by reference the facts and procedural history as presented in Ms. Lemons's supplemental brief, submitted to this Court on November 14, 2022.

ARGUMENT

I. SBS/AHT DIAGNOSES HAVE LED TO DEMONSTATED WRONGFUL CONVICTIONS AND ARE THE SUBJECT OF SIGNFICANT DEBATE WITHIN

THE SCIENTIFIC COMMUNITY; ASSERTIONS TO THE CONTRARY ARE MISLEADING

When new developments arise in the area of SBS/AHT, some in the child abuse community have reacted by attacking the critics and pretending there is no debate. The debate is not, nor has it ever been, about whether people abuse children or whether child abuse is wrong. Improving the diagnosis of child abuse and the literature supporting that diagnosis can only be helpful to children and families, despite hyperbolic claims that serious scientific scrutiny will threaten public health and safety.

Instead, the debate, at its core, is about what the science supports and what the research shows. This area of scientific inquiry seeks to understand whether a physician, when confronted with ambiguous medical findings that have myriad causes, can make a reliable determination that child abuse occurred. Current scientific understanding is that a physician *cannot* reliably do this, both because the medical findings long attributed to abuse can have many other causes and because biomechanical studies have demonstrated that it is unclear in the first place whether shaking alone is capable of producing those findings.

Rather than grappling directly with these worthwhile questions, however, the response by the child abuse community has been to attack the critics and pretend there is no debate. These responses obfuscate; they do not educate or elucidate.

In fact, the controversy over the validity of SBS/AHT is widespread.[9] Far from being limited to legal spheres, it has been discussed in medical journals,[10] government meetings,[11]

[9] Barnes, *Ethical Issues in Imaging Nonaccidental Injury: Child Abuse*, 13 Topics in Mag Resonance Imaging 85, 85 (2002) ("One of the most controversial areas of nonaccidental injury is the medical diagnosis of inflicted central nervous system injury and its impact on medical, social, and legal outcomes for children and families"); Gabaeff, *Exploring the Controversy in Child Abuse Pediatrics and False Accusations*, 18 Legal Med 90, 90 (2016); Leestma, Forensic Neuropathology (CRC Press, 3d ed, 2014) p 642; Papetti et al, *Outside the Echo Chamber: A Response to the "Consensus Statement on Abusive Head Trauma in Infants and Young Children,"* 59 Santa Clara L Rev 299, 312 (2019) (SBS/AHT "is not merely controversial, but is perhaps *the most* controversial area in forensic medicine.") (emphasis in original); Papetti, *The Forensic Unreliability of the Shaken Baby*

books,[12] and more. And far from being limited to the legal consequences of determinations of abuse, the controversy extends to diagnostic accuracy and, as discussed, questions surrounding what types of physical manifestations (pathophysiology) can even be associated with abuse.[13] In other words, physicians and scientists are engaged in discussions not only about diagnosis, but about how and why the medical findings often associated with shaking and other abusive injuries occur in the first place.

Moreover, even the most casual review of the SBS/AHT literature reveals that the focus remains primarily on the "triad"—the literature is replete with child abuse pediatricians, prosecutors, and other researchers describing the triad, vouching for the triad, even claiming the

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Syndrome (Acad Forensic Pathology Intl, 2018) p 7 ("[T]oday such basic issues as what the 'syndrome' is and on what bases it is diagnosed are themselves hotly debated issues.").

[10] Jenny et al, *Biomechanical Response of the Infant Head to Shaking: An Experimental Investigation*, 34 J Neurotrauma 1, 1 (2017) ("Controversy exists regarding whether violent shaking is harmful to infants in the absence of impact."); Hymel et al, *Intracranial Hemorrhage and Rebleeding in Suspected Victims of Abusive Head Trauma: Addressing the Forensic Controversies*, 7 Child Maltreatment 329, 329 (2002); Greeley, *Letter to the Editor, A Witnessed Short Fall Mimicking Presumed Shaken Baby Syndrome (Inflicted Childhood Neurotrauma)*, 44 Pediatric Neurosurg 90, 90 (2008) ("It is refreshing to see controversial topics addressed in the medical literature in such a balanced fashion. This will hopefully result in furthering our understanding of some of the controversies in inflicted brain injury and fewer unsupported opinions in legal proceedings."); Dias, *Inflicted Head Injury: Future Directions and Prevention*, 13 Neurosurg Clin N Am 247, 247 (2002) ("Despite the explosion of interest and the clarification of certain features, many unanswered questions remain [about AHT]. Some of the answers to these questions are difficult or even impossible to obtain, because the medical facts are, by nature, uncertain or unreliable in many cases.").

[11] Nicholson, *Preface to Am Acad of Pediatrics, Inflicted Childhood Neurotrauma* (Reece & Nicholson eds, 2003) p IX (publishing the conference proceedings). ("Because there is very little scientific experimental or descriptive work [on SBS], the pathophysiology remains obscure, and the relationship to mechanics even cloudier . . . . What we need is science—research and evidence that just isn't there right now.").

[12] See, e.g., Lazoritz & Palusci, *The Shaken Baby Syndrome: A Multidisciplinary Approach* (Routledge, 2001) pp 79-83; Papetti, *Forensic Unreliability*; Leestma, *Forensic Neuropathology*.

[13] See, e.g., Gerber & Coffman, *Nonaccidental Head Trauma in Infants*, 23 Childs Nerv Syst 499, 505 (2007) ("Nonaccidental head trauma in infants is the leading cause of infant death from injury. The high rate of repeated abuse makes identification of potential cases crucial. The underlying biomechanics of injury in this syndrome and the purported sequelae of accidental and nonaccidental trauma remain controversial."); Costine-Bartell et al, *Development of a Model of Hemispheric Hypodensity ("Big Black Brain")*, 35 J Neurotrauma 1, 2 (2018) ("[T]he exact etiological mechanisms that cause injury in children with AHT remain controversial."); Denton & Mileusnic, *Delayed Sudden Death in an Infant Following an Accidental Fall: A Case Report with a Review of the Literature*, 24 American J Forensic Med & Pathol 371, 371 (2003) ("Several controversies exist regarding ultimately lethal head injuries in small children. Death from short falls, timing of head injury, lucid intervals, presence of diffuse axonal injury (DAI), and subdural hematoma (SDH) as a marker of DAI are the most recent controversial topics of debate in this evolving field of study.").

near-infallibility of the triad, and the triad alone, in making an abuse determination.[14] And, significantly, the triad was an important diagnostic driver *in this case*. EH 7/19/2017 at 26-27. Dr. Cassin testified that he used this diagnostic paradigm to make his determinations about cause

[14] See, e.g., Chadwick et al, *Shaken Baby Syndrome—A Forensic Pediatric Response*, 101 Pediatrics 321, 321 (1998) (letter published by 72 leading child abuse pediatricians asserting that SBS "is now a well-characterized clinical and pathological entity with diagnostic features in severe cases virtually unique to this type of injury—[1] swelling of the brain (cerebral edema) secondary to brain injury, [2] bleeding within the head (subdural hemorrhage), and [3] bleeding in the interior lining of the eyes (retinal hemorrhages)."); Jentzen, *Pathological Findings in Fatal Shaken Impact Sydrome*, in THE SHAKEN BABY SYNDROME (Lazoritz & Paluski eds, 2001) pp 199, 300 ("[The] classical findings of retinal hemorrhages, subdural hematoma, and brain swelling cannot be fully explained by any other medical entity."); Harding et al, *Shaken Baby Syndrome: Pathological Diagnosis Rests on the Combined Triad, Not on Individual Injuries*, 328 Brit Med J 720, 720 (2004); Richards et al, *Shaken Baby Syndrome*, 91 Arch Dis Child 205, 205 (2006) ("The triad of encephalopathy, subdural haemorrhages, and retinal haemorrhages as an indicator of head injury has stood the test of time."); Vinchon et al, *Confessed Abuse Versus Witnessed Accidents in Infants: Comparison of Clinical, Radiological, and Ophthalmological Data in Corroborated Cases*, 26 Childs Nerv Syst 637, 637 (2010) ("The hallmarks of shaken baby syndrome (SBS) are subdural hematomas (SDH), encephalopathy, and retinal hemorrhage (RH)."); Holmgren, *Prosecuting the Shaken Infant Case*, in THE SHAKEN BABY SYNDROME (Lazoritz & Paluski eds, 2001) ("The expert who acknowledges the classic findings of SBS including subdural hematoma, retinal hemorrhage and edema, but chooses to ignore this constellation of findings in favor of an alternative hypothesis will appear foolish."); Gerber & Coffman, *Nonaccidental Head Trauma* at 499 ("Clinical features that suggest inflicted head trauma include the triad of the so-called shaken baby syndrome, consisting of retinal hemorrhage, subdural, and/or subarachnoid hemorrhage in an infant with little signs of external trauma."). Kirschner, *The Pathology of Child Abuse*, in THE BATTERED CHILD (Helfer et al eds, 5th ed, 1997) pp 272-73 ("SBS usually produces a diagnostic triad of injuries … [which] must be considered virtually pathognomonic of SBS in the absence of documented extraordinary blunt force such as an automobile accident."); Reichert et al, *Neurologic Sequelae of Shaken Baby Syndrome*, in THE SHAKEN BABY SYNDROME (Lazoritz & Palusci eds, 2001) pp 272-73 ("For all practical purposes, however, retinal hemorrhages in association with acute subdural hemorrhaging means that a violent shaking with or without impact occurred."); Reece, *Child Abuse: Medical Diagnosis and Management*, (2d ed, 2001) pp 272-73 ("Shaken Baby Syndrome . . . usually produces a triad of injuries that includes cerebral edema, subdural hemorrhage, and retinal hemorrhages. No other medical condition fully mimics all of its features."). See also Rob Parrish, *Executive Summary of the Third National Conference on Shaken Baby Syndrome* <https://www.dontshakeorg/media/k2/attachments/2000-SaltLakeCityProgram.pdf> (accessed Feb 9, 2023) ("Often referred to as the 'triad,' the consensus appears to be that a collection of (1) damage to the brain, evidenced by severe brain swelling and/or diffuse traumatic axonal injury; (2) bleeding under the membranes which cover the brain, usually subdural and/or subarachnoid bleeding; and, (3) bleeding in the layers of the retina, often accompanied by other ocular damage, when seen in young children or infants, is virtually diagnostic of severe, whiplash shaking of the head."); Eisenbrey, *Retinal Hemorrhage in the Battered Child*, 5 Child's Brain 40, 42 (1979) ("[R]etinal hemorrhage in children under 3 with or without other evidence of injury is pathognomonic of battered child syndrome."); Carter et al, *Whiplash Shaking Syndrome: Retinal Hemorrhages and Computerized Axial Tomography of the Brain*, 7 Child Abuse & Neglect 279, 280 (1983) ("[B]ilateral extensive pale-centered retinal hemorrhages … are considered pathognomonic of the syndrome of whiplash shaking injury and child abuse."); US Dep't of Justice, *Battered Child Syndrome: Investigating Physical Abuse and Homicide* <ojp.gov/pdffiles1/ojjdp/161406.pdf> (accessed Feb 9, 2023) ("According to all credible studies in the past several years, retinal hemorrhages in infants is, for all practical purposes, conclusive evidence of shaken baby syndrome in the absence of a good explanation"—such as severe automobile accidents and false from several stories onto a hard surface). See also Papetti, *supra* note 9, at 51 n 175 (citing literature and case testimony claiming SBS diagnosis on the basis of one or two features of the triad).

and manner of death. *Id*. Later, consistent with emerging research, he changed his opinion. Dr. Cassin's evolution on this issue provides a snapshot of the larger evolution in the field.

When confronted with wrongful convictions, significant medical literature, and advancements in the field, SBS/AHT proponents will often claim that the "real" scientific consensus can be found only in the Consensus Statement advanced by the Society for Pediatric Radiology. This, too, is unavailing. Consensus statements are opinion pieces, not evidence, and they are considered the lowest form of evidence in evidence-based medicine. See, e.g., Wintermark et al, *Imaging Evidence and Recommendations for Traumatic Brain Injury: Advanced Neuro- and Neurovascular Imaging Techniques*, 36 (2) Am J Neuroradiol 1, 1-11 (2015).

Moreover, the claim that this document even represents true consensus is highly debatable. This statement was not voted upon by all, or even a majority, of the organizations for whom it purports to speak. Findley et al, *Feigned Consensus: Usurping the Law in Shaken Baby Syndrome/Abusive Head Trauma Prosecutions,* 2019 Wis L Rev 1211, 1226. The fifteen authors who did vote on the substance had previously staked out firm positions on the topic of SBS/AHT, either defending the diagnosis or attacking its critics. *Id*. at 1227. Criticisms and recommendations from prominent organization members to ensure a more thorough and nuanced document were ignored. *Id*. at 1228. And the statement is misleading, overlooking legitimate dissent: a survey of providers reveals that, among forensic pathologists, "fewer than half, only 40.7 percent (eleven of twenty-seven) responded yes when asked if SBS is a valid diagnosis." Narang et al, *Acceptance of Shaken Baby Syndrome and Abusive Head Trauma as Medical Diagnoses*, 177 J Pediatrics 273, 273 (2016). More importantly, the statement does not engage with the intricacies of an SBS/AHT determination—the real substance of the debate.

II. BIOMECHANICAL ENGINEERING RESEARCH IS VITAL TO THE CURRENT SCIENTIFIC UNDERSTANDING THAT SBS/AHT IS AN INVALID DIAGNOSIS; EXPERT BIOMECHANICAL TESTIMONY MUST BE ADMITTED IN CASES CHALLENGING AN SBS/AHT ALLEGATION

The SBS/AHT "diagnosis,"[15] once thought to be a reliable means of identifying abuse, is no longer regarded as a reliable method. As noted above, the SBS/AHT diagnosis is based on two underlying assumptions. First, it assumes that it is possible to cause the triad of medical findings by shaking a child. Second, it assumes that shaking is the *only* explanation for the presence of the triad. Neither of these assumptions is based in science. Biomechanical engineers—whose field is the study of how biological tissue responds to force—are the scientists best-positioned to explain the fallacy of the first assumption. Moreover, together with medical doctors, biomechanical engineers have the expertise to identify other potential causes of the triad.

Here, the Court of Appeals held that because biomechanical studies use biomechanical models—as opposed to real babies—to test the forces of shaking, the biomechanical expert testimony proffered by Ms. Lemons to demonstrate that shaking was not the cause of her daughter's death was "too tenuous" to be admissible. *People v Lemons*, No. 348277 (Mich App Nov 18, 2021) at 7. This reasoning is unfounded, inconsistent with scientific consensus and legal precedent from around the country, and risks insulating wrongful SBS/AHT diagnoses from sufficient scrutiny. Moreover, it is inconsistent with this Court's holding in *Ackley*, which held that presenting relevant expert testimony is fundamental to defending accusations of SBS/AHT. *Ackley*, 491 Mich at 397. Accordingly, amici urge this Court to find that biomechanical expert

[15] Amici put "diagnosis" in quotations because, while child-abuse physicians claim the abuse determination is a medical diagnosis, it is actually an etiological determination and a legal conclusion, which purports to determine not just what ails the body, but also the conduct and even mental state (because without a guilty mental state the conduct would be an accident, not abuse) of a third party. See generally, Findley et al, *Feigned Consensus*. This distinction is important, as will be discussed below.

testimony, when proffered by a qualified expert, is admissible in a criminal matter challenging an SBS or AHT determination.

A. BACKGROUND ON BIOMECHANICS

The field of biomechanics refers to the study of how forces affect biological systems, or living organisms, including human children. See, e.g., Freeman & Kohles, *An Evaluation of Applied Biomechanics as an Adjunct to Systematic Specific Causation in Forensic Medicine*, 161 Wien Med Wochenschr 458, 458 (2011); Knudson, *Fundamentals of Biomechanics* (3d ed, 2021) p 3. Experts in biomechanics are typically educated in both mechanical and biomedical engineering and are trained in the study of how to determine the possible causes of an injury, injury prevention, and the manner in which injuries form in the human body. Biomechanics is applied to various fields, including, for example, the treatment of professional sports injuries and the testing of automotive safety devices. See, e.g., Knudson, *Biomechanics* at 5-10. Relevant here, biomechanical experts also research the manner in which traumatic injuries occur in the body, the human body's capacity to withstand various potentially injurious forces, and how injuries caused by such forces manifest. Such biomechanical research is modeled upon scientific methodologies that have been relied upon in engineering and biological sciences, such as physics and anatomy. See, e.g., Freeman & Kohles, *Applied Biomechanics* at 458 ("[I]n the context of forensic medicine the discipline [of biomechanics] is used most often to define injury thresholds, and to match injury mechanisms with expected or observed injuries as a means of causal determination.").

Because, for ethical reasons, it is not always possible to use actual human tissue in biomechanical studies, the research often employs models such as crash test dummies, computer-generated models, human cadavers, and animals. The shaking of an infant, and

whether such shaking has the capacity to cause certain injuries in a child's body, is precisely the type of mechanical event that biomechanical engineers are well-equipped to analyze. Biomechanical evidence is therefore critical for lay factfinders to assess allegations of SBS/AHT.

B. EXPERT TESTIMONY BY BIOMECHANICAL ENGINEERS—INCLUDING ON THE SUBJECT OF SBS/AHT—MEETS MICHIGAN'S ADMISSIBILTY THRESHOLD AND IS REGULARLY ADMITTED BY COURTS ACROSS THE COUNTRY

Expert biomechanical testimony meets Michigan's admissibility threshold. Though expert testimony may be excluded under MRE 702[16] where there is "simply too great an analytical gap between the data and the opinion proffered," *Gen Elec Co v Joiner*, 522 US 136, 146; 118 S Ct 512; 139 L Ed 2d 508 (1997); see also *Gilbert v Daimler Chrysler Corp*, 470 Mich 749, 760; 685 NW2d 391 (2004) (excluding expert's testimony under *Joiner* because of a "yawning 'analytical gap' between the data and the opinion expressed by the expert"), the Court of Appeals erred in concluding that the use of models or animals creates such a gap here. Indeed, the results of model-based biomechanical studies have been routinely accepted as reliable research methods in various arenas that are essential to everyday life—for example, in automobile, playground, and sports equipment safety testing. Findley et al, *Feigned Consensus* at 10-11.

[16] MRE 702 provides: "If the court determines that scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise if (1) the testimony is based on sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." As such, expert testimony is admissible "as long as the basic methodology and principles employed by an expert to reach a conclusion are sound and create a trustworthy foundation for the conclusion reached." *Nelson v Am Sterilizer Co*, 223 Mich App 485, 492; 566 NW2d 671 (1997) (citing *Daubert v Merrell Dow Pharmaceutics*, 509 US 579, 596; 113 S Ct 2786; 125 L Ed 2d 469 (1993)).

Similarly, courts throughout the country have found in a variety of contexts that biomechanical engineers are qualified to testify "about the forces involved [in an incident] and the kinds of injuries that may have resulted therefrom." *Berner v Carnival Corp*, 632 F Supp 2d 1208, 1212-13 (SD Fla 2009) (collecting cases); *Morgan v Girgis*, unpublished opinion of the United States District Court of the Southern District of New York, issued May 16, 2008 (Case No. 07-CV-1960) at *12-13 (collecting cases); see also *Bowers v Norfolk S Corp*, 537 F Supp 2d 1343, 1377 (MD Ga, 2007), *aff'd*, 300 F Appx 700 (CA 11, 2008) (stating that "biomechanical engineers typically are found to be qualified to render an opinion as to the forces generated in a particular accident and the general types of injuries those forces may generate" and holding that a biomechanical expert could testify as to whether "the force sustained . . . in the subject [event] could potentially cause certain injuries"); *Burke v TranSam Trucking, Inc*, 617 F Supp 2d 327, 334 (MD Pa, 2009) (citation omitted) (permitting the testimony of a biomechanical expert to testify "that the forces Plaintiff sustained in the subject collision were sufficient to cause a brain injury and a cervical region injury"). As courts have explained, biomechanical engineering testimony applies "the principles in mechanics to the facts of a specific accident and provide[s] information about the forces generated in that accident." *Bowers,* 537 F Supp at 1377. Such testimony may also "explain how the body moves in response to those forces, and . . . determine what types of injuries would result from the forces generated." *Id*. (alternation in original). Thus, biomechanical expert testimony has been permitted in a wide array of cases that raise the question of whether certain forces applied to the human body in different contexts—such as in vehicular accidents or even, for example, during childbirth—could have caused the resultant physical injuries.[17]

[17] See, e.g., *LM v Hamilton*, 193 Wash 2d 113, 136; 436 P3d 803 (2019) (holding that biomechanical expert testimony regarding the forces involved in childbirth was admissible); *Johnston-*

Indeed, expert testimony regarding biomechanics is essential to understand the validity, or lack thereof, of the primary assumptions underlying an SBS/AHT allegation—namely, whether it is in fact physically *possible* for an adult to shake an infant in a manner that exerts sufficient forces to cause the medical findings associated with SBS/AHT, and whether that is possible *without* the presence of other injuries consistent with such abuse. Biomechanics is thus critical in assessing whether shaking a child—particularly a child who, as here, did not display other signs of head or neck trauma—can feasibly cause the findings commonly attributed to abusive shaking.

Accordingly, expert biomechanical testimony is regularly deemed admissible in criminal trials alleging that the victim's injuries were the result of SBS/AHT and in post-conviction proceedings contesting a conviction premised upon such a diagnosis. See, e.g., *Council v State*, 98 So 3d 115, 116-17 (Fla App 2012) (holding that the trial court abused its discretion in excluding biomechanical expert testimony that "(1) a child of the victim's height and weight could have sustained similar brain injuries by falling out of a day bed; and (2) shaking alone could not have caused such injuries"); *Jones v State*, 2021 Md Spec App LEXIS 76, at *46-47 (2021) (unpublished) (relying on expert testimony from, *inter alia*, a biomechanical engineer, to hold that the petitioner met the requisite standard for a writ of actual innocence, reasoning that the newly discovered scientific evidence undermined the State's SBS allegations and that "if a factfinder, be it a jury or judge, would hear the competing professional medical opinions, there is a substantial or significant possibility of a different result" at a new trial).

Forbes v Matsunaga, 181 Wash 2d 346, 356; 333 P3d 388 (2014) (holding that biomechanical expert testimony was admissible and that it "helped the jury understand what forces might have been involved in the [vehicle] collision"); *Yarchak v Trek Bicycle Corp*, 208 F Supp 2d 470, 499-502 (DNJ, 2002) (holding that biomechanical expert testimony was admissible to assess claims of injuries caused by a bicycle seat).

Likewise, citing this Court's ruling in *Ackley*, the United States Court of Appeals for the Sixth Circuit has ruled that an attorney's failure to proffer biomechanical expert testimony in matters involving allegations of SBS can constitute constitutionally ineffective assistance of counsel. *Ceasor v Ocwieja*, 655 F Appx 263, 265, 273 (CA 6, 2016) (unpublished). The court reasoned that, as in this case, where there is "'no victim who can provide an account, no eyewitness, no corroborative physical evidence and no apparent motive to [harm],' the [State's] expert '*is* the case.'" *Id*. at 286 (citing *Ackley*).[18] Thus, a defense attorney's failure to contest the State's expert's testimony with expert testimony that the "biomechanical and forensic literature demonstrates that shaking without impact is unlikely to cause subdural hematomas or retinal hemorrhages" states a claim for ineffective assistance of counsel. *Id*.

C. BIOMECHANICAL STUDIES DO NOT SUPPORT THE PREMISE THAT SHAKING ALONE CAN CAUSE THE MEDICAL FINDINGS COMMONLY ASSOCIATED WITH IT

Despite the historical prominence of the SBS/AHT diagnosis, no scientific or biomechanical studies exist that validate the hypothesis that abusive shaking can produce the medical findings often associated with it. Notably, this absence of scientific validation is not due to a lack of effort by SBS/AHT proponents. See generally Papetti et al, *Outside the Echo Chamber* (describing and citing academic literature and studies conducted in support of SBS/AHT). Since the late 1980s, there have been numerous attempts to prove that shaking an infant can cause the medical findings that often drive physicians to suspect abuse. *Id*. at 312-13. However, none of those attempts has been successful; no study produced reliable evidence that shaking generates the acceleration-deceleration forces necessary to cause these findings. See

[18] Thereafter, in 2021, the State dismissed the charges against the defendant. See NRE, *Terry Ceasor* <https://www.law.umich.edu/special/ exoneration/Pages/casedetail.aspx?caseid=6043> (accessed Feb 9, 2023).

Jones et al, *Development of a Computational Biomechanical Infant Model for the Investigation of Infant Head Injury by Shaking*, 55 Med Sci L 291, 292, 296-97 (2015).

To the contrary, recent studies indicate that shaking an infant produces only a small fraction of the angular acceleration necessary to cause medical findings, like intracranial bleeding, often associated with abusive shaking. In one study, a team of biomechanical engineers conducted experiments designed to compare the relative accelerations created by different methods of producing rotational forces—that is, different methods of shaking—that yield brain injuries. See Prange et al, *Anthropomorphic Simulations of Falls, Shakes, and Inflicted Impacts in Infants*, 99 J Neurosurgery 143, 149 (2003). The experiments demonstrated that *none* of various forms of shaking tested was sufficient to cause subdural hemorrhages in an infant. See *id*. In a 2015 study, biomechanical engineers concluded, based on an experiment involving monkeys, that the minimum "rotational acceleration to cause traumatic shaking injury would be about 4,000 radian/sec^2,"[19] Miller, *Application of Hill's Criteria* at 4, while, as shown below, research has repeatedly shown that the most vigorous shaking a human adult can generate falls well below that threshold.

Even studies published by SBS/AHT proponents fail to provide a scientific basis for the hypothesis. In 1987, Dr. Ann-Christine Duhaime, a leading figure in the SBS community, "constructed models of infants with various neck and head properties in order to measure the forces created by shaking and impact." Papetti et al, *Outside the Echo Chamber* at 312. Duhaime's team measured the forces generated as the models were aggressively shaken by volunteers. The results demonstrated that "no matter how hard the volunteers shook the models, the shaking did not generate acceleration measurements anywhere near those estimated as

[19] Radians per second is a measurement of rotational accelerations. Miller, *Application of Hill's criteria of causation to shaken baby syndrome: Further evidence that questions the existence of shaken baby syndrome*, 1 J of Biomedical Eng'g and Informatics 1, 4 (2015).

necessary to tear cortical bridging veins and cause subdural hemorrhage or other intracranial injury." *Id*. The volunteers' aggressive shaking of the dolls produced a rotational acceleration of only about one quarter of that necessary to cause a traumatic shaking injury. *Id*. The Duhaime study used a fairly primitive model, but cannot be easily dismissed—the paper is widely accepted in the medical and biomechanical communities, and its findings have been consistently sustained by studies that employed more sophisticated models. Ommaya et al, *Biomechanics and Neuropathology of Adult and Paediatric Head Injury*, 16 Brit J of Neurosurg 220, 226 (2002); Goldsmith & Plunkett, *A Biomechanical Analysis of the Causes of Traumatic Brain Injury in Infants and Children*, 25 Am J Forensic Med Pathology 199 (2005); Prange et al, *Anthropomorphic Simulations.*

The finding in a later study—authored by Corrina Cory and others—that minimal adjustment, such as "altering the center of gravity[,] produced forces that exceed injury thresholds in eight out of ten trials" is highly misleading. Cory et al, *Can Shaking Alone Cause Fatal Brain Injury? A Biomechanical Assessment of the Duhaime Shaken Baby Syndrome Model*, 43 Med Sci & Law 317, 317 (2003). In fact, the design of both the dummy and the shaking mechanism in the Cory study failed to mimic either the human neck or the kind of shaking generally alleged in SBS/AHT cases, rendering the findings effectively meaningless. First, to achieve these accelerations, the researchers adjusted the neck to provide the least resistance and hence most acceleration possible—with no attempt to replicate the actual human neck. Second, to exceed injury thresholds, they modified the shaking action itself: study participants did not hold the dummy in front of them and shake it back and forth, as is commonly alleged in shaking cases, but rather raised the dummy up over one shoulder and then forcefully launched it downward and across the body below the participant's waist by the opposite knee, using gravity

as an aid—an exaggerated motion never described in any of the shaking literature. Third, the paper explains that the injury thresholds were exceeded only when the dummy's chin and occiput (back of the head) made impact with the dummy's chest and back—an impact made possible only by the extreme design of the dummy—thereby producing *an impact* and not just shaking. In that regard, this study did nothing more than confirm what other biomechanical research has found—that pure shaking does not cause sufficient acceleration, but impact does.

Furthermore, there is evidence that the magnitude of force needed to cause intracranial brain damage would likely cause severe neck injuries—that is, given that "[t]he forces required to cause bridging vein rupture would exceed the strength of the infant neck. . . . Any infant shaken sufficiently violently to produce [subdural hematoma] would be expected also to have injury to the bones and soft tissues of the neck and spinal cord." Squier & Mack, *The Neuropathology of Infant Subdural Haemorrhage*, 187 Forensic Sci Int'l 6, 12 (2009); see also Ommaya et al, *Biomechanics and Neuropathology* (biomechanical research demonstrates that, in the case of shaking, "the neck torque in the infant would cause severe injury to the high cervical cord and spine long before the onset of cerebral concussion"); Papetti et al, *Outside the Echo Chamber* at 312. Thus, when an infant does not have neck injuries, as is true in most cases where SBS/AHT has been diagnosed, "violent shaking is not a plausible explanation." Papetti et al, *supra* note 9, at 5. The child in this case did not have a neck injury.

D. BIOMECHANICAL AND MEDICAL RESEARCH DEMONSTRATE THAT THE SO-CALLED DIAGNOSTIC SYMPTOMS ARE BEST EXPLAINED BY CAUSES OTHER THAN SHAKING

Recent advancements in scientific and medical research have established that each component of the triad and related findings is attributable to a wide variety of non-abusive

causes. Several studies have found that subdural hematomas can be caused by a variety of accidental and genetic causes unrelated to trauma. For example, the American Heart Association identified Cerebral Venous Thrombosis ("CVST"), a type of stroke most prevalent in early infancy, Papetti et al, *Outside the Echo Chamber* at 344, as a cause of subdural hematoma and retinal hemorrhages. See Roach et al, *Management of Stroke in Infants and Children*, 39 Stroke 2644, 2668 (2008); Binenbaum et al, *Patterns of Retinal Hemorrhage Associated with Pediatric Cerebral Sinovenous Thrombosis*, 21 J of AAPOS 23, 23 (2017). Moreover, it is now understood that there are myriad other accidental and natural causes of subdural hematomas, including short falls, prenatal conditions, congenital vascular malformations, birth trauma, genetic and metabolic disorders, clotting disorders, infectious diseases (such as meningoencephalitis), and acute or progressive atrophy of the brain from various causes. See Frasier et al, *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference* 129, 129-226 (2006); see also Atkinson et al, *Childhood Falls with Occipital Impacts*, 34(12) Pediatric Emergency Care 837, 840 (2018).

Likewise, studies demonstrate that retinal hemorrhages are associated with a variety of accidental and natural causes. SBU Assessment at 12. Research has shown that retinal hemorrhages are not diagnostic of shaking, exclusively, but rather "can be caused by all kinds of other insults to the head" such as cerebral edema and advanced cardiac life support, meningitis, prematurity/congenital heart disease, in utero intracranial hemorrhage, apnea/gastroesophageal reflux, SIDS/resuscitation, disseminated intravascular coagulation, cerebral vein thrombosis, high blood pressure, cardiopulmonary resuscitation, seizures, and birth-related causes. See Findley et al, *Examining Shaken Baby Syndrome Convictions in Light of New Medical Scientific Research*, 37 Okla City U L Rev 219, 227 (2012) (citing studies). Even SBS/AHT supporters

have acknowledged that retinal hemorrhaging is not exclusive to abusive head trauma,[20] and studies reveal that retinal hemorrhaging can be caused by accidents, genetic or metabolic conditions, anemia, hypoxia, clotting disorders, increased intracranial pressure, and meningitis. See Narang, *A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome*, 11 Hous J Health L & Pol'y 505, Appx C (2011). Indeed, because non-abusive causes are a "far more likely explanation for [retinal hemorrhages] than shaking," Squier, *Infant Retinal Haemorrhages Correlate with Chronic Subdural Haemorrhage, Not Shaking*, 111 Acta Paediatrica 714, 715 (2022), the presence of retinal hemorrhages is of limited value in the investigation of suspected infant abuse and is insufficient to determine the presence of an intentionally inflicted injury. See Thiblin et al, *Retinal Hemorrhage in Infants Investigated for Suspected Maltreatment Is Strongly Correlated with Intracranial Pathology*, 111 Acta Paediatrica 800, 806 (2022); Thiblin et al, *Medical Findings and Symptoms in Infants Exposed to Witnessed or Admitted Abusive Shaking: A Nationwide Registry Study*, PLOS ONE 1, 2 (2020). SBS/AHT proponents occasionally claim that while not *all* retinal hemorrhages are exclusively diagnostic of abuse, certain patterns can be sustained only in abusive situations. This, too, is false. There is no type or pattern of retinal hemorrhages that is exclusively diagnostic of abuse,[21] and severe retinal hemorrhages have been seen with birth,[22] from natural causes like aneurysm,[23] and from witnessed (seemingly minor) accidents like short falls. Shuman & Hutchins, *Severe Retinal Hemorrhages with Retinoschisis in*

[20] See Levin & Christian, *The Eye Examination in the Evaluation of Child Abuse*, 126 Pediatrics 376, 376 (2010) ("Although [retinal hemorrhages] are an important indicator of possible AHT, they are also found in other conditions.").

[21] Till, *Subdural Haematoma and Effusion in Infancy*, 3(5615) Brit Med J 3, 400-402 (1968).

[22] Watts et al, *Newborn Retinal Hemorrhages: A Systematic Review*, 17(1) J AAPOS 70 (2013); Callaway et al, *Retinal and Optic Nerve Hemorrhages in the Newborn Infant: One-Year Results of the Newborn Eye Screen Test Study*, 123(5) Ophthalmology, 1043 (2016).

[23] Mena et al, *Ocular Findings in Raised Intracranial Pressure: A Case of Terson Syndrome in a 7 Month Old Infant*, 32(2) Am J Forensic Med Pathology 55 (2011).

Infants Are Not Pathognomonic for Abusive Head Trauma, 62(3) J Forensic Sci 807 (2017); Atkinson et al, *Childhood Falls* at 837.

Research has also found that cerebral edema is not significantly associated with trauma. See Piteau et al, *Clinical and Radiographic Characteristics Associated with Abusive and Nonabusive Head Trauma: A Systematic Review*, 130 Pediatrics 315, 319 (2012). Indeed, current research indicates such brain findings reflect deprivation of oxygen or oxygenated blood to the brain (i.e., hypoxia-ischemia) and, therefore, do not necessarily—or even usually—indicate trauma. Papetti et al, *supra* note 9, at 333. Indeed, every diagnostic sign relied upon by child-abuse physicians who support SBS/AHT has multiple recognized non-abusive etiologies.

Further, as even committed SBS/AHT proponents agree, abusive shaking can be asserted as a *potential* explanation for an infant's condition *only* after every non-abusive potential cause of the components of the "triad" has been ruled out.[24] And even then, it is not appropriate for shaking to be "ruled in" as the cause of an infant's triad of findings because, as discussed above, such a finding has never been scientifically established.

While SBS/AHT proponents claim to use a differential diagnosis methodology in making determinations of abuse, this methodology differs significantly from the accepted differential diagnosis model. First, because no standard diagnostic criteria exist for the determination of child abuse (SBS/AHT or otherwise), such a determination will always be controversial. This is because in the absence of an articulable, repeatable, reliable methodology, different providers

[24] Choudhary et al, *Consensus Statement on Abusive Head Trauma in Infants and Young Children*, 48 Pediatric Radiology 1048, 1048, 1060 (2018) [hereinafter Consensus Statement] ("The workup must exclude medical diseases that can mimic AHT. . . . Each infant suspected of suffering AHT must be further evaluated for other diseases that might present with similar findings."); Narang et al, *Abusive Head Trauma in Infants and Children*, 145 Pediatrics 1, 2 (2020) (warning that "[m]edical diseases that can mimic the findings commonly seen in AHT are increasingly recognized," so "[p]ediatric practitioners should be cautious to not overstate the significance of particular medical findings").

will interpret the available information and medical signs in different ways and will disagree about specific cases.

Second, the methodology employed is not diagnostic, but rather a differential etiology (determination of cause), which courts have distinguished from the differential diagnosis methodology, finding that differential etiology lacks inherent reliability. *Bowers*, 537 F Supp 2d at 1361. Differential diagnosis addresses the disease, rather than focusing on the external causation, which is generally within the purview of medical doctors. Differential etiology is concerned with external causation; it is a practice of determining cause using a process of elimination. *McClain v. Metabolife Intern Inc*, 401 F3d 1233, 1252 (CA 11, 2005) (citing Mary Sue Henifin et al, *Reference Guide on Medical Testimony*, Reference Manual on Sci Evidence (Federal Judicial Center, 2d ed, 2000) pp 439, 481). Courts have recognized that differential etiology is not only different from a differential diagnosis, but is a much more dubious proposition. See, e.g., *Bowers*, 537 F Supp; *Hendrix v Evenflo Co, Inc*, 609 F3d 1183 (CA 11, 2010); *CW ex rel. Wood v Textron, Inc*, 807 F3d 827 (CA 7, 2015); *Tamraz v Lincoln Electric Co*, 620 F3d 665, 673 (CA 6, 2010); *Higgins v Koch Development Corp*, 794 F3d 697, 705 (CA 7, 2015); *Myers v Ill Central R Co*, 629 F3d 639, 644 (CA 7, 2010). In fact, one of the very few topics in the field on which there is widespread agreement is that much remains unknown.[25]

[25] Costine-Bartell, *supra* note 13, at 7 ("While the exact etiologic mechanisms that cause injury in children with AHT remain controversial, repetitive motions attempting to model aspects of shaking have been employed in some animal models to investigate injury, but none has resulted in the extensive SDH nor the wide-spread hypoxicischemic type damage observed after the more severe forms of AHT in children."); *id*. at 30 ("The exact pathophysiological mechanisms by which wide-spread unilateral hemispheric hypoxic-ischemic injury is initiated and propagated in children are not fully understood, but similar findings were produced in this model in the absence of angular acceleration/deceleration."); Binenbaum et al, *Retinal Hemorrhage and Brain Injury Patterns on Diffusion-Weighted Magnetic Resonance Imaging in Children with Head Trauma*, 17 J AAPOS 603, 603 (2013) (team of SBS/AHT adherents acknowledging that "[t]here are currently multiple hypothesized factors in the pathogenesis of brain pathology and retinal hemorrhage in abusive head trauma … [and] the relative importance of these factors cannot be determined precisely based on the published data"); *id*. at 604 (asserting an association between retinal hemorrhages and AHT but acknowledging, "however, the mechanisms underlying retinal hemorrhages are still not clearly established …").

Without clear scientific evidence of the cause of the medical findings that purport to support an SBS/AHT diagnosis, it is not possible to accurately identify external causation.

E. COURTS ACROSS THE COUNTRY ARE RECOGNIZING THAT SBS/AHT IS NOT A RELIABLE DIAGNOSIS

In light of the expanding body of research that casts doubt upon the validity of SBS/AHT diagnoses, courts throughout the country "have ordered new trials in SBS/AHT cases based on the shifting science, either because the science is newly discovered, or because counsel was ineffective for failing to use it at trial, or because the defense was otherwise denied resources needed to challenge the medical evidence[.]" Findley & Risinger, *The Science and Law Underlying Post-Conviction Challenges to Shaken Baby Syndrome Convictions: A Response to Professor Imwinkelried*, 48 Seton Hall L Rev 1209 (2018) at 1226 n.58 (collecting cases). For example, in 2014, a federal district court granted relief to a daycare worker who was convicted of killing a child who was in her sole custody based upon the State's experts' opinions that the child died from "abuse or baby shaking." *Del Prete v Thompson*, 10 F Supp 3d 907, 958 (ND Ill, 2014). Significantly, in granting relief based on the new science that undermined the State's experts' cause of death determination, the court reasoned that the new science "arguably suggests that a claim of shaken baby syndrome is more *an article of faith than a proposition of science*." *Id*. at 957 n 10 (emphasis added). Similarly, in *Allison v State*, an Alaska appeals court vacated a conviction based on an AHT diagnosis where excluded evidence showed that the child's death could have resulted from natural causes. 448 P3d 266, 275 (Alas App, 2019). In *Vanek v Wofford*, a California federal court granted habeas relief from a conviction based on an AHT diagnosis, and the court noted, "[t]he triad of signs and symptoms" do not necessarily indicate "violent shaking." Kalik Cert, Ex C, No. CV 14-4427-AG (KK),

2016 WL 6783340, at *10-11 (CD Cal, 2016) (report and recommendation adopted), No. CV 14-4427-MWF (KK), 2016 WL 6781086 (CD Cal, 2016). The court acknowledged that the child may have "suffered from a pre-existing medical condition that may have been present from birth." *Id*. And, in *People v Bailey*, a New York appellate court affirmed a decision acknowledging that "there has been a compelling and consequential shift in mainstream medical opinion . . . as to the causes of the types of trauma that [the child] exhibited," and ordering a new trial for a defendant convicted of abuse on the basis of an AHT diagnosis. 47 Misc 355, 373 (NY Co Ct 2014), *affd*, 41 NYS 3d 625 (App Div 4d Dep't 2016). See also *Smith v State*, 315 Ga 287; 882 SE2d 300 (2022) (granting a hearing on petitioner's motion for a new trial based on the evolution in scientific understanding of SBS/AHT and the causes of head trauma); *Hanson v Baker*, 766 F Appx 501, 504 (CA 9, 2019); *Ex Parte Henderson*, 384 SW3d 833, 833–34 (Tex Crim App, 2012); *State v Edmunds*, 308 Wis 2d 374, 391–92; 746 NW2d 590 (2008).[26]

Significantly, in a recent decision, a trial court in New Jersey precluded the State's proffered SBS/AHT testimony, finding that "it is not reliable evidence and is far more prejudicial than probative in value" and allowing the testimony would "compromise the integrity of this prosecution and our criminal justice system." *People v Nieves*, No. 17-06-00785, NJ (2020) at *75. Indeed, as noted, at the time of this writing, at least thirty innocent caregivers have been exonerated after having been wrongfully convicted of "shaking" a child in their care. NRE, *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed

[26] The People's amici incorrectly characterize the *Edmunds* and *Ackley* cases, writing "because, apparently unbeknownst to *Edmunds* (and presumably this Court in *Ackley*), the theories advanced by those defense experts have been thoroughly discredited by the medical community. *Ackley* and *Edmunds* highlight the potential pitfalls of relying solely on *ipse dixit* of a few select witnesses." Amicus The Innocence Network counts among its members the organizations whose attorneys litigated both cases. These organizations (as well as this Court, for *Ackley*) can confirm both decisions were made after careful consideration of copious medical witnesses and published literature. The only way to arrive at the conclusion that decisions by the Wisconsin and Michigan courts these cases rest only on *ipse dixit* is to be wholly unfamiliar with the record in both. Similarly, the only way to reach the conclusion that the defense witnesses in these cases have been "wholly discredited" is to cherry-pick from the literature and record, referencing only that which supports the SBS/AHT hypothesis.

Jan 30, 2023). As noted *supra*, the problem of wrongful convictions based on invalid SBS/AHT diagnoses is particularly prevalent in Michigan. *Id*.

The wrongful conviction of Michigan resident Tonia Miller exemplifies the danger of faulty forensic testimony that, as here, wrongfully informs a factfinder that SBS is the only possible cause of a child's death in light of the "triad" of internal injuries. On October 19, 2001, Ms. Miller called 911 to report that her baby was not breathing. NRE, *Tonia Miller* <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=6030> (accessed Feb 9, 2023). The baby died at the hospital the next day. *Id*. The medical examiner, in reliance upon his observance of the "triad" of symptoms historically associated with an SBS diagnosis, concluded that the baby's death was a homicide caused by intentional abuse. *Id*. In 2018, Ms. Miller filed a motion for a new trial based on newly discovered evidence undermining the SBS diagnosis and supporting a finding that the baby may have in fact died of pneumonia. *Id*. Ultimately, the motion was granted, the charges were dismissed, and Ms. Miller was released from prison after spending *nearly two decades* wrongfully incarcerated for the murder of her child based on an invalid SBS diagnosis. *Id*.

For all the reasons stated above, this Court should hold, consistent with courts around the country, that biomechanical engineering testimony, proffered by a qualified expert, is admissible in cases alleging child abuse or homicide caused by SBS/AHT. To hold otherwise prevents courts and factfinders from understanding the unreliability of such allegations and, therefore, places innocent people at risk of wrongful conviction or continued wrongful incarceration.

III. TO ENSURE THAT WRONGFUL CONVICTIONS ARE NOT IMPROPERLY UPHELD, CONFESSION EVIDENCE MUST NOT BAR AN OTHERWISE MERITORIOUS NEWLY DISCOVERED EVIDENCE CLAIM

Like a substantial percentage of innocent women who were wrongfully convicted of killing a child, Ms. Lemons, in response to a coercive police interrogation on the same day her infant daughter died, "confessed" to "shaking" her daughter. See NRE, *Detailed View* <https://www.law.umich.edu/special/exoneration/Pages/detaillist.aspx> (accessed Feb 7, 2023) (demonstrating that nearly 30% of the women exonerated after having been wrongfully convicted of murdering a child had falsely confessed). The circumstances of Ms. Lemons's interrogation and her vulnerability to interrogation coercion at the time of police questioning raise serious doubts about the reliability of her purported confession. Yet, the Court of Appeals relied primarily upon the confession evidence to deny relief, despite finding that she presented "favorable" newly discovered evidence that directly undermined the State's theory of guilt. Specifically, the Court of Appeals found *inter alia*, that it was "improbable" that the medical examiner's recantation of his prior SBS diagnosis or the new scientific evidence regarding the changing understanding of SBS/AHT would result in a different outcome at a new trial because Ms. Lemons's "confession [to 'shaking' the child] leaves" the newly discovered evidence "without significant weight." *Lemons*, No. 348277 at 10-11.

In so holding, the Court of Appeals paradoxically accepted the "genuine dispute" surrounding the validity of the SBS diagnosis,[27] yet relied primarily on Ms. Lemons's confession to "shaking"—a cause of death that the Court acknowledged may be scientifically insupportable based on the symptoms that Ms. Lemons's child exhibited—to uphold her conviction. *Id* at 7. Thus, the Court of Appeals failed to recognize that Ms. Lemons's confession to "shaking" her child and the recanted SBS diagnosis are inextricable from one another, in that the new scientific

[27] As the Court of Appeals correctly acknowledged, "[t]he extensive expert testimony offered in this case and plethora of authority cited below make it clear that there is a genuine dispute regarding SBS and the diagnostic significance" of the three symptoms historically associated with SBS/AHT—known as the "triad." *Lemons*, No. 348277 at 7.

evidence undermined the very substance of her confession. Said simply, there is significant scientific evidence that suggests Ms. Lemons was coerced into "confessing" to a crime that did not occur, as many other caregivers wrongfully convicted of causing a death by SBS/AHT diagnosis have been. Indeed, the Court of Appeals' decision does not account for the reality—as demonstrated by hundreds of cases of wrongful convictions involving false confessions and the now-robust body of scientific research regarding the causes of such police-induced false confessions—that an admission of guilt extracted in the course of a psychologically coercive interrogation may be false. Moreover, the decision below disregards the fact that unreliable confession evidence often taints the other evidence in a case, resulting in a false appearance of corroborating evidence against an innocent person.

To ensure that courts do not, as below, afford improper weight to unreliable confession evidence to uphold a conviction based on an invalid, recanted forensic opinion, amici urge this Court to reverse the ruling below and hold that a confession elicited in response to police interrogation cannot bar an otherwise meritorious newly discovered evidence claim, particularly when, as here, the new evidence undermines the substance of the confession itself.

A. FALSE CONFESSIONS—A LEADING CAUSE OF WRONGFUL CONVICTION—ARE POWERFULLY PREJUDICIAL AND DIFFICULT TO DETECT

As noted above, false confessions have been a contributing factor in the wrongful convictions underlying nearly one-third of all known DNA exonerations. See Innocence Project, *DNA Exonerations in the United States* <https://www.innocenceproject.org/dna-exonerations-in-the-united-states/> (accessed Feb 7, 2023). These proven false confessions "most surely represent the tip of an iceberg," in that the known dataset of cases necessarily excludes "false confessions that are disproved before trial, many that result in guilty pleas, those in which DNA

evidence is not available, those given to minor crimes that receive no post-conviction scrutiny, and those in juvenile proceedings that contain confidentiality provisions." Kassin et al, *Police-Induced Confessions: Risk Factors and Recommendations*, 34 L & Hum Behav 3, 3 (2010). Once a false confession is uttered in an interrogation room, it often biases the investigative process, catalyzing a course of events that lead to the wrongful conviction of the innocent "confessor." Following a confession, police often "close the investigation, deem the case solved, and overlook exculpatory information—even if the confession is internally inconsistent, contradicted by external evidence, or the product of coercive interrogation." Kassin, *Why Confessions Trump Innocence*, 67 Am Psychol 431, 433 (2012) (citations omitted). As one expert aptly stated, "no other class of evidence is so profoundly prejudicial" as the false confession, which has a "strong biasing effect on the perceptions and decision-making of criminal justice officials." See Leo, *False Confessions: Causes, Consequences, and Implications*, 37 J Am Acad Psychiatry L 332, 340 (2009) (citation omitted).

Indeed, the biasing impact of a false confession has been repeatedly shown to be "potent enough to corrupt other evidence in a case" and, consequently, create a false "appearance of corroboration." Appleby & Kassin, *When Self-Report Trumps Science: Effects of Confessions, DNA, and Prosecutorial Theories on Perceptions of Guilt*, 22 Psychol Pub Pol'y & L 127, 137 (2016). A false confession may influence the testimony of lay eyewitnesses, *id*., and, significantly, also has the power to "taint[] the perceptions of . . . forensic experts[.]" Kassin, *Why Confessions Trump Innocence* at 436-438; accord Kassin et al, *Police-Induced Confessions* at 23-24 (describing a study in which fingerprint experts changed 17% of their previously correct matches or exclusions when presented with a false confession); see also *infra* section II D. Thus, in many of the proven false confession cases, there are "subsequently collected evidentiary

errors[.]" Kassin, *Why Confessions Trump Innocence* at 440.

Furthermore, once admitted into evidence, false confessions have an overwhelming impact on factfinders and, accordingly, *even in the face of compelling evidence of innocence*, the innocent "confessor" is at significant risk of wrongful conviction. In fact, 22% of exonerees whose wrongful convictions were based on confession evidence now known to be false were convicted *despite the availability of exculpatory DNA evidence* at the time of trial. See Innocence Project, *DNA Exonerations in the United States* <https://www.innocenceproject.org/dna-exonerations-in-the-united-states/> (accessed Feb 7, 2023). See also Appleby & Kassin, *When Self-Report Trumps Science* at 127-128 (discussing a report analyzing 19 cases in which innocent confessors to rape and/or murder were tried and convicted despite having been exculpated by DNA tests). Social scientists studying the influence of false confession evidence on jurors have found "unequivocal" evidence that "confessions have more impact on verdicts" than most other forms of evidence. Appleby & Kassin, *When Self-Report Trumps Science* at 127-129 (citation omitted). In light of the commonly held belief that people would never falsely confess to a crime themselves, see Costanzo et al, *Juror Beliefs About Police Interrogations, False Confessions, and Expert Testimony*, 7 J Empirical Legal Stud 231, 238-239 (2010), and "the adverse consequences that will follow" a false admission of guilt, people tend to trust confession evidence. Kassin, *False Confessions: How Can Psychology So Basic Be So Counterintuitive?*, 72 Am Psych 951, 956 (2017). Consequently, "people do not adequately discount confessions—even when they are retracted and judged to be the result of coercion." Kassin, *Why Confessions Trump Innocence* at 433-434 (citations omitted).

The undue weight that factfinders give false confession evidence may be exacerbated when the confession is "contaminated," meaning the innocent suspect adopts detailed crime facts

which are suggested to them by interrogating officers. See Garrett, *The Substance of False Confessions*, 62 Stan L Rev 1051, 1079-1083 (2010) (detailing instances in which suggestion by police was apparent in recordings of analyzed false confessions). As a result of contamination—which may occur when, for example, police use leading questions or show photographs of the crime scene or victim to the suspect during the interrogation—many proven false confessions contain detailed factual narratives that the innocent suspect had no knowledge of, but which were suggested, sometimes inadvertently, to the innocent confessor by the interrogating officers. See Appleby et al, *Police-Induced Confessions: An Empirical Analysis of Their Content and Impact*, 19 Psychol Crime & L 111, 124-125 (2013). Because contaminated confessions contain detailed information—supplied by law enforcement—that only the true perpetrator would know, contamination can "create the illusion that a completely false confession is verifiably true." Leo et al, *Promoting Accuracy in the Use of Confession Evidence: An Argument for Pretrial Reliability Assessments to Prevent Wrongful Convictions*, 85 Temp L Rev 759, 764 (2013).

The tendency of law enforcement to truncate an investigation after a confession is elicited and the inclination of factfinders to credit confession evidence not only make wrongful convictions of innocent confessors highly likely but may also allow the actual perpetrators to remain at large without accountability. *Id*. at 771-73; see Innocence Project, *DNA Exonerations in the United States* <https://www.innocenceproject.org/dna-exonerations-in-the-united-states/> (accessed Feb 7, 2023) (noting that, since the first DNA exoneration in 1989, there were 48 additional crimes—including 25 murders—that were committed by the true perpetrators of crimes for which innocent false confessors were wrongfully convicted).[28] The elicitation and admission into evidence of false confessions thus present a high risk of injustice not only for

[28] In wrongful convictions involving SBS/AHT, ending an investigation means that the real cause of the child's injuries—which may have been natural or accidental, rather than the result of intentional abuse—remains unknown.

innocent suspects, but also for crime victims and the local community.

B. MODERN SOCIAL SCIENCE REVEALS THAT SEVERAL "RISK FACTORS" FOR FALSE CONFESSION ARE AT ISSUE

Since the first DNA exoneration in 1989, a comprehensive canon of scientific research has developed, providing empirical data on the factors that lead innocent people to falsely incriminate themselves. These "risk factors"—many of which are present in the instant case—are categorized broadly into the "dispositional" characteristics of the confessor (such as youth or cognitive disability) and the "situational" circumstances of the interrogation itself (such as police interrogation tactics or the environment in which the interrogation occurred). See Kassin et al, *Police-Induced Confessions* at 4.

Although Ms. Lemons's interrogation was not recorded,[29] and thus a fully comprehensive assessment of the interrogation and confession cannot be completed, the available evidence reveals that various "risk factors" for false confession are at issue. See generally *id*. at 3.

Specifically, at the time of the interrogation, Ms. Lemons was presenting with at least two such "dispositional" risk factors for false confession. First, the same day Ms. Lemons's daughter died and just one day after attempting to resuscitate her infant with CPR—an unquestionably traumatic experience—she was arrested, handcuffed, and transported to the police station, where she was isolated and held overnight in a jail cell for approximately twelve

[29] In 2013, Michigan lawmakers passed a law requiring police to video-record custodial interrogations for certain felonies, to "protect[] against wrongful convictions through coerced or misinterpreted statements." See Cook, *Michigan Law to Require Police to Video Record Interviews*, Oakland Press <https://www.theoaklandpress.com/2013/03/24/michigan-law-to-require-police-to-video-record-interviews/> (accessed Feb 7, 2023); see also 2012 PA 479. Without a full recording of an interrogation, the presence of "situational" risk factors may not be revealed, and the extent of any police contamination will inevitably be "difficult to detect." Leo et al, *Promoting Accuracy in the Use of Confession Evidence* at 770. Today, pursuant to this law, Ms. Lemons's custodial interrogation would have been required to be recorded. Ms. Lemons's custodial statements, however, were documented by interrogating officer Chief Williams only after the interrogation and entirely from memory. TT 08/07/06 at 69, 70 (indicating that Williams did not take notes during the interview, despite testifying to "a lot of back and forth" that went undocumented in his written record of the interrogation).

hours before the interrogating officer, Chief Williams, began the interrogation. Individuals who have experienced trauma—such as trauma resulting from the sudden death of a child—are more susceptible to coercion and therefore more likely to falsely incriminate themselves during police interrogation. See, e.g., Drake, *Interrogative Suggestibility: Life Adversity, Neuroticism, and Compliance*, 48 Pers & Individ Differ 493 (2010). Thus, as a result of her recent, acute trauma, Ms. Lemons was particularly susceptible to police coercion and manipulation when Chief Williams interrogated her. Indeed, experts have opined that, as here, when "interrogations occur immediately after a child's death . . . distraught parents . . . may be particularly vulnerable to suggestion, manipulation or memory lapses." Findley et al, *Shaken Baby Syndrome, Abusive Head Trauma, and Actual Innocence: Getting It Right*, 12 Hous J Health L & Pol'y 209, 257–260 (2012) (explaining that "[c]onfessions are particularly problematic in the child abuse area").

Second, Ms. Lemons had been suffering from depression at the time of her interrogation. TT 08/07/06 at 66. Those living with depression are particularly vulnerable to false confession because "[d]epression . . . frequently causes feelings of excessive or misplaced guilt, which may . . . facilitate internalization of inaccurate police narratives of events." Rogal, *Protecting Persons with Mental Disabilities from Making False Confessions: The Americans with Disabilities Act as a Safeguard*, 47 NM L Rev 64, 70 (2017) (noting that "mental disabilities, such as . . . depressive[] . . . disorders, can . . . increase vulnerability to police interrogation"). Today, experts overwhelmingly agree that there is reliable scientific evidence that demonstrates that "[i]ndividuals with diagnosed psychological disorders are particularly vulnerable to influence during an interrogation." Kassin et al, *On the General Acceptance of Confessions Research: Opinions of the Scientific Community*, 73 Am Psychol 63, 70 (2018). Thus, Ms. Lemons's

underlying mental health condition likely exacerbated her trauma-induced vulnerability to police coercion.

Not only did Ms. Lemons present with at least two dispositional risk factors—trauma and depression—rendering her vulnerable to interrogation coercion, but Chief Williams also engaged in a powerfully manipulative interrogation tactic known as the "false evidence ploy." The false evidence ploy is a tactic in which the police lie to a suspect, falsely claiming to have inculpatory evidence—such as DNA evidence, video surveillance or, as here, the final results of a forensic analysis—that does not in fact exist. See generally Kassin et al, *Police-Induced Confessions* at 28. Because of the false evidence ploy's demonstrated power to induce the innocent suspect to falsely confess, experts agree that the ploy is a "situational" risk factor for false confessions. *Id*.; see also Kassin et al, *On the General Acceptance of Confessions Research* at 72 (94% of experts surveyed agreed that there is reliable evidence demonstrating that deceiving a suspect about the incriminating evidence against them increases the risk of false confession). Indeed, the tactic has been seen in a vast number of the documented, proven false confessions.[30] Kassin et al*, Police Induced Confessions* at 12.

The false evidence ploy functions to engender feelings of helplessness as the suspect, regardless of guilt or innocence, feels "trapped" based on the perceived "inevitability" of evidence against them and consequently views acceding to officers' suggestions of guilt as their only option. *Id*. at 16-17; see also Kassin, *The Social Psychology of False Confessions*, 9 Soc Issues Pol'y Rev 25, 34 (2015) (concluding, based on scientific studies, that the false evidence ploy has a grave psychological impact and leads to false confessions). The ploy also exacerbates

[30] Because of the risk that the false-evidence ploy will elicit a false confession from an innocent suspect, the Innocent Project, in another amicus curiae brief submitted to this Court in *People v Stewart,* No. 162497, has argued that an interrogating officer's use of a false evidence ploy should render the subsequent confession per se involuntary and inadmissible.

the suspect's stress of denying the interrogators' accusations, thereby incentivizing even innocent suspects to comply with officers' demands for a confession, as such compliance will put an end to the immediate stress of interrogation. See Kassin et al, *Police-Induced Confessions* at 14, 28 (explaining that the goal of an interrogation is "to increase the anxiety and despair associated with denial and reduce the anxiety associated with a confession" and that "the false evidence ploy . . . is designed to thrust suspects into a state of inevitability and despair"). Such confessions—where the innocent suspect ultimately views persistence in their claim of innocence as ineffectual and compliance with officers' insistence on a confession as the better alternative to the stress of continued interrogation—are known as "coerced-compliant" false confessions. *Id*. at 14. Strikingly, experimental research has supported the conclusion that innocent people, *because of their innocence* and corresponding tendency to believe that there will, ultimately, be sufficient evidence to demonstrate their innocence, are paradoxically at particular risk of providing a coerced-compliant confession in response to such coercive tactics. Kassin, *Why Confessions Trump Innocence* at 433 (providing a real-world example of how "*innocence* can put *innocents* at risk" and discussing laboratory experiments that have shown that "innocence is a state of mind that leads people to trust the criminal justice system during interrogation").

Here, Chief Williams used this controversial tactic to elicit Ms. Lemons's confession, telling her that the medical examiner had concluded that shaking was the cause of her daughter's death when, in fact, Dr. Cassin had not yet completed his autopsy. Specifically, prior to the interrogation, Chief Williams spoke to the medical examiner, Dr. Cassin, regarding the

preliminary findings of his examination—the autopsy was not yet complete.[31] TT 08/07/06 at 71. At the time, Dr. Cassin's cause of death determination was "pending," and he told Chief Williams that the injuries that caused Nakita's death could have been intentional *or* accidental. *Id*. at 32, 71. Despite information that the child may have died due to an accident, during the interrogation, Chief Williams "confronted [Ms. Lemons]" with the purported "results of the autopsy . . . show[ing] that [her daughter] had died as a result of being shaken." *Id.* at 62. Thus, while Dr. Cassin had not yet excluded the possibility that the child's death was accidental—a possibility he now indicates is consistent with the evidence in this case[32]—Chief Williams falsely "confronted" Ms. Lemons with the not-yet-existent evidence of the medical examiner's conclusion that "shaking" was the scientifically-established cause of her daughter's death.[33]

Williams's misrepresentation of the autopsy's preliminary findings thus amounted to a psychologically manipulative false evidence ploy, thereby placing Ms. Lemons at heightened risk of falsely confessing to the "shaking" of her child. *Id*. at 12. And even if Dr. Cassin had completed his autopsy—which he had not—confronting Ms. Lemons with his conclusion that the child had suffered SBS/AHT as though it was iron-clad scientific fact was akin to using a false evidence ploy, given the critical doubt that now surrounds the diagnosis. As one federal appellate court explained, using a supposedly incontrovertible medical diagnosis of SBS during interrogation "destroy[s] the information required for a rational choice" and "force[s] on [the suspect] a premise that le[a]d[s] inexorably to the conclusion that he must have been responsible

[31] As noted above, Dr. Cassin made his preliminary postmortem report on 10/11/05, the interrogation occurred on 10/12/05, and the formal autopsy report was completed and sent to the Wayne Police Department on 10/13/05. Mot For Relief From Judg Appendix D Mar 2016 at 77-80.

[32] At the 2017 evidentiary hearing, Dr. Cassin testified that he would now characterize Nakita Lemons's cause of death as "indeterminate, meaning it's unable to be determined." EH 7/19/2017 at 33. He noted that choking on formula was a plausible explanation for her death. *Id*. at 34.

[33] Chief Williams's confrontation of Ms. Lemons with false evidence that "shaking" was the cause of death, despite his knowledge that the cause of death was still unknown, also reveals his likely presumption of her guilt—a bias that risks the misclassification of innocent people as guilty suspects. See generally Leo & Drizin, *The Three Errors: Pathways to False Confession and Wrongful Conviction*, APA (2010) at 13-17.

for [the child]'s death." *Aleman v Village of Hanover Park*, 662 F3d 897, 906 (CA 7, 2011). Particularly, when interrogators' misrepresentation of evidence "foreclose[s] any other conclusion" but that the suspect committed the offense, . . . the suspect's choice of whether or not to confess may be "seriously distort[ed]." *Id*. (quoting *United States v Rutledge*, 900 F2d 1127, 1130–31 (CA 7, 1990)). Here, as in *Aleman*, the interrogator's misrepresentation of medical findings may have "seriously distort[ed]" Ms. Lemons's perception of her choices, rendering her more likely to succumb to the officer's insistence in her guilt and "confess" as an act of compliance, not because of actual guilt.[34] *Id*. Indeed, as that court recognized, when such powerfully manipulative ploys are used during an interrogation, the "confession so induced is worthless as evidence[.]" *Id*. at 907.

C. NEWLY AVAILABLE EVIDENCE UNDERMINES THE VERY SUBSTANCE AND RELIABILITY OF THE CONFESSION EVIDENCE AT ISSUE; RELIEF IS WARRANTED

The Court below relied primarily on Ms. Lemons's unrecorded "confession"—which was elicited in a manner that placed her at risk of falsely confessing—to dismiss the significant, scientific evidence that her daughter likely died as a result of accidental, non-abuse causes, and not because of any intentional abuse or "shaking." Because there is no scientific support for the conclusion that shaking alone can cause the triad of medical findings that Dr. Cassin observed in Nakita, see *supra* Section I and II, then there must be grave doubt as to whether Ms. Lemons's

[34] The Court of Appeals here distinguished Ms. Lemons's case from *Aleman* because Ms. Lemons purportedly raised the possibility of shaking her daughter *before* Williams told her about the autopsy results. *Lemons*, No. 348277 at 10. Further, the Court of Appeals noted that the accused in *Aleman* "repeatedly expressed disbelief that he could have caused the baby's injuries" after his confession, while Ms. Lemons apparently did not do so. *Id*. However, the court relied entirely on Chief Williams's testimony to draw this distinction. As noted, the interrogation was not recorded and was only documented by Williams retroactively after the interrogation had elapsed, entirely from memory. TT 08/07/06 at 70. Williams did *not* take notes during the interview, despite testifying to "a lot of back and forth" that went undocumented in his written record of the interrogation. TT 08/07/06 at 70. Further, the hour-long interrogation produced only two paragraphs in the official police report, meaning that much of the intervening conversation is entirely undocumented. Mot For Relief From Judg Appendix D Mar 2016 at 80.

confession is true. Just as the Court would question any confession that describes the infliction of injuries in a fantastical or implausible way, the confession here describes a mechanism—shaking—that the State's own trial expert now believes is scientifically insupportable as a cause for the particular symptoms the child presented with. Stated simply, the new scientific evidence undermines the very confession itself and thus cannot be relied upon to conclude, as the Court did below, that it is "improbable" that the newly discovered evidence would result in a different outcome at a new trial.[35] *Lemons*, No. 348277 at 8.

Furthermore, the evidence that "would be presented at a new trial"—and thus must be considered in determining whether Ms. Lemons is entitled to relief, *People v Johnson*, 502 Mich 541, 571; 918 NW2d 676 (2018)—would include the social science, discussed *supra*, that demonstrates Ms. Lemons was at risk of providing a coerced, false confession. Although there was some scientific evidence regarding false confessions available at the time of Ms. Lemons's 2006 trial, the scientific evidence has advanced since 2006 in significant ways and the broad scientific consensus regarding two of the relevant risk factors at issue here—the false evidence

[35] Other than the unrecorded, unreliable confession evidence, the Court of Appeals also cited the only other evidence against Ms. Lemons to deny relief—her failure to promptly call 911 when her daughter first exhibited signs of distress as a basis for denying relief. TT 08/07/06 at 11. The incorrect assumption that a person's hesitation to call 911 is necessarily indicative of guilt can have tragic consequences, as exemplified by the wrongful conviction of Clemente Aguirre-Jarquin. Aguirre-Jarquin was wrongfully convicted in 2004 for the murder of two women, whose bodies he found after walking inside his neighbor's home shortly after the true perpetrator committed the violent attack. NRE, *Clemente Aguirre-Jarquin* <https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=5406> (accessed Feb 16, 2023). Fearing the killer, he picked up a knife to arm himself, confirmed no one else was there, then sprinted back to his house where he could have called 911, but did not. *Id*. Aguirre-Jarquin later explained that he did not call for emergency assistance because he was undocumented and feared deportation from the United States. *Id*. Fourteen years after his wrongful conviction for the double homicide, DNA evidence exculpated him, and the prosecution ultimately dismissed all charges. *Id*.

Here, the Court of Appeals' assumption of guilt based on Ms. Lemons's decisions in the moments immediately after she found her daughter struggling to breathe failed to acknowledge that Ms. Lemons immediately sought help as soon as her daughter's health was at risk and did so from three different sources: her neighbor, her wife, and her wife's mother. TT 08/03/06 at 100-101. Further, Ms. Lemons's initial hesitation to call 911 may be attributable to her lived experiences and interactions with institutions of authority as a Black person who identified as "transsexual" at the time. Mot For Relief From Judg Appendix D Mar 2016 at 80. Accord Seo et al, *Barriers and Disparities in Emergency Medical Services 911 Calls for Stroke Symptoms in the United States Adult Population: 2009 BRFSS Survey*, 15(2) West J Emerg Med, 251, 259 (2014) ("[I]ndividually, socio-economically, or financially vulnerable populations might encounter more barriers to calling 911 for EMS services.").

ploy and Ms. Lemons's psychiatric condition—had not yet been documented. Moreover, the scientific research regarding the connection between trauma and susceptibility to false confession had not yet been studied in 2006. Accordingly, this new, previously unavailable social science regarding the relevant false confession risk factors further undermines the State's theory of Ms. Lemons's alleged guilt, increases the probability that she would be acquitted at a new trial, and thus supports her motion for relief from judgment. *Id*.

Since Ms. Lemons's 2006 trial, the social science on false confessions has advanced in significant ways. The seminal "White Paper" on false confessions, commissioned by the American Psychology-Law Association (AP-LS), which firmly established the taxonomy of "dispositional" and "situational" risk factors, was not published until 2010—years after Ms. Lemons's trial. See Kassin et al, *Police-Induced Confessions* at 16-23; Kassin, *False Confessions* at 955. Further, it was not until 2018 that researchers published a peer-reviewed meta-analysis of the laboratory experiments regarding false confessions. See Stewart, Woody & Pulos, *The Prevalence of False Confessions in Experimental Laboratory Simulations: A Meta-Analysis*, 36(1) Behav Sci & L, 12 (2018). Significantly, the 2018 meta-analysis concluded that "laboratory false confession research is no longer a fledgling field or specialized research paradigm, but rather an established and growing body of tested, reliable, peer-reviewed experimental research accepted by relevant scientific communities[.]" *Id*. at 26 (internal citations omitted). The study also found that, "[a]cross studies and methods, [false evidence ploys] that included presentation of described or actual fabricated evidence increased rates of false confessions." *Id*. at 23.

The same year that the 2018 meta study was published, social scientists published a survey of experts in the scientific community of confession psychology,[36] and found that various dispositional and situational risk factors are widely and generally accepted by the scientific community. See Kassin et al, *On the General Acceptance of Confessions Research*. As relevant here, and as noted above, the 2018 survey demonstrated that experts overwhelmingly agree that there is reliable scientific evidence to establish that "presentations of false incriminating evidence during interrogation increase the risk that an innocent suspect would confess to a crime he or she did not commit[,]" and that individuals with diagnosed psychological disorders are "particularly vulnerable" to influence during interrogation. *Id*. at 70-72; see also Snook et al, *Urgent Issues and Prospects in Reforming Interrogation Practices in the United States and Canada*, 26(1) Legal & Crim Psychol at 10 (2021) (noting that "the scientific community is in agreement regarding the risk of false evidence" in interrogation because it is "clear that misinformation renders people vulnerable to manipulation" and "[n]umerous laboratory experiments specifically demonstrate the false evidence effect").

Moreover, the scientific research regarding the correlation between the experience of trauma—like the loss of a child—and susceptibility to interrogation coercion did not exist in 2006. The first study that aimed to measure the suggestibility or vulnerability of people who have reported experiencing a significant trauma was not published until 2008, two years after Ms. Lemons's conviction. Drake et al, *Interrogative Suggestibility, Self-Esteem, and the Influence of Negative Life-Events*, 2(13) Legal & Crim Psychol, 299 (2008). Today, there are now thirteen such studies which have found a correlation between trauma exposure and a

[36] Survey participants (1) held a Ph.D. in psychology, sociology, criminology, criminal justice, or another empirical social science, and (2) published, within the last 15 years and in a peer-reviewed journal, at least one article relating to interrogations and/or confessions; or (3) testified as an expert witness in court on the issue of police interrogations and confessions.

person's heightened suggestibility and compliance levels, and resultant increased risk of providing a false confession. See, e.g., Drake, *The Role of Trait Anxiety in the Association Between the Reporting of Negative Life Events and Interrogative Suggestibility*, 60 Personality & Individual Differences, 54 (2014); Drake, *Further Insights into the Relationship Between the Experience of Life Adversity and Interrogative Suggestibility*, 51(8) Personality & Individual Differences, 1056 (Dec 2011). Furthermore, it was not until 2012, six years after Ms. Lemons's conviction, that the novel concept of "'interrogation-related regulatory decline' (IRRD)—or decline in the self-regulation abilities necessary to resist the forces of influence inherent to interrogation[,]"—was introduced by experts as a mechanism for better understanding the psychological processes experienced by a subject who falsely confesses, which, in turn, helped inform future scientific assessments on how trauma . . . impacts such "regulatory decline." See Davis & Leo, *Interrogation-Related Regulatory Decline: Ego Depletion, Failures of Self-Regulation, and the Decision to Confess*, 18(4) Psychol Pub Pol'y & L 673, 673 (2012).

In sum, the new scientific evidence Ms. Lemons presented below suggests that there was, in fact, no "shaking" for Ms. Lemons to confess to, and thus severely undermines the reliability of her alleged statement. Moreover, the modern social science regarding the false confession risk factors at issue here—which further undermines the reliability of Ms. Lemons's confession—compels a conclusion that "a different result [is] probable on retrial." Accord *Johnson*, 502 Mich at 579.

D. "FORENSIC CONFIRMATION BIAS" MAY LEAD TO A FALSE APPEARANCE OF CORROBORATION IN CASES INVOLVING FALSE CONFESSIONS; CONFESSION EVIDENCE MUST NOT BE A BAR TO RELIEF

The lessons learned from dozens of wrongful conviction cases and recent social science demonstrate that unreliable confession evidence can bias the investigative process and result in

the collection of additional false evidence, due to implicit biases among forensic practitioners and other criminal legal system actors. A false confession can thus initiate a "bias snowball effect," creating a false appearance of weighty evidence against an innocent person. Kassin et al, *The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions*, 2 J Applied Res Memory & Cognition 42, 46 (2013). This concept, referred to as "forensic confirmation bias," is defined as a "class of effects through which an individual's preexisting beliefs, expectations, motives, and situational context influence the collection, perception, and interpretation of evidence during the course of a criminal case." *Id*. at 45*;* see also Kassin, *Why Confessions Trump Innocence* at 436-38.

Indeed, there has been a recent emergence of new scientific studies demonstrating the impact of forensic confirmation bias on forensic practitioners, including forensic pathologists, revealing that cause-of-death decisions—like the SBS findings rendered by Dr. Cassin in this case—are routinely influenced by medically-irrelevant, biasing information, such as a confession.[37] See generally Almazrouei et al, *The Forensic Disclosure Model: What Should Be Disclosed* to*, and* by*, Forensic Experts?*, 59 Intl J L, Crime & Just 1, 1 (Dec 2019) (explaining that "[a] growing body of empirical research has demonstrated the existence of biases in forensic expert decision making across forensic domains[.]"); see also Dror et al, *Cognitive Bias in Forensic Pathology Decisions*, 66 J Forensic Sci 1751, 1751 (2021); Jenkins et al, *Testing the Forensic Confirmation Bias: How Jailhouse Informants Violate Evidentiary Independence*, 8 J Police & Crim Psychol at 2 (2021) (noting that "research has found that contextual information

[37] Sources of confirmation bias include: "something about th[e] case" itself, like a confession; something particular to the forensic analyst's "experience, their personality, their working environment, their motivation, etc.[,]"; as well as biases that "arise from human nature, the very cognitive architecture of the human brain that we all share, regardless of the specific case or the specific person doing the analysis." Dror, *Cognitive and Human Factors in Expert Decision Making: Six Fallacies and the Eight Sources of Bias*, 92 Analytical Chem 7998, 7999 (2020).

can change the perceptions of . . . forensic experts in their analyses of forensic evidence") (internal citation omitted). Recently, in 2021, social scientists demonstrated for the first time that there are "biases in manner of death determinations among forensic pathologists, the principle medical arm of the death investigation system." Dror et al, *Cognitive Bias in Forensic Pathology* at 1752.

Forensic confirmation bias is implicit, unintentional and, as such, cannot be controlled or willed away by the practitioner. Dror, *Cognitive and Human Factors in Expert Decision Making* at 7999 (explaining that "no one is immune to bias, not even experts."). Although unintentional, the impact of biasing information can pervade every aspect of the forensic process, as it has been shown to even "impact the actual *observation* and *perception*" of the relevant data or evidence, as well as "testing strategies." *Id*. at 7998 (emphasis added). This, in turn, "infect[s] how courts interpret evidence, creating 'an 'investigative echo chamber' . . . whereby misinterpreted evidence compounds and affects how courts evaluate corroboration." *People v Powell*, 37 NY3d 476, 530; 182 NE3d 1028 (2021) (Rivera, J., dissenting) (internal citations omitted).

The research on forensic confirmation bias also reveals that implicitly biased conclusions drawn about evidence in a criminal investigation are "bidirectional," meaning that "evidence influences conclusions, which, in turn, influence the evaluation of other evidence." Hasel & Kassin, *On the Presumption of Evidentiary Independence*: *Can Confessions Corrupt Eyewitness Identifications?*, 20 Psychol Sci 122, 125 (2009). Accordingly, "just as confessions can taint other evidence, other evidence [such as faulty forensic diagnoses] can taint confessions as well." Kassin et al, *The Forensic Confirmation Bias* at 48. Real-world examples of the bidirectional nature of forensic confirmation bias abound. Indeed, in a 2012 review of known false confession cases, additional evidentiary errors were found in an overwhelming majority—78%—of the false

confession cases examined. Kassin et al, *Confessions that Corrupt: Evidence From the DNA Exoneration Case Files*, 23 Psychol Sci 41, 42 (2012). In other words, the majority of known false admissions of guilt by demonstrably innocent people were "corroborated" by other evidence that erroneously pointed to the innocent confessor's guilt.

This case exemplifies the potential for unreliable evidence to bias the proceedings and create additional, false indicia of guilt. Indeed, the record reveals that Ms. Lemons's confession may have impacted Dr. Cassin's final postmortem report that conclusively diagnosed the child's symptoms as SBS. Accord *id*. at 43 (explaining that a review of wrongful convictions involving false confessions revealed that confessions have the power to "corrupt[] . . . expert witnesses"). Here, Dr. Cassin made his preliminary postmortem report on 10/11/05, the interrogation occurred on 10/12/05, and the formal autopsy report was completed and sent to the Wayne Police Department on 10/13/05. Mot For Relief From Judg Appendix D Mar 2016 at 77-85. As noted, Dr. Cassin's preliminary report expressed uncertainty about the cause of Nakita's death—which was listed as "pending"—and had not yet opined as to whether the injuries were caused intentionally or accidentally. TT 08/07/06 at 32, 71. Prior to making his final report on 10/13/05, Dr. Cassin received a call from Chief Williams. Mot For Relief From Judg Appendix D Mar 2016 at 83. While there is no direct evidence indicating that Chief Williams informed Dr. Cassin of Ms. Lemons's confession to "shaking" before Dr. Cassin made his final report—and Dr. Cassin testified at the post-conviction evidentiary hearings that he did not recall whether or not he was informed, see EH 7/29/2017 at 37—a factfinder at a new trial would be entitled to draw that inference and weigh the evidence accordingly.

In light of the danger that unreliable confession evidence may bias the investigation and collection of evidence, a confession extracted by police interrogation must not bar an otherwise

meritorious claim based on newly discovered evidence. To hold otherwise would risk that innocent people who were coerced into "confessing" are wrongfully convicted and left without meaningful remedy, despite, as here, presenting compelling new evidence that undermines their conviction.

CONCLUSION

To ensure adequate remedies for wrongful convictions based on unreliable forensic evidence regarding SBS/AHT diagnoses and false confessions, amici respectfully urge this Court to grant Ms. Lemons relief and, in so doing, hold that (1) biomechanical engineering expert testimony is admissible if proffered by a qualified expert in a relevant case involving SBS/AHT allegations, and (2) in light of a confession's power to corrupt other evidence in a case and create false indicia of corroboration, confession evidence is not a bar to an otherwise meritorious motion for a new trial based on newly discovered evidence.

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Respectfully submitted,

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