IN THE COURT OF CRIMINAL APPEALS
OF TEXAS

NO. PD-0292-15

JENNIFER BANNER WOLFE, Appellant

v.

THE STATE OF TEXAS

ON APPELLANT'S PETITION FOR DISCRETIONARY REVIEW
FROM THE SECOND COURT OF APPEALS
TARRANT COUNTY

ALCALA, J., delivered the opinion for a unanimous Court.

O P I N I O N

In this opinion, we address whether expert testimony on the subject of abusive head trauma is reliable. Jennifer Banner Wolfe, appellant, presents this issue in her petition for discretionary review following her conviction in a bench trial for first-degree-felony injury to a child after an infant under her care sustained serious internal head injuries. The primary evidence presented at appellant's trial was the testimony of the State's three expert witnesses, each of whom opined that the complainant's injuries were indicative of intentionally inflicted

impact, also known as abusive head trauma, rather than accidental injury or a preexisting medical condition as appellant had suggested. Appellant objected to the State's experts' testimony on the basis that it was unreliable, but the trial court overruled her objection. On discretionary review, appellant challenges the court of appeals's ruling upholding the admissibility of this evidence on two bases. First, appellant contends that the court of appeals erred by concluding that the experts' testimony on abusive head trauma "based solely on a constellation of symptoms" was sufficiently reliable so as to render it admissible under the rules of evidence. Second, appellant contends that the court of appeals incorrectly determined that her appellate challenge to the reliability of the experts' testimony on abusive head trauma did not fairly include the issue of whether the expert testimony was unreliable "given this specific injured party's history."[1] With respect to appellant's contention challenging the reliability of the experts' testimony of abusive head trauma based solely on a constellation of symptoms, we agree with the court of appeals's assessment that the

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[1] Appellant's grounds for review ask,

> 1. Whether the court of appeals wrongly decided that the appellant's point of error that the trial court abused its discretion by admitting unreliable expert testimony of abusive head trauma based solely on a constellation of symptoms did not fairly include the issue [of] whether the expert testimony was unreliable given this specific injured party's history.
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> 2. Whether the court of appeals wrongly decided that the trial court did not abuse its discretion by admitting unreliable expert testimony of abusive head trauma based solely on a constellation of symptoms.

To facilitate our analysis, we will address appellant's grounds for review in reverse order.

experts' testimony was sufficiently reliable so as to warrant a conclusion that the trial court did not abuse its discretion by admitting that evidence, and we thus overrule appellant's complaint as to this matter. With respect to appellant's contention that the court of appeals erred by declining to consider this particular complainant's history in conducting its reliability analysis, we conclude that the court of appeals's analysis reflects that it did consider whether the experts' opinions were reliable in light of this complainant's particular injuries. Further, to the extent that appellant complains that the court of appeals improperly declined to consider the complainant's medical history of prior bleeding in the brain as a basis for rejecting the reliability of the State's experts' testimony, we conclude that appellant did not rely on the complainant's history of prior bleeding as a basis for arguing that the experts' opinions were unreliable, and thus the court of appeals did not err by declining to address that issue. Finding no error in the court of appeals's analysis, we overrule appellant's grounds for review, and we affirm the court of appeals's judgment upholding appellant's conviction.

I. Background

Appellant ran an in-home daycare and was a licensed child-care provider. One morning, one of the children in appellant's care, seven-month-old Jack, sustained internal head injuries that caused him to lose consciousness.[2] After appellant called 911, fire department officials arrived on the scene and began giving Jack CPR. By the time

[2] The court of appeals's opinion used a pseudonym for the complainant in this case. For consistency's sake, we will also adopt that pseudonym.

paramedics arrived, Jack's skin had turned blue, he did not have a pulse, and he was not breathing. Appellant told paramedics that, after feeding Jack, she had set him down on a foam-padded floor, he was crying and screaming loudly, and then he "just fell back unconscious."[3] While he was being transported in the ambulance, as a result of CPR and other advanced life-support procedures, Jack's pulse and spontaneous breathing resumed. By the time he reached the hospital, Jack was awake and crying.

The doctors who examined Jack at the hospital determined that he needed immediate surgery to stop bleeding in his brain. Jack's injuries included a subdural hematoma, retinal hemorrhaging, and brain swelling—symptoms sometimes referred to as the "triad" of symptoms associated with abusive head trauma.[4] He had no fractures, bruising, or other external physical injuries. A pre-operative CT scan of Jack's brain showed the presence of two older stages of blood in his brain as well as new bleeding, indicating that there had been bleeding in his brain in the past. Dr. Roberts, a pediatric neurosurgeon, performed an emergency craniotomy to evacuate the hematoma and to alleviate pressure in Jack's brain.

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[3] In her subsequent explanations for what had occurred, appellant told Jack's mother that she had put him on the floor in a seated position and he had fallen backwards. Appellant later told a police officer and personnel from the Texas Department of Health and Human Services that she had set Jack down and he had fallen backwards onto a foam-padded floor and had immediately gone limp. In a subsequent written statement, appellant conceded that, "when [she] set [Jack] down, it was possibly hard," but she maintained that she did not shake or strike Jack against anything.

[4] A subdural hematoma is a collection of blood between the covering of the brain, also known as the dura, and the surface of the brain. A retinal hemorrhage is abnormal bleeding of the blood vessels in the retina, the membrane in the back of the eye. Brain swelling, also known as cerebral edema, consists of tissue swelling caused by the accumulation of fluid in the brain.

Trial Proceedings

Appellant was charged with the offense of first-degree-felony injury to a child. The indictment alleged that she knowingly caused serious bodily injury to Jack by shaking him and/or by striking him against a hard surface. Appellant pleaded not guilty. She waived her right to a jury trial and the case proceeded to a bench trial.

In anticipation of the likelihood that the State would present expert testimony at trial, appellant filed a pretrial motion to determine the admissibility of that evidence. In her motion, she requested a hearing pursuant to Rules of Evidence 702, 703, and 705, as well as *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,[5] to determine the experts' qualifications and the reliability of the evidence. The trial judge granted appellant's motion for a hearing as to each of the State's expert witnesses.

At the commencement of the trial proceedings, appellant's counsel addressed the basis for her challenge to the reliability of the State's experts' testimony in this case. Counsel stated,

> [I]n this particular case, given the nature of the evidence as I believe it's going to be introduced, I believe the State is going to rely on shaken baby syndrome as virtually the only proof of intent as well as causation in this particular case. And that is a—the scientific basis and theory that I want to challenge, and I'm urging to challenge in a *Daubert/Kelly* 702 through 705 hearing.
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> So I think I needed to put that on the record at this point challenging any references to shaken baby syndrome and that we are challenging the underlying principle as unreliable in the scientific community and not reliable

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[5] 509 U.S. 579 (1993).

in this case under *Daubert* and *Kelly*.[6]

Appellant's counsel then asked the trial court for a "running objection to any mention of [ ] shaken baby syndrome." She further requested that the trial court carry the motion with the trial and make a ruling on her motion after hearing all the experts' testimony in the case.[7] The trial court agreed to carry appellant's motion with the trial.

In its case in chief, the State offered into evidence the testimony of three expert witnesses. The first of these witnesses was Dr. Roberts, the pediatric neurosurgeon who had performed Jack's craniotomy. Dr. Roberts stated that he had been actively practicing pediatric neurosurgery for approximately four years and that he had treated "many" children under the age of five who had suffered head trauma.[8] He testified that Jack had presented with a subdural hematoma, or bleeding beneath the brain's dura, brain swelling, and

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[6] Appellant's counsel later clarified that she was using the terms "shaken baby syndrome," "abusive head trauma," and "sudden impact injury" interchangeably to refer to the same medical theory that was the basis for the State's case.

[7] Specifically, counsel stated,

> What I propose to the Court, though, is—so we don't have to have a hearing and—and do it all twice, I think the case law shows that . . . we can respect the Judge's position and the intellect to go, 'Okay, if I believe it's not reliable, I can disregard it even though I've heard it.' So if I can have an ongoing and running objection to any mention of that, shaken baby syndrome, so I don't have to object every time it's mentioned. And that once we—once you make a determination after you've heard all the medical experts and make a finding on that, if you find that it's not reliable, then you won't consider it. And if you find that it is reliable, obviously you would consider it.

[8] Dr. Roberts attended medical school at Louisiana State University. Prior to commencing his practice at Cook Children's Hospital in Fort Worth, he completed a six-year residency in neurosurgery and an additional year-long fellowship in pediatric neurosurgery.

compression of the brain that was "worrisome for surviving." While performing Jack's craniotomy, Dr. Roberts discovered that Jack had what was likely an avulsed bridging vein that had been pulled off the point where it ordinarily would connect to the sagittal sinus, resulting in brisk bleeding that was in turn causing compression of the brain.[9] Dr. Roberts agreed with the suggestion that an avulsion of a bridging vein does not just happen within the course of everyday life, but instead would require some sort of force to cause it. Specifically, he stated, that, in the typical case, the cause will be "high-energy impact[ ] where force is sufficient to move the brain far enough away from the covering of the brain to stretch those bridging veins and tear them or avulse them." Although he indicated that Jack's injuries could not have been caused by shaking alone, Dr. Roberts stated that the injuries could have been caused by shaking plus impact or striking Jack against a hard surface, such as the floor. When asked how he could explain the lack of external injuries to Jack in light of his opinion that some impact was necessary to cause Jack's injuries, Dr. Roberts indicated that, if the "surface was a non-marking surface, say, something softer than concrete, we would not necessarily have to have a bruise, or it may not be evident as a bruise." He also found it significant that Jack had retinal hemorrhaging and retinal tearing, or retinoschisis. He stated that Jack's combined symptoms were "all classically associated with high-energy input to the head." He indicated that, typically, there would have to be acceleration and deceleration in order to cause the types of injuries that Jack presented with

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[9] According to Dr. Roberts, bridging veins are "small, lateral-like veins entering [a] larger vein." The sagittal sinus is "the main draining vein for the top part of the brain."

and that his injuries did not "fit the story" of Jack merely falling backwards onto a padded surface from a seated position. Dr. Roberts opined that, "in a normal, healthy brain, we see car accidents or falls from second-story windows to cause those types of injuries." As a result, it was his opinion, based on the "constellation" of symptoms, that Jack's injuries were caused by non-accidental trauma. Specifically, Dr. Roberts stated, "[B]ased on our history of seeing other non-accidental traumas with these exact same constellation of symptoms, then we would diagnose this as a . . . subdural hematoma due to trauma and given the story, non-accidental because the story does not match the—the story doesn't match what I'm seeing clinically." Dr. Roberts agreed with the suggestion that his opinion was based on his training, experience, and education within pediatric neurosurgery, and that the basis for his opinion was generally accepted within the medical community.

With respect to the evidence of prior subdural bleeding in Jack's brain, Dr. Roberts described Jack's pre-operative CT scan as showing the presence of one or possibly two prior stages of bleeding in the brain as well as the new bleeding. Upon operating on Jack, Dr. Roberts observed, in addition to the new bleeding, "a rapid efflux of older-appearing blood, so very dark, purplish blood . . . as well as some clotted material." He indicated that it was his opinion that Jack "had, at some point prior, another hemorrhage." He indicated that he was unaware of any method for estimating when the prior bleeding had occurred. Dr. Roberts agreed with the suggestion on cross-examination that, due to the prior bleeding, "we are not talking about a healthy brain." He could not offer any explanation for the cause of the

old bleeding in Jack's brain, and he further stated, "It is not normal for anyone to have blood inside their head outside of the blood vessels[.]" He also appeared to acknowledge that it was "possible" that the old bleeding had caused some displacement of the brain and had stretched Jack's bridging vein in a way that could contribute to the new bleeding.[10] But he opined that the old bleeding by itself would not have caused Jack's injuries. Specifically, asked whether the old blood could have caused the "constellation" or the "entirety of the injuries," Dr. Roberts responded, "Not by itself and certainly not because I—I found a brisk bleeding point when I did the surgery." Asked to explain how Jack's prior bleeding could have caused no observable symptoms and required no medical care, Dr. Roberts opined that "chronic subdurals are sometimes asymptomatic" and they "certainly can" heal on their own without treatment.

Dr. Ranelle, a pediatric ophthalmologist, examined Jack after his craniotomy.[11] She determined that, although his right eye was uninjured, Jack's left eye showed signs of

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[10] As to this matter, the following exchange occurred:

[Defense counsel]:	Isn't it possible that that old blood that is sitting there has something to do with the—with how compromised the child is already? It's got to take up volume.
[Dr. Roberts]:	It's going to—it's going to take up space, yes.
[Defense counsel]:	Okay. So the bridging vein that we're talking about is already stretched. The volume—that old blood—isn't it possible? Isn't it possible?
[Dr. Roberts]:	It is—it is possible.

[11] Dr. Ranelle attended medical school at Kansas City University of Biomedical Sciences. She completed her six-year residency in osteopathic ophthalmology and a one-year fellowship in pediatric ophthalmology. At the time of trial, she had been practicing pediatric ophthalmology in Fort Worth since 2005.

multilayered intra-retinal hemorrhages and retinoschisis, which occurs when the retina splits apart. The left eye also exhibited a chemosis, which is swelling in the conjunctiva. Dr. Ranelle testified that chemosis can occur with traumatic injury. According to Dr. Ranelle, the vitreous base had also separated from the retina in Jack's left eye. Dr. Ranelle opined that Jack's eye injuries were consistent with nonaccidental trauma "in a normal healthy baby." She acknowledged that, given the evidence of prior brain bleeding, Jack was not a "completely healthy child." But she asserted that it was not possible that appellant's version of events had caused Jack's injuries, nor could his injuries have been caused by his prior brain bleeding. Dr. Ranelle agreed with Dr. Roberts's suggestion that Jack's injuries were caused by an accelerating force followed by deceleration. She opined that his collection of symptoms was suggestive of non-accidental injury and was consistent with a very significant traumatic, violent, high-energy force. She indicated that the type of unilateral hemorrhaging exhibited by Jack was "well described in the literature" as being present in cases of non-accidental trauma. Regarding the lack of external physical injuries on Jack, Dr. Ranelle stated that this is "sometimes the case in nonaccidental trauma. You sometimes don't see it outwardly, especially in babies." On cross-examination, she denied being aware of any literature that challenged the use of retinal hemorrhages as a basis for diagnosing intentionally inflicted head trauma. She disagreed with the suggestion that there was a state of unrest in the field of pediatric ophthalmology regarding the validity of a diagnosis of abusive head trauma. She stated, "I would say the majority of my peers would look at this

case and come to a similar conclusion as I did." She acknowledged that there were some doctors "who question the validity of retinal hemorrhages in [diagnosing] nonaccidental trauma," but indicated that she did not "personally know any of them."

Dr. Coffman, a board certified physician in both general pediatrics and child-abuse pediatrics, evaluated Jack after the initial assessment, surgery, and treatment.[12] She testified that the torn bridging vein and retinoschisis had to be from severe trauma—in particular, a high-energy violent impact or a combination of impact and shaking. She said the injuries could not have been caused by Jack's prior brain bleeding or from falling onto a foam-padded floor from a seated position. In particular, regarding the prior bleeding in Jack's brain, she stated that old blood could not create or contribute to a torn blood vessel, and she further indicated that "rebleeding of chronic subdural[ ] [hematomas] does not cause massive retinal hemorrhages and retinoschisis." Regarding the lack of external bruising, Dr. Coffman stated, "If [the impact is] onto something that's padded, we don't . . . necessarily see external bruising. That doesn't mean that there's not bruising . . . underneath the scalp." She explained that, in her experience, she had observed child autopsies in which the child did not exhibit any external bruising following head trauma, but, "when the child went to autopsy and they reflect the scalp back, there's bruising underneath the scalp." She also testified that there is no "unrest" within the various sub-fields of pediatrics, including pediatric

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[12] Dr. Coffman attended medical school at the University of Texas Health Science Center in San Antonio. She completed her residency in pediatrics and later opened a private pediatrics practice. At the time of trial, she had worked at Cook Children's Medical Center since 2000 and had been practicing pediatric medicine since 1990.

ophthalmology, radiology, and neurosurgery, about abusive head trauma. She indicated that any unrest regarding the diagnostic criteria for abusive head trauma existed in the "biomechanical world" and the "medical examiner world," but not in the field of pediatrics. She indicated that the American Academy of Pediatrics recognizes abusive head trauma as a valid diagnosis. She also testified that she did not diagnose abusive head trauma based on any triad of symptoms. She described the triad as a "fallacy because we don't make our diagnosis based on a triad." Instead, she suggested that the diagnosis "is based on the individual patient's history, presentation, and findings."

In contrast to the State's three experts, the defense presented testimony from Dr. Rothfeder, an emergency-room physician who had treated multiple child trauma cases during his decades-long experience as a treating physician and has privately researched abusive head trauma for fifteen years. He testified that the medical community was in a state of disagreement about the principles for diagnosing abusive head trauma and that the dispute was by "far and away the area of greatest dispute in any medical topic I've ever encountered." He stated that the diagnosis of abusive head trauma based on the triad of symptoms was accepted "by the majority of the pediatricians, and I think by the minority of anyone else who is active in the field." He said that the classic triad of symptoms—subdural hematoma, retinal hemorrhages, and brain swelling—previously would have resulted in a shaken-baby-syndrome diagnosis, but that diagnosis has now become the abusive-head-trauma diagnosis. He indicated that some within the biomechanical sciences, ophthalmology

and neuro-radiology communities have "come to a different set of conclusions regarding the cause and effect and the medical certainty associated with those conclusions." But he also acknowledged that members of the pediatric-medicine community disagree with those contrary conclusions. He said that the problem with the diagnosis in a case such as this is that a child with no external signs of injury could not likely have suffered an impact in a way significant enough to cause the internal injuries.

Regarding the particular facts of this case, Dr. Rothfeder stated that the "big issue in this case" is the fact that this "was not a normal child . . . with a normal brain" due to the presence of old bleeding in the brain. Dr. Rothfeder observed that the cause of Jack's prior bleeding could not be identified and that there was "no clinical history that makes any sense that explains where those fluid collections came from." He suggested that, given the existence of prior bleeding, new bleeding could take place "either spontaneously or with minimal trauma"—for example, he cited possible causes of new bleeding as being forceful crying, vomiting, long periods of coughing, or possibly setting a baby down hard. Dr. Rothfeder opined that the old blood in Jack's brain had likely stretched the bridging vein, "putting a tension on" it and "weakening the vein." He stated that, given the old bleeding, "the issue then becomes, well, how does one know in that set of circumstances how much force, if any, is required to . . . initiate that hemorrhage?" He continued by explaining that "the child who has subdural hematomas that are chronic sitting inside the head where one already knows in retrospect that there's been rebleeding is just like a bomb waiting to go off

and . . . those were capable of rebleeding almost at any point in time with—with who knows what kinds of trigger." He opined that Jack's brain swelling was probably caused by cardiac arrest, which then led to retinal hemorrhaging. Another possible theory put forth by Dr. Rothfeder was that Jack suffered an asymptomatic birth-related subdural hematoma that did not resolve and finally broke loose on the day in question.

In addition to the witness testimony, both appellant and the State presented the court with scholarly articles addressing the reliability question in this case. The State provided the court with an article by Dr. Sandeep Narang, J.D., M.D., titled, *A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome*, in which the author concludes that the theory of abusive head trauma is widely accepted within the relevant scientific community and has been thoroughly researched.[13] Appellant provided several articles that appeared to question the validity of abusive head trauma as a proper diagnosis, including an article by Dr. Steven Gabaeff titled, *Challenging the Pathophysiologic Connection between Subdural Hematoma, Retinal Hemorrhage and Shaken Baby Syndrome*;[14] an article by Dr. Mark Donohoe titled *Evidence-Based Medicine and Shaken Baby Syndrome*;[15] and a law review article titled, *The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts*.[16]

At the conclusion of the evidence, appellant asked the trial judge, "as the gatekeeper

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[13] 11 HOUS. J. HEALTH L. & POL'Y 505 (2011).

[14] 12 WEST. J. EMERG. MED. 144 (2011).

[15] 24 AM. J. FORENSIC MED. PATHOLOGY 239 (2003).

[16] 87 WASH. UNIV. L. REV. 1 (2009).

. . . to find this medical theory that is being urged in the court unreliable." Counsel stated that her objection was "based on the . . . medical evidence in general, as well as the specific facts of this particular case and how that runs in conjunction with the facts we have presented before this Court." She asserted that the State's experts had relied upon a faulty or unproven medical theory in forming their opinions and that their "expert diagnosis that a child has been abused" was also flawed. In response, the State argued that the pediatric medical community was in broad agreement that abusive head trauma was a valid diagnosis; that the theory had been the subject of extensive research and testing; and that those who challenged the theory's validity constituted a "vocal minority." In addition, regarding the facts of this case, the State noted that Jack's injuries went beyond the "triad" of symptoms because he also had avulsion of a bridging vein and retinoschisis "that they've never seen in anything other than violent trauma." After the parties made their respective arguments on appellant's *Daubert/Kelly* motion, the trial judge stated that he would delay his ruling on the motion because he "need[ed] some time to review all of this material." The trial judge did not rule on appellant's motion until a later hearing. At that subsequent hearing, the judge overruled appellant's motion, found appellant guilty, and sentenced her to five years' imprisonment. The judge explained that his decision to overrule appellant's motion was premised on his determination that the State's experts' testimony met the reliability requirements of Rule 702, *Kelly v. State*,[17] and *Daubert*.

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[17] 824 S.W.2d 568, 573 (Tex. Crim. App. 1992).

Proceedings in the Court of Appeals

On appeal, appellant raised a single point of error in which she challenged the trial court's admission of what she characterized as unreliable medical expert opinion testimony on abusive head trauma. *Wolfe v. State*, 459 S.W.3d 201 (Tex. App.—Fort Worth 2015). At the outset of its analysis, the court of appeals determined that the arguments presented in appellant's brief were limited to challenging "only the reliability of the State's medical expert testimony regarding a diagnosis of abusive head trauma—in general—on the basis of the 'triad' of subdural hematoma, retinal hemorrhaging, and brain swelling, without evidence of external injuries." *Id.* at 211. Thus, the court concluded that appellant's complaint did not encompass any argument that the experts' diagnosis in this particular case was unreliable based on Jack's medical history of previous bleeding in the brain. *Id.* ("In other words, [appellant] argues only that the general theory behind diagnosing abusive head trauma is flawed, relying on debate and disagreement within the scientific community about the general theory. . . . Appellant does not, at any point within her brief, alternatively argue that even if a diagnosis of abusive head trauma could be reliable with respect to a typical patient based on the symptoms that Jack presented with, it was not reliable as to Jack based on his prior medical history, including the prior bleeding in his brain."). Based on this assessment, the court of appeals indicated that it would "examine only the general reliability of testimony relating to diagnosing abusive head trauma." *Id.*

Second, the court of appeals held that the trial court did not abuse its discretion by

overruling appellant's objection and admitting the evidence provided by the State's experts. *Id.* at 212. Applying the factors from *Kelly v. State*,[18] the court of appeals reasoned that the experts, who "demonstrated their unchallenged qualifications to testify about pediatrics generally and the injuries Jack suffered specifically, clearly articulated the conditions under which they diagnosed abusive head trauma and confirmed that the pediatric medical community generally accepts the diagnosis of abusive head trauma from the types of injuries that Jack suffered." *Id.* The court of appeals further noted that the State had provided the trial court with "literature supporting the diagnosis of abusive head trauma with the types of injuries that are present here," and it took note of decisions from other courts "that have upheld convictions based on such testimony." *Id.* Regarding appellant's evidence that suggested the existence of some unrest within certain areas of the medical and biomechanical engineering communities regarding the validity of a diagnosis of abusive head trauma based on the "triad" of symptoms, the court of appeals acknowledged that evidence but determined that "that disagreement in and of itself does not make the State's expert testimony unreliable." *Id.* at 213; *see also id.* at 213-14 ("[E]ven if the principles supporting the testimony are not universally accepted in various medical fields, we cannot hold that the State presented inadmissible junk science.") (citations omitted). Further, to the extent that appellant had cited sources challenging the reliability of a diagnosis of abusive head trauma based on shaking alone, the court of appeals deemed those sources "inapposite because both

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[18] 824 S.W.2d at 573.

Dr. Roberts and Dr. Coffman testified that Jack's injuries could not have occurred by shaking alone." *Id.* at 213. The court of appeals concluded that the trial court had not abused its discretion by admitting the challenged evidence, and it overruled appellant's sole point of error. *Id.* at 214.

Justice Walker dissented. *Id.* at 214. She disagreed with the majority opinion's apparent assessment that appellant's argument on appeal did not encompass a challenge to the reliability of the State's experts' testimony concerning abusive head trauma as applied to Jack. *Id.* Justice Walker would have held that the "subsidiary question of the reliability of the State's experts' testimony concerning abusive head trauma as applied to Jack is fairly included in [appellant's] issue on appeal." *Id*. Thus, she would have addressed "the issue of whether the expert opinion testimony . . . diagnosing Jack with abusive head trauma (that is, non-accidentally inflicted head trauma) was reliable." *Id.* Justice Walker further found that a "serious question" existed as to the reliability of the experts' conclusion that Jack suffered abusive head trauma in this case, given Jack's medical history of bleeding in the brain and the lack of any external injuries. *Id*.

II. Experts' Testimony On Abusive Head Trauma Based on a Constellation of Symptoms Was Reliable

In her second ground in her petition for discretionary review, appellant challenges the court of appeals's conclusion that the experts' testimony on abusive head trauma based on a constellation of symptoms was reliable. In particular, appellant asserts that there is extensive "ongoing debate" in the medical community regarding the validity of the diagnosis

based "exclusively" on symptoms of subdural hematoma, retinal hemorrhaging, and brain swelling, and she contends that the existence of this debate serves to undermine the reliability of the experts' opinions in this case. In response to this argument, the State contends that the experts' opinions in this case were not based exclusively on a "triad" of symptoms, but were instead arrived at through a process of differential diagnosis that is an "all-encompassing process-of-elimination consideration of every possible cause" based on the particular patient's history and presentation. The State further contends that the abusive-head-trauma diagnosis is widely accepted amongst most esteemed national and international medical organizations as a valid diagnosis and has been the subject of extensive research.

As we will explain further below after reviewing the applicable standard in *Kelly v. State* and applying the relevant factors to this case, we disagree with appellant's arguments, and we agree with the State that the experts' testimony in this case was sufficiently reliable. *See Kelly v. State*, 824 S.W.2d 568, 572 (Tex. Crim. App. 1992). We hold that the court of appeals correctly determined that the trial court did not abuse its discretion by admitting the experts' testimony on abusive head trauma based on the types of injuries that Jack exhibited in this case.

A. Applicable Law

A trial judge's ruling on the admissibility of expert testimony is reviewed under an abuse-of-discretion standard and will not be disturbed if it is within the zone of reasonable disagreement. *Russeau v. State*, 291 S.W.3d 426, 438 (Tex. Crim. App. 2009); *State v.*

Dixon, 206 S.W.3d 587, 590 (Tex. Crim. App. 2006). The admissibility of expert testimony is governed by Texas Rule of Evidence 702, which provides that "[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue." TEX. R. EVID. 702. In addition, Rule 705 provides that, if the court determines that "the underlying facts or data do not provide a sufficient basis" for the expert's opinion under Rule 702, the opinion is inadmissible. TEX. R. EVID. 705(c). For expert testimony to be admissible under these rules, the proponent of the expert scientific evidence must demonstrate by clear and convincing evidence that the testimony is "sufficiently reliable and relevant to help the jury in reaching accurate results." *Kelly*, 824 S.W.2d at 572. "In other words, the proponent must prove two prongs: (1) the testimony is based on a reliable scientific foundation, and (2) it is relevant to the issues in the case." *Tillman v. State*, 354 S.W.3d 425, 435 (Tex. Crim. App. 2011).[19] Here, we limit our analysis to the first prong addressing reliability because appellant has not challenged the second prong addressing the relevancy of the testimony to the issues in the case.

This Court in *Kelly* set forth three criteria for reliability that the proponent of scientific evidence must prove: (1) the underlying scientific theory must be valid; (2) the technique

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[19] In addition, a trial court must determine whether a witness is qualified to testify as an expert. *See Vela v. State*, 209 S.W.3d 128, 131 (Tex. Crim. App. 2006); TEX. R. EVID. 702. Because no question has been raised as to the qualifications of the State's experts in this case, we do not address that matter.

applying the theory must be valid; and (3) the technique must have been properly applied on the occasion in question. *Kelly*, 824 S.W.2d at 573. This Court in *Kelly* went on to suggest a nonexclusive list of factors that might influence a finding of reliability: (1) the extent to which the underlying scientific theory and technique are accepted as valid by the relevant scientific community, if such a community can be ascertained; (2) the qualifications of the testifying experts; (3) the existence of literature supporting or rejecting the underlying scientific theory and technique; (4) the potential rate of error of the technique; (5) the availability of other experts to test and evaluate the technique; (6) the clarity with which the underlying scientific theory and technique can be explained to the court; and (7) the experience and skill of the person who applied the technique on the occasion in question. *Id*. In weighing these factors as a means of assessing reliability, the focus "is to determine whether the evidence has its basis in sound scientific methodology such that testimony about 'junk science' is weeded out." *Tillman*, 354 S.W.3d at 435 (citing *Jordan v. State*, 928 S.W.2d 550, 555 (Tex. Crim. App. 1996)); *see also Massey v. State*, 933 S.W.2d 141, 152 (Tex. Crim. App. 1996) ("The overarching concern under Rule 702 is the scientific validity of the evidence; its reliability depends upon whether it is rooted in sound scientific methodology."). Unreliable scientific evidence is inadmissible because it "simply will not assist the jury to understand the evidence or accurately determine a fact in issue; such evidence obfuscates rather than leads to an intelligent evaluation of the facts." *Kelly*, 824 S.W.2d at 572.

In sorting untested or invalid theories from those that are grounded in "good" science, trial judges are called upon to serve as gatekeepers. *See Jordan*, 928 S.W.2d at 555 (citing *Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579, 595-99 (1993)). "The trial court's essential gatekeeping role is to ensure that evidence that is unreliable because it lacks a basis in sound scientific methodology is not admitted." *Coble v. State,* 330 S.W.3d 253, 273 (Tex. Crim. App. 2010); *see also Vela v. State*, 209 S.W.3d 128, 134 (Tex. Crim. App. 2006) ("The court in discharging its duty as gatekeeper must determine how the reliability of particular testimony is to be assessed. The reliability inquiry is, thus, a flexible one."). The trial court's gatekeeping function under Rule 702 does not supplant cross-examination as "the traditional and appropriate means of attacking shaky but admissible evidence." *Gammill v. Jack Williams Chevrolet*, 972 S.W.2d 713, 728 (Tex. 1998) (quoting *Daubert*, 509 U.S. at 596).

B. Application of Relevant Factors Demonstrates that Experts' Testimony on Abusive Head Trauma was Sufficiently Reliable so as to Render it Admissible

Applying the seven *Kelly* factors to the evidence presented in this case, we conclude that the court of appeals correctly determined that the trial court did not abuse its discretion in admitting the expert opinion testimony of Dr. Roberts, Dr. Ranelle, and Dr. Coffman. As we will explain further below, we hold that the State's experts provided reliable testimony that addressed the subject of abusive head trauma generally and further indicated, based on the particular types of injuries Jack suffered, that those injuries were the product of an intentionally inflicted impact.

Acceptance of Theory in Scientific Community

Regarding the first *Kelly* factor—the extent to which the underlying scientific theory and technique are accepted as valid by the relevant scientific community—we agree with the court of appeals's assessment that the experts' testimony was adequately shown to be accepted within the pediatric medical community. *See Wolfe*, 459 S.W.3d at 212. In particular, we note that all three experts testified consistently that their opinions were based on their training in medical school and on their experience as physicians in their respective specialties actively treating pediatric head trauma. As the court of appeals noted, Dr. Roberts indicated that his opinion was based on principles that are generally accepted within the medical community, and he opined that, in the absence of any explanation or known cause for the types of injuries that Jack sustained, those symptoms were "classically associated" with high-energy input to the head of a non-accidental source. Dr. Roberts's testimony regarding the widespread acceptance of abusive head trauma as a valid diagnosis under these circumstances was corroborated by the testimony of Dr. Ranelle, who indicated that the majority of her peers would have reached the same conclusion as she did in this case, and by the testimony of Dr. Coffman, who testified that there was "no unrest" within the field of pediatrics regarding a diagnosis of abusive head trauma based on these types of symptoms.

In addition to the agreement of the three experts in this case as to the mainstream acceptance of abusive head trauma as a valid medical diagnosis based on a patient's presentation with the constellation of symptoms exhibited by Jack, we observe that at least two courts in other jurisdictions have concluded that this type of evidence is admissible over

a challenge to its reliability. *See In re Morris*, 355 P.3d 355, 493 (Wash. App. 2015) (holding that abusive head trauma is a "generally accepted theor[y] in the relevant scientific community," and observing that "the American Academy of Pediatrics, the Academy of Ophthalmology, and the National Association of Medical Examiners, as well as a publication from the Centers for Disease Control and Prevention" each "recognizes abusive head trauma" as a valid diagnosis); *Day v. State*, 303 P.3d 291, 296 (Okla. Crim. App. 2013) (rejecting defendant's contention that he was entitled to a *Daubert* hearing on expert evidence applying theory of abusive head trauma because that theory has been accepted as valid by Oklahoma courts, has not been discredited by recent scientific research, and is "not a novel scientific theory"). This Court has observed that the acceptance of a scientific theory by other courts is a relevant consideration in assessing a trial judge's ruling on questions of reliability. *See Somers v. State*, 368 S.W.3d 528, 536-37 (Tex. Crim. App. 2012) ("When evaluating a trial judge's gatekeeping decision, appellate courts may take judicial notice of other appellate opinions concerning a specific scientific theory or technique."). In light of these considerations, we conclude that the first factor weighs strongly in favor of upholding the trial court's reliability determination here.

Expert's Qualifications, Experience, and Skill

Regarding the second and seventh *Kelly* factors—the experts' qualifications and their experience and skill—the record reflects that all three experts were eminently qualified through both training in pediatric medicine and experience as treating physicians to render

opinions both as to the nature of Jack's injuries and the likely causes of those injuries. All three physicians testified that they had treated pediatric patients on many occasions involving head trauma, both accidental and non-accidental. Although we recognize that a medical license does not "automatically qualify the holder to testify as an expert on every medical question," if the offering party has "establish[ed] that the expert has knowledge, skill, experience, training, or education regarding the specific issue before the court," then the expert is qualified to render an opinion on that issue. *Roberts v. Williamson*, 111 S.W.3d 113, 121 (Tex. 2003) (citing *Broders v. Heise*, 924 S.W.2d 148, 153 (Tex. 1996)). We conclude that this requirement was met here, and we thus agree with the court of appeals's assessment that this factor also weighs in favor of upholding the trial court's determination of reliability. *See Wolfe*, 459 S.W.3d at 212 (describing experts' qualifications in this case as "unchallenged").

Existence of Scholarly Literature

Regarding the third *Kelly* factor, the existence of scholarly literature supporting the validity of a diagnosis of abusive head trauma based on a patient's presentation with certain symptoms, we conclude that the trial court's ruling was supported by the article by Dr. Sandeep Narang, *A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome*,[20] which was provided to the trial judge by the State as evidence of the reliability of the experts' testimony in this case. As the court of appeals correctly noted, Dr. Narang's article reviews

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[20] 11 HOUS. J. HEALTH L. & POL'Y 505 (2011).

the medical literature and research- and evidence-based studies on the relation of subdural hematoma and retinal hemorrhaging in abusive head trauma, and it details "several studies demonstrating the significant statistical association" of both subdural hematomas and retinal hemorrhages with intentional child abuse. *Wolfe*, 459 S.W.3d at 212. Specifically, Dr. Narang's article indicates that there are over 700 peer-reviewed, clinical medical articles published by over 1,000 different medical authors in twenty-eight countries addressing the topic of abusive head trauma.[21] In addition, Dr. Narang's article asserts that "there have been at least eight systematic reviews, over fifteen controlled trials, over fifty comparative cohort studies or prospective cases series, and numerous well-designed, retrospective case series/reports, comprising thousands of cases, supporting the diagnosis of [abusive head trauma]," and his article details the findings of those studies as showing a strong correlation between subdural hematoma and retinal hemorrhaging with nonaccidental injury.[22] He states that it is "virtually unanimous among national and international medical societies that AHT is a valid medical diagnosis."[23] Given the thoroughness with which the Narang article

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[21] *Id.* at 539-40.

[22] *Id.* at 540.

[23] *Id.* at 574-76, 583. He lists several of those organizations as follows: (1) The World Health Organization; (2) The Royal College of Paediatrics and Child Health; (3) The Royal College of Radiologists; (4) The Royal College of Ophthalmologists; (5) The Canadian Paediatric Society; (6) The American Academy of Pediatrics; (7) The American Academy of Ophthalmology; (8) The American Association for Pediatric Ophthalmology and Strabismus; (9) The American College of Radiology; (10) The American Academy of Family Physicians; (11) The American College of Surgeons; (12) The American Association of Neurologic Surgeons; (13) The Pediatric Orthopaedic Society of North America; (14) The American College of Emergency Physicians; and (15) The American Academy of Neurology.

discusses the current medical and legal theories supporting a diagnosis of abusive head trauma as being valid and based on widely accepted medical principles, we conclude that this factor also weighs in favor of upholding the trial court's ruling.

The Rate of Error

Regarding the fourth *Kelly* factor, the rate of error, we conclude that this factor weighs slightly against a finding of reliability in this case because the State's experts opined that, given the types of injuries that give rise to a diagnosis of abusive head trauma, there is no way to engage in controlled trials to directly test the degree of force required to cause these injuries in an infant, and the actual rate of error is thus unknown. Specifically, Dr. Roberts opined that it would be impossible to "do a double-blind and randomized trial with a healthy baby to see what kind of forces need to be applied to the head to cause a subdural hematoma." Dr. Ranelle also acknowledged that it "would be pretty hard to study the actual forces" required to cause the injuries that give rise to the diagnosis because no one could subject babies to that type of trauma in experimentation. In a factually analogous case involving an expert's diagnosis of inflicted pediatric injury, the Kentucky Supreme Court has observed that these types of diagnoses "generally ha[ve] not been and cannot be tested through randomized, controlled trials." *Futrell v. Commonwealth*, 471 S.W.3d 258, 284 (Ky. 2015). But, as to this matter, the Court in *Futrell* also noted that any concerns regarding the lack of a known rate of error were minimized due to the underlying theory having "been tested by repeated scrutiny in peer-reviewed observational studies conducted in accord with

well-established statistical principles." *Id.* This observation is echoed by Dr. Narang's article, which states that, with respect to the rate of error, any concerns with respect to that factor should be minimal because "there are numerous systematic reviews, controlled trials, and well-designed, prospective, and retrospective studies that demonstrate a highly significant statistical association of [subdural hematomas] and [retinal hemorrhages] with AHT."[24] In sum, although the inability to directly test the theory of abusive head trauma to produce a known rate of error weighs slightly against a determination of reliability here, we cannot conclude, in light of other sources indicating that the diagnosis is generally valid, that this factor alone would serve as an adequate basis for disturbing the trial court's ruling.

Availability of Other Experts and Clarity of Explanation to a Court

With respect to the remaining two factors—the availability of other experts to test and evaluate the technique and the clarity with which the underlying scientific theory and technique can be explained to the court—we determine that these considerations also weigh in favor of upholding the trial court's ruling. The experts in this case explained that the technique employed as a means of diagnosing abusive head trauma involves differential diagnosis, which is the process by which "a child-abuse pediatrician presented with an injured child will attempt to eliminate from a list of potential causes of the injury those causes not likely in the given case until arriving at the cause that is most likely." *Futtrell*, 471

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[24] 11 HOUS. J. HEALTH L. & POL'Y 505, 579 (2011).

S.W.3d at 283.[25] This type of deductive-reasoning process is conducive to evaluation by other experts, as is demonstrated by the experts' testimony in the instant case, and, further, it is the type of process-of-elimination reasoning that can be clearly explained to the court. Moreover, other courts have recognized differential diagnosis as a "reliable method of ascertaining causation" and as being "well-recognized and reliable." *Morris*, 355 P.3d at 361; *see also Coastal Tankships U.S.A., Inc., v. Anderson,* 87 S.W.3d 591, 604-05 (Tex. App.—Houston [1st Dist.] 2002) (observing that a "properly conducted and explained differential diagnosis is not junk science"; differential diagnosis is "in itself a reliable and widely accepted methodology"). We recognize here, however, that there is some inherent degree of subjectivity in reaching a diagnosis by using differential diagnosis, because two equally qualified physicians may apply that technique in a slightly different manner based on different reasoning and experience, and thus the process may in some cases be susceptible to a degree of inconsistency amongst experts. *See Clausen v. M/V New Carissa*, 339 F.3d 1049, 1058 (9th Cir. 2003) (with respect to opinions based on differential diagnosis, a court

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[25] *See also* Dr. Sandeep Narang, *A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome–Part II: An Examination of the Differential Diagnosis*, 13 HOUS. J. HEALTH L. & POL'Y 203, 303-04 (2013) ("In the differential diagnosis methodology, the physician gathers historical information on a patient's symptoms and signs and generates hypotheses (a.k.a., the differential diagnosis). Through the attainment of additional clinical information (via various diagnostic tests), the physician goes through an inferential and deductive process of hypothesis refinement until a consistent 'working diagnosis' is achieved. Hypothesis refinement utilizes a variety of reasoning strategies—probabilistic, causal, and deterministic—to discriminate among the existing diagnoses of the differential diagnosis. . . . In the simplest sense, the methodology relies on process-of-elimination reasoning. As one eminent evidentiary scholar stated, '[I]n differential diagnosis, if there are four possible diagnoses and you eliminate three, logic points to the last illness as the correct diagnosis.'") (citations and quotations omitted).

is justified in "excluding evidence if an expert utterly fails . . . to offer an explanation for why the proffered alternative cause was ruled out"; "The expert must provide reasons for rejecting alternative hypotheses using scientific methods and procedure and the elimination of those hypotheses must be founded on more than subjective beliefs or unsupported speculation"); *see also Transcont'l Ins. Co. v. Crump*, 330 S.W.3d 211, 217 (Tex. 2010) ("The mere fact that differential diagnosis was used does not exempt the foundation of a treating physician's expert opinion from scrutiny—it is to be evaluated for reliability as carefully as any other expert's testimony."). In any event, here, given the consistency with which the experts in this case explained the basis for their opinions and the methodology underlying those opinions, we conclude that these considerations support the trial court's ruling.

Whether the Trial Court's Assessment of the Factors Was an Abuse of Discretion

We agree with the court of appeals's application of the *Kelly* factors to the evidence presented at appellant's trial and its ultimate conclusion that the trial court's ruling was not outside the zone of reasonable disagreement. We, therefore, agree with the court of appeals that, affording appropriate deference to the trial court's ruling in this case, the trial court did not abuse its discretion in admitting the experts' testimony on abusive head trauma based on the particular constellation of symptoms exhibited by Jack. *See Tillman*, 354 S.W.3d at 442. Although appellant seeks to avoid this conclusion by pointing to her expert's testimony that there is some significant disagreement within various segments of the medical and

biomechanical communities regarding the validity of the diagnosis based on the triad of symptoms, we agree with the court of appeals's assessment that a lack of universal agreement would not render the State's evidence "junk science," given the other indications of reliability described above. *See Wolfe*, 459 S.W.3d at 214. Moreover, to the extent that appellant relies on her own expert's opinion regarding the ongoing debate about the validity of the abusive-head-trauma diagnosis as a basis to refute the reliability of the State's experts' testimony in this case, we agree with the court of appeals's observation that even appellant's own expert acknowledged that the diagnosis is widely accepted as valid in the pediatric medical community. *See id.* at 213 n.20. Further, even accepting that appellant's expert and the State's experts were all qualified, their disagreement about their methods and conclusions would not necessarily render one side's testimony unreliable. *See Commonwealth v. Martin*, 290 S.W.3d 59, 68-69 (Ky. 2008) ("[M]erely because two qualified experts reach directly opposite conclusions using similar, if not identical, data bases, or disagree over which data to use or the manner in which the data should be evaluated, does not necessarily mean that . . . one opinion is *per se* unreliable. . . . That some scientists in a field disagree with an expert's theories or conclusions does not render those theories or conclusions unreliable[.]") (citations and internal quotations omitted).

In light of all the foregoing considerations, we conclude that the trial court did not abuse its discretion in admitting this evidence, and we thus uphold the court of appeals's ruling as to the admissibility of the experts' testimony on abusive head trauma based on the

types of injuries that Jack suffered. We overrule appellant's second ground.

III. Court of Appeals Properly Addressed All Arguments Made by Appellant on Appeal

In her first ground in her petition for discretionary review, appellant contends that the court of appeals erred by declining to consider whether the State's experts' testimony was unreliable "given this specific injured party's history." In particular, appellant asserts that the court of appeals erred to hold that her complaint on appeal did not fairly include any argument that the State's experts' opinions were unreliable given Jack's particular injuries and his medical history of bleeding in the brain. We disagree. Based on a careful reading of the court of appeals's opinion, we conclude that it reflects that the court of appeals did review the reliability of the experts' conclusions that Jack suffered abusive head trauma in light of the particular injuries that he suffered, including subdural hematoma, retinal hemorrhaging and tearing, and brain swelling in the absence of any external injuries. We thus disagree with the suggestion by appellant that the court of appeals wholly declined to consider whether the experts' opinions were reliable in applying a diagnosis of abusive head trauma to the facts of this case. To the extent that appellant complains to this Court that the court of appeals improperly declined to consider Jack's history of prior brain bleeding in conducting its reliability analysis, we agree with the court of appeals's assessment that appellant failed to brief that issue as a basis for rejecting the reliability of the State's experts' testimony, and we further conclude that that issue was not fairly included within her arguments on appeal.

Appellant asserts that the court of appeals failed to consider the reliability of the experts' conclusions as they pertained to Jack's particular injuries, but that suggestion is inaccurate. A fair reading of the court of appeals's opinion in this case shows that it considered not only the reliability of a diagnosis of abusive head trauma in the abstract, but also the reliability of the experts' conclusions that Jack had suffered abusive head trauma based on his particular injuries. Specifically, the court of appeals explained that it was considering whether the State's experts provided reliable testimony regarding a diagnosis of abusive head trauma based on the "triad" of symptoms, without evidence of external injuries, which were the exact symptoms presented by Jack. *See Wolfe*, 459 S.W.3d at 211. In the course of addressing appellant's reliability complaint, the court of appeals referred at multiple points to the particular injuries that Jack had suffered, and it suggested that the experts' conclusions were reliable in applying the diagnosis to a patient with those symptoms. *See id.* at 212 (explaining that the experts were qualified to testify about "the injuries Jack suffered specifically" and that the experts "confirmed that the pediatric medical community generally accepts the diagnosis of abusive head trauma from the types of injuries that Jack suffered"); *see also id.* (explaining that the Narang article supported "the diagnosis of abusive head trauma with the types of injuries that are present here"). The court of appeals further rejected appellant's reliance on sources challenging the reliability of a diagnosis of abusive head trauma based on shaking alone, given that the experts in this case testified that "Jack's injuries could not have occurred by shaking alone." *Id.* at 213. Given

these portions of the court of appeals's analysis, it is clear that the court did in fact take into consideration the complainant's particular injuries in assessing the reliability of the experts' testimony applying a diagnosis of abusive head trauma to this case.

In explaining the scope of its reliability analysis as one that would consider only the "general reliability" of the experts' testimony, the court of appeals indicated that it would not consider the significance of Jack's history of bleeding in the brain. *Id.* at 211. The court stated, that, although she had presented a challenge to "the reliability of the State's medical expert testimony regarding a diagnosis of abusive head trauma—in general—on the basis of the 'triad' . . . without evidence of external injuries," appellant had not "at any point within her brief, alternatively argue[d] that even if a diagnosis of abusive head trauma could be reliable with respect to a typical patient based on the symptoms that Jack presented with, it was not reliable as to Jack based on his prior medical history, including the prior bleeding in his brain." *Id.* The court of appeals further noted that all cites to authority within appellant's brief "focus[ed] only on attacking the theory of diagnosing abusive head trauma generally," and that only three sentences within the eleven-page argument portion of her brief "even mentioned Jack's old brain bleeds." *Id.* The court continued by observing that these sentences were "unconnected with legal citations and do not purport to challenge the reliability of the experts' testimony based on the old bleeds." *Id.* It was within this context that the court of appeals indicated that it would review only the "general reliability" of the experts' testimony. *Id.* Although this statement, taken out of context, may appear to suggest

that the court broadly declined to consider the reliability of the experts' conclusions in this case at all, when viewed in context, this portion of the court of appeals's analysis is more properly viewed as a narrow holding that the court would not consider any challenge to the reliability of the experts' testimony based on the evidence of Jack's history of bleeding, due to appellant's failure to brief that issue on appeal. We now turn to consider whether this narrow holding by the court of appeals was in error.

The Rules of Appellate Procedure provide that an appellate brief "must contain a clear and concise argument for the contentions made, with appropriate citations to authorities and to the record." TEX. R. APP. P. 38.1(i). Further, the "brief must state concisely all issues or points presented for review," and the "statement of an issue or point will be treated as covering every subsidiary question that is fairly included." *Id.* 38.1(f). In addressing appellate briefing requirements, this Court has explained that "Rule 38.1 allows an appellant to present whatever issues for review he or she desires, with very few limitations. Thus, an appellant is the master of his or her own destiny with respect to what issues the court of appeals is required to address within its written opinion." *Garrett v. State*, 220 S.W.3d 926, 928-29 (Tex. Crim. App. 2007). On the other hand, we have emphasized that, given this wide latitude afforded to appellants, an appellate court has no "obligation to construct and compose [an] appellant's issues, facts, and arguments with appropriate citations to authorities and to the record." *Busby v. State*, 253 S.W.3d 661, 673 (Tex. Crim. App. 2008); *see also Lucio v. State*, 353 S.W.3d 873, 877-78 (Tex. Crim. App. 2011) (holding that "sole reference

to [an] assertion in the argument section of [an appellant's] brief" that was "unaccompanied by any other argument or authorities" supported conclusion that argument was inadequately briefed, and court of appeals thus properly declined to consider that argument); *Cardenas v. State*, 30 S.W.3d 384, 393-94 (Tex. Crim. App. 2000) (holding that defendant's points of error were inadequately briefed "by neglecting to present argument and authorities" in support of them). Stated more succinctly, an appellate court is not required to make an appellant's arguments for her. *See Lucio v. State*, 351 S.W.3d 878, 898 (Tex. Crim. App. 2011) (holding that appellant's point of error was "inadequately briefed and presents nothing for review as this Court is under no obligation to make appellant's arguments for her").

Here, a review of appellant's summary of her argument and her arguments shows that the court of appeals correctly determined that appellant failed to advance any argument on appeal that could plausibly be interpreted as challenging the reliability of the experts' conclusions in light of Jack's prior history of bleeding in the brain. Appellant's summary of her argument was, in total, that

> The trial court abused its discretion by allowing medical expert testimony on shaken baby syndrome (or its current vernacular, "abusive head trauma") as support for its findings. The State presented testimony that the child suffered a non-accidental, intentional head injury; yet the child displayed no external, physical signs of trauma. There is a vigorous debate supported from multiple sources and studies against the opinion that subdural hemorrhage and retinal hemorrhage in an infant is indicative of Shaken Baby Syndrome (SBS).
>
> The fact of the matter is that there is growing unrest in the medical community regarding the diagnosis of abusive head trauma on the basis of subdural hematoma, retinal hemorrhaging, and brain swelling, and the trial court abused its discretion to admit and consider the opinions relying upon these markers.

The "Argument and Authorities" section of appellant's brief included the following assertions:

- Appellant characterized her contentions at trial as "complain[ing] that the State experts issued the opinion of non-accidental, intentional injury based upon finding subdural hematoma, retinal hemorrhage, and brain swelling. Furthermore, especially given no external, physical signs of trauma or injury, the State experts were 'medically diagnosing' a crime. [Appellant] complained in essence that the trial court should disregard the State experts' opinions due to the general disagreement and retraction in the medical community that a certain constellation of symptoms was exclusively child abuse."

- Appellant discussed several cases from this Court as well as opinions from other courts addressing convictions that had been based upon expert medical testimony related to shaken baby syndrome. *See Ex parte Henderson*, No. AP-76,925 (Tex. Crim. App.—Dec. 5, 2012); *State v. Edmunds*, 746 N.W.2d 590 (Wis. Ct. App. 2008); *Cavazos v. Smith*, 132 S. Ct. 2 (2011) (Ginsburg, J., dissenting); *Ex parte Robbins*, 360 S.W.3d 446 (Tex. Crim. App. 2011). Appellant contended that these sources were "illustrative of the modern unease in the medical community with the reliability of shaken baby or shaken with impact syndrome."

- In light of these arguments and authorities, appellant urged the court of appeals to "find that the trial court abused its discretion by admitting and relying upon the state experts' opinions that the injuries sustained were non-accidental."

Throughout her brief to the court of appeals, appellant mentioned Jack's history of bleeding only in two places.[26] In both instances, appellant was merely describing the testimony of Dr.

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[26] In one place, appellant stated that Dr. Roberts, upon commencing the craniotomy, "saw a rapid efflux of older-appearing blood." In another place, appellant described in further detail Dr. Roberts's testimony regarding the evidence of prior bleeding. She stated,

> Dr. Roberts also noted from the CT scans a chronic, or "old bleed." According to Dr. Roberts, [Jack] must have had another prior hemorrhage, but according to Dr. Roberts the old blood would not have caused the constellation or entirety of the injuries. Dr. Roberts further acknowledged that there were two older bleeds, and both were subdural. On cross-examination, Dr. Roberts unequivocally stated more than once that his opinion that non-accidental trauma (child abuse) occurred was based upon a patient with a subdural hematoma, retinal hemorrhaging, and brain swelling.

Roberts, and her description of that testimony was unconnected to any legal authority or argument. Even construing appellant's arguments liberally, we can find no basis for concluding that the arguments in her brief expressly or implicitly addressed Jack's history of prior bleeding as a basis for refuting the reliability of the experts' conclusions of abusive head trauma in this case.

The question then arises whether, in spite of appellant's failure to present any argument in her brief pertaining to Jack's prior brain bleeds, the court of appeals was nevertheless obligated to consider that matter as a subsidiary question that was "fairly included" within appellant's complaint on appeal. *See* TEX. R. APP. P. 38.1(f). Appellant now raises this contention on discretionary review and asks this Court to hold that the court of appeals erred by declining to address Jack's history of bleeding in the brain as an issue that was fairly included within her reliability challenge on appeal. We decline to do so. Here, it is apparent that, although she may have placed substantial emphasis on Jack's history of prior bleeding at trial, appellant chose not to advance that argument on appeal as a basis for refuting the reliability of the experts' conclusions in this case. Instead, she narrowed her challenge on appeal to focus solely on the types of injuries that Jack presented with and on the sources that allegedly undermined the reliability of a diagnosis of abusive head trauma based on those types of injuries. When an appellant has narrowed her arguments on appeal to address only a particular basis for disturbing a trial court's ruling, it is not for the appellate court to then scour the record in search of other possible bases for reversing the trial court's

ruling on appeal. *See Alvarado v. State*, 912 S.W.2d 199, 210 (Tex. Crim. App. 1995) (observing that, as an appellate court, "it is not our task to pore through hundreds of pages of record in an attempt to verify an appellant's claims," nor is it "our task to speculate as to the nature of an appellant's legal theory"). To hold that the court of appeals erred by declining to consider an issue that appellant elected not to argue on appeal would conflict with the principle that an appellate court is under no obligation to make an appellant's arguments for her, and it would further conflict with the principle that an appellant is the master of her own destiny on appeal. *See Busby*, 253 S.W.3d at 673; *Garrett*, 220 S.W.3d at 928. Thus, under the circumstances of this case which show that appellant narrowed her arguments on appeal to challenge only the experts' conclusions of abusive head trauma based on Jack's particular injuries and ongoing debate in some segments of the medical community regarding the validity of the diagnosis based on those injuries, we decline to hold that the distinct issue of Jack's medical history of bleeding in the brain was an issue "fairly included" within her arguments. We, therefore, hold that the court of appeals was not obligated to consider whether the experts' conclusions were unreliable in light of Jack's medical history. We overrule appellant's first ground.

IV. Conclusion

We agree with the court of appeals's assessment that the trial court did not abuse its discretion by admitting the State's experts' medical opinion testimony on abusive head trauma. We, therefore, affirm the judgment of the court of appeals.

Delivered: February 15, 2017

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