COMMONWEALTH OF MASSACHUSETTS
SUPREME JUDICIAL COURT

No. SJC-11928

COMMONWEALTH OF MASSACHUSETTS,
Appellee,

v.

OSWELT MILLIEN,
Appellant.

BRIEF OF AMICUS CURIAE THE INNOCENCE NETWORK IN SUPPORT OF APPELLANT

November 23, 2015

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INTEREST OF AMICUS CURIAE

The Innocence Network (the "Network") is an association of more than sixty organizations dedicated to providing pro bono legal and investigative services to convicted individuals seeking to prove their innocence. The sixty-six current members of the Network represent hundreds of prisoners with innocence claims in all 50 states and the District of Columbia, as well as Canada, the United Kingdom, Ireland, Australia, New Zealand, and the Netherlands. Based on its experience exonerating innocent individuals and examining the causes of wrongful convictions, the Network has become keenly aware of the role that unreliable or improper scientific and medical evidence has played in producing miscarriages of justice, particularly in cases such as the instant case where the prosecution is entirely dependent on expert opinions. The "science" underlying such convictions has been exposed as flawed, disputed, or outright false.

In approximately half of the over 330 convictions later overturned through DNA evidence in the United States, flawed or inaccurate forensic and/or medical evidence played a role in the wrongful conviction.

Therefore, especially in science-dependent cases such as the present one, the Network is committed to ensuring, as an essential component of a fair and just determination of the facts, that convictions are premised upon accurate scientific and medical evidence—an interest directly implicated by Oswelt Millien's case.

STATEMENT OF FACTS

In the interest of brevity, the Network adopts by reference the statement of facts as set forth in Mr. Millien's initial brief.

SUMMARY OF ARGUMENT

Prosecutions based on the disputed scientific or medical hypothesis of shaken baby syndrome or abusive head trauma ("SBS/AHT") pose a serious risk of wrongful conviction. Here, the Commonwealth's medical experts testified that Mr. Millien must have intentionally caused injury to his infant daughter based simply on specific symptoms with which she presented and the assumption that there could be no explanation other than intentional abuse. Put simply, this explanation exceeds the limits of science.

The risk that invalid scientific or medical testimony results in wrongful conviction is especially high when the prosecution relies almost exclusively on expert opinion to make its case, as it did here. The scientific and medical community now recognizes that the so-called "SBS/AHT hypothesis" leads to scientifically unsupportable conclusions premised on deeply flawed research. Given the contemporary understanding that the triad of medical findings observed in Mr. Millien's daughter, Jahanna, can be attributed to a wide variety of causes completely unrelated to shaking, the SBS/AHT hypothesis cannot be used to diagnose abuse without corroborating evidence.

Inadequate representation also contributes to wrongful convictions, especially when questioned forensic or medical evidence is not rigorously tested. In particular, a defense lawyer's failure to investigate a viable scientific defense, like Mr. Millien's counsel's failure to even consult with a medical expert, is manifestly unreasonable, contrary to the Sixth Amendment's guarantee of effective assistance, and just the sort of conduct that can lead to wrongful convictions.

Finally, because Mr. Millien's trial counsel could have recognized and effectively rebutted the SBS/AHT testimony in this case with the assistance of an appropriate expert, the use of an expert would have made a meaningful difference in Mr. Millien's defense. This is particularly true where the prosecution's experts gave incorrect and unsupported testimony that could have been rebutted by an appropriate defense expert, who also could have supported the defense's theory that Jahanna sustained her injuries from an accidental short fall onto a hard surface.

ARGUMENT

I. Prosecutions Based On Disputed Scientific Or Medical Hypotheses, Like The SBS/AHT Hypothesis, Pose A Serious Risk Of Wrongful Conviction.

In the United States alone, DNA evidence has thus far been used to exonerate over 330 people who were convicted of crimes they did not commit. Faulty and misleading forensic or medical evidence — like the expert medical testimony on which Mr. Millien's conviction was based — contributed to the underlying conviction in nearly half of these cases.[1] Here, the Commonwealth's medical experts testified that Mr.

[1] See Innocence Project, Forensic Oversight, available at http://www.innocenceproject.org/fix/Crime-Lab-Oversight.php.

Millien had to have caused the injuries sustained by his infant daughter, Jahanna, due to the specific symptoms with which she presented and the assumption that there could be no explanation other than intentional abuse. Based on today's understanding of shaken-baby syndrome and abusive head trauma ("SBS/AHT"), it is clear that this type of testimony is deeply flawed because, put plainly, it exceeds the limits of science.

The perils of invalid scientific and medical testimony are amplified in cases where, as here, the prosecution relies almost entirely on expert opinions to attempt to prove the elements of a crime and the identity of a perpetrator. That is, cases alleging unwitnessed child abuse, especially those dependent on the so-called "SBS/AHT hypothesis," carry an even greater danger of wrongful conviction.[2] In SBS/AHT cases like that of Mr. Millien, the problematic, untested, and highly controversial SBS/AHT hypothesis is used as the foundation for every element of the

[2] See Deborah Tuerkheimer, Science-Dependent Prosecution and the Problem of Epistemic Contingency: A Study of Shaken Baby Syndrome, 62 Ala. L. Rev. 513 (2011).

alleged offense; oftentimes, no other evidence is offered to corroborate or establish proof of guilt.

In its classic form, the SBS/AHT hypothesis suggests that abuse caused by the shaking of an infant can be diagnosed when the infant presents with a so-called "triad" of findings: (1) subdural hematoma, (2) retinal hemorrhage, and (3) cerebral edema or encephalopathy. Under the SBS/AHT hypothesis, the logic supposedly follows that if an infant presents with this triad of symptoms, the only explanation is intentional abuse by the person physically with the child at the time closest to manifestation of symptoms.

Cases premised on the SBS/AHT hypothesis typically follow three steps. First, the prosecution calls a doctor as an expert witness to testify regarding the cause and manner of the child's death or injuries and to opine that the child's observed medical condition could have been caused only by shaking the infant, or shaking and some additional impact. Second, the testifying expert relies on the hypothesis to identify the perpetrator by telling the jury that the last person physically with the child had to be the abuser because the child would have

exhibited symptoms immediately upon infliction of the abuse. Finally, the prosecution's expert draws a conclusion about the defendant's purported state of mind by postulating that the injuries in question required such massive force that they could only have occurred through an intentional act.[3]

In the end, the SBS/AHT hypothesis—especially when used as the only means of proving the elements of a crime—simply cannot support the conclusions drawn. The SBS/AHT hypothesis lacks the hallmarks traditionally associated with science (which are required of admissible expert testimony), and the research on which the hypothesis is based is replete with foundational and design flaws. Perhaps most significantly, the SBS/AHT hypothesis is undermined by the problem of circularity: the very signs or conditions beings studied for their diagnostic value are used to categorize the cases under study as either

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[3] Keith A. Findley, et al., Shaken Baby Syndrome, Abusive Head Trauma, and Actual Innocence: Getting It Right, 12 Hous. J. Health L. & Pol'y 209 (2012); Deborah Tuerkheimer, The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts, 87 Wash. U. L. Rev. 1 (2009).

abuse or non-abuse.[4] Put another way, the researchers assume the very conclusion they are studying.

Commentators and researchers in the field of SBS/AHT, including the most ardent supporters of the SBS/AHT hypothesis, acknowledge that circularity plagues the research and that it is difficult to conduct high-quality, unbiased research on the effects of shaking on infants.[5] While these challenges highlight the deficiencies in the underpinnings of the hypothesis, they cannot excuse criminal convictions based on inadequate, methodologically questionable research. And while advocates of the classic hypothesis call instead for reliance on the clinical judgment of examining physicians in the absence of a robust scientific foundation, as the Supreme Court has made clear, the ipse dixit of a group of purported experts cannot on its own suffice to establish reliable scientific evidence. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 157 (1999) (internal quotation omitted).

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[4] Findley, *supra* n. 3, at 274.

[5] Sandeep Narang, A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome, 11 Hous. J. Health L. & Pol'y 505, 529-32 (2011); Findley, *supra* n. 3, at 236.

In light of the dispute and evolving understanding in the medical community with respect to the SBS/AHT hypothesis, courts around the country have begun to reverse convictions based on SBS diagnoses by medical experts. Recognizing the recent developments in evidence-based medicine and biomechanical research, courts have begun to question the viability of the SBS/AHT hypothesis as utilized in criminal prosecutions. In a 2011 dissent, U.S. Supreme Court Justice Ginsburg observed that "[b]y the end of 1998, it had become apparent that … the commonly held opinion that the finding of [subdural hemorrhage] and [retinal hemorrhage] in an infant was strong evidence of SBS was unsustainable." Cavazos v. Smith, 132 S. Ct. 2, 10 (2011) (Ginsburg, J., dissenting).

In recent years, both federal and state courts have overturned convictions obtained through the use of a medical expert utilizing the SBS/AHT hypothesis to demonstrate alleged guilt. For example:

- Wisconsin v. Edmunds (2008) – in Edmunds, a Wisconsin state appellate court ordered a new trial for a defendant convicted in a SBS/AHT case solely on the basis of expert medical testimony, holding that newly discovered evidence undermined the validity of the SBS/AHT hypothesis. See Wisconsin v. Edmunds, 308 Wis. 2d 374, 392 (Wis. Ct. App. 2008). The court stated there that "there

has been a shift in mainstream medical opinion since the time of [the defendant]'s trial as to the causes of the types of trauma [the infant] exhibited." Id. at 391. Citing the "emergence of a legitimate and significant dispute within the medical community" regarding the SBS/AHT hypothesis, the court found that a jury might have reasonable doubt as to the defendant's guilt. Id. at 392. The state subsequently dismissed all charges against Edmunds.

- Del Prete v. Thompson (2014) - in Del Prete, a federal court in Illinois found that newly discovered evidence discrediting the SBS/AHT hypothesis demonstrated the innocence of a woman convicted on the basis of a SBS diagnosis in 2005. See Del Prete v. Thompson, 10 F. Supp. 3d 907, 958 (N.D. Ill. 2014). The court found that new evidence based on today's understanding of SBS/AHT "[gave] rise to abundant doubt, not merely reasonable doubt, regarding Del Prete's guilt." Id. at 957. The court observed that recent scientific developments discrediting the SBS/AHT hypothesis "arguably suggest[] that a claim of shaken baby syndrome is more an article of faith than a proposition of science." Id. at 957 n.10.

- Dobson v. Maryland (2014) - in Dobson, a Maryland court ordered a new trial for a defendant convicted in 2010 under the SBS/AHT hypothesis, finding that the defendant had received ineffective assistance of counsel when her trial attorney failed to call expert witnesses to challenge the SBS diagnosis of the prosecution's experts. See Order at 26-27, Dobson v. Maryland, No. 20-K-09-9572 (Cir. Court, Kent County, Apr. 7, 2014).

- People v. Bailey (2014) - in Bailey, a New York court granted a new trial on the basis of newly discovered evidence for Renee Bailey, who was convicted in 2002 on the

> basis of a SBS diagnosis of abuse. See People v. Bailey, 47 Misc. 3d 355, 374 (Sup. Ct. Monroe County 2014). The court determined that "there has been a compelling and consequential shift in mainstream medical opinion since the time of the defendant's trial as to the causes of the types of trauma that [the infant] exhibited." Id. at 373.

In the end, the recent and escalating judicial recognition of developments in the scientific understanding of the SBS/AHT hypothesis undermine the validity of convictions secured wholly or in large part on the basis of this theory. It is clear that convictions like that of Mr. Millien, based almost exclusively on the SBS/AHT hypothesis, lack the scientific foundation necessary to sustain a diagnosis of SBS/AHT and, it surely follows, guilt beyond a reasonable doubt.

II. The SBS/AHT Hypothesis, And Its Specific Application In This Case, Is Not Supported By Contemporary Scientific And Medical Research.

Over the past two decades, a growing body of scientific and medical research has demonstrated that the presence of the so-called "triad" of symptoms associated with SBS/AHT does not prove that an infant was abused. And despite the confidence with which some medical experts testify, the SBS/AHT hypothesis is far from established in the scientific and medical

community. Recent research in the fields of evidence-based medicine and biomechanics has demonstrated that the combination of subdural hematoma, retinal hemorrhage, and cerebral edema is diagnostic neither of abuse in general, nor of the specific finding of abuse by shaking. Moreover, recent research has demonstrated that the SBS/AHT "triad" of medical findings cannot be used to determine the level of force applied or the time at which an injury occurred.

A. Subdural Hematoma, Retinal Hemorrhage, And Cerebral Edema Or Encephalopathy Have A Wide Variety Of Cases Unrelated To Trauma Or Abuse.

Taking into account the recent research and developments in the field, the triad of medical findings traditionally associated with the SBS/AHT hypothesis may not be used to make an unequivocal diagnosis of SBS/AHT. More specifically, each of the "triad" of findings is now known to be associated with any of a number of accidental or non-traumatic causes, thus undermining the level of certainty typically communicated as to a SBS/AHT diagnosis.[6] Moreover,

[6] See M. Vaughn Emerson, et al., Ocular Autopsy and Histopathologic Features of Child Abuse, 114 Am. Acad. Ophthalmology 1384, 1393 (2007) ("[M]uch of what we think we know about the systemic and ocular findings

when combined with an absence of neck injuries — as was the case here — the triad of injuries provide even less support for a diagnosis of SBS/AHT.[7]

Regarding subdural hematoma, the classic formulation of the SBS/AHT hypothesis suggests that an act of shaking causes the brain's bridging veins and axons to rupture, leading to the bleeding and swelling associated with SBS/AHT.[8] However, the scientific and medical community now recognizes many different reasons for subdural hematoma, including natural and accidental causes.[9] Indeed, according to several

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of child abuse will continue to be the result of speculation rather than based on sound evidence").

[7] Faris A. Bandak, Shaken Baby Syndrome: A Biomechanics Analysis of Injury Mechanisms, 151 Forensic Sci. Int'l 71, 78 (2005) ("Head acceleration and velocity levels commonly reported for SBS generate forces that are far too great for the infant neck to withstand without injury"); A.K. Ommaya, et al., Biomechanics and Neuropathology of Adult and Pediatric Head Injury, 16 Brit. J. Neurosurg. 220, 228-29 (2002) (observing that biomechanical research demonstrates that, in the case of manual shaking of an infant by an adult, "the neck torque in the infant would cause severe injury to the high cervical cord and spine long before the onset of cerebral concussion").

[8] See M.E. Case, et al., Position Paper on Fatal Abusive Head Injuries in Infants and Young Children, 22 Am. J. Forensic Med. & Pathology 112, 112 (2001).

[9] See J.F. Geddes, et al., Neuropathology of Inflicted Head Injury in Children, Microscopic Brain Injury in Infants, 124 Brain 1290, 1304 (2001) ("[B]rain damage responsible for loss of consciousness in the majority

studies, bleeding and swelling in the brain in infants is actually more likely to be explained by a non-traumatic cause, given the relatively small amount of bleeding generally found in alleged SBS/AHT cases.[10]

With respect to the second of the triad of findings associated with the SBS/AHT hypothesis, retinal hemorrhages are also now known to result from various causes other than abuse. Under the SBS/AHT hypothesis, experts usually testify that an infant's eye injuries were caused by violent shaking due to the number and multilayered nature of retinal hemorrhages

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of cases is hypoxic rather than traumatic"); see also Mark S. Dias, The Case for Shaking, Child Abuse and Neglect: Diagnosis, Treatment, and Evidence, 362, 368 (Carole Jenny, ed., 2011) ("It is becoming increasingly clear from both neuroimaging studies and post-mortem analyses of fatal cases that the widespread cerebral and axonal damage in cases of AHT are, in fact, ischemic rather than directly traumatic in nature").

[10] See Geddes, et al., *supra* n. 9, at 1297 (explaining that the subdural bleeding sometimes seen in infants is very different from the bleeding that would be expected to result from the bursting of the high-volume bridging veins thought to be caused by shaking); Waney Squier & Julie Mack, The Neuropathology of Infant Subdural Hemorrhage, 187 Forensic Sci. Int'l 6, 7-8 (2009); Marta Cohen & Irene Scheimberg, Evidence of Occurrence of Intradural & Subdural Hemorrhage in the Perinatal and Neonatal Period in the Context of Hypoxic Ischemic Encephalopathy: An Observational Study from Two Referral Institutions in the United Kingdom, 12 Pediatric & Dev. Pathology 169, 175-76 (2009).

and the presence of perimacular retinal folds. However, research now demonstrates that the scientific basis for such an opinion is anything but conclusive.[11] And even proponents of the SBS/AHT hypothesis now concede that retinal hemorrhaging is consistent with a number of other potential causes, both traumatic and non-traumatic.[12]

While retinal hemorrhages may result from trauma caused by tremendous force, they may alternatively result from numerous other traumatic and non-traumatic causes, including short falls, metabolic disease, nutritional deficiencies, genetic syndromes, tumors, stroke, infection, hypoxia, hypotension, hypertension,

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[11] See Ommaya, *supra* n. 7, at 233 ("The hypothesis of 'intra-ocular' retinal hemorrhages caused by orbital shaking has not been tested experimentally"); P.E. Lantz, et al., Perimacular Retinal Folds from Childhood Head Trauma, 328 Brit. Med. J. 754, 756 (2004) ("Statements in the medical literature that perimacular retinal folds are diagnostic of [SBS/AHT] are not supported by objective scientific evidence"); accord Gregg T. Leuder, et al., Perimacular Retinal Folds Simulating Nonaccidental Injury in an Infant, 124 Archives Ophthalmology 1782, 1782 (2006).

[12] See, e.g., Alex V. Levin & Cindy W. Christian, Clinical Report—The Eye Examination in the Evaluation of Child Abuse, 126 Pediatrics 376, 376 (2010) ("Retinal hemorrhage is an important indicator of possible abusive head trauma, but it is also found in a number of other conditions.").

and cranial pressure.[13] In fact, retinal hemorrhages have resulted from cardiopulmonary resuscitation (CPR) without trauma.[14]

Finally, cerebral edema and encephalopathy are indisputably and universally known to result from any type of insult to the brain. Cerebral edema is defined as "excessive accumulation of fluid in the brain substance," and encephalopathy is defined as "any degenerative disease of the brain." Dorland's Medical Dictionary at 568, 590 (29th Ed. 2000). The swelling and encephalopathy previously associated with shaking is more likely the result of hypoxia-ischemia, or deprivation of oxygen or oxygenated blood to the brain, a finding that has been acknowledged even by proponents of the SBS/AHT hypothesis.[15] Significantly,

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[13] See Findley, *supra* n. 3, at 214; Evan Matshes, Retinal and Optic Nerve Sheath Hemorrhages Are Not Pathognomonic of Abusive Head Injury, 16 Proc. Am. Acad. Forensic Sci. 272, 272 (2010); Leuder, *supra* n. 11, at 1782.

[14] Mark Goetting & Bonnie Sowa, Retinal Hemorrhage After Cardiopulmonary Resuscitation in Children: An Etiological Reevaluation, 85 Pediatrics 585, 587 (1990).

[15] See Geddes, et al., *supra* n. 9, at 1304 (2001) ("[B]rain damage responsible for loss of consciousness in the majority of cases is hypoxic rather than traumatic"); see also Dias, *supra* n. 9, at 368 ("It is becoming increasingly clear from both neuroimaging studies and post-mortem analyses of fatal cases that

hypoxia-ischemia can result from a variety of accidental and non-traumatic causes, including birth or other accidental trauma, metabolic diseases, nutritional deficiencies, genetic syndromes, clotting disorders, tumors, strokes, and infection.[16] In light of the numerous causes of brain swelling and degenerative brain disease, cerebral edema and encephalopathy are simply not diagnostic of any particular cause of injury to the brain, let alone trauma or abuse. Brain swelling or general brain injury thus add little support to a diagnosis of SBS/AHT and could be as easily caused by any type of accidental trauma or disease.

Given the contemporary understanding in the scientific and medical community that the triad of medical findings can be attributed to a wide variety of causes completely unrelated to shaking or abuse, the SBS/AHT hypothesis cannot be used to diagnose abuse without corroborating evidence. Although

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the widespread cerebral and axonal damage in cases of AHT are, in fact, ischemic rather than directly traumatic in nature.").

[16] See Kent P. Hymel, et al., Intracranial Hemmorhage and Rebleeding in Suspected Victims of Abusive Head Trauma: Addressing the Forensic Controversies, 7 Child Maltreatment 329, 333-37 (2002).

prosecution experts associate certain findings with shaking, the literature is clear that there are many other possible causes for subdural hematoma, retinal hemorrhage, and cerebral edema or encephalopathy. In fact, numerous studies identify patients who present with this triad of symptoms, but who do not have any history of shaking incidents.[17] Put simply, this combination of symptoms — or "constellation," as Dr. Newton referred to them at Mr. Millien's trial and hearing — do not on their own give rise to a definitive diagnosis of abuse.

B. Testimony That A Short Fall Could Not Have Caused The Injuries In This Case Was Erroneous.

Beyond their diagnosis of SBS/AHT, the Commonwealth's medical experts made the claim that a short fall could not have caused Jahanna's injuries. See, e.g., Millien Trial Transcript, Volume 5 ("TT5")

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[17] See, e.g., John Plunkett, Fatal Pediatric Head Injuries Caused by Short-Distance Falls, 22 Am. J. Forens. Med. & Pathology 1, 2-7 (2001); Michael T. Prange, et al., Anthropomorphic Simulations of Falls, Shakes, and Inflicted Impacts in Infants, 99 J. Neurosurg. 143, 149 (2003); Scott Denton & Darinka Mileusnic, Delayed Sudden Death in an Infant Following an Accidental Fall, 24 Am. J. Forensic Med. & Pathology 371, 373-75 (2003); Werner Goldsmith & John Plunkett, A Biomechanical Analysis of the Causes of Traumatic Brain Injury in Infants and Children, 25 Am. J. Forensic Med. & Pathology 89, 94-96 (2004).

at 101; Millien Trial Transcript, Volume 4 ("TT4") at 145. Based both on the evolution of opinion in the medical community and recent research, it is clear that the opinion that short falls cannot cause the type of injuries sustained by Jahanna is disfavored and incorrect.

Though at one time the American Academy of Pediatrics ("AAP") endorsed a presumption of abuse when an infant presented with intracranial injuries like those included in the "triad," the AAP has since revised its position and acknowledged that short falls *can* cause such injuries. Indeed, by 2009, the AAP had revised its official position to reflect developing medical research.[18] The AAP acknowledged the possibility that injuries like those sustained by Jahanna can be caused by accidental falls and stated that "controversy is fueled because the mechanisms and resultant injuries of accidental and abusive head injury overlap." Id. Moreover, recent research demonstrates that short falls can, and in fact

[18] Cindy W. Christian & Robert Block, Abusive Head Trauma in Infants and Children, 123 Pediatrics 1409 (2009).

sometimes do, cause injuries precisely like those sustained by Jahanna.[19]

In evaluating evidence in alleged SBS/AHT cases, courts have also begun to reject the prosecution's contention in this case. In Bailey, a toddler fell from an eighteen-inch-tall chair, suffered serious brain injuries, and later died. People v. Bailey, 47 Misc. 3d 355, 374 (Sup. Ct. Monroe County 2014). At trial, the prosecution claimed that a short fall could not have caused the injuries sustained, which included retinal hemorrhages, a brain contusion, and cerebral edema. At a three-week evidentiary hearing, experts for both the prosecution and defense agreed that short falls can cause fatal injuries. Id. at 20. Indeed, even the prosecution's experts agreed that the testimony presented against Bailey at trial — that short falls cannot kill — was false. Id. at 12. The

[19] See, e.g., J.R. Hall, et al., The Mortality of Childhood Falls, 29 J. Trauma 1273 (1989); P.E. Lantz & D.E. Couture, Fatal acute intracranial injury, subdural hematoma, and retinal hemorrhages cause by stairway fall, 56 J. of Forensic Sci. 1648 (2011); K.A. Kim, et al., Analysis of Pediatric Injuries Caused by Short-Distance Falls, 23 Am. J. Forensic Med. & Path. 1 (2001); P. Steinbok, et al., Early hypodensity on computed tomographic scan of the brain in an accidental pediatric head injury, 60 Neurosurgery 689 (2007).

court concluded that "even falls of just a few feet generate levels of force and velocity that exceed known thresholds for brain injury." Id. at 8, 22.

III. Inadequate Defense Representation Contributes To Wrongful Convictions, Especially When Questioned Forensic Evidence Is Not Rigorously Tested.

Poor lawyering is a major cause of wrongful convictions across the country. One study has found that inadequate assistance of counsel contributed to almost 25 percent of DNA exonerations.[20] Another study identified inadequate defense counsel as a primary factor contributing to wrongful convictions and highlighted counsels' "failure to fully investigate or to offer alternative theories and/or suspects" in mounting a defense.[21] Here, given the dearth of direct evidence introduced against Mr. Millien and the deeply flawed medical testimony relied upon by the prosecution, the dangers of ineffective assistance of defense counsel make the Court's intervention critical.

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[20] Brandon L. Garrett, Innocence, Harmless Error, and Federal Wrongful Conviction Law, 2005 Wisc. L. Rev. 35, 75 (2005).

[21] New York State Bar Assoc., Final Report of the New York State Bar Association's Taskforce on Wrongful Convictions, 6 (2009), available at https://www.nysba.org/WorkArea/DownloadAsset.aspx?id=26663.

A. Failure To Investigate A Viable, Scientific Defense Is Manifestly Unreasonable And Is Conduct That Can Lead To Wrongful Convictions.

Consulting with knowledgeable experts and introducing expert testimony should have been crucial to Mr. Millien's defense in the face of a SBS/AHT hypothesis-based prosecution. Because any reasonable defense strategy would necessarily involve challenging the testimony of the prosecution's witnesses regarding SBS/AHT, there simply is no rational explanation for Mr. Millien's defense counsel's failure to investigate or introduce affirmative evidence and expert testimony undermining this hypothesis.

Under the standard established by this Court, counsel's conduct was "manifestly unreasonable" and constitutes grounds for a finding of ineffective assistance. See Commonwealth v. Walker, 460 Mass. 590, 598-99 (2011). Although ultimately denying Mr. Millien's claim, the Superior Court judge agreed and explicitly found that counsel's representation "fell measurably below that which might be expected from an ordinary fallible lawyer." June 30, 2014 Order of Superior Court Justice S. Jane Haggerty, Commonwealth v. Millien, No. MICR 2009-1522 at 17 (citing

Commonwealth v. Marinho, 464 Mass. 115, 123 (2012)). The appellate court nonetheless denied Mr. Millien's ineffective assistance claim on the basis that a defense expert somehow would not have "added anything substantial to the defense." Millien at 19. This is a misapplication of the U.S. Supreme Court's decision in Strickland v. Washington and its progeny. 466 U.S. 668 (1984) (requiring defendant to show a reasonable probability that the result of the proceeding would have been different "but for counsel's unprofessional errors" and defining "reasonable probability" as "a probability sufficient to undermine confidence in the outcome").

The "affirmative obligation under State and Federal law 'to conduct an independent investigation of the facts' . . . exists because the Sixth Amendment right to counsel is a cornerstone of a fair trial." Commonwealth v. Hampton, 36 N.E.3d 586, 590 (Mass. App. Ct. 2015) (quoting Commonwealth v. Baker *supra*). The Sixth Amendment imposes on counsel a duty to investigate because reasonably effective assistance must be based on professional decisions, and informed legal choices can be made only after an investigation of options. Strickland, 466 U.S. at 680; Commonwealth

v. Baker, 440 Mass. 519, 529 (2003) ("Until [defense counsel investigated the accuracy of the Commonwealth's expert testimony], he simply had no way of making a reasonable tactical judgment."). This Court must review defense counsel's investigation for objective reasonableness at the time of trial. Strickland, 466 U.S. at 689. This standard cannot be met when, as here, an attorney fails to investigate the prosecution's scientific evidence because his client could not afford an expert. See Dugas v. Coplan, 428 F.3d 317, 332 n. 21 (1st Cir. 2005) (finding ineffective trial counsel assistance where counsel failed to "thoroughly investigate the 'not arson' defense and seek expert assistance" for his indigent client). This is especially true when defense counsel knows what evidence the prosecution will use, such as forensic science or a theory founded on such science, and fails to investigate or even attempt to challenge that science and/or theory.

In Wiggins v. Smith, the U.S. Supreme Court found counsel's performance deficient because "counsel chose to abandon their investigation at an unreasonable juncture, making a fully informed decision . . . impossible." 539 U.S. 510, 527-28 (2003). Here, Mr.

Millien's counsel reached such an "unreasonable juncture" when he learned that Mr. Millien's father was not willing to pay for the cost of a defense expert. Aff. of Att'y Stanley E. Greenidge in Support of the Def.'s Mot. for a New Trial ("Greenidge Affidavit") ¶¶6-7, Trial Record at 52-53. Instead of petitioning the court for funds on behalf of his indigent client, he simply abandoned all efforts to locate and consult his own medical expert. Id. As a result, not only was Mr. Millien denied the opportunity to rigorously challenge a theory that has been roundly condemned, but he also was deprived of the expert assistance his counsel needed to effectively cross-examine the prosecution's medical witnesses. See, e.g., Dugas, 428 F.3d at 331 (discussing effect consulting an expert can have on cross-examination and finding that defense counsel "demonstrated a clear lack of understanding of arson investigation and the principles invoked by the state's many expert witnesses"); Commonwealth v. Baran, 74 Mass. App. Ct. 256, 277 (2009) (an expert could have strengthened cross-examination and provided material for rebuttal). Even the court below acknowledged that "Jahanna's medical records and the

literature discussing Abusive Head Trauma involve complicated and technical information which Attorney Greenidge was not qualified to interpret or evaluate." Millien at 17.

Defense counsel's actual cross-examination of the prosecution's key medical expert, Dr. Alice Newton, demonstrates his lack of preparedness and inability to effectively challenge the SBS/AHT hypothesis. For example, instead of rigorously testing the science or asking the expert to confront alternative explanations or studies that conflict with her opinions, counsel focused on whether the doctor thought a violent episode would create a lot of noise (TT5/97-98) and whether the doctor knew if anyone other than Mr. Millien was involved in caring for Jahanna (TT5/75-78, 99-100). Counsel also failed to object when, on direct examination, Dr. Newton stepped far beyond the bounds of her medical "expertise" and observed, "[O]ne thing we know is that many times [] a caretaker is unable to handle a crying infant or an infant who has, you know, provoked him in some way..." TT5/58-59. Dr. Newton, cloaked in the authority of a qualified expert, was evidently suggesting that parents will violently shake or "throw an infant down" if they get

angry. A jury does not need an expert to tell them that parenting can be frustrating; nor is it a medical opinion to say that infants sometimes "provoke" parents into fits of violence.[22] Defense counsel failed to meet even a minimal standard for effective assistance by allowing the jury to hear this kind of comment, unchallenged, from a medical expert. Accordingly, this Court should find that "better work might have accomplished something meaningful for [Mr. Millien's] defense." Baran, 74 Mass. App. Ct. at 272 (quoting Commonwealth v. Satterfield, 373 Mass. 109, 115 (1977)).

Furthermore, while "strategic choices made after thorough investigation of law and facts relevant to plausible options are virtually unchallengeable," here, counsel did no such thing. Strickland, 466 U.S. at 690-91. Instead, by not even consulting an expert regarding the medical issues in the case – forming virtually the entire foundation for the prosecution's

[22] Counsel's failure to object is particularly striking given that this line of testimony should not have been admitted in the first place: "an expert opinion is admissible only where it will 'help jurors interpret evidence that lies outside of common experience.'" Commonwealth v. Canty, 466 Mass. 535, 541 (2013) (citing Commonwealth v. Tanner, 45 Mass. App. Ct. 576, 581 (1998)).

case — Mr. Millien's attorney failed to investigate the "facts relevant to plausible options." See id. Further investigation (in fact, any investigation) would likely have led him to an expert like Dr. Uscinski, the physician who testified at Mr. Millien's post-conviction hearing that Jahanna's injuries could be accounted for by a fall from a 17.5-inch couch onto a hard surface. See, e.g., Millien Evid. Hr'g Tr., Volume 1 ("EHT1") at 46. Had he retained an expert to rebut the prosecution's flawed theory of the medical evidence, his decision would be considered reasonable "precisely to the extent that reasonable professional judgments support the limitations on investigation." Strickland, 466 U.S. at 691. It was manifestly unreasonable for defense counsel to abandon his duty simply because his client could not pay.

B. Hinton v. Alabama Requires A Thorough Investigation Before The Selection Of An Expert.

In Hinton v. Alabama, the U.S. Supreme Court found counsel's performance deficient with respect to his failure to obtain an adequate expert. 571 U.S. __, 134 S. Ct. 1081 (2014). In so doing, the Court recognized the risk of wrongful convictions based on faulty forensic science and that "this threat is

minimized when the defense retains a competent expert to counter the testimony of the prosecution's expert witnesses." Hinton, 134 S. Ct. at 1090. No such threat was minimized in Mr. Millien's case. On the contrary, at Mr. Millien's trial, defense counsel's failure to combat the prosecution's evidence with competent expert testimony served only to exacerbate the threat of wrongful conviction.

In Hinton, a unanimous Supreme Court held that a "trial attorney's failure to request additional funding in order to replace an expert he knew to be inadequate ... constituted deficient performance." Id. at 1088. Counsel can be ineffective where, like in Hinton, defense counsel's decision is based on a mistake of law or on an incomplete investigation of the facts. Here, like in Hinton, no such investigation took place. According to Hinton, this failure to investigate, based on the belief that there were no funds to pay the expert, constitutes ineffective assistance of counsel.

Contrary to the approach taken by the lower court, this case does not require this Court to weigh "the relative qualifications of experts hired and experts that might have been hired." See id. at

1089. The lower court failed in this particular respect by engaging in an improper analysis of the relative weight of the experts' testimony, specifically stating that "due to the *powerful* medical evidence that was before the jury, it is unlikely that an expert's assistance or opinion would have 'accomplished something meaningful for the defense.'" Millien at 18 (emphasis added). The question is not whether any particular doctor was more qualified (or more powerful) than the other; the question is whether counsel performed a "thorough investigation of the . . . facts" before choosing between an expert who could support his theory, and one who could not. Hinton at 1088-89. In Mr. Millien's case, it is uncontestable that his trial counsel made no such investigation.

This Court should heed the warnings of Hinton that a robust investigation by trial counsel is not only required under the law, but necessary to curb the very real threat of wrongful convictions based on the unsupportable and untested opinions of prosecution experts. Hinton at 1089 ("Prosecution experts, of course, can sometimes make mistakes. Indeed, we have recognized the threat to fair criminal trials posed by

the potential for incompetent or fraudulent prosecution forensics experts . . . [s]erious deficiencies have been found in the forensic evidence used in criminal trials") (internal quotations omitted).

The reality of this threat is particularly alarming in jurisdictions like Massachusetts (and Middlesex County), where courts recently have become entangled in high-profile SBS/AHT prosecutions that have been either overturned or dropped based on medical reviews that debunk the "triad" or "constellation" approach taken by those who adhere to the SBS/AHT hypothesis. Two such cases in Massachusetts actually involved testimony from Dr. Newton, a key witness relied upon by the prosecution in its case against Mr. Millien.

In the first example, the Boston Globe reported that Dr. Newton's medical testimony in the trial of Geoffrey Wilson, a former MIT employee charged with violently shaking his infant son to death, was deeply flawed and that a medical examiner later "determined there is no way to tell if the boy in the Wilson case was murdered, [thus] calling into question the diagnosis of one of the prosecution's chief witnesses,

Dr. Alice Newton."[23] Dr. Newton also testified in a failed case against Aisling Brady McCarthy, an Irish nanny accused of killing a child by violent shaking. The case was dropped abruptly after "serious doubts" were raised that the child had been the victim of abusive head trauma.[24] Especially in light of the flawed analyses in these cases, this Court should find that Mr. Millien's trial counsel's representation was meaningfully deficient.

IV. With The Assistance Of An Appropriate Expert, Trial Counsel Could Have Recognized And Effectively Rebutted The SBS/AHT Testimony In This Case.

Much of the state's expert testimony in this case was deeply flawed on multiple levels. If defense counsel had presented expert testimony, Mr. Millien would have been able demonstrate this to the jury — or at least present an alternative theory for Jahanna's

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[23] Zachary T. Sampson, Lawyers argue evidence from separate case could help prove nanny's innocence, Boston Globe, Aug. 14, 2014, available at: http://www.bostonglobe.com/metro/2014/08/14/court-hearing-focus-shaken-baby-syndrome-two-middlesex-county-prosecutions/SyPtkQPvdzAuSU6kE08zcI/story.html.

[24] Peter Schworm, et al., In stunning reversal, nanny's case dropped, Boston Globe, Aug. 31, 2015 available at: https://www.bostonglobe.com/metro/2015/08/31/state-medical-examiner-office-changes-finding-finds-homicide-infant-death/yQSNRpNQwWw5Ha29Bhqs4H/story.html.

injuries. The Superior Court Judge erred by finding that such integral testimony would not have had a meaningful impact on the verdict. And in the end, the jury was left with only the unrebutted, faulty SBS/AHT testimony presented by the prosecution's experts.

A. The Prosecution's Experts In This Case Gave Incorrect And Unsupportable Testimony, Which Could Have Been Rebutted By An Expert.

The prosecution's two chief expert witnesses gave medical testimony that could have been easily rebutted by a competent defense expert. In particular, their testimony concluding that Jahanna's injuries must have been caused by violent shaking was erroneous, as was their testimony that a short fall could not have caused the injuries presented, and conveyed a level of scientifically unsupportable certainty.

i. Experts testified at trial that violent shaking must have caused Jahanna's brain injuries. At a minimum, this assertion implies a scientifically unsupportable level of certainty.

Dr. Newton testified at trial that Jahanna's brain injuries must have been caused by violent shaking. See TT5/67 ("It's my opinion that Jahanna was violently shaken by a caretaker.") However, given today's understanding of SBS/AHT, this assertion conveys a level of certainty that exceeds the limits

of science and medicine. Indeed, Dr. Newton herself attempted to shift her position at Mr. Millien's post-conviction evidentiary hearing when she was confronted with some of her previous trial testimony. See Millien Evid. Hr'g Tr., Volume 3 ("EHT3") at 64.

At the evidentiary hearing, Dr. Uscinski, called by Mr. Millien's post-conviction counsel, provided multiple possible explanations that could account for the brain injuries Jahanna suffered that were not abuse. First, he testified that shaken baby syndrome is "contrary to the laws of physics" (EHT1/45), and that research shows that humans are unable to generate by shaking the force necessary to cause the kinds of injuries Jahanna suffered, like subdural bleeding. EHT1/18. Second, he testified that if a child was injured due to shaking, you would expect to see a broken neck or some spinal injury not seen in Jahanna's scans. EHT1/18, 63, 130 ("the physical impossibility of shaking without injury to the neck is manifest"), 151 (confirming Jahanna's records did not show a neck injury). Third, Dr. Uscinski further testified that some of Jahanna's subdural bleeding could have been "additional bleeding simply by the act of removing the blood and disturbing intact blood

vessels" during the emergency craniotomy performed on her at the hospital. EHT1/83. These medical opinions culminated in Dr. Uscinski's testimony that scalp injuries, skull fractures, diffuse axonal injuries, and cerebral edema could all occur with or without abuse. EHT1/112-113. Accordingly, the jury was misleadingly informed that Jahanna's brain injuries must have been caused by violent shaking.

ii. Experts testified that Jahanna's retinal hemorrhages must have been caused by violent shaking. Again, this conclusion is erroneous, or at a minimum conveys an unsupportable level of certainty.

A second prosecution expert, Dr. Mantagos, testified at trial that Jahanna's retinal hemorrhages were not the result of an accidental fall and instead the result of violent shaking. See, e.g., TT4/144. Dr. Newton also expressed her opinion that "these retinal hemorrhages are related to a violent shaking injury of the child." TT5/64. However, the only conclusion to be drawn from a review of the literature is that retinal hemorrhages appear in severe injury, whatever its cause.[25] Other studies have similarly

[25] See, e.g., P. Watts & E. Obi, Retinal folds and retinoschisis in accidental and non-accidental head injury, Eye Advance, July 18, 2008 (comparing two

indicated that retinal hemorrhages do not assist in distinguishing between accidental and abusive head injuries.[26] At the evidentiary hearing, Dr. Uscinski testified that retinal hemorrhaging can occur when, due to intracranial pressure from a head injury, blood will fill up in the eye's blood vessels and the "weakest ones will expand and burst." EHT1/27-28. An "increase in retinal venous pressure, which may be seen with abrupt increases in intracranial pressure . . ." causes retinal hemorrhaging. EHT1/27-28; EHT1/113, 153. Accordingly, the jury heard unchallenged, erroneous testimony that Jahanna's

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case studies, one accidental and one non-accidental, with very similar ophthalmic findings); Kirsten Bechtel, et al., Characteristics That Distinguish Accidental From Abusive Injury in Hospitalized Young Children with Head Trauma, 114 Pediatrics 165, 165-68 (2004); A.V. Levin, *Retinal* Hemorrhage in Abusive Head Trauma, 126 Pediatrics 961, 961-70 (2010); S.Q. Longmuir, et al., Retinal hemorrhages in intubated pediatric intensive care patients, 18 J. of AAPOS 129, 129-33 (2014) (of the 85 eye examinations conducted of intubated children in the hospital, 7% were positive for retinal hemorrhages); Gil Binenbaum, et al., An Animal Study to Retinal Hemorrhages in Nonimpact Brain Injury, 11 J. Of AAPOS 84, 84-85 (2007); Leuder, *supra* n. 11, at 1782.

[26] See, e.g., R. Uscinski, Shaken Baby Syndrome: Fundamental Questions, 16 British J. of Neurosurgery 217 (2002) (suggesting that impact from a short distance fall can damage the brain stem).

retinal hemorrhages must have been caused by violent shaking.

iii. The prosecution's experts testified that the fall could not have caused Jahanna's brain injuries. This is false.

Injuries more serious than Jahanna's, including fatal injuries, have been observed in children who suffer accidental falls from short distances.[27] In one study, researchers performed a biomechanical recreation of a videotaped fatal fall and confirmed that the force attendant to such a fall was sufficient to cause subdural hematoma, retinal hemorrhage, and cerebral edema.[28] The dangers of short-distance falls have since been confirmed by other physicians and scientists.[29] Devastating injuries to the brain have been associated with accidental falls of all kinds, including household falls or falls from furniture, and the presence or purported severity of brain injuries cannot serve to indicate the type or degree of force that caused them.[30]

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[27] See, e.g., Plunkett, *supra* n. 17; Lantz & Couture, *supra* n. 19, at 1648; Steinbok, *supra* n. 19.

[28] See Chris Van Ee, et al., Child ATD Reconstruction of a Fatal Pediatric Fall, Proc. ASME (2009).

[29] See, e.g., Steinbok, *supra* n. 19.

[30] Id.

Indeed, at the evidentiary hearing, Dr. Uscinski testified that the comminuted fracture he observed in Jahanna's scans, as well as subdural bleeding, could have been sustained from a fall off of a 17.5-inch couch onto a hard surface. EHT1/40-41. Accidental falls have the potential to cause subdural and retinal hemorrhages and to trigger brain swelling, which in some cases even leads to death.[31] Dr. Uscinski further testified that "subdural hemorrhaging and retinal hemorrhaging and brain swelling can occur with an impact to the skull, period" (EHT1/111), and that head trauma, like that seen in Jahanna, could occur with or without abuse. Simply put, "trauma is trauma," EHT1/112, and there is nothing about Jahanna's injuries that show that they must have been caused by intentional abuse.

B. Expert Testimony Could Have Supported The Theory That Jahanna Sustained Her Injuries By Falling Off A Couch Onto A Hard Surface.

The introduction of competent expert testimony combatting the unsupportable conclusions and flawed testimony presented by the prosecution would invariably have aided Mr. Millien's trial defense and would almost certainly have cast doubt as to guilt.

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[31] See Plunkett, *supra* n. 17.

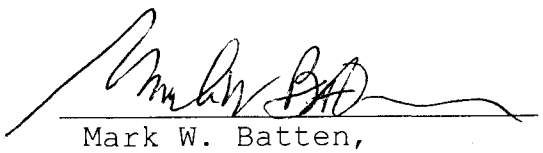
However, according to Mr. Millien's trial counsel, he instead only reviewed Dr. Newton's resume and the studies she cited, and although he believed he "challenged . . . Dr. Newton as to the basis underlying her opinion," he did not consult with a medical expert or make so much as an attempt to "debunk the methodology or the science underpinning 'shaken baby syndrome.'" Greenidge Aff. ¶¶8-9.

As discussed above, Dr. Uscinski's testimony and the medical community's current understanding of SBS/AHT discredit the theory that violent shaking "had to have" caused Jahanna's injuries. Testimony like that offered by Dr. Uscinski at Mr. Millien's post-conviction hearing — that fall from a 17.5-inch couch could in fact have caused the injuries sustained by Jahanna — would undoubtedly have had a meaningful impact on Mr. Millien's defense. Accordingly, the Court of Appeals erred by finding otherwise and denying Mr. Millien's request for a new trial.

CONCLUSION

For the reasons discussed above, Mr. Millien should be entitled to post-conviction relief, as his trial was tainted by the scientifically unsupportable opinions of the prosecution's experts and his counsel's failure to procure the aid of a rebuttal expert witness to more accurately represent today's understanding of SBS/AHT.

Respectfully submitted,



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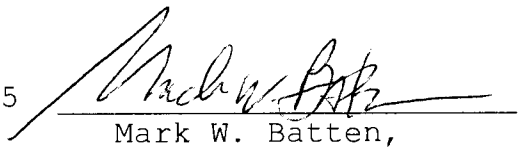
Rule 16(k) Certification

I, Mark W. Batten, on behalf of counsel for *Amicus Curiae*, hereby certify that this brief complies with the rules of Court that pertain to the filing of briefs, including but not limited to Mass. R. App. P. 16(a)(6), 16(e), 16(f), 16(h), 18, and 20.

I further attest, that this brief is being filed under rule 13(a), and that the day of mailing is within the time fixed for filing by the court.

Date: November 23, 2015



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