

MAY 31 2019

No. 20170957

IN THE
COURT OF APPEALS OF THE STATE OF UTAH

**State of Utah,
Plaintiff and Appellee,**

v.

**Tisha Morley,
Defendant and Appellant.**

REPLY BRIEF OF THE APPELLANT

**On appeal from the Second Judicial District Court, Weber County,
Honorable Scott Hadley, District Court No. 141900806**

Ms. Morley is currently incarcerated

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Argument

Appellant Tisha Morley left Child on the floor, unsupervised, with several three- and four-year old children playing around him for fifteen minutes, and then she heard him crying. For the hours that followed, Child was fussy, vomited repeatedly, and was lethargic. Later that day, medical professionals discovered that Child had a skull fracture, and complications from that fracture caused his death.

The State argued that Ms. Morley slammed Child's head against a changing table. But its theory did not comport with the evidence. It had no physical evidence on the changing table—no DNA or fibers in the crack. (R. 5083, 5240, 5254.) In interviews, the children at the daycare said that Child cried when the children played with him and did "something different" to Child. (Exh. 133 at 14:00–15:00; Exh. 132 at 9:15–19.)

Ms. Morley's pediatric forensic pathologist spent years working with law enforcement to identify child deaths caused by abuse. (R. 5741, 5745.) She noted that Child was not mobile and was likely laying with his head on the floor, making him vulnerable if other children were running and playing around him. (R. 5779.) She testified that a one- or two-foot fall for an eight-month-old child could be fatal and cause a skull fracture. (R. 5803.) A 35-pound child jumping on Child's head could have caused the skull fracture. (R. 5894.) She knew of reported cases of three-year-olds causing serious and fatal injuries to younger children. (R.

5839, 5852–53.) She opined that it was more plausible that Child was injured from the other children than the changing table. (R. 5839.) She noted that if Child had been injured on the changing table, the police would have found tissue or DNA or trace evidence on the table, but no such evidence was found. (R. 5840–41.) Because she could not say to a reasonable degree of medical certainty that Child’s injuries were caused either by the changing table or by another child, she testified that the cause of Child’s death should be undetermined. (R. 5838.)

Despite this evidence—evidence that did not show beyond a reasonable doubt that Ms. Morley harmed Child by slamming his head into the changing table—the jury convicted Ms. Morley. That conviction should be overturned because Ms. Morley’s trial counsel did not object to two pieces of improper evidence: (1) a biomechanical engineer’s testimony on medical causation that was beyond his expertise and (2) misleading photographs.

1. The Biomechanical Engineer’s Testimony on Causation Far Exceeded the Scope of the State’s Medical Experts and His Own Expertise

The State based its case against Ms. Morley on the testimony of its experts. The State had no forensic evidence it could point to. It had no witnesses who claimed to see Ms. Morley harm Child. It had no confessions or damning text messages or statements. Its entire case came down to its experts. But one of those experts—the biomechanical engineer—rendered more aggressive opinions than the others, and, what’s worse, his testimony far exceeded his expertise and

qualifications. Rather than limiting his testimony within his expertise and focusing on forces and how those forces impact the body, the biomechanical engineer testified about who injured Child and how—something he was not qualified to address. His medical causation testimony went well beyond that of the State’s medical experts and fell well outside the scope his own expertise. But Ms. Morley’s trial counsel did not object to that improper testimony, and that was ineffective.

1.1 The State Relied Heavily on the Biomechanical Engineer’s Testimony and It, Therefore, Prejudiced Ms. Morley

To prove her ineffective assistance of counsel claim, Ms. Morley must argue deficient performance and prejudice. The State first takes issue with the prejudice prong.

The State argues that Ms. Morley was not prejudiced by the biomechanical engineer’s testimony because its four medical experts offered “materially indistinguishable testimony.” But that is not so. As it happens, their testimonies were materially and qualitatively different from that of the biomechanical engineer.

The biomechanical engineer concluded that a specific person (an adult) took certain actions (shaking and slamming) in a certain place (the changing table) that caused Child’s injuries. The biomechanical engineer, without medical qualification, concluded that Child’s injuries were caused by “a single event where an adult grabbed [Child], shaking him, forcibly causing his head to strike a firm

object which is perfectly explained by the fracture in this changing table.” (R. 4944.) The biomechanical engineer’s conclusion was much more specific, affirmative, and unqualified than the considerably more guarded testimony of the State’s medical experts.

In contrast, the State’s medical experts all concluded that Child’s injuries were consistent with inflicted trauma, or trauma caused by someone else. For example, the medical examiner concluded, “[Child] died from inflicted injury of the head. Anyway, with the information that I have, I had no explanation for any other accidental injury or anything like that, so blunt force injury of the head.” (R. 5427.) The ophthalmologist concluded, “My opinion, with all of the findings that we had and . . . the review of the literature and the cases that I’ve looked at is that this was a non-accidental trauma. This is consistent with abusive head trauma.” (R. 4521, 4553–54.) The physician concluded that Child’s injuries were “very consistent with and specific for abusive head trauma and very consistent with significant abusive head trauma by shaking and/or shaking . . . [with] impact.” (R. 4630.) And the State’s rebuttal expert, the radiologist, concluded that Child’s injuries “build upon one another to increase what we call the positive predictive value. . . [I]t so strongly points to abusive trauma or inflicted injury.” (R. 6235.) The biomechanical engineer’s conclusion far exceeded the conclusions of the State’s medical experts: it conjectured about where and who.

The State, however, contends that its medical experts testified similarly to the biomechanical engineer because they testified that (1) Child's injuries were consistent with shaking and impact and (2) Child's skull fracture was likely caused by abusive trauma. But the biomechanical expert testified well beyond this. Along with testifying how the injuries were caused, the biomechanical engineer testified about who injured Child and where. (R. 4919.) He also improperly informed the jury that his testimony was a "perfect explanation" of or "fit[] perfectly" with Child's injuries. (R. 4923, 4925.) The biomechanical engineer, without proper medical education, training, or experience, rendered emphatic opinions on causation.

By contrast, the medical experts' testimonies were carefully couched in probabilities for which reasonable doubt existed.

When asked to provide a likely scenario that would take into account all of Child's injuries, the medical examiner testified, "Well, obviously, I do have an impact site. I can't say for sure how it happened. You know, it could be that he impacted something or that something impacted him. The metaphyseal fractures in his shoulders—or the proximal humerus, those are unusual fractures that they're generally associated with more of a—a twisting that happens when the arm is extended, and that's usually going to be more of an inflicted type of injury as opposed to just falling onto a straight arm . . . " (R. 5432.) The medical

examiner also admitted that a three-year-old could injure an infant, but it would depend on the circumstances. (R. 5429.)

The ophthalmologist testified it was “very doubtful” that a three-year-old could generate enough force to injure an infant. (R. 4517.) But he noted that researchers had found retinal folds in a four-month-old who had been fallen on by a six-year-old. (R. 4547.) And he admitted that hitting a head with a door could cause the retinal folds. (R. 4523.) The prosecutor asked the ophthalmologist, “If I were to take this baby and go—and slam him into the table, would that be significant enough force to cause what you’re seeing?” (R. 4548.) The ophthalmologist answered, “In looking at the literature with what’s been reported, yes.” (R. 4549.) But the ophthalmologist did not go into any detail, and he specifically testified that he could not say who caused the trauma. (R. 4555.)

The physician testified it was conceivable but unlikely that a baby could be injured from being dropped from a toddler’s height (R. 4627.) When the prosecutor asked the physician if Child’s injuries could be explained by taking Child by the arms, shaking him and slamming him down on the changing table, the physician testified it would be a “very plausible, and in my opinion, a very likely cause” of Child’s injuries. (R. 4628.)

Similarly, the radiologist testified Child’s injuries could be caused by an impact with a flat surface or a corner of a piece of furniture. (R. 6242–43.) But he

could not say specifically how the head injury happened, although he believed the injuries were caused by an adult and not a child. (R. 6252, 6260.)

The State contends the biomechanical engineer's testimony was cumulative. That is incorrect. The State called him to the stand for a reason. It called him in its case-in-chief after the ophthalmologist and physician had testified. His testimony was the pivot-point at trial, where the State went from presenting testimony on Child's injuries and the process of the investigation to presenting evidence on who injured Child and the instrument of injury. And the State solicited medical and causation testimony from him for which he was unqualified to testify. That testimony effectively erased the cautious testimony of the medical experts by emphatically connecting Child's injuries, the mechanism of injury, and the person who injured Child, without hesitation or equivocation. The failure to object was prejudicial to Ms. Morley.

The engineer's testimony was important to the State's case. The State singled out and relied heavily on the engineer's testimony during closing argument. The State told the jury, "[The engineer opined that all Child's injuries] were caused in one event that is explained by grabbing [Child] around the arms, shaking him, and impacting him into a hard surface." (R. 6344.) The State's "emphasis in closing argument of Expert's testimony . . . is not only an indicator that the State considered that testimony important corroborative evidence, but

also that the testimony was important enough to make a difference.” *State v. Burnett*, 2018 UT App 80, ¶ 40, ___ P.3d ___.

1.2 Trial Counsel Performed Deficiently

Ms. Morley’s trial counsel was ineffective by not objecting to the engineer’s testimony about the specific cause of Child’s injuries. In so doing, the engineer exceeded his expertise and qualifications. Although the engineer was qualified to testify about the effect of certain forces generally on the human body, the engineer lacked the medical training necessary to opine about the exact causes of Child’s specific injuries. *See, e.g., Smelser v. Norfolk S. Ry. Co.*, 105 F.3d 299, 305 (6th Cir. 1997), *abrogated on other grounds, Morales v. Am. Honda Motor Co.*, 151 F.3d 500, 515 & n.4 (6th Cir. 1998); *Hankla v. Jackson*, 699 S.E.2d 610, 615 (Ga. App. 2010).

Trial counsel’s failure to object to the engineer’s testimony constituted deficient performance.

The State argues that the biomechanical engineer did not offer “medical testimony” but rather offered testimony “about the forces that could result in the injuries that the medical doctors diagnosed.” The biomechanical engineer did testify about force. But the biomechanical engineer testified about more than just force. He testified about *how* the injuries occurred, and he tied certain events to Child’s specific injuries; he testified about medical causation. (*See R. 4944* (engineer testifying that Child’s injuries were caused “effectively a single event

where an adult grabbed [Child], shaking him, forcibly causing his head to strike a firm object which is perfectly explained by the fracture in this changing table”).) Ms. Morley cited dozens of cases in her opening brief that excluded biomechanical engineers without medical training from testifying about medical causation because it was beyond their expertise. (Appellant’s opening brief, pgs. 36–39.)

The State also argues that competent counsel would not have objected to the biomechanical engineer’s testimony because his testimony was so similar to the testimony of other medical experts. But as explained in section 1.1 above, the biomechanical engineer’s testimony went far beyond the testimony of the medical experts. Unlike the medical experts, the biomechanical engineer conclusively testified that an adult grabbed Child around the arms, shook him, and impacted Child’s head on the changing table. No medical expert offered testimony that so neatly connected all the State’s evidence. The biomechanical engineer was not a superfluous witness; he was key to the State’s case.

To find Ms. Morley guilty of child abuse homicide, the jury had to find that she caused Child’s death while recklessly abusing the child. Utah Code § 76-5-208(1). The biomechanical engineer provided all the testimony the jury needed to find that these elements existed. He informed the jury that an adult—it would have had to be Ms. Morley because she was the only adult in the home at the time—shook and slammed Child’s head against the changing table.

It was deficient for trial counsel to not challenge the testimony that exceeded his education, training, and expertise.

2. Trial Counsel Was Ineffective By Not Objecting to the Photographs of the Doll on the Changing Table and the Video of Brother Lifting the Doll

2.1 Trial Counsel Performed Deficiently by Not Objecting to the Photographs

Throughout trial, the State showed photographs of a doll on the changing table: Exhibits 84, 85, and 86. But these photographs were not relevant because the doll was several inches shorter than Child, and the too-small doll was artificially positioned so its head aligned perfectly with the crack in the changing table. The photographs had no probative value because they did not accurately inform the jury about what happened to Child. Rather, the photographs were misleading but became a frequent and eventually common point of reference by the State such that, with no challenge or objection, the jury was left with little choice but to assume their accuracy.

The State argues that the photographs are not that bad because the biomechanical engineer “did not suggest that [Child] was lying on the changing table when he incurred the injuries.” Contrary to the State’s representation, that is precisely what the biomechanical engineer testified: he stated that Exhibit 85 “is an example of a surrogate infant showing that the physical dimensions and location of the head in relationship to the fracture and the length and breadth of

the changing table are consistent with—the opinion I had formed that [Child] was grabbed, shaken, and—and was forcibly caused to strike some firm object. This changing table becomes a—is becoming more and more likely to be the location where the injury occurred.” (R. 4941–42.) The prejudice resulting from the medical causation testimony given by an unqualified witness was compounded by his tying together his medical causation opinions with a photograph that was not an accurate, fair, or reasonable representation of the actual dimensions of Child or Child’s alignment with the crack in the changing table.

The size of Child in relation to the doll and the changing table is important. Compare the following two photographs. The first is Exhibit 84 as it was submitted to the jury:



This next photograph is a modified version of Exhibit 84, with the doll being closer to the size of Child:



With the doll the appropriate size, the doll's head no longer aligns perfectly with the crack. The modified photo is much less damning.

The State argues that any objection to the photographs would have been futile, because the biomechanical engineer explained the purpose of the photographs. But the biomechanical engineer never informed the jury that the photograph did not accurately depict the size of Child.

Not only did the biomechanical engineer rely on the photographs, so did the police officers who investigated the case. The State showed the photographs several times throughout the officers' testimonies as the officers discussed their

investigation. The officers used the photographs to show how the crack on the changing table fit the doll's head. (R. 4429–30, 5133, 5233–34.) One officer testified, as Exhibit 84 was being shown to the jury, that the purpose of putting the doll on the changing table was “[t]o see if it would be consistent with [Child] having his head slammed into the table.” (R. 5133.) The State used the photographs as a representation of what happened to Child.

The State cites two cases to support its argument that any objection to the photographs would have been futile. First, it cites *Faust v. State*, 805 S.E.2d 826, 833 (Ga. 2017). But *Faust* is inapposite. In *Faust*, there was no question that real guns were used in the crime, but the prosecutor showed the jury bigger guns as demonstrative exhibits during the trial. *Faust*, 805 S.E.2d at 833. Several witnesses testified about the differences between the real guns and the demonstrative exhibits, and “it was made clear to the jury that the exhibits were not the actual guns.” *Id.* However, in this case, a key dispute at trial was whether the changing table was the source of injury, and the reference to Child's height was a brief comment during a 12-day trial. It is highly unlikely that any juror remembered Child's height and compared his height with the size of the changing table and the doll. Certainly no witness did.

In the State's second case, the court allowed the use of a doll as a demonstrative exhibit because “it was similar in size to the victim.” *State v. Jones*, 984 N.E.2d 948, 966 (Ohio 2012). In this case, there is no dispute that the

doll was several inches shorter than Child. And several inches make a significant difference when dealing with an infant on a changing table and a crack in the middle of that table.

Helpful in this analysis is the Kentucky Supreme Court's discussion about the admissibility of posed photographs. *Gorman v. Hunt*, 19 S.W.3d 662, 667–70 (Ky. 2000). In that case, the court noted that “photographs frequently communicate the testimony of a witness to the jury more fully and accurately than the words in the testimony do.” *Id.* at 668. It allowed the admittance of posed photographs if the photographs were a fair and accurate portrayal of a scene or object, the photographs were relevant, and their probative value was not substantially outweighed by the danger of undue prejudice or misleading the jury. *Id.* at 669. “Because of the deceptive possibilities of photographs, they should be subject to careful scrutiny by the trial court to determine whether the photograph will lead to undue prejudice and misrepresentation.” *Id.*

In that case, the court allowed photographs modelling how an individual was struck by a car. Although the photographs showed the individual's head facing one direction, the expert who used the photographs “did not use the photographs to offer his opinion as to the direction [the individual] was facing, but instead, utilized the photographs to show [the individual's] position relative to [the] vehicle at impact. In fact, during his testimony, [the expert] disclaimed

any opinion as to the direction [the individual] was facing and whether she was moving forward at the time of the accident.” *Id.* at 670.

The biomechanical engineer in this case did the exact opposite with the photographs. Rather than informing the jury that the doll was much smaller than Child, the engineer pointed to the photographs as reconstructions of how the accident occurred. The engineer testified that Exhibit 84 “is an example of a surrogate infant showing that the physical dimensions and location of the head in relationship to the fracture and the length and breadth of the changing table are consistent with—the opinion I had formed that [Child] was grabbed, shaken, and—and was forcibly caused to strike some firm object. This changing table becomes a—is becoming more and more likely to be the location where the injury occurred.” (R. 4941–42.)

The photographs were inaccurate and misleading and allowed the State to create its own narrative about causation that did not conform to the physical evidence in the case. Trial counsel failed to object to the photographs based on the considerable discrepancies between them and the actual physical evidence. The State used the photographs as a focus, a central part of its narrative, throughout the trial. The State used the photographs to show the jury how Child was injured. But when a doll of the correct size is placed on the changing table, the State’s narrative comes apart.

Finally, the State argues that trial counsel acted reasonably by not objecting to the photographs. The State asserts that trial counsel used the photographs to argue that the police investigators were obsessed with proving that Ms. Morley was the culprit. But it is not clear from the record that this was trial counsel's strategy. In closing argument, trial counsel did not point out to the jury that the doll in the photograph was several inches shorter than Child, only that the police manipulated the doll's legs so that its head would fit the crack. But the doll was so much shorter than Child that, if the doll had been the same size as Child, there was no way the police could have manipulated the doll's legs to have its head fit the crack.

It is more likely that Child's height in comparison with the doll slipped by trial counsel's notice. Child's height was mentioned only briefly in the middle of a 12-day trial.

And even if it was trial counsel's strategy to use the photographs to show a faulty police investigation, that strategy was not reasonable. Photographs are more powerful than words. Showing the jury these photographs over and over throughout the trial cemented into the jury's brains, without any pushback, that Child was injured on the changing table in the way pictured in the photographs. And when the jury got into the deliberation room, the jury had the photographs, but it did not have any document relaying Child's height. Those photographs staring at the jury during deliberations could have persuaded the jury to convict.

2.2 Ms. Morley Was Prejudiced

Ms. Morley was prejudiced by the admission of the photographs. The photographs depicted in a vivid way the State's theory of how Child was injured.

The State argues that taking away the photographs does not change the evidentiary picture; it still had experts that testified about Child's injuries and how those injuries could have occurred.

But the medical experts were quite guarded in their causation testimony and opinions, as discussed above. The photographs created a false narrative that took away any equivocation expressed about causation by the medical experts. The photographs allowed the State to overcome the reasonable doubt that the medical experts expressed.

Moreover, the photographs were misleading because they did not match the physical evidence but formed a central role in the State's causation theory. Take away the unfair photographs and replace them with modified photos that depict the actual physical dimensions of the changing table and Child, such as the one on page 12 of this brief, the State has to come up with a different version of causation. Its story doesn't work.

The photographs also compounded the error in not objecting to the biomechanical engineer's testimony. The photographs vividly depicted the biomechanical engineer's improper causation testimony. The jury, then, had misleading photos that substantiated the engineer's improper testimony.

Conclusion

The question the jury had to decide was whether the State proved beyond a reasonable doubt that Ms. Morley injured Child. The lack of forensic evidence, the children's interviews, Ms. Morley's forensic pathologist, and the State's medical experts' equivocal testimony on causation created reasonable doubt.

But the State presented two pieces of improper evidence that harmed the reasonable doubt analysis: the biomechanical engineer's testimony on medical causation that was beyond his expertise and the misleading photographs. Because Ms. Morley's trial counsel was ineffective for not objecting to that evidence, this Court should reverse her conviction for child-abuse homicide.

If this Court reverses Ms. Morley's child-abuse-homicide conviction, Ms. Morley requests that this Court direct the district court to enter a conviction for the lesser-included offense of negligent homicide and remand for the limited purpose of resentencing, with a direction that all time Ms. Morley has served will be counted as time served towards her new sentence.

This remedy is appropriate. *See State v. Bilek*, 2018 UT App 208, ¶ 30, 437 P.3d 544 (“If a defendant's conviction must be vacated because of an error that occurred in the district court, [appellate courts] have the power to enter judgment for a lesser included offense if (i) the trier of fact necessarily found facts sufficient to constitute the lesser offense, and (ii) the error did not affect these findings.” (quotation omitted)).

The jury was instructed on the lesser-included offense of negligent homicide. (R. 1584–86.) A common element of child-abuse homicide and negligent homicide is that a defendant caused the death of another. *Compare* Utah Code § 76-5-208(1) *with* Utah Code § 76-5-206(1). When the jury convicted Ms. Morley of child abuse homicide, it necessarily found that she caused the death of Child, which is also an element of negligent homicide. And the ineffective assistance of counsel claims on appeal do not affect this finding.

Alternatively, Ms. Morley requests that this Court remand her case for a new trial.

DATED this 31st day of May, 2019.

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Certificate of Compliance With Rule 24(f)(1)

I hereby certify that:

1. This brief complies with the type-volume limitation of Utah R. App. P. 24(a)(11) and 24(g) because this brief contains 4,278 words, excluding the parts of the brief exempted by Utah R. App. P. 24(g)(2).

2. This brief complies with Utah R. App. P. 21.

DATED this 31st day of May, 2019.

_____/s/ Emily Adams_____

Certificate of Service

This is to certify that on May 31, 2019, I caused two true and correct copies of the foregoing to be served on the following via first class mail, postage prepaid:

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_____/s/ Emily Adams_____

Addendum A

Medical examiner's testimony

1 parties and counsel are present. We're outside the presence
2 of the jury, but the jury is being summoned, even as I speak.

3 Members of the audience, the attorneys have informed
4 me the next presentation will be by the medical examiner,
5 Dr. Ulmer. Many of you know and loved this little boy,
6 Lincoln, and these are going to be possibly very graphic and
7 may be disturbing photographs to some of you. So if you want
8 to leave at this point, it might be a good point before those
9 images are shown.

10 But I just wanted to warn you. It -- it can get
11 pretty detailed and pretty graphic, and where you know the
12 person, it might be a little hard. So if you'd like to not
13 see that, now would be the time to exit the courtroom.

14 (Pause in proceedings)

15 **THE BAILIFF:** The jury is present, Your Honor.

16 **THE COURT:** Okay. Thank you, Dave.

17 Members of the jury, welcome back. It looks like
18 we're ready to go. If -- if we weren't late, we'd be on time.
19 So here we go. The State will be calling their next witness.

20 **MS. TOOMBS:** Yes, Your Honor. The State would call
21 Dr. Pamela Ulmer.

22 **DR. PAMELA ULMER,**
23 being first duly sworn, testifies as follows:

24 *****

25 *****

1 **A.** So I am board certified in anatomic, clinical, and
2 forensic pathology, and then I also have a medical license for
3 the State of Utah.

4 **Q.** Okay. So what exactly is a medical examiner? What
5 does that mean?

6 **A.** So a medical examiner is kind of a loose term. It
7 means different things in different jurisdictions. So in the
8 State of Utah, a medical examiner is a forensic pathologist
9 that is hired by the state in order to do postmortems on
10 medical examiner cases.

11 **Q.** Okay. And when you say "hired by the state," you
12 have a group of people that that's the only job -- their only
13 job is to do -- do postmortem examinations.

14 **A.** That's correct.

15 **Q.** Okay. As part of those duties, are you asked to
16 certify cause and manner of death?

17 **A.** I am.

18 **Q.** And were you working, obviously, in that capacity in
19 February of 2014?

20 **A.** I was.

21 **Q.** Can you just explain to the jury, how does a case
22 come to your office?

23 **A.** It comes to my office from a variety of situations.
24 So depending on the scenario of the case, we have jurisdiction
25 for any nonnatural death for the State of Utah. We also do

1 natural deaths where the decedent died but they are not
2 attended, they don't have a physician that they've seen
3 recently. So a person may come to our office because they
4 died at home and then law enforcement was called to do a
5 welfare check. And here is this person that's dead and
6 there's no explanation for why they're dead, so they become
7 our patient.

8 Anybody who is involved in an act of violence, whether
9 it's a suicide or homicide, would become our patient once they
10 pass.

11 And then, also, accidental deaths. We do have a category
12 that's undetermined for cases when we can't decide if it might
13 fit one category or another better or we just don't know why
14 the person is dead.

15 **Q.** Okay. And that -- that occasionally occurs?

16 **A.** It does.

17 **Q.** Okay. Can you explain how -- how does the body end
18 up in your -- in your office?

19 **A.** Sure. So -- so there's a scene, whether it be at a
20 person's home or sometimes they get transported to the
21 hospital, so we don't really get the original scene but we'll
22 get the hospitalized scene. One of our death investigators
23 will go to the scene, they'll ask questions of whoever is
24 available, whether it's medical personnel, law enforcement,
25 family members, to try and find out what led up to this

1 person's death.

2 And then after that point, then the body is brought to
3 our office by a transport service. So it's placed in a body
4 bag. That body bag is sealed by our investigator so that it
5 can't be tampered with during transport, and then it arrives
6 at our office.

7 For a general case where there's no concern of a
8 suspicious nature, the body bag will then be opened at our
9 scene. The body will -- will be weighed and general height
10 and weight measurements as well eye color and hair color will
11 be documented, and then the body will go into the cooler.

12 For suspicious deaths, the bag is not opened. It's
13 simply weighed and then taken into the cooler until we would
14 examine it later.

15 **Q.** Okay. And how about the assignment of who performs
16 the autopsy? How does that work?

17 **A.** Basically, we have a schedule, month by month, on
18 what doc -- what doctors are working on what days. Some days
19 we are in autopsy and then some days we would have paper days.
20 So the autopsy days are scheduled out for the whole month a
21 month at a time, and it's just a random draw of if the person
22 happens to die on that particular day then it becomes your
23 case.

24 **Q.** Okay. Now, there's been testimony here about a
25 roundtable -- is what officers were calling it -- that

1 occurred at the ME's office on March 19th of 2014. Would you
2 be aware of what that is? What are they referring to?

3 **A.** I assume they're talking about the child fatality
4 review. That's a monthly meeting that we have for all child
5 fatalities in the State of Utah. It's not specific to any one
6 type of case. It's all dead children. Specifically, medical
7 examiner cases, but they also keep statistics for non medical
8 examiner cases.

9 So this is a diverse group of people who come to this
10 meeting. Obviously medical examiners are there. There are
11 people from the Department of Health that this is what their
12 meeting is, they're actually running this child fatality
13 review. And then there's other people from other agencies:
14 DCFS, the attorney general's office, a variety of other state
15 agencies that help with services.

16 So this fatality review does a variety of things. It
17 helps to document the type of cases that children are dying
18 from. This is especially important for say, like, suicide
19 deaths as they try to figure out possible things that they can
20 do or recommend for prevention, how can we help our children
21 to avoid these scenarios.

22 Also, it brings about possible services that might be
23 available to the family, whether it's helping with burial
24 funds because in certain types of deaths there is money
25 available for those types of services. There's also money

1 available for -- if they need to have counseling, especially
2 for, like, a sibling who, you know, a -- a younger or older
3 sibling of the person who died, then these counseling services
4 are available. So that's pretty much what it's for.

5 We do also discuss our homicide cases and a lot of times
6 we will invite the law enforcement folks to come and discuss
7 with us because sometimes it's not clear whether this is
8 really a homicide or maybe it's an accidental death or maybe
9 we don't know what happened. And so getting all of this
10 information together helps to try and -- and tie all of that
11 together so that everybody is on the same page.

12 **Q.** And is that something -- a group of professionals,
13 are you changing each other's -- well, I guess, is it unusual
14 in your field to get a group of professionals together to have
15 these kinds of discussions?

16 **A.** No. This is something that's done across the nation.
17 You know, it's -- any -- any major metropolitan area or state.
18 I think some of them are funded on a county basis; some of
19 them are funded on a state basis. So it's very common to have
20 these child fatality reviews.

21 **Q.** Okay. And was Lincoln Penland's case reviewed, to
22 your knowledge?

23 **A.** Yes, it was.

24 **Q.** Okay. On or about February 28th of 2014, were you
25 notified that there was a death or an impending death of an

1 eight-month-old child by the name of Lincoln Penland?

2 **A.** Yeah, I believe we found out on the 27th. I'm not
3 totally clear on that. But, yes, we were -- definitely knew
4 on the 27th that this child's life support was being turned
5 off.

6 **Q.** Okay. And were you then notified by Primary
7 Children's -- obviously, is that where that came from?

8 **A.** Yes. It was from one of the physicians that was
9 working in the intensive care unit.

10 **Q.** And why were you notified?

11 **A.** Why were we notified? Because it was a suspicious
12 death and so that would make it a medical examiner case.

13 **Q.** Okay. So you indicate that it's a suspicious death.
14 When you have a suspicious death, is it unusual for law
15 enforcement or a representative of the State to attend those
16 autopsies?

17 **A.** No, that's really quite common. We have different
18 investigators for different agencies that will come. We might
19 have -- depending on the type of case, we might have
20 individuals from the crime lab come and -- and, say, try to
21 fume for fingerprints on the body or collect other type of
22 evidence.

23 So, no, that's not unusual. And where I did my
24 fellowship in Seattle, it was similar. Actually the
25 prosecutor came on all homicide cases for at least the initial

1 part of the autopsy.

2 Q. Okay. And that was even in Seattle, you said?

3 A. Yes.

4 Q. Okay. So when -- on February 28th when Lincoln
5 Penland was transported, did you receive him in the normal
6 course as you would expect it to be?

7 A. Yes, I did.

8 Q. And you performed the autopsy?

9 A. That's correct.

10 Q. Okay. Did you prepare a report of your findings?

11 A. I did, and I've got it in front of me because I'm
12 going to be using it for reminding me how things were since
13 it's been a while.

14 Q. It has been about -- a little over three years,
15 right? How many autopsies have you done in the last -- we'll
16 just narrow it -- since then?

17 A. I would say I average about 350 to 375 a year. Last
18 year was a little bit on the high side as we're short-staffed
19 right now, so I did over 500 cases last year.

20 Q. In this case, did you -- were you able to make a
21 finding regarding the cause of Lincoln's death?

22 A. The cause of death was blunt force injury of the
23 head.

24 Q. And were you also able to make a conclusion as to the
25 manner of death?

1 **A.** Yes. With the information that was available at the
2 time, the manner of death was considered homicide.

3 **Q.** Okay. And when was that report prepared?

4 **A.** The final signing was on June 9th of 2014.

5 **Q.** Okay. Let's talk, if we can, about some of the
6 findings that -- that led you to those conclusions. First
7 off, as part of your examination, do you photograph the body
8 as it comes in?

9 **A.** We do. We do extensive photoing. We will photo
10 layer by layer so -- especially for homicides, we try to be
11 conscientious about not missing anything that's at least
12 obvious.

13 **Q.** Okay.

14 **A.** So we will photograph the body bag itself as we are
15 undoing the seal and then we do a layer by layer -- we're
16 opening the bag, showing how the body is wrapped in the bag.
17 They might be in another body bag or they might just be
18 wrapped in a sheet or a blanket. Everything gets -- excuse
19 me -- layer by layer.

20 And then with clothing on, if they are clothed, with
21 medical equipment in place, if they have medical equipment,
22 and then once everything is removed, again, how they look.

23 And then certainly -- not specific for this case, but for
24 other types of homicide cases where they haven't gone to the
25 hospital, before we remove any clothing or anything we'll

1 actually do dirty photos of the hands, take fingernail
2 clippings that could potentially be used for DNA to determine
3 who might have inflicted the trauma.

4 And then the body gets washed and it's photoed again once
5 it's clean. We photo the front, we photo the sides, we photo
6 the back, so it gets photoed.

7 **Q.** Fair to say there's a large number of photos taken?

8 **A.** There is.

9 **Q.** Okay.

10 **A.** And that's just externally. And then once we do the
11 internal exam, there's a lot more.

12 **Q.** So we could potentially be here all day if we were to
13 look at each and every one of your photos?

14 **A.** Well, maybe not that long, but --

15 **Q.** A long -- a while at least?

16 **A.** It depends on how much discussion there is for each
17 one.

18 **Q.** Okay. We're -- we're going to not look at every one
19 of your photos, if that's okay?

20 **A.** That's fine.

21 **Q.** And you indicated that in some cases, not specific to
22 this one, you check fingernail clippings, things like that.
23 Why did you not do that in this case?

24 **A.** Because in this case, the infant had been in the
25 hospital for approximately 10 days so any significant DNA

1 information would be clouded over by everybody who touched him
2 while he was in the hospital.

3 **Q.** Okay. I'm going to show you what has been marked
4 State's Exhibit 93, 94, 95, 96, 97, 98, and 99. They are now
5 reversed.

6 I'm going to just show these to you and just ask if you
7 recognize these photos first. I'm going to have you look at
8 each of those.

9 **A.** Yeah. So these are all photographs of Lincoln
10 Penland that were taken during the autopsy.

11 **Q.** Okay.

12 **MS. TOOMBS:** Move to admit 93 through 99.

13 **THE COURT:** Any objection?

14 **MR. BUSHELL:** No objection.

15 **THE COURT:** Okay. State's Exhibits 93 through 99 are
16 received.

17 **MS. TOOMBS:** Permission to publish?

18 **THE COURT:** Any objection?

19 **MR. BUSHELL:** Not at all.

20 **THE COURT:** Okay. It may be published to the jury.

21 **Q. (BY MS. TOOMBS)** Dr. Ulmer, as we go through these, if
22 it's easier for you to stand down, feel free to do so.

23 Should be coming up briefly here. Okay. Are you able
24 to -- are you able to see them now? Looking at Exhibit 93,
25 what are we looking at here?

1 **A.** So this is a -- a picture of Lincoln just from the
2 front. It's showing the top half of his body.

3 **Q.** Okay. And --

4 **A.** Just for information, this is a placard that we'll
5 use for these photos of the -- initially. These are
6 centimeter marks and then the case number, as well the date.

7 **Q.** And that's just something that you place for
8 identification in every photo?

9 **A.** Right. We'll use a big placard like this for the
10 overall photos and then we'll use a small -- smaller with just
11 the number and measurement on it for, like, wound photos or
12 other significant photos.

13 **Q.** Okay. Moving forward to Exhibit 94, are you able to
14 identify what we see here?

15 **A.** So this is the lower half of Lincoln's body and you
16 can see that he still has his medical in place, so he's got a
17 disposable diaper as well some cardiac monitor pads. This is
18 a mark from an intraosseous catheter. There's an IV line
19 here. And then I think this was -- I'm not sure what that
20 was. And then just his ID label that has his name and medical
21 record number on it.

22 **Q.** Okay. And you -- you identified that circled spot,
23 that is --

24 **A.** That's where an intraosseous catheter -- so when they
25 need to do an IV fast and you can't get a vein very easily,

1 then they'll actually take a needle and they'll go right into
2 the bone marrow of a bone and then they can use that for
3 infusing saline or medicines.

4 **Q.** Okay. Moving on to State's Exhibit 95, what are we
5 seeing in this photograph?

6 **A.** So this is the back side of Lincoln. And you can see
7 that there's this red-purple discoloration here and that is
8 called lividity or livor mortis. And what happens is once you
9 die, your circulation stops and so then all of the blood
10 starts settling towards gravity. And eventually, over time,
11 it -- the blood cells kind of break down and leak into the
12 tissue and it becomes fixed.

13 So initially if you were at a scene and you -- and it was
14 very recent, the lividity would not be yet fixed. So blood is
15 settling, but if you turn the body over the other way, it will
16 resettle to gravity once again. Once it's had time to fix
17 into the tissue, it won't move anymore, so we'll have what's
18 called fixed lividity.

19 **Q.** Okay. And so there's a -- a significant amount of
20 redness on Lincoln's back. That is a condition of his death,
21 not trauma. Is that fair to say?

22 **A.** That's correct.

23 **Q.** Moving on to Exhibit 96, what do we see here?

24 **A.** We're seeing his lower legs. And I really can't see
25 it very well in this photograph, but I believe in the autopsy

1 report there were just a couple of small bruises on the
2 posterior thighs that were just small and pretty much not --
3 not very prominent. Their coloration was rather pale. So I
4 don't know the significance of those bruises, but that's what
5 I was probably trying to document with this picture.

6 Q. Okay. Moving on to Exhibit 97, what are we looking
7 at here?

8 A. So here we're looking at the right side of Lincoln's
9 head. And we're starting to see here -- it looks red here in
10 this photo, but there's a bruise that's going all the way back
11 behind his ear that I think we'll see more of soon.

12 Q. Soon? Okay. Let's go ahead and skip to that photo.
13 Exhibit 99, is that what you're referring to?

14 A. So, again, you're seeing all of this discoloration
15 right here and this is all bruise -- bruising of the skin.

16 Q. Okay. And back to Exhibit 98, what am I looking at
17 here?

18 A. This was just a little red mark that was on the back
19 of his head and there was some concern of, you know, whether
20 that was some type of significant injury. And in my reviewing
21 of the medical records, they had a C collar on him, which is
22 called a Papoose, to kind of hold his head in place. And it
23 was mentioned in the medical records that that was just a rub
24 mark from that C collar and that that's not inflicted trauma.

25 Q. Okay. So that in and of itself is not significant to

1 your findings?

2 **A.** That's correct.

3 **Q.** Okay. Now, you can go ahead and have a seat for a
4 minute and I'll probably have you bounce back up.

5 Push a button and it may break things or I may -- okay.

6 Now, moving forward in your examination, so so far at
7 this point you've documented significant bruising behind the
8 right ear, possibly some small, tiny little bruises behind his
9 legs.

10 **A.** Correct.

11 **Q.** Okay. Other than that, the medical documentation.

12 **A.** Yes.

13 **Q.** Okay. Moving point -- moving forward from this
14 point, what did you do next?

15 **A.** So in those photos, he still had his medical on. So
16 that will -- that will get documented and then it will get
17 removed.

18 **Q.** Okay.

19 **A.** And then we'll photograph him again without those.
20 Once we're done with all of those photos and all of the
21 external exam, on infants we have certain testing that we do.
22 Pretty much on any infant under the age of one that's going to
23 come in that we don't know why they're dead, we're going to do
24 cerebral spinal fluid cultures, blood cultures. So we do both
25 of those looking for possible infections. And then we'll do a

1 nasopharyngeal swab of the inside of the nose and actually
2 pretty deep back for possible viral cultures for respiratory
3 tract infection. If I'm concerned about possible pneumonia, I
4 might do a lung culture.

5 And so everything in that category was done on Lincoln
6 except for the lung culture. I did not do that. So those are
7 all things that are done. They can be done exteriorly, but
8 usually the blood culture I'll do interiorly from the heart.
9 And then any other documentation that we might need to make.
10 And that pretty much is the end of the external examination,
11 and then we'll move on to the internal examination.

12 Q. Okay. So before we move on to the internal
13 examination, let me just ask you, you did the cultures in
14 Lincoln?

15 A. Uh-huh.

16 Q. Did you note any -- any -- did anything come back
17 abnormal?

18 A. He did have some growth in his blood for two
19 different types of streptococcus, but they're not typical
20 bacteria that I would associate with disease. So I assumed
21 that those were just postmortem artifact just due to
22 decomposition, basically.

23 Q. Okay. And I'm going to show you what's been marked
24 State's Exhibit 100. I'm going to ask you if you recognize
25 this photo?

1 **A.** Yeah. This is a photo -- when I was doing the
2 collection of spinal fluid, I do that in the lower back, and
3 so this is a photo of that first collection. And, initially,
4 what came out --

5 **Q.** Let me -- let me just stop you right there.

6 **A.** Sure.

7 **MS. TOOMBS:** And I'll move to admit Exhibit 100.

8 **MR. BUSHELL:** No objection.

9 **THE COURT:** Okay. State's Exhibit 100 is received.

10 **MS. TOOMBS:** Okay.

11 **THE WITNESS:** I want to backtrack just a minute too.

12 **Q. (BY MS. TOOMBS)** Sure.

13 **A.** Another thing that we'll do is we'll also do a
14 full-body X-ray. Even though this child did have imaging at
15 the hospital, which was certainly of better quality than what
16 we can do at our office because they have actual radiologists
17 to read them, we do do imaging at our office too, so --

18 **Q.** Okay. And -- and that was done in this case, as
19 well?

20 **A.** I believe it was, yes.

21 **Q.** Okay.

22 **MS. TOOMBS:** Permission to publish Exhibit 100.

23 **THE COURT:** Any objection?

24 **MR. BUSHELL:** No.

25 **THE COURT:** It may be published.

1 **MS. TOOMBS:** And (unintelligible).

2 **THE COURT:** Yeah. Thank you.

3 **MS. TOOMBS:** Thank you.

4 **Q. (BY MS. TOOMBS)** If I could have you step down. I
5 believe you started to explain what you were finding here.

6 **A.** Right.

7 **Q.** If you could just tell the jury what this is
8 significant for.

9 **A.** So --

10 **Q.** And you've got them --

11 **A.** So just for -- is it on?

12 **THE BAILIFF:** Yes.

13 **A.** So just for point of reference, this is the back of
14 Lincoln. And, then, this is a syringe, and I'm just poking it
15 through the skin and down into the spinal column until it gets
16 down into where the spinal fluid will be, next to the spinal
17 cord.

18 I -- I pulled back this blood and so that tells me one of
19 two things: Either, A, the spinal fluid is really bloody; or,
20 B, I'm not in the right place and I'm drawing some other type
21 of -- or I'm drawing blood up from some other site.

22 **Q.** Okay. Go ahead.

23 **A.** And so then because I'm not sure, then I'm going to
24 go and look at a different area to see whether it's going to
25 be the same. This is very important because I need to know up

1 front whether I'm concerned about whether this is truly spinal
2 fluid looking like this because then that might change my
3 thought process as I'm going through this investigation. A
4 lot of infants that we get in don't come in with any
5 information at all.

6 So if I have this on a case where this was not reported
7 to us as a potentially traumatic injury, then I have to really
8 start thinking about what I need to do, any evidence that I
9 might need to preserve or anything like that because that
10 would tell me that there's blood in the spinal fluid and this
11 kid has traumatic injury to the brain. So -- are you going to
12 put up that other one or not?

13 **Q.** I'll put it up in -- the -- now, you did a -- a tap
14 in the neck.

15 **A.** And that's what I'm asking, so --

16 **Q.** I don't have that one.

17 **A.** Okay.

18 **Q.** -- let's go ahead and just chat about the -- what you
19 did. So at this point you've got some concerns, and what did
20 you do to alleviate those concerns?

21 **A.** So I want to make sure that this was not just a
22 mistake and that this was contamination from another area. So
23 then what I did was I did another spinal tap, but I did it at
24 the base of the skull where the spinal cord goes into the
25 skull or the foramen magnum, and I did another collection of

1 spinal fluid there. That spinal fluid was still a little bit
2 bloody, but nothing like this. So what that tells me is this
3 blood was probably coming from another area.

4 Q. Another area, in other words, separate from the
5 brain?

6 A. Separate from where the spinal fluid is surrounding
7 the spinal cord.

8 Q. Okay. And did you subsequently do additional
9 investigation that would lead you to believe that there was
10 trauma in that area?

11 A. Yeah. So, I mean, ultimately, when we go through the
12 process of the internal examination -- I can just go ahead and
13 start talking about that or do you want me to --

14 Q. Let's narrow it down to just the lower lumbar area
15 here. As you do your internal examination, what did you find?

16 A. So -- so we'll -- we'll look at the back, especially
17 on infants like this, and we'll want to actually look at the
18 spinal cord. So in order to do the spinal cord examination,
19 you have to reflect the skin on the back out of the way and
20 then you have to actually remove the spinous processes on the
21 back of the spinal cord -- I mean on the back of the spine
22 itself to be able to get into where the spinal cord is. So
23 it's actually inside those spine -- each vertebra.

24 When I unfolded this and was looking at the cord, I could
25 see that there was blood in the subdural space and so -- that

1 shouldn't have been there. That's unusual too. It should --
2 the subdural space isn't actually normally a space. It's
3 usually a potential space, but it doesn't -- it doesn't really
4 have anything in it. And so for me to draw this blood out of
5 that space would suggest that something else was going on in
6 that area of the back.

7 **Q.** And in your -- your training, experience, and own
8 research, what kinds of things would be going on in the back
9 at that point?

10 **A.** Well, it -- it's not always readily available for the
11 information so certainly medical therapy -- he could have had
12 a spinal tap at the hospital that could have caused this
13 because there could have been leakage around when they did it,
14 doing a traumatic tap, but I don't believe he had a spinal tap
15 at the hospital in this particular case.

16 It might be from blunt force injury. For example, in
17 a -- some type of a motor vehicle accident or something like
18 that where there's significant injury.

19 There's some speculation that it could be associated,
20 possibly, with shaken baby syndrome, but I don't really have a
21 good feel for that to know whether that's plausible or not.
22 But certainly trauma-related.

23 **Q.** When you don't have a good feel for it, it's not your
24 area of expertise.

25 **A.** That's correct.

1 **Q.** Okay. Let's see. And did you -- subsequently, after
2 this day, did you review the medical records from the
3 hospital?

4 **A.** I did.

5 **Q.** And is that placement -- the placement of that
6 subdural hematoma consistent with what was seen by the doctors
7 at Primary Children's on the MRIs?

8 **A.** There was some mention of some bleeding down in that
9 lumbar spine region. And so I don't know if they were seeing
10 the same thing that I was seeing, but there was mention of
11 bleeding down in that area.

12 **Q.** Okay. Now, at -- at this point, though -- well,
13 let's move on to the head. Did you also have information that
14 there may have been trauma to the head?

15 **A.** Yeah, that was reported to us initially. They had
16 seen fracture -- a skull fracture at the hospital on his
17 initial -- when he was originally seen at McKay-Dee, which was
18 the originating hospital. There was a skull fracture as well
19 as some bleeding associated with that.

20 **Q.** And there's other things that you do before you get
21 to the head; is that fair to say?

22 **A.** Yes.

23 **Q.** If you could just briefly explain to the jury what
24 happens there.

25 **A.** Sure. So once we've done all of our external

1 examination and I've collected all my cultures and done my
2 X-rays and all of that kind of thing that I can do, we're
3 going to open up the chest and abdomen. We do a Y-shaped
4 incision and reflect the skin back. And then we will cut out
5 the rib cage, just kind of a U shape, so that we can get
6 access to the lungs and heart.

7 In infants, we remove all the organs in one entire block
8 and that's done by the autopsy assistant. And they give that
9 block to me and then I will then look at it, make sure
10 everything looks good, as far as healthy. And then I will
11 remove each organ. It will get weighed. It will actually get
12 cut through to make sure there's no trauma or no disease on
13 the inside because that's what we're looking for. We're
14 looking for any kind of natural disease, any indication of
15 infection, and also trauma.

16 So we do all of the organs in the chest and abdomen,
17 then, separately, and then once we're done with the chest and
18 abdomen examination -- and, again, I collect my blood culture
19 from the heart blood, so I'll do that once I've removed that
20 chest plate.

21 Once that is done, we move up to the head examination.
22 So we'll do an incision across the top of the head and the
23 scalp gets reflected back. That allows us to see any kind of
24 bruising that might be on the inside of the scalp as opposed
25 to what you're seeing outside. You might not always see the

1 same thing. You might see bruises on the outside that you're
2 not seeing because they're superficial bruises or you might
3 see bruises on the inside that you didn't see on the scalp
4 just because of the type of impact and the type of surface
5 that was impacted.

6 So in this particular case, there was a skull fracture
7 that basically was from behind the ear and across the back of
8 the scalp -- or back of the skull, and then it also went
9 underneath to the bottom of the skull a little bit too. To go
10 along with this, there was bruising that we saw behind the
11 ear, so you already saw that. There was also sub
12 (unintelligible) bruising that was along the region of where
13 that skull fracture was and then behind that ear. And that's
14 essentially what we saw in that area.

15 Q. Okay. Let's take a look -- did you photograph that
16 area?

17 A. Yes.

18 Q. Okay. I'm going to show you what's been marked
19 State's Exhibit 101. It is black and white. I'm going to
20 just show it to you here. Are you able to identify this?

21 A. Yeah. That's the scalp -- the front of the scalp
22 that's been reflected.

23 Q. Okay.

24 MS. TOOMBS: Move to admit Exhibit 101.

25 MR. BUSHELL: No objection.

1 **THE COURT:** Okay.

2 **MS. TOOMBS:** Permission to --

3 **THE COURT:** State's Exhibit 101 is received.

4 **MS. TOOMBS:** Permission to publish?

5 **THE COURT:** Any objection?

6 **MR. BUSHELL:** No, that's fine.

7 **THE COURT:** It may be published to the jury. Thank
8 you.

9 **Q. (BY MS. TOOMBS)** So as I put Exhibit 101 up, what are
10 we seeing here?

11 **A.** So this is kind of hard to really appreciate since
12 it's in black and white, but they wanted to try and make it as
13 little offensive to you guys as possible.

14 So -- so this is the body down here and then this is the
15 scalp. The incision was up over the ears and then this has
16 been reflected forward so that it's basically down covering
17 the eyes and nose. And this is what the normal color is and
18 then all of this here is bruising that's underneath, in the
19 scalp. So very deep bruising.

20 **Q.** So -- and that would be significant to -- a
21 significant finding?

22 **A.** Yes, it would. I mean, it goes along with that --
23 with the skull fracture so --

24 **Q.** Okay. So where do you go from here?

25 **A.** So then we're going to actually remove the skull cap

1 so that we can look inside and look at the brain and the
2 different layers that cover the brain. So your brain has a
3 protective group of layers that are called the meninges. So
4 the one that's more on the outside is called the dura and then
5 you have the arachnoid and the pia mater and all of those
6 layers have kind of different functions.

7 The dura matter is very thick and tough and so it allows
8 protection and allows kind of a nice enclosed membrane because
9 then the -- in what's called the subarachnoid space is where
10 all of your spinal fluid is going to flow through and so that
11 allows kind of a cushioning pillow that's all enclosed in
12 those membranes to protect your head from impacts against the
13 skull.

14 **Q.** Okay. And I may be out of order here, so let me just
15 double check. At this point, are we -- we haven't seen the
16 skull fracture, correct?

17 **A.** No.

18 **Q.** Okay. Let's see. I'm going to show you a couple of
19 photographs, one marked State's Exhibit 102.

20 (Off-the-record discussion)

21 **Q.** So State's Exhibit 102 and State's Exhibit 169, do
22 those look familiar to you?

23 **A.** Yeah. Those are photographs of the skull fracture.

24 **Q.** Okay.

25 **MS. TOOMBS:** Move to admit 102 and 169.

1 **MR. BUSHELL:** No objection.

2 **THE COURT:** Okay. State's Exhibits 102 and 169 are
3 received.

4 **MS. TOOMBS:** Permission to publish?

5 **THE COURT:** Any objection?

6 **MR. BUSHELL:** No.

7 **THE COURT:** May be published to the jury.

8 **MS. TOOMBS:** May I approach the witness?

9 **Q. (BY MS. TOOMBS)** All right. Moving forward to 102,
10 what are we seeing in this photograph?

11 **A.** So we're seeing the skull fracture just along the
12 right side. So here you can just barely catch the corner of
13 the ear and then you can appreciate -- this is going through
14 what's called the lambdoid suture. So when you are developing
15 in utero, your skull basically is little islands of bone that
16 eventually grow together, and where they come together are
17 called suture lines.

18 In an infant, those suture lines stay open because their
19 brain and their skull isn't done growing. And so those will
20 stay open somewhat, meaning that there's a -- kind of a
21 fibrous connection there that allows them to kind of grow and
22 stretch as the brain grows, but also it can allow for a spot
23 of separation. And what you're seeing in this case, it's
24 separated enough that it's considered a fracture.

25 **Q.** And does that occur naturally?

1 **A.** No. This has to be from trauma.

2 **Q.** Okay. And I'm going to now move forward to
3 Exhibit 169.

4 **A.** And so this is kind of awkwardly oriented because
5 this is the bottom. And what it's showing is that that skull
6 fracture is going all the way across the back of the skull
7 until it's probably about here. And this, again, is a
8 diastatic fracture that I was talking about with that suture.
9 And then when we get over here, it actually makes a sharp turn
10 down, down towards the occipital region of the skull.

11 **Q.** And to be fair, does the fracture -- is the fracture
12 limited -- other than this sharp turn over here, is the
13 fracture on the -- the right side limited to the suture area?

14 **A.** No. It goes down into what's called the middle
15 cranial fossa. So on the bottom of the skull, there are
16 little areas of recesses. It's not a nice smooth surface. So
17 you've got basically like two cups where the frontal lobes can
18 sit, two cups where the temporal lobes can sit, and then two
19 cups where your cerebellum sits. And that's kind of how the
20 bottom of the skull is arranged. And so on the right side
21 where that temporal lobe would sit, the fracture goes down and
22 into that bone as it's kind of going forward.

23 **Q.** Okay. So that is a -- is that a pretty significant
24 fracture, then?

25 **A.** Yes, it is.

1 Q. Do you see any other fractures in Lincoln?

2 A. So --

3 Q. Let me -- let me stop -- back up and rephrase that.
4 In his head.

5 A. No.

6 Q. No other fractures in his head, nothing on the
7 side of his face -- the right -- left side of his face or
8 anything of that nature.

9 A. No.

10 Q. Okay. Then moving forward from here, what do we --
11 where do we go from here?

12 A. So we've seen the outside of the skull, so then we're
13 going to remove the skull cap.

14 Q. Okay. And when you removed the skull cap, did you
15 also document that?

16 A. Yes, we did.

17 Q. Okay. I'm going to show you what's been marked --
18 I'm going to show you what's been marked State's Exhibit
19 105 and 106. Are you familiar with these photographs?

20 A. Yes.

21 Q. Okay.

22 **MS. TOOMBS:** Move to admit --

23 **THE WITNESS:** Yes.

24 **MS. TOOMBS:** -- 105 and 106.

25 **MR. BUSHELL:** No objection.

1 **THE COURT:** Okay. State's Exhibits 105 and 106 are
2 received.

3 **MS. TOOMBS:** Permission to publish and approach?

4 **THE COURT:** Any objection?

5 **MR. BUSHELL:** No.

6 **THE COURT:** Okay. You may publish.

7 **Q. (BY MS. TOOMBS)** So moving to 105, what are we seeing
8 here?

9 **A.** So we're seeing the inside of the skull. And, again,
10 it's showing that fracture as you would see it from the
11 inside. So we're going across the back here. And then you
12 can't really see where it goes down, but there's another
13 little fracture somewhere over here. I think it's right
14 there.

15 **Q.** Okay. And 106?

16 **A.** And then this shows where it was going forward on the
17 right side and going down into that middle cranial fossa, so
18 this is going more towards the front of the brain.

19 **Q.** And that would be that thick area of bone behind your
20 ear?

21 **A.** Yes.

22 **Q.** Okay. And I think earlier testimony has called that
23 the mastoid region; is that correct?

24 **A.** Yeah. So your mastoid area is right here behind your
25 ear and, generally, that's the thickest part of the skull. So

1 you can get a lot of impact there and -- and it will hurt, but
2 it shouldn't be causing trauma whereas, like, your temporal is
3 like the thinnest area. So this is always a concern for
4 getting punched in the temple or something that might cause
5 trauma.

6 So, generally, you know, although this is an infant and
7 so his bones are going to be much thinner and weaker than an
8 adult would be, this is still going to be like the thickest
9 area of his skull.

10 Q. Okay. Fairly -- would you say fairly rare to see a
11 fracture like that?

12 A. Yes. And it's not one that you would see with just
13 like a simple fall. Usually, like, if you have a simple
14 ground-level fall or a fall off of a swing set or a jungle gym
15 or something like that, kids actually do get fractures all the
16 time. A lot of them probably aren't even diagnosed, but
17 they're just simple linear fractures. They don't cause any
18 problems and they just heal so they might have a headache or
19 something like that, but --

20 Q. Is that what we would be seeing from Lincoln with
21 this fracture?

22 A. No, this is more extensive. This is what I -- I
23 would consider something that required more force than the
24 things that I just suggested. So I can't really describe like
25 how much force this would require, but certainly it's not

1 going to be just a simple tap on the head or a simple
2 ground-level fall.

3 Q. Okay. Think it would cause pain at all?

4 A. I would expect that it would, yes.

5 Q. Okay.

6 A. Anybody who's whacked their head without even
7 breaking it knows that it hurts so --

8 Q. Okay. So we've documented the fracture itself and
9 you are -- I think you started to talk about examining the
10 brain itself. Fair?

11 A. Yes.

12 Q. Okay. I'm going to show you State's Exhibit 103 and
13 104, see if you recognize them and if they'll be helpful as we
14 talk through those.

15 A. Okay.

16 Q. Do you recognize those?

17 A. I do. Those are the brain and the dura.

18 Q. Okay.

19 MS. TOOMBS: Move to admit 103 and 104.

20 MR. BUSHELL: No objection.

21 THE COURT: Okay. State's Exhibits 103 and 104 are
22 received.

23 MS. TOOMBS: Permission to approach?

24 THE COURT: Yes.

25 MS. TOOMBS: May I publish?

1 **THE COURT:** Any objection?

2 **MR. BUSHELL:** No.

3 **THE COURT:** Okay. May be published.

4 **Q. (BY MS. TOOMBS)** Okay. 103. What are we looking at
5 in State's Exhibit 103?

6 **A.** So just for reference, this is the front of the body
7 and this is the brain after the skull cap has been removed.
8 So we're looking at the inside of the dura here and what we're
9 seeing is called subdural hemorrhage. So it's underneath the
10 dura layer, so it's subdural. There's more on the right side
11 than there is on the left. We're also seeing some of that
12 same blood still on the surface of the brain.

13 And then it's hard to tell in this picture, but you can
14 see how the surface of the brain is irregular and kind of
15 convoluted. So we have sulci which are the ridges and then --
16 excuse me, gyri which are the ridges and then sulci which are
17 the deeper spots. And there's pooling of blood in some of
18 these deeper spots that's called subarachnoid hemorrhage,
19 meaning that's below the arachnoid membrane.

20 And now if you remember earlier I was talking about
21 that's where the cerebral spinal fluid flows. And so having
22 bleeding in that area would explain why -- at least the stick
23 by the foramen magnum, I was getting kind of a bloody show in
24 that, that would explain why there's blood in that cerebral
25 spinal fluid.

1 **Q.** Okay. And is it fair to say that the black and white
2 kind of diminishes what you were seeing on the autopsy table?

3 **A.** Yes, it does. It's certainly --

4 **Q.** So would it be fair to say that where you see black
5 in this or a -- a dark color in this photograph, that would be
6 the blood that you're referring to?

7 **A.** Yeah. So some of this blood, like, down in these
8 little areas might actually be inside small vessels and that
9 would be normal. But all of the stuff that's more on the
10 surface is abnormal and that would be due to some type of head
11 injury that's traumatically induced. It's also hard to tell
12 on this photo, but also there was some swelling of the brain.
13 So when we see swelling in this type of scenario, the whole
14 brain is swollen and so you'll see flattening of these gyri as
15 they're squished against the skull.

16 **Q.** Okay. And you saw that in this case?

17 **A.** Yes.

18 **Q.** And, again, these are significant for what?

19 **A.** So the -- the bleeding is certainly significant for
20 some kind of blunt force injury of the head, and then the
21 swelling of -- of the brain has to do with basically the
22 blood -- it can have a variety of reasons, but it's -- it's a
23 reaction to trauma. So it can be chemicals in the cells that
24 are starting to make the cells swell, or it can be the fact
25 that the blood is not getting to the brain as well so you're

1 not getting oxygen to the brain, or the person stopped
2 breathing so you're not getting oxygen in the blood into the
3 brain. And then they're going to end up with what's called
4 anoxic brain injury or hypoxic ischemic encephalopathy. So,
5 basically, the brain is dying because it's not getting enough
6 oxygen.

7 **Q.** Okay. And you can go ahead and take your seat for
8 just a moment. I think we're --

9 **MS. TOOMBS:** Actually, Your Honor, may -- may we just
10 do two more quick ones?

11 (Off-the-record discussion)

12 **MS. TOOMBS:** Oh. I mean, we -- we admitted 104 but
13 we did not discuss 104 so we need to go back --

14 **THE COURT:** Okay.

15 **MS. TOOMBS:** -- into the dim world. Thank you.
16 We're going to be replacing batteries so --

17 (Off-the-record discussion)

18 **MS. TOOMBS:** All right. Let me go back. Sorry. I
19 was done looking at this.

20 **Q. (BY MS. TOOMBS)** Exhibit 104. What are we seeing in
21 Exhibit 104?

22 **A.** So this is just the skull cap after it's been
23 removed. And this here is the dura, so we can peel that off
24 of the skull. It's pretty firmly adhered. And then this is
25 the inside part of it that would be covering the brain. And

1 all of this, again, is what we're calling subdural hemorrhage.
2 So --

3 Q. Okay. Again, significant for trauma?

4 A. Yes, it is.

5 Q. All right. We've looked at 105 and 106. I'm going
6 to just ask you briefly, I have Exhibits 167 and 168. Was --
7 were these taken at your office on that day?

8 A. Yes, they were.

9 Q. And to your knowledge, what are they depicting?

10 A. They are photos of a changing table that was taken as
11 evidence from the daycare center.

12 Q. Okay.

13 MS. TOOMBS: Move to admit 167 and 168.

14 MR. BUSHELL: No objections.

15 THE COURT: Okay. State's Exhibits 167 and 168 are
16 received.

17 MS. TOOMBS: And permission to approach and publish?

18 THE COURT: Any objection?

19 MR. BUSHELL: No, that's fine.

20 THE COURT: Okay. May be published.

21 MS. TOOMBS: Thank you.

22 (Off-the-record discussion)

23 MS. TOOMBS: Okay. Now we've got it.

24 Q. (BY MS. TOOMBS) So looking at Exhibit 167, is this
25 what you described as being the photograph taken at -- at your

1 office?

2 **A.** Yeah. This is a changing table that was brought in
3 with law enforcement when they came for the autopsy. They
4 just wanted to show it to me. It's kind of an odd picture and
5 not very obvious, but this is, like, an open side of the
6 changing table. This is the top of it here and on the top
7 there was a kind of a U-shaped crack that was in the particle
8 board that the top surface is made out of.

9 **Q.** Okay. And moving on to 168, are we seeing, again,
10 the same changing table?

11 **A.** Yeah. Crack.

12 **Q.** Okay. Now I mean it. Now you can sit down. I've
13 run myself out of photographs.

14 Oh, I guess I should ask. Was this taken on
15 February 28th during your autopsy -- were these taken during
16 the autopsy on the 28th?

17 **A.** Yeah, because that's the placard date, so, yes.

18 **Q.** Do you do additional examination of the organs or the
19 head itself?

20 **A.** Yeah. Everything gets visually examined with what we
21 call is a gross examination where I'm just looking at the
22 outside of it. And then after I've looked at the outside of
23 it and documented anything that's interesting, the organs get
24 weighed individually, all of that gets documented. Also, I'm
25 going to cut through each one looking for any natural disease,

1 maybe a tumor, like a kidney tumor or something like that is
2 something I might see, or in an older person I might see a
3 heart attack evidence with coronary artery disease. So we're
4 looking for any kind of natural disease as well as any kind of
5 trauma or any indication of old trauma. You know, there might
6 be scar tissue that's developed indicating something that
7 happened long ago so --

8 Q. Okay. And in this case, did you see any kind -- did
9 you find anything that was -- that was concerning for Lincoln
10 as far as natural causes?

11 A. No. I didn't see anything specifically that was
12 naturally debilitating or anything that was naturally
13 occurring.

14 Q. And you also indicated that you look for, I guess,
15 chronic injuries. In this case, did you see anything about
16 your examination of Lincoln that would suggest chronic injury?

17 A. No, I -- I did not. I -- I saw, as I had mentioned
18 before, that subdural hemorrhage. It was more of a clotted
19 rather than liquid blood because, again, he's coming to me
20 after he's been in the hospital for 10 days so this is
21 something that happened at least 10 days before I saw him.
22 And also, then, the subarachnoid hemorrhage, there were areas
23 of that.

24 So with subdural hemorrhage, you can have what is called
25 acute. Subacute is if it's like actively bleeding which is

1 something that a radiologist might see as they're doing CT
2 imaging or something like that. You can see subacute which is
3 something that's weeks to months old, or you can not see
4 anything.

5 In this particular case, I saw subdural hemorrhage that
6 was consistent with being with the time frame that he was
7 admitted to the hospital, so 10 to 14 days old. I didn't see
8 anything that looked to me to be older than that. And this
9 was by gross examination as well looking at it under the
10 microscope.

11 **Q.** Okay.

12 **A.** Also, you know, just like slicing all of the other
13 organs, I'm going to make sections of the brain to look at it.
14 And one of the findings that you'll see with the brain is --
15 we already talked about swelling, but you'll also see what's
16 called -- hypoxic ischemic encephalopathy is the medical term
17 for it -- not so much the pathological term -- but the
18 radiologist will see that there's loss of definition of a
19 gray-white interface and I will also see that when I do my
20 external -- or, excuse me, my cut sections.

21 And so what that means is your brain is kind of organized
22 by regions and you have all of these nerves that live, like,
23 in the outer layer of your brain which is basically the gray
24 matter. And then the nerves have all of these long axons that
25 impulses are traveled along and those axons are coated with

1 myelin which makes them appear white. And so you'll have this
2 gray ribbon surrounding all of this white. And then, also,
3 it -- then you get into other areas like the brainstem and
4 you'll see more gray matter, again, that has just -- that
5 tells you there's more neurons there with a different
6 function.

7 So with this hypoxic ischemic encephalopathy, you lose
8 that nice sharp definition between that gray ribbon and then
9 all of the sur -- adjacent white matter. And that's what I
10 saw in this infant was areas where I couldn't see that
11 distinction as well.

12 Q. Okay. And, again, something that is consistent with
13 trauma.

14 A. Yes, it is.

15 Q. Traumatic injury.

16 Did you also examine or -- or do anything with the eyes
17 of Lincoln Penland?

18 A. So in infant deaths like this where there's concern
19 for non-accidental trauma, we will actually remove the eyes
20 through the skull. And then once we take them out, we'll
21 photograph them in our office and then we'll send them over to
22 the Moran Eye Center and they'll be looked at by an ophthalmic
23 pathologist over there. He will describe what he sees on the
24 outside of the eye.

25 So you're looking at the -- basically the corneal surface

1 as well the nerve that comes out the back, the optic nerve.
2 And then he'll actually cut into the eye and look at the
3 inside of the eye, and that's where we can see the retinal
4 hemorrhages that were mentioned earlier. And so then you can
5 look in and see the retinal hemorrhages and get a good idea
6 of -- of the location of them and what they look like. And
7 then he'll also take the central section that contains the
8 optic nerve and he'll put that into a cassette and do
9 histology on it so that he can look at it under the
10 microscope.

11 Q. And would that ophthalmic pathologist -- that's a
12 hard thing to say for me -- would that have been Dr. Nick
13 Mamalis?

14 A. Yes.

15 Q. And I believe the jury heard from him earlier. Did
16 he -- did he provide you with his findings?

17 A. He did. I got a copy of his report and then some
18 photo images of what they saw when they were sectioning
19 through the eyes.

20 Q. Okay. And did anything that he saw change your
21 opinion as far as whether or not this was a traumatic injury?

22 A. It didn't change my opinion. It just helped maybe
23 solidify it.

24 Q. Okay. So we've talked about skull fracture, injury
25 to the brain, injury to the eyes, injury to the lower lumbar

1 spine. Did you also find any other injuries on Lincoln
2 Penland?

3 **A.** So when he was in the hospital they -- and they did a
4 skeletal survey there, they -- they noticed what they thought
5 might be a fracture in the proximal humerus. And these are
6 called metaphyseal fractures or they'll use another -- another
7 name for it, bucket-handle fracture, because that's kind of
8 the appearance that it has is that shape of a bucket handle.

9 So at autopsy, I removed that bone so that I would be
10 able to look at it under the microscope. And when you remove
11 one, then you remove the other one because you have a built-in
12 control because you have two of them. And so originally, I
13 believe they just saw hemorrhage -- or fracture in the left
14 one and so I was expecting to maybe see it, maybe not see it,
15 because sometimes they think they see things in radiology that
16 I don't see histology for, so it wouldn't have surprised me if
17 I didn't see it.

18 But what surprised me even more was not only did I see it
19 on the left side, but I also saw it on the right side. So
20 this infant had fractures on both sides. It's in what's
21 called the growth plate and that's what the metaphysis is. So
22 in an infant, that's an area that's still maturing and a lot
23 of activity there as far as growing your bones bigger.

24 And so it's an uncommon site for a fracture, but it is
25 common -- well, I can't say common. It's more common to see

1 it in cases of abuse. So that's typically when it's most
2 commonly seen is in child abuse in children that are, like,
3 one to three years of age.

4 Q. Okay. And, again, does this help to inform your
5 ultimate conclusion?

6 A. It does. Certainly this is looking more and more
7 like inflicted trauma all the time.

8 Q. Okay. Did you -- did you note any other injuries on
9 Lincoln Penland? In fact, maybe what I'll do is I'll just
10 have you refer to your report. And I think we've talked about
11 them all, but page 1, your -- you list out the injuries. If
12 you could just review for -- for the jury the injuries that
13 you found in Lincoln.

14 A. Sure. Sure. So the first thing that we saw was
15 the -- the contusion behind the right ear, so the scalp
16 contusion, the right mastoid area. And then we saw multiple
17 subgaleal contusions which were the bruising that we saw on
18 the underside of the scalp once it was reflected back. We saw
19 the right temporal skull fracture with diastatic fracture of
20 the lambdoid suture and right -- and fracture extension into
21 the left occipital skull, and so that was that fracture that
22 we were seeing -- it's kind of behind the right ear and it
23 goes across the back of the head, but then it also went up
24 underneath the bottom of the skull towards the front of the
25 head.

1 Oh, one thing we didn't talk about was there was a small
2 amount of epidural blood which is seen on the outside of the
3 dura. So we saw the blood that was on the inside; we didn't
4 talk about the blood that was on the outside. Epidural blood
5 is seen usually when a skull fracture cuts through an artery
6 that's feeding the brain. In this case, that was not what it
7 was from. It was just probably some leakage from that
8 diastatic sutural fracture and -- and that kind of stuff going
9 on in that area. But there wasn't a lot of blood there. And
10 so -- but we did see the subdural and the subarachnoid
11 hemorrhage as well as the diffuse cerebral edema. And then
12 also we mentioned bilateral retinal hemorrhages.

13 **Q.** And that is -- that list is just in the -- in the
14 head, correct?

15 **A.** Correct.

16 **Q.** And what was your conclusion as to the cause of those
17 injuries?

18 **A.** Blunt force injury.

19 **Q.** And then did you also list additional -- I think in
20 bullet item 2?

21 **A.** The metaphyseal fractures of both the right and left
22 humerus bones.

23 **Q.** And other than that, just the evidence of medical
24 therapy?

25 **A.** Yes.

1 **Q.** Okay. And I believe you already answered this.
2 Would you -- would you be able to say timing-wise any
3 determination of when these would have occurred, based on what
4 you're seeing?

5 **A.** Well, they would have occurred probably sometime on
6 the day that he was admitted to the hospital.

7 **Q.** Okay. Not like TV where we can say exactly one
8 minute?

9 **A.** No.

10 **Q.** Okay. So we've listed out a number of injuries that
11 Lincoln has sustained. Based on your training and experience,
12 are these injuries that are going to be noticeable in a child,
13 even one who can't talk?

14 **A.** Yeah. I mean, this is a very significant skull
15 fracture and you've got subarachnoid and subdural bleeding.
16 So I would expect that this infant would definitely have
17 mental status changes, certainly -- potentially even to the
18 point that he's unconscious. That would not be surprising.

19 **Q.** And something that a caregiver would definitely
20 notice?

21 **A.** Yeah. I think that it would be fairly obvious that
22 there was something wrong with this infant.

23 **Q.** Would you expect to possibly see some vomiting with
24 it?

25 **A.** Yeah. So with head injuries there's certainly a

1 spectrum. You know, you can start with concussion where you
2 might have a really bad headache. You might even feel
3 nauseous. You might have vomiting with just a concussion.
4 And so when we're talking about this more extensive injury
5 where you actually have all of these other factors playing in
6 with the subdural and subarachnoid and skull fracture, I
7 would -- like I said before, I would expect this child
8 basically to be unconscious from this impact.

9 Other -- other less severe things that you might see, the
10 child might be lethargic. They might not want to eat.
11 Certainly, these are all things that, you know, when your --
12 when your child has a fall and they've hit their head and you
13 take them to the doctor and the doctor tells you to look for
14 these types of things to make sure that there's not something
15 more severe going on, especially when you have what we were
16 talking about earlier with epidural hemorrhage, what you'll
17 see in, like, a skull fracture or an injury where it's
18 actually cutting one of those arteries that feeds the brain,
19 depending on the size of the cut depends on how much blood
20 flow is going in.

21 And that's basically expanding as time goes on so that
22 initially, you know, the person may not -- they might be fine.
23 They might be acting normal other than the fact that, you
24 know, they -- their head hurts where they got hit. But as
25 that hematoma expands, then it's going to compress the brain

1 and that's when you're going to get kind of a delayed onset of
2 symptoms. So initially they seem normal and then later on
3 they actually end up going unconscious. And that is what's
4 called a lucid interval.

5 It's typically associated with epidural hemorrhage, you
6 know, whether -- it could be from a baseball player getting
7 hit in the head with a ball. I've certainly heard of someone
8 who was at a hockey game and the puck went flying and the
9 person got hit with the puck, and they certainly weren't
10 feeling good at the time they got hit, but they didn't die
11 until, like, the next day because that's how long it look for
12 that expanding hematoma to cause problems.

13 **Q.** But to be clear, that's a different level of injury
14 than what you're seeing in Lincoln Penland.

15 **A.** Yes.

16 **Q.** So this -- this theory of a lucid interval that you
17 have described, they -- not feeling good, that's not what we
18 would expect to -- what you would expect to see given
19 Lincoln's injuries.

20 **A.** No. I wouldn't expect a lucid interval because he
21 doesn't have any space-occupying epidural bleed.

22 **Q.** Okay. And I believe you testified earlier, there is
23 some epidural, but it's minimal.

24 **A.** Correct.

25 **Q.** Okay. So not -- something that a caregiver would

1 clearly or should clearly have seen.

2 **A.** I would think so, yes. I mean, again, each case
3 is -- is different and without actually being there to witness
4 it, it's -- I can't say for sure, but my expectation is that
5 he would have basically instantly been unconscious.

6 **Q.** Based on the medical evidence that you've got.

7 **A.** Yes.

8 **Q.** Okay. You mentioned that you took samples for
9 purposes of testing and I think you talked about the viral
10 infections, et cetera. Did you also -- did you also review
11 medical records for any kinds of coagulation issues or
12 problems?

13 **A.** I looked at his medical records in general and I did
14 notice that there was -- when he arrived at Primary
15 Children's, there was a little bit of concern because his
16 protein was a little bit high and his fibrinogen level was a
17 little bit low. These are findings that are not unusual with
18 trauma patients and so they treat them with blood products or
19 something that will help to normalize those levels again. I
20 didn't see any unusual indication of abnormal bleeding that
21 was described in any of his medical records. The only thing
22 that was mentioned was basically the blood associated with the
23 trauma so --

24 **Q.** Okay. So the -- all the blood that you're seeing
25 where it's not supposed to be, associate with trauma,

1 otherwise the blood appears to be where it's supposed to be?

2 **A.** Correct.

3 **Q.** And is there other things that even we as parents can
4 be noticing? For example, if -- if your child has a bleeding
5 disorder are there things -- especially a male child, that --
6 that would show that?

7 **A.** Sure. So easy bruising is something that would be
8 something that a parent would potentially notice. Another
9 thing that might be noted is -- especially for male babies --
10 when they have a circumcision, if they're -- if they're
11 bleeding longer than the physician would expect would be
12 normal for that procedure then that's something that would
13 maybe be a -- something that would turn the light on for the
14 physician anyway.

15 **Q.** Nothing to your knowledge, no history of that in
16 Lincoln?

17 **A.** I didn't see any knowledge -- or any history of that.
18 Everything indicated that, basically, he had a normal
19 childbirth. Reviewing the records, he did have a little bit
20 of breathing issues when he was first in the hospital, so they
21 kept him on oxygen for a few days, it sounds like, and then
22 sent him home with a monitor just to make sure that he was
23 breathing okay.

24 **Q.** Okay. After you -- so did you also rule out things
25 like brittle bone disease and things like that?

1 **A.** So certainly the histology that I did showed that
2 there was normal bone growth, just the fact that he had these
3 fractures that everything looked like it was normally
4 developed. I didn't see any other old fractures that had
5 healed or anything like that to concern me for anything like
6 that.

7 And there's other external findings that you might see
8 with those -- that particular group of disease states.
9 Because they don't have normal collagen, the whites of their
10 eyes actually look kind of pale blue, and I didn't see
11 anything like that.

12 We also sent out for testing that is the same as what you
13 get done when your infant is a newborn. They do a newborn
14 screen. So it's looking for metabolic diseases like maple
15 syrup disease or something like that, and it also checks, you
16 know, thyroid function as well as adrenocortical function,
17 which are the same things that the newborn screen checks at
18 the hospital. So everything was normal.

19 **Q.** Okay. After your examination, what was your
20 conclusion?

21 **A.** That this decedent died from inflicted injury of the
22 head. Anyway, with the information that I have, I had no
23 explanation for any other accidental injury or anything like
24 that, so blunt force injury of the head.

25 **Q.** Okay. Would you characterize it as pretty

1 significant blunt -- blunt force trauma?

2 **A.** Yes. Obviously since he came to my office it was
3 significant.

4 **Q.** Fair statement.

5 Have you -- at some point during the course of this case,
6 have you learned that there was a comment about Lincoln being
7 picked up by another toddler?

8 **A.** Yeah. I -- I heard some mention that there was some
9 potential interactions with another one of the toddlers in the
10 daycare which was actually his -- his brother, his older
11 brother.

12 **Q.** And would -- if -- if a toddler is picking him up and
13 he falls, would you expect the injuries that you're seeing?

14 **A.** Not without something really obvious like falling on
15 the corner of a end table or something like that, but I didn't
16 really see external trauma to suggest that type of an impact
17 because there was no abrasion or obvious focal injury.

18 **Q.** Okay. Would these injuries that you saw be
19 consistent with a -- about a 30-pound three-year-old kicking
20 him?

21 **A.** No. I don't think he could generate enough force if
22 he's only --

23 **MR. BUSHELL:** Your Honor, I'm going to object. I
24 don't think there's been any foundation laid that Dr. Ulmer is
25 at all qualified as a -- a biomechanic engineer to discuss

1 force, the amount of force.

2 MS. TOOMBS: Would -- maybe what I can do is just ask
3 it this way.

4 Q. (BY MS. TOOMBS) In your training and experience, do
5 you keep up on the literature?

6 A. Yes, I do. I try to.

7 Q. Okay. And in -- in your experience, would you --
8 would you be -- would you find it unusual to think that a
9 three-year-old could cause that injury, those injuries, all
10 those injuries?

11 A. It would depend on the given scenario. I mean,
12 there's certainly a few cases in the literature that do show
13 that young children have injured toddlers -- or excuse me,
14 that toddlers have -- have injured infants. But without a
15 scenario in the story to guide me in that direction, I -- I
16 don't have any grounds to go there so --

17 Q. And were you given a story ultimately that -- that
18 was provided by another child at the daycare? Were you told
19 about that story?

20 A. I was told about that story.

21 Q. And, in fact, was that discussed at the fatality
22 roundtable -- the fatality review?

23 A. I truly don't remember.

24 Q. Okay. After you've been told about that, would the
25 injuries -- all the injuries that you see in Lincoln be

1 consistent with that story?

2 **A.** I don't see how because some of the things that were
3 mentioned would require, basically, dragging him all the way
4 across the room and then -- and then back to where he was
5 originally placed. So, again --

6 **Q.** What about bleeding? Did you see anything in your
7 examination of Lincoln that would have him bleeding visibly?

8 **A.** No.

9 **Q.** Okay. We've talked about the fracture. Is that --
10 is that something that you would expect from the story that
11 you were given?

12 **A.** Not from the story I was given.

13 **Q.** Okay.

14 **A.** No.

15 **Q.** Just let me review. We -- we skipped ahead on some
16 of these points, so I can skip some questions.

17 When you -- at the autopsy, were you informed of the
18 circumstances of how he was found prior to coming to the
19 hospital?

20 **A.** You mean as far as his father picking him up?

21 **Q.** Yes.

22 **A.** Yeah, I was -- I was told, you know, that he was
23 dropped off at the daycare by his mother and then his father
24 came to pick him up that evening. And when he arrived,
25 Lincoln was essentially unresponsive and -- and limp.

1 **Q.** Okay. Were you also notified that there had been a
2 text message sent at 4:19 describing Lincoln's day?

3 **A.** Yeah. I wouldn't remember the time frames exactly or
4 anything, but there was general descriptions of how his day
5 was going and he was not maybe having a great day at daycare
6 because he was -- doesn't sound like he was maybe as active
7 and outgoing as he usually would be, from the description.

8 **Q.** But he was eating. Do you remember that?

9 **A.** Yes.

10 **Q.** And would that be consistent with these injuries?

11 **A.** I wouldn't expect -- you know, depending on what time
12 the injuries occurred. Certainly, I wouldn't expect him to be
13 eating after the injuries occurred.

14 **Q.** And would you expect vomit, though?

15 **A.** Yeah, that's very likely.

16 **Q.** Okay.

17 **A.** And it's also likely in a toddler that -- well, he's
18 not even toddling yet. He's still an infant. So certainly
19 just spitting up is a common -- common event with infants.

20 **Q.** Okay. He's a -- he's an infant and you indicated,
21 sounds like he probably wasn't having a very good day. He is
22 described to have become very fussy, but he stops crying when
23 held. Would that be consistent with your definition of
24 inconsolable?

25 **A.** No, it would not.

1 **Q.** Would that be consistent with what you would expect
2 in these tra -- in these injuries that you've seen?

3 **A.** I don't believe so. These injuries are pretty
4 extensive.

5 **Q.** Having reviewed the constellation of injuries to
6 Lincoln Penland and basing this on your training, your
7 experience, the review of the literature, would you -- are you
8 able to provide a likely scenario that would explain all the
9 injuries as well as the lack of external injuries on Lincoln,
10 anywhere except the head, of course?

11 **A.** Well, obviously I do have an impact site. I can't
12 say for sure how it happened. You know, it could be that he
13 impacted something or that something impacted him.

14 The metaphyseal fractures in his shoulders -- or the
15 proximal humerus, those are unusual fractures and they're
16 generally associated with more of a -- a twisting that happens
17 when the arm is extended, and that's usually going to be more
18 of an inflicted type of injury as opposed to just falling on
19 to a straight arm, especially since he's not walking yet,
20 basically limited mobility. So while that might be more
21 common in an older child, it seems unlikely that it would
22 happen in his scenario other than to be caused by someone
23 else.

24 **Q.** And is it important to consider all of the injuries
25 that Lincoln sustained?

1 **A.** Yeah. You have to look at the whole thing as a group
2 because I think everything happened at about the same time.

3 So --

4 **Q.** And your conclusion here today for the jury is what?

5 **A.** Just that this infant died from inflicted trauma.
6 Without a better explanation of how it might have happened, I
7 don't have any other explanation for it so --

8 **Q.** Okay. And, therefore, it's homicide?

9 **A.** Correct.

10 **Q.** Okay.

11 **MR. BUSHELL:** Judge, I'm going to object to that last
12 question as a leading question. This is direct examination.
13 I'd ask that that comment be struck.

14 **MS. TOOMBS:** I'll withdraw it.

15 **THE COURT:** Okay. I'll sustain the objection and
16 that's -- that com -- or the answer is stricken.

17 **MS. TOOMBS:** Co-counsel keeps reminding me that we
18 should take breaks for lunches and things like that. I think
19 at this point the State has no further questions, and it is
20 12:16.

21 **THE COURT:** Want to take the --

22 **MS. TOOMBS:** Perhaps we break for lunch?

23 **THE COURT:** -- lunch break? Does that work for the
24 defense as well?

25 **MR. BUSHELL:** That would be great. Yes, please.

1 **THE COURT:** Okay. Members of the jury, we'll take
2 our lunch break, then. We'll resume -- if you could be back
3 at 1:45, we'll start again. Same instructions apply to your
4 conduct during the recess. Thank you and have a good lunch.

5 Dr. Ulmer, you're free to step down and roam around.
6 Did you run out of water?

7 **THE WITNESS:** I did.

8 **MS. TOOMBS:** We'll refill it.

9 **THE BAILIFF:** I'll -- I'll refill it.

10 (Unintelligible)

11 **MS. TOOMBS:** Thank you.

12 (Pause in proceedings)

13 **THE COURT:** Okay. We're still on the record. We're
14 outside the presence of the jury.

15 Any other business to take care of from the State
16 before we recess for lunch?

17 **MS. TOOMBS:** Not at the moment, Your Honor.

18 **THE COURT:** Okay. Any from the defense?

19 **MR. BUSHELL:** No, Your Honor. Thank you.

20 **THE COURT:** Okay. Thank you all. We'll see you back
21 at 1:45. Have a nice lunch as well.

22 Thank you, Dr. Ulmer.

23 **MR. MILES:** 1:45, right, Your Honor?

24 **THE COURT:** Yes.

25 **(Lunch recess taken from 12:17:33 to 1:42:08.)**

1 **THE COURT:** Okay. We're back on the record.
2 We're -- both parties and counsel are present. We have -- the
3 doctor is back on the stand. We're outside the presence of
4 the jury, but they're coming in as we speak.

5 (Pause in proceedings)

6 **THE BAILIFF:** The jury is present, Your Honor.

7 **THE COURT:** Okay. Thank you, Dave.

8 Members of the jury, welcome back. I hope you're
9 ready to go. As you might have noticed, it's getting warm
10 again in here. You -- you're veterans now from last week, but
11 if you feel a need to take off a coat or anything like that,
12 feel free to do so.

13 Same with counsel and you, Doctor. If you feel
14 uncomfortable, go ahead and -- and do what you can or raise
15 your hand, let us know.

16 Please, everybody, you can sit down. Thanks for your
17 respect.

18 But if it does get so uncomfortable that you're --
19 you're finding yourself losing your ability to concentrate on
20 the evidence being presented, just raise your hand. We'll
21 take a break or do whatever we can to make it more comfortable
22 so we can resume and make sure that you have the ability to
23 concentrate on the presentation.

24 So with that said, we'll go back to the State. I
25 believe you were done questioning Dr. Ulmer, but I just wanted

1 to make sure.

2 **MS. TOOMBS:** Yes, Your Honor. We have completed our
3 direct examination.

4 **THE COURT:** Okay. Thank you.
5 And from the defense?

6 **MR. BUSHELL:** Yes, Your Honor. Thank you.

7 **CROSS-EXAMINATION**

8 **BY MR. BUSHELL:**

9 **Q.** How's it going, Doctor?

10 **A.** It's going.

11 **Q.** Give me just one quick second. So, Doctor, I -- I
12 think probably the best way to -- to go through this
13 cross-examination is to try to go in the same order that
14 Ms. Toombs walked you through.

15 **A.** Okay.

16 **Q.** However, that was a lot of information, so I
17 apologize if it seems like my line of questioning is
18 scattered, but I will do my best to keep it in an order that
19 make sense.

20 So let me -- I guess let's just start from the beginning.
21 You, in your conversation -- in your direct testimony with
22 Ms. Toombs -- walk me through how this matter came to you and
23 the medical examiner's office.

24 **A.** Sure. So any time there is a nonnatural death or,
25 say, someone comes into the emergency room at the hospital and

1 they're not seen long enough to be fully evaluated and they're
2 either DOA or dead right there, or -- or it's a natural death
3 at home and they don't have an attending physician that can
4 sign the death certificate for them --

5 Q. Okay.

6 A. -- they become our cases because of the medical
7 examiner's act. Any nonnatural death or any unattended death
8 comes into our purview.

9 Q. Okay.

10 A. So in this particular case, because this child was at
11 a hospital and that was where his death was going to be, and
12 we -- we knew ahead of time because they had said they were
13 going to withdraw care, so we had already been --

14 Q. Notified.

15 A. -- notified that that was going to happen. So
16 they -- it's usually either a physician or a nurse, like a
17 charge nurse or something like that, or also the hospital
18 chaplain, those are the usual ones from the hospital that will
19 call our office. They'll talk to one of our death
20 investigators, and then the death investigator is responsible
21 for getting all of the initial information about -- personal
22 information like date of birth, name, all of that kind of
23 stuff.

24 Q. Sure.

25 A. As well as what happened, why is this person coming

1 to our office. So it's a matter of interviewing either
2 medical staff or law enforcement staff or family members,
3 whatever. It's -- it's just dependent on the case.

4 Q. Okay. So more specifically, I guess, then, why you?
5 Why were you assigned to Lincoln Penland's autopsy?

6 A. Because it was my day to be primary staff member down
7 in autopsy.

8 Q. Okay. So just luck of the draw.

9 A. Yeah. We rotate service. So all of us, basically,
10 will have one primary physician and one backup physician,
11 Monday through Friday, and the primary physician does all
12 homicides and all babies.

13 Q. I see.

14 A. And then on the weekend, we just have a single
15 pathologist that's on so --

16 Q. So you're not a specialist in pediatric forensic
17 pathology?

18 A. No.

19 Q. You're not a specialist or -- yeah, specialist in
20 your field regarding traumatic head injuries in children?

21 A. No.

22 Q. Prior to today's testimony -- well, I guess, in -- in
23 anticipation for today's testimony, what materials did you
24 review?

25 A. I reviewed medical records that I had. It's not a

1 complete set because I'm at the whim of whatever medical
2 records happens to send over.

3 Q. Okay.

4 A. I did have some police records, although I didn't
5 really look too much at the police part of the records, but
6 just more if they had medical records in there that I didn't
7 have.

8 Q. Okay.

9 A. And then my investigator's report, my autopsy report,
10 the photos that I had. Some of them were hospital photos that
11 were taken by Safe and Healthy Families. I had photos that
12 were obviously taken at autopsy. And I'm not sure that I had
13 any other photos from any other agencies.

14 Q. Okay. I guess more specifically -- sorry, I keep
15 asking these broader questions --

16 A. That's okay.

17 Q. -- and then narrowing them down, what materials --
18 let me back up.

19 Do you recall -- do you recall coming to this very
20 courtroom on May 7th, 2015?

21 A. Yes.

22 Q. And testifying at a preliminary hearing in this
23 matter?

24 A. Uh-huh.

25 Q. Between then and now, what new materials have you

1 received and reviewed?

2 **A.** Specific about this case?

3 **Q.** Yes.

4 **A.** I'm not sure I have any new materials.

5 **Q.** Okay. What about any new literature, advancements in
6 your field?

7 **A.** Well, certainly, I have read a bunch of literature in
8 preparation for the case. And if you ask me specific
9 articles, I can't say, but a lot of --

10 **Q.** Okay.

11 **A.** -- a lot of articles on retinal hemorrhaging, a lot
12 of articles just on child injuries, in general.

13 **Q.** Okay. Well, we'll get to some of those in a -- in a
14 moment, I'm sure. At any point between May 7th, 2015 -- that
15 was the date you testified here at the preliminary hearing --
16 and today, did you review the birth records of Lincoln
17 Penland?

18 **A.** Not the exact birth records. I thought I had them in
19 my possession, but I did not find them in my file folder so --

20 **Q.** Okay. And what about the prenatal documentation,
21 medical records?

22 **A.** I had some records that were through Primary
23 Children's, but, again, those were probably second person from
24 other attending physicians at Primary's.

25 **Q.** What about the well-child pediatric records of

1 Lincoln Penland?

2 **A.** Again, those were records that I thought that I had,
3 but they're not in my file so --

4 **Q.** So fair to say then, Doctor, those three -- so the
5 prenatal care, the delivery records, and the well-child
6 pediatric records, you made an autopsy report and
7 determination and you testified at a preliminary hearing --

8 **A.** Uh-huh.

9 **Q.** -- without having reviewed the actual -- those
10 records?

11 **A.** That's true.

12 **Q.** Okay.

13 **A.** What I reviewed was --

14 **Q.** Doctor, I --

15 **A.** -- other physician's records.

16 **Q.** Okay. Maybe just right out the gate, I know you
17 don't know this, but the last full week of trial it's been
18 like pulling teeth to try -- trying to get answers constrained
19 to -- to just the questions asked. I'm not trying to be rude;
20 I'm not trying to cut you off. I'm just asking that when I do
21 ask questions, that the answer -- just answer the question and
22 move on. Okay?

23 **MS. TOOMBS:** And Your Honor, I -- I would just simply
24 ask, as I did with others, that she be allowed to answer --
25 if -- if she needs to explain an answer that she be allowed to

1 explain. Sometimes you can't answer some of these questions
2 yes and no.

3 **MR. BUSHELL:** If I can respond? That -- that is
4 certainly a fair request. And it's -- where that happens is
5 on redirect, as the Court knows. The State is aware of that
6 as well.

7 **THE COURT:** I think both attorneys are right, Doctor.
8 But the question/answer that just happened is a good example
9 of it. It was answerable by a yes or no and then you went on.
10 So just stay with the question and then allow the State to
11 bring out the explanation, if it's necessary. If you feel
12 like it cannot be answered with a yes or no, then simply
13 answer that way.

14 **THE WITNESS:** Okay.

15 **THE COURT:** Can't be answered with a yes or no.

16 **Q. (BY MR. BUSHELL)** So let me ask it again.

17 **A.** Sure.

18 **Q.** 2014 when you performed an autopsy, you generated a
19 report without having reviewed the prenatal medical records.

20 **A.** I'm going to say yes.

21 **Q.** In 2014 you performed an autopsy and generated a
22 report without having reviewed the delivery records.

23 **A.** Yes.

24 **Q.** In 2014 you performed an autopsy and generated a
25 report without having reviewed Lincoln Penland's well-child

1 pediatric records.

2 **A.** Yes.

3 **Q.** And in May, 2015, you testified at a preliminary
4 hearing without having reviewed the prenatal care records, the
5 delivery records, and the well-child pediatric records.

6 **A.** Apparently.

7 **Q.** Let's turn to your autopsy report.

8 **A.** Okay.

9 **Q.** You identify and characterize the immediate cause of
10 death as, quote, "blunt force injury of the head." Is that
11 correct?

12 **A.** That's correct.

13 **Q.** Doctor, would you agree -- well, let me back up. I'm
14 not a doctor, by any means.

15 **A.** Uh-huh.

16 **Q.** But my understanding of this case is that immediate
17 cause of death, blunt force injury of the head, would imply
18 impact, death. So my question is, wouldn't you agree the
19 better characterization here of immediate cause of death would
20 be complications from blunt force injury to the head?

21 **A.** I would say that's semantics, but sure.

22 **Q.** Okay. You also -- right before the lunch hour,
23 Ms. Toombs from the -- the prosecuting attorney asked you a --
24 well, a leading question that you affirmed that you
25 categorized this as a homicide.

1 **A.** That's correct.

2 **Q.** Okay. And then -- well, you were here. The -- the
3 judge pointed out that this was an inappropriate line of
4 questioning. He asked the jury to ignore your -- your answer,
5 but the comment was already made. So let's talk about that.
6 You do categorize the manner of death as quote, "homicide," in
7 your report; is that true?

8 **A.** That's true.

9 **Q.** Okay. And isn't it also true, Doctor, that that term
10 of homicide does not carry the same connotation as it, you
11 know, colloquially does. Would you agree with that?

12 **A.** I'm not sure exactly -- I think I know what you're
13 asking.

14 **Q.** Okay. Well, I --

15 **A.** Can I answer it with more than one word?

16 **Q.** I think I -- I think I can ask the question. I know
17 where we're -- we're headed with this. So it doesn't carry
18 the same meaning as it does in the legal sense.

19 **A.** That's correct.

20 **Q.** Okay. So explain to the jury, please, what -- when
21 you put homicide, what that means, in your field.

22 **A.** Homicide, in the medicolegal investigation field,
23 means just that the death was inflicted by another person. So
24 it's a statistical way of categorizing these things. We have
25 primarily five different categories. We can do homicide,

1 suicide, natural, accident, or undetermined. And these are
2 statistical classifications that are for people who generate
3 data for government agencies and other -- other agencies. And
4 so in this particular area, homicide is for the convenience of
5 saying that this was a death that was caused by someone else.

6 Q. So it does not carry -- it doesn't carry the
7 connotation of intent, correct?

8 A. That's correct.

9 Q. So it just means it was --

10 A. Death at the hands of another.

11 Q. Death at the hands of another. Okay.

12 And you mentioned that when making this determination,
13 you have other options. You have natural, accidental,
14 suicide, homicide, and undetermined?

15 A. Correct.

16 Q. And undetermined is used in your line of work when
17 you don't have enough information to be able to make that
18 determination; is that correct?

19 A. Yes.

20 Q. Okay. And you can also use undetermined when you
21 can't say whether the injury was caused by an accident or
22 whether it was inflicted.

23 A. That's a possibility, yes.

24 Q. Okay. Well, let's shift gears. Again, we're going
25 to -- I know it's bifurcated here, but let's shift gears a bit

1 and talk about -- well, you mentioned in your direct
2 examination that you like to stay apprised of, you know,
3 recent developments and recent studies --

4 **A.** Uh-huh.

5 **Q.** -- on the current state of the -- the science,
6 forensic pathology; is that true?

7 **A.** That's correct.

8 **Q.** Okay. And previous -- previously, with other medical
9 professionals called by the State, we've discussed, for
10 example, Ommaya. It's a rather common and kind of a
11 seminal --

12 **MS. TOOMBS:** Objection to characterization by the
13 witness (sic), Your Honor.

14 **MR. BUSHELL:** She's right. I'll strike that.

15 **Q. (BY MR. BUSHELL)** Would you -- are you familiar with
16 Ommaya?

17 **A.** The name sounds familiar, but I can't put it with a
18 specific article.

19 **Q.** Okay.

20 **A.** I read a lot of articles and I don't necessarily
21 remember who the authors were.

22 **Q.** Well, Ommaya and others authored a study entitled
23 Biomechanics and Neuropathology of Adult and Pediatric Head
24 Injuries.

25 **A.** Uh-huh.

1 **Q.** It's published in the British Journal of
2 Neurosurgery. Are you familiar with this article?

3 **A.** It -- it sounds vaguely familiar, yes.

4 **Q.** So you're likely familiar that -- well, aware of the
5 findings that the level of force for retinal hemorrhaging from
6 shaking is biomechanically improbable, and case studies in
7 that study confirm that retinal hemorrhaging and other ocular
8 findings were also found in accidental injuries and natural
9 disease processes.

10 Does that ring a bell?

11 **A.** Yeah. And --

12 **Q.** Okay.

13 **A.** -- that's certainly one group's research experience.

14 **Q.** Another article we've also discussed here the last
15 week was by Leuder. I'm sure I'm mispronouncing --
16 L-E-U-D-E-R. Are you familiar with that name in your field?

17 **A.** Not off the top of my head, no.

18 **Q.** Okay. Authored a -- an article entitled Perimacular
19 Retinal Folds Simulating Non-accidental Injury in an Infant.

20 **MS. TOOMBS:** I'm sorry, Your Honor. I -- I think
21 that she indicated she didn't know, so at this point I don't
22 know that -- that this question is proper.

23 **THE COURT:** Okay. Mr. Bushell?

24 **MR. BUSHELL:** I'm not sure what the objection there
25 was.

1 **MS. TOOMBS:** Objection. She indicated that she
2 didn't know. There's no foundation for -- for what the
3 attorney is testifying to.

4 **THE COURT:** I think she indicated she didn't know the
5 author. Now you're asking the article name.

6 **MR. BUSHELL:** Right. Maybe that may jog her memory.

7 **THE COURT:** Okay. So I'm going to reserve ruling on
8 the objection. Let's see if she knows the article.

9 **Q. (BY MR. BUSHELL)** Does that title --

10 **A.** Can you repeat it, please?

11 **Q.** Sure. Perimacular Retinal Folds Simulating
12 Non-accidental Injury in an Infant.

13 **A.** I'm not familiar with that one, no.

14 **Q.** Well, let me tell you what they found and maybe that
15 will ring your bell -- or ring a bell.

16 **MS. TOOMBS:** Objection, Your Honor. If she's not
17 familiar with it, it's improper -- well, may we approach, I
18 guess?

19 **THE COURT:** Yes.

20 (Discussion at the bench at 2:00:54.)

21 **MS. TOOMBS:** I don't want to get a speaking
22 objection.

23 **THE COURT:** Was I too hard on you? Now I -- I've
24 scared you, huh?

25 **MS. TOOMBS:** You have.

1 **THE COURT:** Don't be scared.

2 **MS. TOOMBS:** Your Honor, Mr. Bushell is simply
3 testifying. The -- the witness has -- has indicated that she
4 doesn't -- she's not familiar with the author, she's not
5 familiar with the name of the article. At this point, he's
6 just trying to get in his information through her and it's him
7 testifying. At this point, I would object based on lack of
8 foundation.

9 **THE COURT:** Okay.

10 **MR. BUSHELL:** I would disagree. I asked her, number
11 one, whether she likes to stay apprised of recent developments
12 and the literature in the field; she said yes. I asked her an
13 author's name; she said no. I asked her the title; she said
14 no. I think that the finding is what matters and that might
15 jog her memory, and I can follow up with questions.

16 **MS. TOOMBS:** And if he wants to hand her the finding
17 and ask her after she's read it, then that might be
18 appropriate, but to put this theory in the -- in the jury's
19 mind based on the testimony of the attorney is an
20 inappropriate use.

21 **THE COURT:** What about handling it that way?

22 **MR. BUSHELL:** Well, I -- I don't -- I don't see a
23 rule that says that that's required. I can ask a witness --
24 she said that she likes to stay apprised of recent
25 developments and journals, and I can ask her if she's familiar

1 with these findings.

2 **MS. TOOMBS:** And -- and, again, the rule is the
3 refresh and recollection of a witness under the rules of
4 evidence -- and -- and it indicates that you hand them the
5 paperwork, ask them if that refreshes their recollection.

6 **THE COURT:** Well, I -- I don't know that she has any
7 memory of this article, but I am worried if you state the
8 results of this article or a study that the jury will take
9 that as a fact. So why don't we hand it to her and see if --

10 **MR. BUSHELL:** I don't have it with me.

11 **THE COURT:** Do you have the quote or something?

12 **MR. BUSHELL:** I do. I have the quote.

13 **THE COURT:** Is there a way you can --

14 **MR. BUSHELL:** Which I was about to read to her to see
15 if --

16 **MS. TOOMBS:** And, again --

17 **THE COURT:** Is it -- what -- what form is it in?

18 **MR. BUSHELL:** It's in digital form.

19 **THE COURT:** Oh, is it? Can you just show her that
20 without showing all your notes?

21 **MR. BUSHELL:** No, I can't. I could try to find it,
22 copy and paste it.

23 **THE COURT:** How -- how long is it?

24 **MR. BUSHELL:** It's literally one sentence long. I
25 could copy and paste it.

1 **THE COURT:** Oh, could we just write it down then or
2 copy and paste?

3 **MR. BUSHELL:** Sure. Sure.

4 **THE COURT:** Let's do that and show it to her.

5 **MR. BUSHELL:** Do we need to do that with every single
6 article? So every time a witness now says I'm not familiar
7 with that, I have to write it out and hand it to them?

8 **MS. TOOMBS:** Or have the articles available for them
9 to read through.

10 **MR. BUSHELL:** And how does this -- approaching the
11 bench does not change the fact that this is still a speaking
12 objection. I mean, whether we're there or we're here, it's --
13 the State is -- the objection is --

14 **THE COURT:** Well, the difference is I'm not the fact
15 finder, so I --

16 **MR. BUSHELL:** Okay. Fair enough.

17 **THE COURT:** -- I don't mind this -- this speaking
18 objection. And I'm -- and I'm asking questions, too --

19 **MR. BUSHELL:** Okay.

20 **THE COURT:** -- because I want to make sure, but I
21 think that's a good compromise so the jury doesn't think that
22 it's a fact. Let's see if she recognizes it. She may say,
23 well, I didn't know the author, I didn't -- I didn't recall
24 the article, but I've heard about this study. I think she
25 could say that and then you can keep going from there.

1 **MR. BUSHELL:** Okay.

2 **THE COURT:** But if the study comes in, I'm worried
3 the jury will say, oh, crud, there's a study, it must be true.
4 Just because this witness doesn't know it, it still might be
5 true. And I -- I don't think that's right because that would
6 be -- I'm worried that they'll treat that as a fact that
7 really didn't come in as evidence. It came in as a question.

8 **MR. BUSHELL:** Okay. Fair enough.

9 **THE COURT:** Okay.

10 (Proceedings resume in open court at 2:04:33.)

11 **Q. (BY MR. BUSHELL)** Give me just one moment, Doctor.
12 Okay?

13 **A.** Sure.

14 (Off-the-record discussion)

15 **MR. BUSHELL:** Your Honor, may I approach?

16 **THE COURT:** You may.

17 **Q. (BY MR. BUSHELL)** Doctor, I've just handed you --
18 well, first of all, handwritten -- which I'm the first to
19 admit is very poor -- the findings in that -- that research
20 that we were just discussing. Let me back up, though, and
21 I'll move on to that question here in a second.

22 In your direct examination with Ms. Toombs you
23 indicated that, quote, "There are a few cases in the
24 literature that does show that toddlers have injured infants
25 on this level." Is that accurate?

1 **A.** That's accurate.

2 **Q.** What literature are you referring to when you say
3 that?

4 **A.** I can't give you specific examples. There was
5 certainly an older literature where it showed five children
6 that had been injured in various situations, although none of
7 them quite exactly like this one. When you do a literature
8 search for children of this age group, you're going to have a
9 much more likelihood of finding cases that involve gunshot
10 wounds where one child was shot by another child.

11 **Q.** Sure.

12 **A.** That's much more prevalent than these types of
13 injuries.

14 **Q.** Of course.

15 **A.** But certainly just in the regular news, there was a
16 case down in Florida where a six-year-old killed a newborn
17 because he was tired of it crying so --

18 **Q.** Would you agree that if a toddler fell onto a
19 six-month-old that that six-month-old could have severe
20 retinal hemorrhaging?

21 **A.** I think that, depending on what happens, I -- I don't
22 know about severe, but possibly retinal hemorrhaging.

23 **Q.** You've read the -- what I've written there, does that
24 make sense? Can you read my handwriting?

25 **A.** "Four-month-old child killed when six-year-old fell

1 on him. Upon examination, four-month-old had severe retinal
2 hemorrhages."

3 Again, without the whole scenario -- I can't say that
4 it's not possible.

5 Q. Okay. You would agree that the problem in these
6 scenarios, Doctor, you would agree, is that research in
7 traumatic head injuries in children -- is that the research is
8 typically done retroactively?

9 A. That's correct.

10 Q. Okay.

11 A. People don't like their children being volunteered
12 for studies.

13 Q. Randomized controls are impossible. They're
14 unethical and no one's going to subject their child to do
15 that.

16 A. You would hope not.

17 Q. And would you agree that the biggest problem -- or
18 perhaps a problem that this poses is that in retroactive
19 research, the research is dependent on accurately sorting
20 cases into suspected abuse and non-abuse categories.

21 A. That is true because some of the cases are gray area.
22 You don't really know what it is.

23 Q. Okay. Well, let's -- let's, again, shift gears a
24 bit. Upon -- let's turn to your examination of -- of Lincoln
25 Penland. Doctor, you noted some bruising behind his right ear

1 and other areas of his head; is that correct?

2 **A.** That's correct.

3 **Q.** Okay. In fact -- Doctor, if you want to step down.
4 I believe your -- I'll wait for the lights to dim here. You
5 indicated in your exam -- your direct examination testimony
6 that what you see here is some -- the bruising I just
7 referenced; is that right?

8 **A.** Yeah, you can see it here.

9 **Q.** Okay. And down here a bit as well, the base?

10 **A.** Probably, yeah. I mean, that's a little bit harder
11 to tell because it's getting into the zone of possible
12 lividity, so -- but this -- you can see different colors here
13 where it's more green, yellow, and -- and it was a lot more
14 obvious when the scalp was reflected, so, yes.

15 **Q.** Okay. A lot more obvious -- when you say "when the
16 scalp was reflected," after incision?

17 **A.** During the autopsy, once you reflect the scalp.

18 **Q.** Okay.

19 **A.** It's more obvious.

20 **Q.** More obvious than just right here.

21 **A.** Right. I mean, this lighting isn't the best on that
22 photograph so --

23 **Q.** Sure. How -- you can have a seat. Thank you.

24 (Off-the-record discussion)

25 **Q. (BY MR. BUSHELL)** Doctor, how long would it take from

1 the -- the hit for the bruising to pop up like that and be
2 visible?

3 **A.** Develop?

4 **Q.** Yeah.

5 **A.** It's going to be variable. It could be hours to a
6 day or two --

7 **Q.** Okay.

8 **A.** -- to get that really dramatic effect. So it's going
9 to depend on whether you're basically doing deeper tissues or
10 more superficial tissues and then the amount of actual
11 hemorrhage.

12 **Q.** Okay. And during your external analysis and
13 examination of Lincoln's head --

14 **A.** Yes.

15 **Q.** -- did you notice anything else on his head other
16 than -- other than this?

17 **A.** This small abrasion?

18 **Q.** Yeah, the small abrasion?

19 **A.** No.

20 **Q.** No scratches along his scalp?

21 **A.** No.

22 **Q.** No abrasions along his scalp or head area?

23 **A.** No.

24 **Q.** And you -- you indicated that this is only caused --
25 this was caused by the head stabilizer that he had on him

1 during his hospital stay?

2 **A.** That little abrasion, that's my understanding.

3 **Q.** Okay.

4 **A.** There was no mention of it in the first couple of
5 days of -- of the medical records. And then they do mention
6 it, like, about midway through and they actually have a
7 wound -- wound team look at it.

8 **Q.** Okay. But no abrasions, no scratches?

9 **A.** No.

10 **Q.** Okay.

11 **A.** I didn't see any and there were none mentioned in the
12 medical records.

13 **Q.** Doctor, let's -- again, shifting gears, are you
14 familiar with the term "baseline state of good health"?

15 **A.** In general, yes.

16 **Q.** Okay. We'll talk -- can you explain to the jury what
17 that is and why it matters in your field?

18 **A.** So you're talking about basically what the person's
19 normal function is. It's going to vary from individual to
20 individual. And so it -- it says, you know, on a day-to-day
21 how you will function both mentally and physically so --

22 **Q.** And how do you -- well, why is this important in a
23 case such as this?

24 **A.** Because you are evaluating the patient throughout his
25 hospital course and also when he's initially found to get an

1 idea of his injuries. And then, also, prior information of
2 what he would have -- be acting like normally.

3 Q. So, in other words, you're trying to find out when
4 did this maybe happen?

5 A. That's true.

6 Q. Okay. How do you establish this?

7 A. For the most part, it's going to be from interviewing
8 with the family.

9 Q. Okay.

10 A. There might be other members involved depending on
11 whether there's relatives or teachers or --

12 Q. Friends, family?

13 A. Whatever.

14 Q. Okay.

15 A. That have a -- a more -- I want to say intimate
16 experience with the individual.

17 Q. Law enforcement?

18 A. Potentially. I mean, they're going to be doing
19 questioning.

20 Q. Okay.

21 A. But unless they're directly involved with law
22 enforcement because it's a family member or a family friend.

23 Q. And when you establish this baseline state of good
24 health, you would agree that it's -- it's important to rely on
25 multiple sources. The more sources really the better. Is

1 that fair?

2 **A.** Sure.

3 **Q.** Okay. And in this case, the -- the people you
4 received information from was Ms. Toombs, prosecuting
5 attorney; law enforcement; and a few other doctors at Primary
6 Children's Hospital; is that correct?

7 **A.** That is essentially correct. Interviews with family
8 members via Safe and Healthy Families, physicians, other
9 physicians at Primary Children's, so yes, I mean, those were
10 the basic.

11 **Q.** You indicated in your testimony here this morning
12 before the lunch break that there wasn't anything abnormal in
13 Lincoln Penland's child records; is that true?

14 **A.** No. I probably didn't get the chance to go through
15 everything or I -- or I just didn't mention it. So we talked
16 about the fact that he did have some problems with his oxygen
17 saturation when he was a newborn. So he went home a few days
18 later because they kept him in the hospital for examination
19 and to check his sat levels. If I remember correctly, he was
20 in for three days instead of the typical two. They did the
21 car seat test where they put the child in a car seat so they
22 can see if they can sit in there for a long enough time to
23 make it home without their oxygen saturation going too low.
24 So he had problems with that.

25 And there was also some question about low -- low weight,

1 although his autopsy weight and height didn't seem
2 particularly low. And then just some mention that maybe he
3 was a little developmentally delayed.

4 Q. Okay.

5 A. That's --

6 Q. And those were all conclusions you came to even
7 though, by your own admission, you had not reviewed the
8 prenatal records, delivery records, and well-child pediatric
9 records?

10 A. That's correct. That's information from the medical
11 records at Primary Children's through multiple different
12 physicians as well as some of their other services so --

13 Q. Okay. For example, the advocacy group, Safe and
14 Healthy Families.

15 MS. TOOMBS: Objection. Mischaracterization.

16 A. That would be considered multiple physicians.
17 They're PICU, the intensive care physician, any of the other
18 surgery teams, anybody who did any kind of a consult note on
19 this kid is going to basically review basic information.

20 Q. (BY MR. BUSHELL) Okay. Doctor --

21 A. And I had access to at least some of those records.

22 Q. Dr. Ulmer, would you agree that traumatic injury can
23 cause subarachnoid hemorrhaging?

24 A. Traumatic injury, yes.

25 Q. Would you agree that there are -- are other causes of

1 subarachnoid hemorrhaging?

2 **A.** Yes.

3 **Q.** Okay. And in scenarios where a traumatic injury does
4 cause subarachnoid hemorrhaging, you can't tell us who caused
5 that traumatic injury. Is that true?

6 **A.** Yeah. That sounds reasonable.

7 **Q.** Okay. So -- well, we'll come back to that.

8 Isn't it true -- so during the nine days that Lincoln
9 Penland was hospitalized prior to removing -- being removed
10 from life support, his -- his tissues would have undergone
11 some changes. Is that true?

12 **A.** Potentially, yes.

13 **Q.** Okay. There would have been a certain amount of
14 breakdown with the brain tissue, for example?

15 **A.** Yes.

16 **Q.** Okay. You've previously testified here that -- that
17 after the brain is fixed -- let's back up.

18 What did -- when you say the brain is fixed, can you
19 explain what that means?

20 **A.** Sure. So the -- the brain is put into a formalin
21 solution that allows the tissues to set up because it causes a
22 chemical reaction to occur in the proteins that causes cross
23 linking, so it makes it more firm to cut because especially on
24 infant brains, they have a high water content so when you cut
25 them fresh, it's kind of like cutting into a Jell-O Jiggler or

1 something --

2 Q. Okay.

3 A. -- to that consistency.

4 Q. Okay. So when the brain is fixed, you slice through
5 it so you can look for any natural diseases, for example, or
6 any diseases associated with a patient's hospital stay. Is
7 that true?

8 A. I'm sorry?

9 Q. Okay. So one of the reasons -- after you fixed the
10 brain --

11 A. Uh-huh.

12 Q. -- you slice through it --

13 A. Uh-huh.

14 Q. -- and oftentimes what you're looking for are
15 indications of any natural diseases.

16 A. Yes.

17 Q. Also looking for any diseases that could be
18 associated with the hospital stay.

19 A. Yes.

20 Q. Or any indication of trauma.

21 A. Yes.

22 Q. And you indicated that before you can do that, the
23 brain must be fixed for a couple of weeks. Is that true?

24 A. It doesn't have to be. I mean, you can cut it fresh,
25 but --

1 Q. In Lincoln Penland's case --

2 A. It was cut fixed because it -- it's easier to -- so
3 because he was on -- sorry, it's after lunch. It's that
4 postprandial --

5 Q. You're fine. Do you have water, Doctor?

6 A. Yes, I do.

7 Q. Okay.

8 A. So he was on the respirator for a significant amount
9 of time so usually that means that they're not functioning
10 normally on their own so that means they're probably not
11 getting adequate fluid to their -- or blood with oxygen to
12 their brain. That's probably why they're on the respirator,
13 because they're not breathing correctly.

14 Q. Yeah.

15 A. So those folks, whether it be a small child or an
16 adult, their brain tissue starts to break down and it becomes
17 softer. So if fixing it will help firm it up a little bit so
18 that it helps with the examination, then it's better to fix
19 it.

20 Q. Understood. Okay.

21 Did you take a sample from the skull fracture to
22 determine the degree of healing?

23 A. I did not.

24 Q. You did not.

25 A. I guess I could clarify that. I did not submit the

1 histology. I did keep the specimen.

2 Q. Okay. Let's, again, shift gears and talk about the
3 fractures that you've noted in the arm bones, the humerus --

4 A. Yes.

5 Q. -- I believe. You indicated that at the hos -- at
6 the hospital prior to coming to you, a full skeletal survey
7 was conducted.

8 A. Yes.

9 Q. Okay. And at that time, quote, "They noted what they
10 thought was a fracture on the proximal humerus." Is that
11 correct?

12 A. That's correct.

13 Q. You would agree the fractures that you observed were
14 rather small in nature?

15 A. That's correct.

16 Q. And these, you would also agree, could be caused
17 naturally.

18 MS. TOOMBS: I'm sorry. What are we --

19 A. If you're inquiring like from a bone cyst or
20 something like that, I did not see that histology.

21 Q. (BY MR. BUSHELL) Okay. But fractures of this nature
22 can be caused naturally?

23 A. From -- not that I'm aware of.

24 Q. Okay. Your testimony this morning was that it could
25 be caused, I think you said, from being pulled up and twisted,

1 perhaps?

2 **A.** The general thought is that you have an extended arm
3 that has tension on it and then twisting.

4 **Q.** Okay.

5 **A.** Another thought is that it's possibly when a child is
6 being held while he's being shaken.

7 **Q.** Okay. Held and shaken?

8 **A.** Held by the arms and shaken or --

9 **Q.** Okay. Well, let's talk about --

10 **A.** Again, that goes into a whole another world so --

11 **Q.** What other world?

12 **A.** The world of shaken baby syndrome so --

13 **Q.** Okay. Well, let's talk about that world.

14 **A.** Okay.

15 **Q.** I think it's fair to say -- correct me if I'm
16 wrong -- that the world of shaken baby syndrome is a rather
17 disputed area?

18 **A.** There -- yes. There are many things about it that
19 are.

20 **Q.** Okay.

21 **A.** And, again, it goes back to that point that we can't
22 do any prospective studies so --

23 **Q.** Sure. Are you aware of what the State's theory of
24 this case is?

25 **A.** I've heard some thoughts about it, but not -- not

1 specifically, no.

2 Q. You're not aware that the State is alleging that our
3 client, Ms. Morley, grabbed Lincoln Penland, shook him, and
4 then slammed him down on that changing table right there?

5 A. I had not had that elaborated to me in that sense,
6 no. I -- I did know that there was question about whether
7 that changing table could have been a representation of it and
8 that was certainly a question that was asked of me.

9 Q. Okay. Doctor, you would agree retinal hemorrhaging
10 often correlates to traumatic injuries?

11 A. It does, yes.

12 Q. Non-accidental injuries, for example, often correlate
13 with retinal hemorrhaging.

14 A. Yes.

15 Q. But it's also true, you would agree, that retinal
16 hemorrhaging can be caused by other forces, correct?

17 A. That's correct.

18 Q. And such forces can include accidental forces,
19 correct?

20 A. That's correct.

21 Q. Okay. In scenarios where traumatic injury does cause
22 retinal hemorrhaging, again, you can't tell us who caused
23 those, correct?

24 A. No, not unless it's witnessed, of course.

25 Q. And retinal hemorrhaging is observed and documented

1 in many scenarios, abusive and non-abusive scenarios.

2 **A.** Yes.

3 **Q.** Okay. And, in general, would you agree, Doctor, that
4 increased intracranial pressure has been documented to cause
5 retinal hemorrhaging?

6 **A.** It has.

7 **Q.** And you would agree that coagulation abnormalities
8 have been shown to cause retinal hemorrhaging?

9 **A.** It has.

10 **Q.** And you -- make sure I'm -- we're on the same page.
11 You agree that the correlation between retinal hemorrhaging
12 and shaken baby syndrome is observed usually -- almost
13 always -- after the fact.

14 **A.** That is correct.

15 **Q.** Doctor, would you agree that shaking could not cause
16 significant brain injuries without first causing massive
17 injuries to the neck and cervical spine?

18 **A.** It depends on which modeling study you go by and also
19 which autopsy information you go by, but I personally have not
20 seen that, but I wouldn't say that it's not -- it makes sense.
21 I mean, you've got -- that's your fulcrum, so it certainly
22 would make sense.

23 **Q.** It would make sense that you would see massive
24 injuries to the neck and cervical spine.

25 **A.** I don't know about massive, but certainly some

1 injuries.

2 Q. Okay. So it makes sense that you would see injuries,
3 whether massive or not -- we'll leave that out.

4 A. Potentially, yes.

5 Q. It makes sense you would see injuries --

6 A. Potentially, yes.

7 Q. -- in the neck and cervical spine in a shaking
8 scenario.

9 A. (Inaudible)

10 Q. Okay. And retinal folds, different -- a bit
11 different from retinal hemorrhaging, but retinal folds, you
12 would agree, can be attributed, also, to causes other than
13 abusive head trauma.

14 A. I think I've read one article that was something
15 else, yes, so --

16 Q. You're aware that crushing has been shown to cause
17 retinal hemorrhaging.

18 A. Yes.

19 Q. Falls have been shown to cause retinal hemorrhaging.

20 A. Yes.

21 Q. Again, increased cranial pressure. Would you agree?

22 A. Yes.

23 Q. Even diabetes has been shown to cause retinal
24 hemorrhaging? Are you aware of this?

25 A. Yes, although unlikely in this age group.

1 **Q.** Sure.

2 **A.** But yes.

3 **Q.** Let me just sum that up. So, Doctor, you can't --
4 you cannot say, based upon these injuries, that shaking is the
5 only explanation for the injuries to Lincoln Penland?

6 **A.** The shaking certainly didn't have anything to do with
7 his skull fracture, but if you're referring to the retinal
8 hemorrhages, yes, there's more than one answer to that
9 question.

10 **Q.** And it's also true there's more than one answer to
11 the fractures?

12 **A.** Potentially, yes.

13 **Q.** Thank you.

14 All right. Let's now shift gears. I want to talk to you
15 a little bit about this idea of a lucid interval, and that
16 there was some conversation in direct examination about what
17 that is and what it isn't.

18 **A.** Uh-huh.

19 **Q.** Let me ask you this. If Lincoln Penland was not
20 immediately symptomatic, would he have been irritable, to say
21 the least?

22 **A.** Certainly.

23 **Q.** Would he have been vomiting?

24 **A.** Yes, probably.

25 **Q.** Would he have loss of -- would you have seen loss of

1 appetite? Didn't want to eat?

2 **A.** Yes.

3 **Q.** Very fussy?

4 **A.** Yes.

5 **Q.** Inconsolable?

6 **A.** I would imagine, yes.

7 **Q.** I'm going to write out yet another study and I'll
8 present it to you and we'll see if you're familiar with it, as
9 it pertains to lucid intervals. If you just give me 35
10 seconds, I'll try to be quick.

11 **MR. BUSHELL:** Your Honor, may I approach the witness?

12 **THE COURT:** You may.

13 **MS. TOOMBS:** May I see what you're --

14 **Q. (BY MR. BUSHELL)** While the State is reviewing that,
15 are you familiar with the recent works -- well, the works of
16 Gillian, Gilliland, I'm sure I mispronounced that as well.
17 Gilliman. Is there a --

18 **A.** I'd have to see it to --

19 **Q.** Okay.

20 **MS. TOOMBS:** We're just trying to pull it up.

21 **Q. (BY MR. BUSHELL)** Here you go, Doctor. Again, I'm
22 sorry about the sloppy handwriting.

23 **A.** All right. So article from 1998 from, yeah, Dr. Mary
24 Gilliland. Yes, I'm familiar with that.

25 **Q.** Okay.

1 **A.** Interval duration between injury and severe symptoms
2 in non-accidental head trauma in infants and young children.
3 Findings, lucid intervals are very real possibilities in
4 infants with constellations of injuries, such as those found
5 in Lincoln Penland.

6 **Q.** Are you familiar --

7 **A.** Which I don't think was part of the article.

8 **Q.** You don't.

9 **A.** I don't think Lincoln was born back then yet, but --

10 **Q.** Right. Well -- okay. But you're familiar with
11 that -- that article, then?

12 **A.** Yeah. I -- I'm sure I've read it at some point
13 because it's been around for a long time and --

14 **Q.** Okay. And you disagree with it?

15 **A.** If I could remember the specifics of it, it would
16 help, but, generally, yes, I disagree with it.

17 **Q.** Okay. Your opinion is that lucid intervals are not
18 real possibilities.

19 **A.** They are possibilities with the correct kind of
20 injury. You're going to see those more likely with -- with an
21 epidural hematoma that's expanding over a period of time.

22 **Q.** Okay.

23 **A.** There's also been some thought that it can happen
24 with reinjury from an old injury if you have a chronic
25 subdural membrane that then re-bleeds. I could buy into that

1 if I had a chronic subdural, but I did not see that in
2 Lincoln --

3 Q. Okay.

4 A. -- when I did his histology so --

5 Q. Doctor, you -- you do agree, however, Lincoln
6 Penland, no doubt about it, suffered a rather significant
7 impact to his head.

8 A. Yes.

9 Q. Of course. You would agree, however, that to
10 quantitate that would be a very difficult task.

11 A. Yes.

12 Q. Okay.

13 MR. BUSHELL: If I may approach?

14 Q. (BY MR. BUSHELL) You're not trained in biomechanic
15 engineering?

16 A. No.

17 Q. Okay. And to, again, quantitate the amount or the
18 impact, the force, would be very difficult.

19 A. It would be. And I think even if I were a
20 biomechanic engineer, there would be other biomechanic
21 engineers who would have a different opinion than what I would
22 have so --

23 Q. Do you agree that an eight-month-old child can suffer
24 head -- I'm sorry, suffer severe head trauma from a fall?

25 A. Yes.

1 **Q.** Okay. And that such falls can oftentimes be fatal?

2 **A.** Yes.

3 **Q.** Okay. And this can occur from a fall -- from falls
4 as little as just a few feet?

5 **A.** In the right scenario there have been short level --
6 short-distance falls that have been deemed to be --

7 **Q.** So it's not like it would require some threshold of a
8 story or more?

9 **A.** Not specifically. I mean, every -- every scenario is
10 going to have its own possibilities so --

11 **Q.** But you agree that there are scenarios and there has
12 been documented -- documented cases where deaths have occurred
13 from falls as little as a few feet.

14 **A.** Yes.

15 **Q.** So while -- I think we all agree Lincoln Penland
16 clearly had some kind of significant blunt force trauma of the
17 head.

18 **A.** Yes.

19 **Q.** That's accurate to say? You also agree, Doctor, that
20 you cannot say what it was.

21 **A.** That's correct.

22 **Q.** Okay.

23 **A.** There's no patterned injury to look at so -- and
24 there's no story that significantly explains how it happened,
25 so, yes.

1 **Q.** And you -- you can't say based on your evaluation,
2 based on your autopsy, whether Lincoln Penland was forced into
3 something or whether something was forced into him.

4 **A.** Not specifically with his symptoms that I'm see -- or
5 signs that I'm seeing at autopsy, no, there's --

6 **Q.** So the answer is -- is yes.

7 **A.** I'm sorry?

8 **Q.** So the answer was that you can't say --

9 **A.** That's correct.

10 **Q.** So let me just clarify. You can't say, based on your
11 findings, whether Lincoln Penland was forced into something.
12 True?

13 **A.** True.

14 **Q.** Nor can you say whether something was forced into
15 him.

16 **A.** True.

17 **Q.** Your findings are inconclusive there.

18 **A.** That's correct.

19 **Q.** And kind of in that same vein, you also can't say,
20 Doctor, nor is it your job to say who the perpetrator was of
21 this injury.

22 **A.** That's correct.

23 **Q.** An eight-month-old can suffer, however, blunt force
24 trauma to the head by accident. You would agree?

25 **A.** Absolutely.

1 **Q.** Doctor, in your medical capacity as a pathologist
2 performing this autopsy, you're an unbiased observer here; is
3 that right?

4 **A.** That's correct.

5 **Q.** Okay. Your job is to document the findings and then
6 present them as you see them.

7 **A.** That's correct.

8 **Q.** Okay. You mentioned one of the reasons Lincoln
9 Penland's body was sent to your office was because that it was
10 deemed or considered a suspicious death.

11 **A.** That's true.

12 **Q.** And prior to your autopsy examination, you were
13 apprised of some facts surrounding his injuries; is that
14 correct?

15 **A.** Yes.

16 **Q.** Okay. For example, you had been told that Lincoln
17 Penland was being cared for by a daycare provider.

18 **A.** Yes.

19 **Q.** And this happened before you did your autopsy.

20 **A.** Yes.

21 **Q.** You also indicated that this information about
22 Lincoln Penland and being in the care of a daycare provider --
23 before your autopsy even began -- may have come from, quote,
24 an investigation report; is that right?

25 **A.** I'm sure that it's actually in my officer's or my

1 death investigator's report. It doesn't state any, you know,
2 specifics, other than the fact that it did happen -- or he was
3 at daycare when he was having issues and then the findings at
4 the hospital, but --

5 Q. Okay.

6 A. And that there's concern that it's an inflicted
7 trauma.

8 Q. A -- a suspicious death.

9 A. Yeah.

10 Q. And you received that information prior to doing your
11 autopsy.

12 A. Yes.

13 Q. Before examining Lincoln Penland.

14 A. I did.

15 Q. And you mentioned in your direct testimony that
16 during the autopsy, standing there in the room next to you or
17 near you, was Lieutenant Smith from Roy police; is that true?

18 A. Yes.

19 Q. Also standing next to you or near you in the autopsy
20 was another officer, Danny Hammon, from Roy Police Department.

21 A. Yes.

22 Q. Also standing next to you or near you during the
23 autopsy was Letitia Toombs from the Weber County Attorney's
24 Office.

25 A. Yes.

1 **Q.** And isn't it true that Lieutenant Smith, Danny --
2 Danny Hammon, and Tish Toombs had brought a changing table
3 that's sitting right there, with them that day of the autopsy?

4 **A.** Yes.

5 **Q.** Okay. And in your own words, you agree what they
6 wanted to know was, quote, "They wanted to know whether the
7 injuries that Lincoln Penland sustained were consistent with a
8 defect that was in the changing table."

9 **A.** That's true.

10 **Q.** Okay.

11 **A.** And my response was, I don't know.

12 **Q.** Yeah. That was my next question. Your response to
13 them was, quote, "You couldn't say that for sure." Is that
14 true?

15 **A.** Yeah.

16 **Q.** You told them you couldn't say.

17 **A.** Yes.

18 **Q.** In fact, you agree that you cannot say whether the
19 changing table was involved or not.

20 **A.** That's true.

21 **Q.** You can't say whether that's the mechanism for
22 causing all those severe injuries.

23 **A.** That's true.

24 **Q.** In fact, fair to say that you characterize the
25 changing table theory as, quote, "It's an interesting

1 scenario, but that you cannot definitively say one way or the
2 other."

3 **A.** That sounds about right.

4 **Q.** Okay. And when law enforcement, that day of the
5 autopsy, showed you that changing table, isn't it true,
6 Doctor, that what you said was, "It could be; it could not be.
7 I don't know."

8 **A.** Possibly, yeah.

9 **Q.** Okay. At this point they hadn't shown you an
10 interview conducted with a little girl named Brylee Shepherd;
11 is that true?

12 **A.** I've never seen an interview conducted by (sic)
13 Brylee Shepherd.

14 **Q.** You still haven't seen an interview conducted with
15 Brylee Shepherd.

16 **A.** No.

17 **Q.** In your testimony prior to lunch here earlier today,
18 you recognize that there are a few cases in the literature
19 that does show that toddlers have injured infants.

20 **A.** Yes.

21 **Q.** But the follow-up question with Ms. Toombs was that,
22 quote, "Based on the story you were given, it doesn't make
23 sense." The story that was given to you was given to you by
24 law enforcement and Ms. Toombs; is that correct?

25 **A.** Most likely, yes.

1 Q. Okay. And, again, you've never seen an interview
2 with Brylee Shepherd.

3 A. No.

4 Q. You never examined or met this little boy named
5 Boston Penland.

6 A. No.

7 Q. You never inspected Ms. Morley's home, I'm assuming?

8 A. No.

9 Q. You never inspected any doors at her home.

10 A. No.

11 Q. You're not familiar with any information at all about
12 those doors, are you? Weight, dimensions?

13 A. No.

14 Q. Doctor, immediately after the autopsy, you determined
15 that there was clearly a traumatic injury. That's fair to
16 say?

17 A. Yes.

18 Q. However, based on your findings, you can't say
19 whether those -- those injuries were accidental or
20 intentional; is that right?

21 A. Not just from the findings, no.

22 Q. You'd agree that an eight-pound bowling ball -- well,
23 let me -- let me back up. If an eight-pound bowling ball was
24 dropped onto the head of an eight-month-old, it could cause --
25 it could certainly cause that skull fracture that you're

1 seeing here?

2 **A.** I would think that would be possible, depending on
3 the height that the ball was dropped from.

4 **Q.** And you agree that Lincoln Penland's unfortunate
5 skull fracture could have been caused by a toddler jumping off
6 the top of a table or something like that and landing on
7 Lincoln Penland's head?

8 **A.** Yes.

9 **Q.** You agree that if this happened, it could a plausible
10 explanation for these injuries that you saw?

11 **A.** Yes.

12 **Q.** Your professional medical opinion, Doctor, is even
13 though you can say that for sure that Lincoln Penland did not
14 cause these injuries himself -- that's a given -- isn't it
15 true that you cannot say that Lincoln Penland's injuries
16 occurred at the hands of an adult?

17 **A.** I can't say for sure. That's true.

18 **Q.** Thank you, Doctor. That's all the questions I have.

19 **THE COURT:** Okay. Any redirect from the State?

20 **MS. TOOMBS:** Yes. Sorry. Just give me just one
21 second to flip through.

22 **REDIRECT EXAMINATION**

23 **BY MS. TOOMBS:**

24 **Q.** Now, Dr. Ulmer, I think you testified during your
25 direct examination that you -- you sent the eyes out to

1 Dr. Mamalis, correct?

2 **A.** Correct.

3 **Q.** And why is that?

4 **A.** Dr. Mamalis does all of our eye examinations on our
5 suspicious baby deaths because he is an expert in that area
6 and we have that service available to us so --

7 **Q.** So he -- he's the expert on the eyes, correct?

8 **A.** Correct.

9 **Q.** So if he were to have testified that when you find --
10 and, again, counsel gave you all kinds of scenarios that could
11 cause things, but I want to ask you directly about the
12 findings in Lincoln Penland. When you find diffuse retinal
13 hemorrhaging, retinal folds, and nerve sheath hemorrhaging,
14 Dr. Mamalis's testimony was that that is -- the findings,
15 according to the studies, according to the literature,
16 95 percent assurance that that is abusive head trauma. Would
17 you agree with Dr. Mamalis or would you dispute that?

18 **A.** No. I mean, I'm not sure about the 95 percent, but
19 certainly that is generally what is the correlation, yes.

20 **Q.** And so we -- counsel asked you about a number of
21 studies and I want to just take one of the -- let me ask you
22 this. Is there a difference between a study and a case
23 report?

24 **A.** Yeah. A case report is usually just one case or
25 maybe a handful of cases that are somehow related but aren't

1 necessarily telling you the exact same thing. So you will
2 have one specific event that never has been reported in the
3 literature before and so that's going to be reported as a case
4 study.

5 Q. Okay. And I'm going to show you --

6 MR. BUSHELL: Can I see it first?

7 MS. TOOMBS: Yeah. This is your perimacular --

8 MR. BUSHELL: Uh-huh.

9 MS. TOOMBS: -- retinal folds stimulating --

10 MR. BUSHELL: From Leuder?

11 MS. TOOMBS: Yes. I would have pronounced it Leuder.

12 Thank you.

13 MR. BUSHELL: How do you say it?

14 MS. TOOMBS: I would have said Leuder.

15 MR. BUSHELL: Leuder. That's probably right. I
16 don't know.

17 MS. TOOMBS: I don't know.

18 Q. (BY MS. TOOMBS) Okay. I'm going to show you this
19 article that -- that counsel wrote down a --

20 A. Uh-huh.

21 Q. This is the perimacular retinal folds article. And
22 if I -- if I could just have you stand -- first off, when was
23 that article published?

24 A. 2006, December.

25 Q. Okay. And as you scan through it -- and you can just

1 read it to yourself. You certainly don't need to read all of
2 it. Is that a study or is that a case report?

3 **A.** This is a case report.

4 **Q.** Okay. And do they give -- I think that counsel said
5 that the child was six years old and a four-month-old child?

6 **A.** Yeah. It's actually a 12-year-old and a
7 four-month-old.

8 **Q.** Okay. And how old did that -- or how much -- excuse
9 me, how much did that 12-year-old weigh?

10 **A.** 63 kilograms. So --

11 **Q.** And I don't do kilograms.

12 **A.** -- multiply that by 2.2 and you get your pounds.

13 **Q.** So 63, 2.2, I would come up with about 100 and --
14 140 pounds, give or take?

15 **A.** Yeah.

16 **Q.** So certainly different than a 30-pound.

17 **A.** Yes.

18 **Q.** Okay. And, also, does that case report talk about
19 the type of fracture?

20 **MS. TOOMBS:** May I approach?

21 **THE COURT:** Yes.

22 **A.** Okay. So we've got a comminuted displaced parietal
23 bone fracture with subdural and intraventricular hemorrhage
24 and brain herniation.

25 **Q. (BY MS. TOOMBS)** Okay. Is that the extent of what

1 they tell you about the --

2 **A.** Yeah. And then it goes on to talk about the ocular
3 findings.

4 **Q.** Okay. So let's just talk about the fracture itself.
5 Comminuted. What does that mean?

6 **A.** That means you've got multiple bone fragments.

7 **Q.** Is that what we found in Lincoln?

8 **A.** No.

9 **Q.** Is that more consistent with a crush kind of a
10 fracture?

11 **A.** From what I'm reading here, yes. I mean, it sounds
12 like it was pretty extensive, but --

13 **Q.** I guess my question would be, would you be more --
14 would you expect a comminuted fracture -- as opposed to the
15 type of fracture that we see -- if this was a crush injury?

16 **A.** Again, it's going to vary, but what you're talking
17 about is basically when you -- for simplicity's sake, you take
18 a hard-boiled egg and you crush it and you're going to have a
19 whole bunch of fractures.

20 **Q.** And that would be --

21 **A.** That's more of a crush injury. But you can see
22 comminuted fractures also through impact, in my experience.

23 **Q.** Okay. But we don't have a comminuted fracture in
24 Lincoln; is that true?

25 **A.** No, we don't. It's more of a -- certainly a

1 depressed -- it's more like what they call a ping-pong
2 fracture where, because it's along that suture line, it's
3 crushing in and then it's breaking away from the suture lines
4 as it's buckling in so --

5 Q. Is that from the impact or from pressure on both
6 sides, though?

7 A. I'm not sure I could state.

8 Q. Okay. All right. Fair enough.

9 Now, they also talk about where that fracture is located
10 and I think you said the parietal bone?

11 A. The parietal bone.

12 Q. Can you explain to the jury where the parietal bone
13 is?

14 A. So the parietal bones are the ones that are right
15 here. You've got frontal bones in the front, temporal bones
16 around the ears, and then the parietal bones. And then in the
17 back, lower, the occipital bones.

18 Q. Okay. And in Lincoln's case, we have the lower
19 fracture in the mastoid region?

20 A. Right. So it's more of a tem -- temporal lobe,
21 occipital lobe, and along the parietal, all three so --

22 Q. So in the case study that counsel asked you to -- to
23 agree with, we had a 12-year-old who weighed 100 -- about
24 140 pounds on a -- that crushed, leaving comminuted fractures,
25 and essentially a severely -- a completely different injury

1 than what we've got here.

2 **A.** Yeah.

3 **Q.** To your knowledge, is a three-year-old going to weigh
4 160 -- or 140 pounds?

5 **A.** No.

6 **Q.** They do also, however, talk about the effect on that
7 child. What was the effect on that child? I can point it out
8 to you if you don't want to spend a whole lot of time looking
9 at it.

10 **A.** Immediate -- the infant was immediately unresponsive.

11 **Q.** Of this scenario, that would be about the only thing
12 that you would -- that you found -- that you would expect to
13 have found in Lincoln?

14 **A.** That's also similar to what I would expect to be
15 found in Lincoln. I would not expect him to be conscious.

16 **Q.** Okay. Rather than go through a whole bunch of
17 studies altogether, I'm going to come back to that a little
18 bit. But -- well, let me just -- let me just go through the
19 studies.

20 Are you familiar with a per -- person by the name of
21 Matthew -- Dr. Matthieu Vinshon -- Vin -- Vinshon -- and I'm
22 sure I'm butchering his name.

23 **A.** I -- I don't know.

24 **Q.** Again, the -- I don't read the author, I read the
25 facts.

1 **A.** (Unintelligible)

2 **Q.** Okay. I'm going to show you a discussion of a
3 study -- make sure I point you to the right spot -- I
4 apologize. That's a different one.

5 **A.** Oh, Dr. Frasier.

6 **Q.** Well, I've got -- I've got this one handy. Maguire.
7 Are you familiar with Maguire?

8 **A.** I don't know.

9 **Q.** Okay. Let's see. This is a synopsis of a study
10 completed in 2009 by Maguire, et al. I'll give you a minute
11 to just read that.

12 **A.** Okay.

13 **Q.** Does that sound familiar, like something you might
14 have heard?

15 **A.** Yeah.

16 **Q.** Okay. And what was the conclusion in that study?

17 **A.** They're basically comparing -- attempting to compare
18 accidental and non-accidental trauma and that the -- the main
19 distinguishing feature was apnea or not breathing. Authors
20 also found retinal hemorrhages that were strongly associated
21 with the inflicted brain injury with a positive predictive
22 value of 71 percent and -- I can't remember what OR stands
23 for and they're not explaining it right here, but they're
24 going to some statistics just indicating that a child with
25 intracranial injury who has coexistent retinal hemorrhages is

1 significantly more likely to have inflicted blunt force trauma
2 than -- than non-inflicted.

3 Q. Okay. And would you agree with those findings?

4 A. Again, it's -- each scenario is going to be
5 different. So certainly, you know, with what they're
6 reviewing, it's possible.

7 Q. Okay. So as you mentioned, each scenario is going to
8 be different. Is it, therefore, important to have all the
9 information possible for you when making a -- a conclusion?

10 A. Yes.

11 Q. So, in other words, having law enforcement available,
12 talking to you, that's important to your job.

13 A. Yes.

14 Q. We've talked a lot about the retinal hemorrhaging.
15 Counsel also talked about short falls and your understanding
16 of short falls. Now, in this case we have a little girl who
17 says Boston picked up his brother and dropped him, kicked him,
18 stomped on him, and slammed his head in the door. We also
19 have seen a video of Boston, at the time, 30 pounds, trying to
20 pick up the doll. Brings me to a very important point that I
21 forgot to ask you earlier. What was Lincoln's weight at the
22 time of his death?

23 A. His weight was 8 kilograms or 17.6 pounds.

24 Q. 17.6 pounds. So there was a reenactment done with
25 Boston picking up a 12.6-pound dummy where he got him up --

1 **MR. BUSHELL:** Objection, Your Honor. This is well
2 outside the scope of cross-examination.

3 **MS. TOOMBS:** I would disagree, Your Honor. Counsel
4 asked about falls and so the only fall that is described is
5 something that Boston picked him up. So that's -- we have to
6 bring it back to what are the facts in this case.

7 **THE COURT:** I think it's within the scope. I'll
8 overrule the objection.

9 **MS. TOOMBS:** Thank you.

10 **Q. (BY MS. TOOMBS)** He picks up the baby, the doll, gets
11 it -- I'm probably being generous -- but maybe 6 inches off
12 the floor before his arms give out and he says, I -- well, he
13 says, I can. Is a fall from 6 inches going to cause the
14 fracture that you saw in Lincoln?

15 **A.** No.

16 **Q.** Is a fall from 6 inches going to cause the -- the
17 rest of the injuries that you see?

18 **A.** No.

19 **Q.** In fact, stomping on, kicking, can it cause the
20 constellation of injuries that you see in Lincoln?

21 **A.** No.

22 **Q.** How about pushing the door closed on his head?

23 **A.** No. I didn't have any injuries on the other side of
24 the head.

25 **Q.** And that's why that's important to you, correct? No

1 injuries on the other side?

2 **A.** Correct.

3 **Q.** If it's hitting here hard -- oops, hitting here hard
4 enough to fracture -- excuse the pun -- but certainly it's
5 going to leave a mark here, correct?

6 **A.** I would hope so, yes.

7 **Q.** Okay. Now, this was asked early on. The -- whether
8 or not you had ac -- whether or not you had reviewed the
9 prenatal, well-child, and birth records of Lincoln Penland.
10 In an autopsy on a child that's eight months old with obvious
11 signs of trauma, is it important for you to review the
12 well-child, birth records, prenatal records?

13 **A.** Actually it's important in any infant autopsy and the
14 fact that I didn't have them was very surprising to me because
15 I usually always request those records, but I had so much
16 information from the Safe and Healthy Families already
17 covering those issues, as well as other physicians within the
18 hospital that were questioned, that I felt like that
19 information had been already covered.

20 **Q.** Okay. So you had enough information to make your
21 determination?

22 **A.** I felt I did, yes.

23 **Q.** Are fractures different? I mean, I guess we've
24 already talked about parietal fractures versus the fracture
25 that we see here. When -- when you say to counsel, yes, a

1 fall can cause a fracture --

2 **A.** Uh-huh.

3 **Q.** -- are there different levels of fractures that you
4 can see?

5 **A.** Sure. Sure. The fractures that are generally
6 associated with lower heights are what are considered linear
7 fractures. They're usually going to be in a more obvious area
8 for impact. So, generally, parietal bone is a common area.
9 So these are fractures that they really don't have to do
10 anything more than evaluate the child and make sure that
11 there's not any other intracranial bleeding or anything
12 associated with it. And then other than that, there's really
13 no significant problems with it. They tend to heal up and be
14 fine with no -- no ramifications from it.

15 **Q.** Now, counsel asked you if -- would it be consistent
16 with -- I can't remember exactly how he phrased it -- but loss
17 of appetite, would you expect to see that in a -- in a
18 traumatic head injury, loss of appetite, and I believe that
19 you indicated yes.

20 **A.** Yeah. It's going to depend on the scope of the
21 injury. You know, you can certainly have someone who has a
22 concussion and they will have severe headache, they will feel
23 nauseous, they may not want to eat anything because they feel
24 nauseous. There is a spectrum of symptoms that you'll see
25 depending on the seriousness of the head injury and that's

1 going to vary from the type of head injury as well as any
2 complications that might be associated with it.

3 Q. And you've used the example a couple of times,
4 concussion, like a football player or a baseball player that
5 gets hit in the head. And that's a concussion, correct?

6 A. Right.

7 Q. Is that the type of injury that we're -- that you
8 were seeing in Lincoln Penland?

9 A. No. This is a more extensive injury with the
10 intracranial bleeding. We've got subdural and subarachnoid
11 hemorrhage, both, in addition to this significant skull
12 fracture that I would expect the symptoms to be more
13 pronounced than an infant who's maybe just cranky or not
14 eating well or sleeping a lot.

15 Q. More than that is what you would expect from Lincoln.

16 A. Yes.

17 Q. Okay. Now, you indicated law enforcement brought the
18 table down to you at autopsy and said, is this what did it?

19 A. Yes.

20 Q. And you said, I'm not going to say for sure. Right?

21 A. Right.

22 Q. Is it consistent with the injuries that you are
23 seeing?

24 A. It could be.

25 Q. Okay.

1 unsettled.

2 **A.** Yes.

3 **Q.** There's a --

4 **A.** A broad spectrum of opinions.

5 **Q.** Medical opinions, scientific opinions.

6 **A.** Yes.

7 **Q.** Clearly -- clearly, a three-year-old does not weigh
8 100-plus pounds, would you agree? I think we all agree. But
9 your testimony is that if an 8-pound bowling ball was dropped
10 onto an eight-month-old's head, it could certainly cause this
11 skull fracture of this magnitude. That was your testimony.
12 Is that true?

13 **A.** I said depending on the height, yeah.

14 **Q.** Okay. And you also agree that Lincoln Penland's
15 skull fracture, the one that you observed and that you saw
16 here, could have been caused by a toddler jumping off the top
17 of a table or something like that and landing on Lincoln
18 Penland's head. Is that true?

19 **A.** Yes.

20 **Q.** And you agree that if this happened, that would be a
21 plausible explanation. That was what you testified to,
22 correct?

23 **A.** That's correct.

24 **Q.** You also indicated that each scenario is going to be
25 different and it's important to have all the information

1 possible in making a conclusion. You agree with that.

2 **A.** Yes.

3 **Q.** Have you ever seen the interview with -- with Brylee
4 Shepherd?

5 **A.** No.

6 **Q.** Have you ever seen the interview with this CPR doll,
7 with Boston Penland trying to pick it up?

8 **A.** No.

9 **Q.** Never saw it.

10 **A.** No.

11 **Q.** You never saw how high Boston Penland was able to
12 pick up that child from his knees, kneeling right next to it,
13 with weights put directly in the middle. You never saw that.

14 **A.** No.

15 **Q.** You also never saw a door -- or any door, for that
16 matter, as it pertains to this case.

17 **A.** Correct.

18 **Q.** But you do agree that each scenario is different and
19 that it is very important to have all the information possible
20 when making a conclusion. You agree.

21 **A.** Yes.

22 **Q.** And lastly, again, you cannot say for sure that
23 Lincoln Penland -- or that his injuries occurred at the hands
24 of an adult. Is that true?

25 **A.** That's true.

1 Q. Thank you, Doctor.

2 THE COURT: From the State?

3 MS. TOOMBS: Only a couple more questions,
4 Your Honor. Attorney questions.

5 FURTHER EXAMINATION

6 BY MS. TOOMBS:

7 Q. Again, we focused an awful lot on that fracture in
8 the head. And -- and we're going far afield of what Brylee
9 Shepherd even contemplated in what she says because she never
10 says he jumped off of anything. She never says he kicked or
11 anything.

12 MR. BUSHELL: Objection, Your Honor.

13 Q. (BY MS. TOOMBS) All he says -- all she says is he
14 kicked him, stepped on him --

15 MR. BUSHELL: May I object here?

16 MS. TOOMBS: Sorry.

17 MR. BUSHELL: Hence the objection. This is assuming
18 facts not in evidence. There's been -- as the doctor
19 indicated, she hasn't seen the video. I have never once
20 indicated exactly what Brylee Shepherd said. Ms. Toombs is
21 now telling the doctor what she said, which was not
22 admitted -- the doctor has not seen the video.

23 THE COURT: Okay.

24 MS. TOOMBS: It isn't facts not in evidence. It
25 is -- the facts are in evidence. The jury watched that video

1 last week. And counsel is -- is now saying -- I mean, if you
2 want to talk about facts not in evidence, there's no evidence
3 indicating that he jumped off the table. There's no evidence
4 indicating any of these -- the bowling ball scenario, none of
5 that.

6 **THE COURT:** I'll overrule the objection. I think you
7 can ask it.

8 **MS. TOOMBS:** Thank you, Your Honor.

9 **THE COURT:** Depending on how it ends. I've only
10 heard a part of it.

11 **MS. TOOMBS:** Okay. Fair enough.

12 **Q. (BY MS. TOOMBS)** So in the scenarios that counsel has
13 presented, you said, yes, that could cause a fracture.

14 **A.** Yes.

15 **Q.** Okay. However, the facts of this case are a 30-pound
16 three-year-old kicked him, picked him up by one hand, dropped
17 him, slammed his head in the door, and stepped on him. Would
18 those -- those four things be sufficient, in your opinion, to
19 cause all of the injuries that you see in Lincoln Penland?

20 **A.** No, they would not.

21 **Q.** You have -- in fact, would any of those scenarios
22 cause the bilateral humeral fractures?

23 **A.** No.

24 **Q.** And you would agree that it's important to consider
25 all of the findings. True?

1 **A.** Yes, very much.

2 **Q.** And you would agree that all of the injuries that are
3 found in Lincoln Penland are important to consider.

4 **A.** Yes.

5 **Q.** And regardless of the -- the, I guess, status of
6 shaken baby or abusive head trauma, if you want to call it
7 shaken baby, is this, in your mind, strictly a shaken baby
8 case?

9 **A.** No.

10 **Q.** Why?

11 **A.** I have a definitive skull fracture with multiple
12 layers of hemorrhage throughout the -- the meninges, and so
13 that is the primary cause of injury, from my perspective.

14 **Q.** Okay.

15 **MS. TOOMBS:** Just one moment, Your Honor.

16 **Q. (BY MS. TOOMBS)** You would agree that Lincoln
17 Penland -- here I am cross-examining. I'm sorry.

18 Counsel -- Counsel indicated that -- or -- well, yeah,
19 indicated that you can't tell us who inflicted these injuries,
20 true?

21 **A.** That's true.

22 **Q.** Can you tell us who didn't? Namely, did Lincoln
23 Penland cause these injuries to himself?

24 **MR. BUSHELL:** Objection, Your Honor. Calls for
25 speculation. The doctor has already said she can't answer

1 that question. Now, the -- the State is asking her to
2 speculate.

3 **THE WITNESS:** I think I can answer that question.

4 **MS. TOOMBS:** I --

5 **THE COURT:** I'm sorry?

6 **THE WITNESS:** I said I think I can answer that
7 question.

8 **THE COURT:** Okay. Could counsel approach the bench?

9 **MS. TOOMBS:** Certainly.

10 (Discussion at the bench at 3:19:33.)

11 **THE COURT:** I thought she already answered that
12 before and said she -- Lincoln could not have caused these.
13 Did I misremember that?

14 **MS. TOOMBS:** I don't really know.

15 **MR. BUSHELL:** All she said was she knows that Lincoln
16 couldn't have caused it. He didn't cause it to himself.

17 **THE COURT:** Right.

18 **MR. BUSHELL:** Other than that, she can't say. She's
19 answered that. It's been asked and answered.

20 **THE COURT:** Well, I -- I thought that was the
21 question you just asked.

22 **MS. TOOMBS:** That is the question. Did Lincoln cause
23 these injuries to himself?

24 **THE COURT:** So is there an objection to that?

25 **MR. BUSHELL:** Asked and answered.

1 **THE COURT:** Well, now I've suggested that to you.
2 You can't use it now. It's tainted.

3 **MR. BUSHELL:** Okay. Strike that. I'll be honest, I
4 thought the question was Boston.

5 **THE COURT:** Oh, no, it was Lincoln.

6 **MR. BUSHELL:** I thought you used the word "Boston."

7 **MS. TOOMBS:** No. Lincoln.

8 **MR. BUSHELL:** Okay.

9 **THE COURT:** And I -- I thought she had asked --

10 **MR. BUSHELL:** For fair game, then, I'm not going to
11 object with asked and answered --

12 **THE COURT:** Okay.

13 **MR. BUSHELL:** -- although it has been asked and
14 answered.

15 **THE COURT:** Before -- before --

16 **MR. BUSHELL:** But if --

17 **THE COURT:** Oh.

18 **MR. BUSHELL:** -- if this line -- and I'll just make a
19 record here. If this line of questioning is going to the
20 ultimate conclusion, that has been asked and answered.

21 **MS. TOOMBS:** No.

22 **MR. BUSHELL:** She's made it a determination that it
23 does call for speculation.

24 **MS. TOOMBS:** And I will -- I'll be perfectly honest.
25 I'm going to ask her if he could have caused it because of

1 that jury questionnaire -- question about where would
2 Lincoln's head be on the changing table, I'm just going to ask
3 her if bouncing his head against the rocking chair could have
4 caused it.

5 **THE COURT:** Against the highchair?

6 **MS. TOOMBS:** Against the highchair.

7 **THE COURT:** Oh. You okay with that?

8 **MR. BUSHELL:** That's fine.

9 **THE COURT:** Okay.

10 (Proceedings resume in open court at 3:21:00.)

11 **THE COURT:** -- Doctor.

12 **THE WITNESS:** Yay.

13 **Q. (BY MS. TOOMBS)** Could Lincoln Penland have caused
14 these injuries to himself?

15 **A.** No.

16 **Q.** All right. I'm going to roll out here what's been
17 marked as State's Exhibit 147. You've seen the changing
18 table. You have not seen this. Is this correct?

19 **A.** That's correct.

20 **Q.** Okay. If the history that you're given is he was
21 bouncing back and forth and bonked his head on this -- on this
22 highchair, would that have caused those injuries?

23 **A.** No.

24 **MS. TOOMBS:** Moment to confer, if I may.

25 **THE COURT:** Uh-huh.

1 **MS. TOOMBS:** No further questions.

2 **THE COURT:** Okay. And from the defense?

3 **MR. BUSHELL:** No, Your Honor. Thank you.

4 **THE COURT:** Okay. Any question for Dr. Ulmer from
5 any member of the jury? Looks like we have a few.

6 Counsel, if you'll join me at the bench.

7 Jurors ask questions, so they write them down, bring
8 them up to the bench. If they're appropriate, then I'll ask
9 them.

10 **THE WITNESS:** Okay.

11 **THE COURT:** Thank you.

12 (Conference at the bench at 3:22:18.)

13 (Counsel confer.)

14 **MR. BUSHELL:** What are the causes of subarachnoid
15 hemorrhage in an infant's head (unintelligible), and would any
16 of these causes be considered in an infant having a skull
17 fracture?

18 (Off-the-record discussion)

19 **THE COURT:** They're smarter than all of us.

20 **MR. BUSHELL:** From the information gathered at
21 autopsy, from your perspective, (unintelligible).

22 I like them.

23 **MS. TOOMBS:** The only concern that I have is that
24 this -- this shows exactly -- this shows exactly the concern
25 that the State raised earlier with these scenarios that

1 Mr. Bushell is raising. I mean, Brylee's statement doesn't
2 say anything about an edge of a table. That's been -- that's
3 a hypothesis and I'm worried that the jury is seeing it as
4 fact.

5 **THE COURT:** So are you objecting to me asking them?

6 **MR. BUSHELL:** We're okay with them.

7 **THE COURT:** With all of these, right?

8 **MR. BUSHELL:** Yes.

9 **MS. TOOMBS:** Uh-huh.

10 **THE COURT:** And both sides are? Okay.

11 (Proceedings resume in open court at 3:24:21.)

12 **THE COURT:** -- question. And this will prove my
13 point yesterday when I was complimenting the jury that -- how
14 bright they are. They're very bright and they're very
15 attentive, so I think you'll agree. And it's always awkward
16 to have the dumbest person in the room read the questions, but
17 here I go. Here's question number one. It's a -- it's got
18 multiple parts, so I'll try to do it justice.

19 From the information gathered at autopsy and from
20 your perspective as assistant medical examiner, can you
21 include or exclude the likelihood of impact with one or more
22 of, number one, a flat surface, for example, a floor or a bat.

23 I'll stop there. And then go -- there's two more
24 parts.

25 **THE WITNESS:** A floor or a bat? The floor --

1 interesting concept. So the -- the thing about the particular
2 fracture that's so interesting is that there's really no
3 external trauma, like, to that ear. You've got this ear
4 that's right where all of that contusion is and right in front
5 of the skull fracture. So it seems like it would be more
6 consistent -- of those two, it would be more consistent with
7 like a bat. Because you're getting impact and you have all of
8 that subgaleal contusion and scalp contusion along that --
9 that's kind of running along the -- the fracture line.

10 **THE COURT:** Okay. Thank you. Then I'll go to part
11 two. So, again, the preface is: Can you include or exclude
12 the likelihood of impact with one or more of; then, number 2,
13 an object where two surfaces meet like the edge of a table?

14 You okay?

15 **THE WITNESS:** I'm not quite sure -- edge of a table,
16 like this type of an edge. Again, unless it's padded, it
17 seems less likely because there's no defined contusion or
18 abrasion along that fracture line, so it seems like it would
19 be more with something that's padded as opposed to just like a
20 sharp edge.

21 **THE COURT:** Okay. And again, the preface is: Can
22 you include or exclude the likelihood of impact with one or
23 more of, number 3, an object where three surfaces meet next --
24 or meet, like the corner of a table or instrument with a
25 pointed end?

1 **THE WITNESS:** And that seems very less likely,
2 Again, it would --

3 **THE COURT:** You okay?

4 **MS. BLUM:** (Unintelligible)

5 **THE WITNESS:** There's not a -- there's not an
6 exterior injury that would go along with, like, that kind of
7 pointed scenario like that.

8 So, again, if it were like a padded corner then
9 maybe, but it seems like less likely with that sharp of a
10 point.

11 **THE COURT:** You okay?

12 **MS. BLUM:** (Unintelligible) a tickle. Sorry.

13 **THE COURT:** Oh, okay.

14 And the next part of this three-part question: In
15 your interaction with professionals at Children's Primary
16 Medical Center, law enforcement, or at the roundtable
17 discussion, were you informed of any person -- were you
18 informed of any reason -- excuse me -- why anyone might
19 inflict the trauma documented in your report?

20 **THE WITNESS:** The only thing that was mentioned
21 was that -- the possibility that there was some jealousy
22 issues between the older brother and the baby, and so that
23 might be one thought of why Boston would want to cause injury
24 to the baby. But then there's no other scenarios mentioned
25 where Boston was ever aggressive to Lincoln, so -- and there

1 were -- there were no other explicit indications of anybody
2 having a reason to injure the baby.

3 **THE COURT:** Okay. Now, here -- I'm hoping I read
4 this one correctly: What other causes of subarachnoid
5 hemorrhage have you seen, read, or heard of in infants?

6 **THE WITNESS:** So you can have subarachnoid hemorrhage
7 associated with, for example, meningitis, as a natural cause.
8 If the person has a coagulopathy, meaning they have an
9 abnormal bleeding disorder. There was some indication in this
10 particular infant, where he came into the hospital and he did
11 have a little bit of a coagulopathy going on, but that's
12 something that's not uncommon for a traumatic injury, to have
13 your -- your labs be a little bit abnormal.

14 And so other causes -- even being on a respirator for
15 an extended period of time, because you start to get breakdown
16 of those cells and so then you tend to possibly get some
17 leakage, kind of secondhand, that might give a subarachnoid
18 hemorrhage. It would be just, like, pretty thin, though, and
19 not very impressive.

20 **THE COURT:** Okay. And our last question: Would any
21 of these causes be considered in an infant having a skull
22 fracture as in Lincoln Penland's case?

23 **THE WITNESS:** No. I mean, the skull fracture and the
24 subarachnoid and subdural all go hand-in-hand with the
25 traumatic event and you can't really separate one from the

1 other. So it's -- I believe it all happened at the same time.

2 **THE COURT:** Okay. Thank you. Were there any other
3 questions from any member of the jury?

4 Okay. Not seeing any.

5 Any other questions for Dr. Ulmer from the State?

6 **MR. MILES:** One moment, Your Honor.

7 **THE COURT:** Ms. Blum, do you need a minute?

8 **MS. BLUM:** Uh-huh. When you guys are done, yes.

9 **THE COURT:** Oh, never say that to the Court.

10 **MS. TOOMBS:** Yeah. It -- it is 3:30, if we want to
11 take a -- a quick break and allow her to -- to have a moment
12 that's --

13 **THE COURT:** Do -- do you need a break? Well, if
14 they're done with questions, though, we'll take a break no
15 matter what. I'm just worried about Dr. Ulmer. I'm trying.
16 How's the temperature for you? Are you okay?

17 **THE WITNESS:** I'm good.

18 **THE COURT:** Sorry about our air-conditioning. They
19 promise to fix it as soon as I'm done with this trial.
20 So that's -- I mean, really, they said the 12th. That's our
21 next to the last day.

22 **MS. TOOMBS:** No questions, Your Honor.

23 **THE COURT:** And from the defense?

24 **MR. BUSHELL:** Just one.

25 **THE COURT:** Okay.

1 **FURTHER EXAMINATION**

2 **BY MR. BUSHELL:**

3 **Q.** Doctor, and I'll just ask it from here. You
4 mentioned that during, perhaps, the roundtable or at some
5 point the question was asked from a juror whether you were
6 informed of any reason why someone might inflict these
7 injuries upon Lincoln Penland. You mentioned that there was
8 some jealousy issue between Boston and Lincoln. Do you know
9 who told you that?

10 **A.** No. There was just -- I don't know if it was in the
11 police records or just general conversation with somebody
12 during the investigation, that plausible explanation of why
13 Boston would want to hurt Lincoln -- because there was some
14 thought that Boston was causing the trauma, as was brought up
15 here.

16 **Q.** Did they tell you -- did they tell you where that
17 information came from?

18 **A.** No.

19 **Q.** Okay.

20 **MR. BUSHELL:** Thank you, Doctor.

21 **THE COURT:** Any follow-up questions from any member
22 of the jury for Dr. Ulmer?

23 Okay. Seeing none.

24 **MS. TOOMBS:** Your Honor?

25 **THE COURT:** Yes.

1 **MS. TOOMBS:** That raised a question for --

2 **THE COURT:** For the State?

3 **MS. TOOMBS:** -- the State. Yes.

4 **THE COURT:** Okay.

5 **FURTHER EXAMINATION**

6 **BY MS. TOOMBS:**

7 **Q.** Now, you indicated that you don't remember exactly,
8 but that may have been something that came up at the
9 roundtable or fatality --

10 **A.** (Overtalking) or at the fatality review board.

11 **Q.** Okay.

12 **A.** Potentially. I don't know. You know, this case has
13 been going on for so many years.

14 **Q.** It could have even come up more recently than that?

15 **A.** Yeah.

16 **Q.** And the -- again, just so the jury understands
17 context, the fatality review was done on March 19th; is that
18 true? Of 2014?

19 **A.** I don't know. I -- I'm not keeping track of that
20 so --

21 **Q.** Okay.

22 **A.** We do it monthly. And so depending on whether the --
23 the purpose -- going back to the fatality review board -- is
24 in a case where there's something that's life-threatening that
25 happened is they want to have an early review -- because

1 normally we're doing it like three months after we do the
2 autopsy. But if there's a scenario where there's concern that
3 one of the other children in the family might be injured or
4 something to that effect, we'll review those deaths, like, as
5 soon as possible so, like, the same month or shortly
6 thereafter, depending on where it falls with our review.

7 And so the whole point is to provide service to the
8 family or service to any other potential victims or that kind
9 of thing. And -- and so --

10 **Q.** So if that question came up based on this interview
11 with Brylee Shepherd, that could potentially have been
12 something that was discussed at the -- at the fatality review?

13 **A.** Maybe, yeah.

14 **Q.** And in any way, does it change the testimony that you
15 gave here today as to whether or not the injuries she
16 described could cause -- or the -- the -- excuse me, the
17 mechanisms that she described could have caused the injuries
18 that you saw in Lincoln Penland?

19 **A.** No, not with that full constellation of injuries.

20 **Q.** Okay.

21 **MS. TOOMBS:** No further questions.

22 **THE COURT:** Anything from the defense?

23 **MR. BUSHELL:** No, Your Honor. Thank you.

24 **THE COURT:** Any other question from any member of the
25 jury?

1 Okay. Thank you, Doctor. You can step down.

2 Now from the State, where are we at at this point?
3 Normally, we would take a break here, but I'm wondering, are
4 we taking a big break?

5 **MS. TOOMBS:** Unfortunately, yes, Your Honor. As I
6 informed the Court this morning, we had a -- a witness that
7 had a medical issue come up and is not able to be here today.
8 We -- we had intended to rest today with Dr. Ulmer's
9 testimony, but as it sits, we've got a couple more witnesses
10 that just could not be heard today.

11 And we would ask that we break today and that
12 Dr. Ulmer be excused, but that we reconvene on Wednesday
13 morning.

14 **THE COURT:** Okay. Any objection to Dr. Ulmer being
15 excused?

16 **MR. BUSHELL:** No, none at all.

17 **THE COURT:** Thank you, Dr. Ulmer.

18 And any objection to the break, then, for --

19 **MR. BUSHELL:** No.

20 **THE COURT:** Okay. That's why I held off and tortured
21 you, Ms. Blum, is I thought we were about done and that we
22 were going to be done not just for a break, but for the day.

23 Okay. Members of the jury, you know the drill by
24 now, but it's been a while since I've read these so I want to
25 read them again, about your behavior, because this is another

Addendum B
Ophthalmologist's testimony

1 Members of the jury, welcome back. We hope you had a
2 good rest over the last day or so. And you'll notice the
3 weather is a little cool in here today. We'll reverse that on
4 Friday, I think, so you might -- kind of watch the weather,
5 dress accordingly, because the air conditioner is not
6 operating yet so this is just air that's circulating and I
7 don't know why it's so cool today, but in any event, welcome
8 back.

9 I will turn to the State now. They're going to call
10 their next witness. This witness is taken a little bit out of
11 order because you'll recall we left off with Lieutenant Kevin
12 Smith and we weren't finished with him, but we're going to
13 take this witness out of order and then I think the State will
14 return to Lieutenant Smith.

15 So if the State will call the next witness, then?

16 **MS. TOOMBS:** Thank you, Your Honor.

17 The State would call Dr. Nick Mamalis.

18 **DR. NICK MAMALIS,**

19 being first duly sworn, testifies as follows:

20 **DIRECT EXAMINATION**

21 **BY MS. TOOMBS:**

22 **Q.** Good morning. Will you please state your name for
23 the record?

24 **A.** Yes. Nick Mamalis.

25 **Q.** And what is your current occupation?

1 **A.** I'm an ophthalmologist. I'm professor of
2 ophthalmology at the Moran Eye Center of the University of
3 Utah.

4 **Q.** Okay. What does that entail? What does that mean?

5 **A.** I have a full clinical practice where I see patients
6 in the clinic who have ophthalmic problems. I do the surgery
7 on those patients. I teach residents, students, fellows. I
8 go to the veterans hospital, but I also do the ocular
9 pathology for the Moran Eye Center.

10 **Q.** Okay. And I'll come back to the ocular pathology
11 here in just a moment. Do you -- did you receive any
12 training -- specialized training in order to attain your
13 position?

14 **A.** I did. I -- do you want me to go back through all of
15 my training or just that pertinent to the pathology --

16 **Q.** Yeah. If you could just give us a -- a history of --
17 of where you started and how you ended up being the -- the
18 person that you are today?

19 **A.** Certainly. I did my undergraduate training at
20 Harvard University where I got a BA in biochemistry. And then
21 I did medical school training here at the University of Utah.
22 I did my training in ophthalmology at Loyola University in
23 suburban Chicago, following an internship in internal
24 medicine. And then I did a year of ophthalmic pathology
25 fellowship, also here at the University of Utah.

1 **Q.** Okay. And do you currently hold any licenses in your
2 field?

3 **A.** Yes. I'm licensed at the -- in the State of Utah.

4 **Q.** All right. Any certifications, of that -- anything
5 of that nature?

6 **A.** Well, the ophthalmic pathology is a fellowship
7 training position. There are no certifications on any of the
8 ophthalmic fellowships, but I am fellowship trained.

9 **Q.** Okay. And you also indicated that you currently are
10 a professor at the university, as well?

11 **A.** Yes, ma'am.

12 **Q.** So you mentioned that you do ocular pathology for the
13 Moran Eye Center. Can you explain to the jury kind of what
14 that means?

15 **A.** Certainly. When tissue is removed from the eye or
16 around the eye or the eye itself, then it gets sent to my
17 laboratory and what we do is we examine the tissue. We call
18 this grossly. We just look at it with a -- with a small
19 microscope and measure it, see what the tissue looks like.
20 Then we section it and the technician will prepare it for
21 processing and cutting. And then we put special stains on it,
22 then we actually look at the tissue under the microscope and
23 from that we can tell exactly, you know, what has happened to
24 the tissue.

25 You know, we get -- we get tumors, we get eye diseases,

1 we get entire eyes, we get the tissue from around the eyes.
2 Because the intermountain area does not have a lot of academic
3 medical centers, we pretty much get any significant eye
4 specimen for about six and -- six-and-a-half states gets sent
5 into our facility and that's what we look at.

6 **Q.** And how long have you been doing this?

7 **A.** This will be coming up on my 30th year in July.

8 **Q.** So fair to say you've looked at a number of eyes?

9 **A.** Indeed, I have.

10 **Q.** All right. I'm going to ask you to take your
11 attention back to February of 2014. Were you asked to examine
12 the eyes from an eight-month-old baby by the name of Lincoln
13 Penland?

14 **A.** I was. And when the medical examiner does an autopsy
15 on a patient and there's a question involving the eyes, they
16 will actually remove the eyes at autopsy and they'll send them
17 to my laboratory. And so we received the eyes from Dr. Ulmer
18 on this -- on this young child.

19 **Q.** Okay. And why did she have a question about the eyes
20 in this case?

21 **A.** There was an examination of the eyes done at Primary
22 Children's Hospital that -- that was noticing some
23 abnormalities in the eyes that led to some -- some suspicion
24 that there were some issues going on and that's why they sent
25 the eyes to us for analysis.

1 Q. Okay. And what were the abnormalities that were
2 noted at Primary Children's?

3 A. They were finding signs of retinal hemorrhages in
4 both eyes when the -- when the child was examined.

5 Q. And so what is that concerning for?

6 A. Retinal hemorrhages is always concerning for, you
7 know, potential abusive head trauma and that's -- especially
8 when it's bilateral and when it's relatively extensive, when
9 it's widespread like it was in this child.

10 Q. Okay. You mentioned earlier that you -- the -- the
11 process that you go through, the -- the first gross
12 examination and then the microscopic examination. Did you do
13 that in this case?

14 A. Yes, we did.

15 Q. All right. I am going to show you what has been
16 marked -- I'm going to actually show you a number of slides or
17 photographs that have been marked Exhibits 107 through 120.
18 And I'm just going to show them to you in paper first and have
19 you just kind of scan through them, see if you recognize
20 these.

21 A. Yes. These are photographs of, first of all, normal
22 eyes, just to show what normal anatomy looks like, but then
23 also of both the right and the left eye on this child, both on
24 gross examination and on microscopic.

25 **MR. BUSHELL:** Your Honor --

1 **Q.** Okay. And --

2 **MR. BUSHELL:** -- if I can just object here quickly.
3 I haven't had a chance -- before he begins testifying about
4 them, can we just review them quickly?

5 **MS. TOOMBS:** Yes. If I may take them back, just one
6 moment.

7 **THE WITNESS:** Uh-huh.

8 **MR. BUSHELL:** Thank you.

9 **Q. (BY MS. TOOMBS)** So these are slides that you -- you
10 looked at, you've prepared both in the examination of Lincoln
11 Penland in 2014 and then, also, in preparation for coming here
12 today. Is that true?

13 **A.** That is correct, yes.

14 **Q.** Okay.

15 **MS. TOOMBS:** Move to admit Exhibits 107 through 120.

16 **MR. BUSHELL:** No objection.

17 **THE COURT:** Okay. State's Exhibits 107 through 120
18 are received.

19 **MS. TOOMBS:** Permission to approach?

20 **THE COURT:** Yes.

21 **MS. TOOMBS:** And publish?

22 **THE COURT:** Any objection to publication?

23 **MR. BUSHELL:** Not at all.

24 **THE COURT:** Okay. They may be published.

25 **MS. TOOMBS:** All right. Give me just one second here

1 to make sure that this is going to work for me. All right.
2 It looks like it is. We're going to dim the lights a little
3 bit to make it easier. Your Honor, may the witness step down
4 so that he can point as we explain?

5 **THE COURT:** Sure.

6 **Q. (BY MS. TOOMBS)** I'm going to show you what's on the
7 screen right now as Exhibit 107. Can you explain to the jury
8 what this is?

9 **A.** Yes, but I -- I don't think I need a microphone.
10 I've never been accused of speaking softly, (unintelligible),
11 so if you can't hear, please let me know.

12 This is actually a picture of a normal autopsy eye. So
13 when an autopsy is done, someone has passed away and the eyes
14 are removed. They are removed from -- from the head, and then
15 when we receive them in the laboratory, we actually section
16 them. So we cut them. So this is what a normal looks like.
17 And this is in an eye that has just literally been cut in half
18 right in -- you know, right in the middle.

19 And when you look at it, what you see is you see -- this
20 is the front of the eye. It's called the cornea. And then
21 there's the color part of the eye, the iris; the lens of the
22 eye; and, then, back here, this is what we're going to be
23 spending a lot of time talking about. This is the retina.

24 And so the eye itself is hollow. It's like a big hollow
25 ball. It's lined by retinal tissue which is much like the

1 film in a camera, and that's the part of the eye that helps us
2 to see. That's what really perceives the light when the light
3 comes in. And so this is the retina.

4 Now, when an eye is -- is taken postmortem, meaning after
5 death, there is a little bit of shrinkage that takes place of
6 that eye. And so what you see is these little white wrinkles
7 in here. So this is like, you know, something that -- that
8 you left in the dryer too long and it comes out wrinkled. And
9 so that's what this looks like. These are a normal artifact
10 that we see in an -- in an eye that -- that's been done at
11 an -- at an autopsy.

12 And then coming from behind the eyes, the optic nerve,
13 and that's the part of the eye that connects the eye to the
14 brain.

15 And so we're going to talk a little bit about some of the
16 findings in this particular case, especially concentrating on
17 the retina here and especially concentrating on the optic
18 nerve behind the eye. So I thought it was nice to just show
19 you what we're talking about here, normally what you should
20 see. And that is what a normal looks like.

21 **Q.** Okay. So if you can advance to Exhibit 108. This is
22 a slide entitled EP141730D Penland. First off, can you
23 explain what that means, what that designation is?

24 **A.** Yes. Basically EP just stands for eye pathology.
25 And so we label specimens as they come into the laboratory for

1 each year sequentially. And so this just means that this was
2 the 173rd specimen we received in 2014 in the laboratory. OD
3 means right eye. And this was the -- the child, Penland, we
4 looked at.

5 So this is the eye. It's been cut in half and we're
6 looking on the inside now. So as you look in the inside, this
7 is the part of the eye, the retina, that we had talked about,
8 and these are those little artifacts or wrinkles that we have
9 talked about.

10 Now, what's different here is you see these little areas
11 of this reddish brown splotchiness right here. These are
12 hemorrhages. And this is what it looks like grossly, meaning
13 when we've just taken the eye and cut it in half and just
14 looked at it when we took the picture with the camera, and you
15 can see these hemorrhages are relatively extensive. They're
16 all along here. This is the front part of the retina, the
17 anterior part. This is the back part, posterior part. And
18 you can see that these hemorrhages are present throughout the
19 entire retina right there.

20 **Q.** And is that a sig -- well, first off, what is a
21 hemorrhage, I guess?

22 **A.** Hemorrhage just means bleeding. And so this is an
23 area where there's been bleeding focally in the retina.

24 **Q.** Okay. And is this a significant finding in -- in
25 your opinion?

1 **A.** This is a -- a significant finding. Whenever we find
2 findings like this, this really raises a suspicion for abusive
3 head trauma. So this is a significant finding.

4 **Q.** Okay. Let's move to Exhibit 109. And, again, we've
5 got a -- a designation at the top, EP141730D Penland, same
6 designation, same explanation?

7 **A.** Exactly. And this is the right eye, once again, cut
8 in half although we're looking at it a little bit differently
9 here. When you look at this one, this is the front of the eye
10 here and this is the lens of the eye right here. And, again,
11 if you're looking at the retina right here, this white tissue,
12 the retina, these areas right here anteriorly, you can see
13 it's very extensive all the way from one end of the eye to the
14 other end of the eye, you see these areas or these hemorrhages
15 here in the retina in the right eye.

16 **Q.** Okay. Moving forward to Exhibit 110.

17 **A.** Now, this is what the retina looks like after we
18 processed it and are looking at it under the microscope. So
19 this is a microscopic view. This is what we look at when
20 we're looking at the microscope. And this is very, very busy,
21 so don't worry about that, but just realize that the retina
22 has multiple layers in it. The multiple layers are the cells
23 here and this is the part on the inside. We call this the
24 internal part of the retina; and this is the outside, the
25 external part. So normally when you look through here you see

1 these cellular layers and the connections between them and
2 this is what a normal retina would look like.

3 Q. Do you have an example of what Lincoln's retina
4 looked like?

5 A. Yes. So when we go to the next slide --

6 Q. And this --

7 A. -- this is, once again, Lincoln's right eye. This is
8 the microscopic view, and now this is the front part, the
9 anterior part. This is where we saw a lot of those
10 hemorrhages on the gross examination. If you look right here,
11 all of this bright red on here is blood, it's hemorrhage.

12 And so you see the hemorrhage here, not only on the
13 inside layers of the retina, but also in the deeper layers of
14 the retina. So it's most prominent here on the innermost
15 layers, the inside layers of the retina, but if you look right
16 here, you can see all of those areas of hemorrhage that are in
17 the deeper layers of the retina, also.

18 Q. And this is Exhibit 111, for the record. The -- and
19 you said this is just a close-up of --

20 A. This is -- this is a lower power.

21 Q. Okay.

22 A. And then what we did is we took a little bit of a
23 higher power. So this is now looking at the same area --

24 Q. And this is --

25 A. -- and we had a higher power.

1 **Q.** And this is Exhibit 112.

2 **A.** Yeah. And what you can see right here, again, is
3 here's the retina and you see all of this blood here in the
4 inner layers of the retina, but also blood here in the outer
5 layers. And so these hemorrhages were found in all of the
6 layers of the retina, especially in the anterior part of
7 the -- of the retina.

8 **Q.** Okay. And let me ask you again, is that significant?

9 **A.** That is -- this is very significant.

10 **Q.** And so far we're simply talking about the right eye.

11 **A.** This is just the right eye so far.

12 **Q.** Okay. If we could move on to Exhibit 113. Is this,
13 again, a portion of -- or a slide of Lincoln's eyes?

14 **A.** This is a slide, once again, from Lincoln's right
15 eye. Now this is looking at a specific part of the retina.
16 And the center of the retina is called the macula. And the
17 macula is the part of the retina that gives us fine vision.
18 It gives us our central vision, lets us read, lets us
19 recognize people's faces.

20 And when we're looking at the retina here in the center
21 in the macula, you see these big folds right here. Now, this
22 is not the little wrinkles that occur normally that we see in
23 an autopsy eye. These are actually folds as if something has
24 been pulling up on this. And so when you look at the macula
25 here, it's got this distinct fold in it.

1 **Q.** And what is that significant for?

2 **A.** Again, that is one of the things that we see when
3 there's a suspicion -- that raises a suspicion for an abusive
4 head trauma. And when you see these folds in the macula, you
5 normally do not see these in an eye of a young child, and so
6 this is abnormal. This is something we normally do not see.

7 **Q.** Have you done research and -- and are you aware of
8 studies that have been done that talk about what is -- what is
9 the mechanism that's causing this?

10 **A.** The inside of the eye -- the eye is hollow. It's
11 like a hollow ball. And the inside of the eye is filled with
12 a material called vitreous. And vitreous is the consistency
13 of jello.

14 Now, in a young child, the vitreous is very thick. It's
15 very much like -- like, you know, that you can bounce
16 something off of. And also in a child the vitreous is pretty
17 tightly adherent to the retina in several areas. And one area
18 is in the anterior part of the retina where we showed you
19 where those hemorrhages are. Another part is in the area of
20 the macula. And in young children the vitreous is pretty
21 adherent to the macula in this area.

22 As we get older, it's not adherent. And, in fact, this
23 vitreous liquifies. And so I'm seeing some reading glasses
24 out there. Many of you probably have floaties in the eye
25 where you see little things floating around, and that comes

1 from this vitreous, this jello inside the eye.

2 So that's in an adult. But in a child, the vitreous is
3 like a solid piece of jello and it's -- it's adherent to the
4 area of the macula right here.

5 **Q.** And you -- I believe earlier you had testified that
6 it's like someone is pulling. Is there a specific mechanism
7 that has been identified or -- or a specific term that is used
8 when you see something of this nature?

9 **A.** Well, when you -- when you see an injury like this,
10 this is called traction and it means pulling onto the macula
11 right there. And whenever you have an -- an incident where
12 there's been a severe acceleration or deceleration of a -- of
13 a child's head, what can happen is is that this solid jello,
14 this vitreous, can actually pull on the area of the macula
15 causing these folds that you're seeing in here, causing
16 traction.

17 **Q.** Okay. Moving to Exhibit 114.

18 **A.** And this is just a close-up. This just shows you,
19 again, at a higher power the area where you see this distinct
20 fold in the macula. Now, there's still hemorrhages here,
21 also. You can even see right here there's an area of a little
22 bit of hemorrhage there and an area of a little bit of
23 hemorrhage here. So there's even hemorrhages here in the
24 macula as well as this distinct macular fold.

25 **Q.** And I -- I'm going to ask you to now move on to

1 Exhibit 115. What are we looking at here?

2 **A.** All right. This is -- and my apologies. This is --
3 this is mislabeled. This is the -- the child's left eye. And
4 so I apologize. This is OD right eye.

5 **Q.** Actually, I think that that is --

6 **A.** Or did this -- did we go back to the first -- that's
7 strange.

8 **Q.** No. I think that someone scanned them --

9 **A.** Oh, I --

10 **Q.** -- in incorrectly because mine say OS.

11 **A.** Yeah. These are all left eye. I apologize for that
12 now because these are all left eye.

13 **Q.** Okay.

14 **A.** So please ignore the OD. They should say OS. And
15 certainly on my pictures that I have it says OS.

16 **Q.** Yes.

17 **A.** Okay.

18 **Q.** Okay. So let's -- let's go ahead and talk about --
19 and I -- I just want to show you what I received from you. Is
20 that the same thing that we're looking at?

21 **A.** That is correct. And -- and that is what I sent and
22 that is in -- in my pictures, too. This should be left eye,
23 OS.

24 **Q.** Okay. So it's just the title that's wrong in that.

25 **A.** The title is wrong, but that is the picture of the

1 left eye. That is correct.

2 Q. Okay.

3 MS. TOOMBS: And if I may, Your Honor, you have
4 the --

5 Q. (BY MS. TOOMBS) So we're looking at Exhibit 115 where
6 it says OD at the top. That is an incorrect title.

7 A. Yes.

8 Q. It should be OS.

9 A. It should be OS. Yes. Yes, ma'am.

10 Q. Okay.

11 A. This is now the left eye. And, once again, it's been
12 cut in half just like the right eye was. This is the front,
13 this is the back, here's the retina. Here's those little
14 artifactual wrinkles that are normal.

15 Now, very similar to the right eye you see these areas
16 here, this -- this reddish brown material. These are
17 hemorrhages here, anteriorly. And you can see that they're
18 diffuse hemorrhages meaning that they're all over. So they're
19 very extensive hemorrhages here.

20 Q. Sorry. I was just explaining to defense counsel and
21 showing them the slides that you sent me originally.

22 So this is, again, the left eye and same thing that we
23 were seeing in the right eye.

24 A. This is the left eye. Same thing. Ignore the OD.
25 This is the left eye, definitely. And now what we're doing

1 is -- this is a little bit differently now. We're not looking
2 inside the eye toward the front part of the retina. We're
3 looking toward the back right now.

4 So we're looking backward and, in fact, this little round
5 area here, this is where the nerve leaves the eye. This is
6 the optic nerve. And here are those big macular folds again
7 here. These aren't the little wrinkles that are the artifact.
8 This is a big macular fold here.

9 And there's areas here, again, of these little
10 hemorrhages. And I apologize that it's a little blurry
11 because it's hard to get something that's shaped like a cup
12 into a good focus.

13 But, again, it shows the areas here where there's the
14 macular folds, but also it shows some diffuse areas of
15 hemorrhaging both in the posterior, the back part of the eye,
16 in addition to what we found in the anterior, the front part
17 of the eye.

18 **Q.** And that is, again, Exhibit 116? Is that true --
19 fair?

20 **A.** Now, let's go back -- now, this is, once again, the
21 left eye, and this is a gross picture of the nerve behind the
22 eye. So this is the back surface of the eye and this is the
23 nerve that comes out of the back of the eye. And the nerve,
24 itself, is surrounded by a little membrane that surrounds it.
25 It's called the sheath. Kind of like if you have a fiber

1 optic cable and you bury it into the ground and it's got
2 the -- you know, the -- the sheath around it, if you will.

3 It's the same thing with the nerve. So it's surrounded
4 by a round sheath of tissue that protects it and then the
5 nerve itself goes in the center of that. And then right here
6 when you're looking at it right here you see that instead of
7 being white in this area, you've got kind of a little brown
8 appearance here. And this is a sign that there is some blood
9 underneath that sheath that surrounds it. And so there's some
10 blood inside of that and that shows up here as kind of a
11 little brown -- a little bit of a brownness on this picture.

12 Q. And that is Exhibit 117; is that correct? Up at the
13 corner?

14 A. Yes. 117.

15 Q. And just for the purposes of the record, again, this
16 title says OD, but this is --

17 A. Yeah. It should be OS, left eye.

18 Q. Okay. And moving to 118, what am I looking at?

19 A. So 118 now, this is now a microscopic picture, you
20 know, looking through the microscope. And we're looking at
21 the retina, just like we did on the other eye. And if you
22 look, it's very similar. You can see, here's the front part
23 of the retina and right in here there's hemorrhaging seen in
24 the retina right here, in the -- in the innermost layers of
25 the retina. I think we did a higher power -- oh, we didn't.

1 So that's the -- that's what we've got here. But, again, it
2 looks very similar to what we saw when we looked at the right
3 eye. So similar findings in both eyes.

4 **Q.** Okay. Moving to Exhibit 119.

5 **A.** 119, once again, this is the left eye now, not the
6 right eye. This is that nerve seen microscopically. And so
7 the optic nerve itself is all these nerve fibers right here in
8 the middle. And then out here, out on the edge of the
9 picture, is that sheath, that membrane that surrounds it. And
10 right underneath that sheath, internal to it, there's areas
11 here of hemorrhage here -- so those are those little red
12 spots -- and there's areas of hemorrhage right here that you
13 can see underneath that. So this is now underneath the sheath
14 that surrounds the optic nerve and we've got hemorrhages there
15 on both sides.

16 **Q.** And just so that -- again, for the benefit of the
17 record, you are pointing with your laser pointer towards, I
18 guess, the upper left area or mid-left side --

19 **A.** Mid-left.

20 **Q.** -- of the -- where there's a darker red color, and
21 then a -- at the lower right corner where there appears to be
22 a significant amount of darker red.

23 **A.** That is correct.

24 **Q.** Okay. And that is -- again, the nerve sheath, is
25 that significant for something?

1 **A.** When we see hemorrhages underneath the nerve sheath,
2 inside of it in a setting like this, again, this is one more
3 thing that is -- raises a suspicion for abusive head trauma.

4 **Q.** Okay. Moving forward to Exhibit 120.

5 **A.** So Exhibit 120 is just a higher power view of the
6 same area that we had looked at before. So, again, down here,
7 this is that nerve itself, all those inner fibers, and the
8 sheath would be up above the edge of the picture. And right
9 here underneath that, again you see these little red dots
10 or -- these are the hemorrhaging. This is the red blood cells
11 here.

12 **Q.** Okay. So this is the -- a more focused -- excuse me,
13 I'm losing my voice -- more focused picture of what we saw in
14 119 --

15 **A.** Exactly. A higher power, if you will.

16 **Q.** Higher power.

17 **A.** So just a little bit of a higher power, if you will.

18 **Q.** Okay.

19 **A.** Okay. And that's -- that's it.

20 **Q.** All right. That's it. Thank you, Dr. Mamalis.

21 Did you -- as you examined the eye back in 2014 of
22 Lincoln Penland -- I should say eyes -- did you prepare a
23 report outlining these findings that you've testified to
24 today?

25 **A.** Yes, I did.

1 **Q.** And did you come to a conclusion based on that
2 report -- your findings?

3 **A.** Yes, we did. We concluded that given the findings of
4 this diffuse retinal hemorrhages in both eyes, along with the
5 macular folds and the hemorrhaging -- we called it
6 subarachnoid. That's just a fancy way of saying underneath
7 that sheath. When we saw this triad of findings in -- in both
8 eyes, this was consistent with -- we call it non-accidental
9 trauma.

10 **Q.** Okay. Now, are you aware that in this particular
11 case there's been a claim that a small three-year-old child
12 was observed to have kicked, stomped, and thrown this baby and
13 slammed the baby's head in the door?

14 **A.** I -- I mean, I was not aware of any of that history
15 when I received these eyes from the medical examiner. But
16 since that time, I am aware -- I am aware of that, yes.

17 **Q.** Okay. And would that explanation be consistent with
18 what you found in the eyes?

19 **A.** When I look at eyes that have this -- this degree of
20 changes, this is significant with -- this is consistent with a
21 very significant trauma to the child. And -- and I would be
22 very -- it would be very doubtful that a three-year-old could
23 generate enough force and enough trauma to cause these
24 particular findings that I'm seeing.

25 **MR. BUSHELL:** Your Honor, I'm going to -- I'm going

1 to object to his last statement. I don't believe there's been
2 any foundation laid for the doctor to opine on that specific
3 issue. As the State was -- well, that's my objection. I'll
4 let the State respond.

5 **MS. TOOMBS:** I'll lay some foundation, Your Honor.

6 **THE COURT:** Okay.

7 **Q. (BY MS. TOOMBS)** Now, we've talked about the fact that
8 you've been practicing specifically in ophthalmology for 30
9 years. Is that -- or nearly 30 years?

10 **A.** Almost 30 years, that is correct.

11 **Q.** Okay. You've reviewed -- well, 173 eyes in 2014 at
12 least as of February -- fair to say thousands?

13 **A.** Thousands. That is correct.

14 **Q.** Thousands of -- of eyes and -- and done that
15 pathologically, as well as in a clinical setting.

16 **A.** That is correct.

17 **Q.** Have you also done research or reviewed the
18 literature and the studies regarding what causes these
19 findings?

20 **A.** I -- I have indeed. There's a very broad literature
21 of studies that have been done looking at, you know,
22 non-accidental trauma, looking at abusive head trauma. And so
23 there's a very large -- literature out there. And one of the
24 things that -- that comes clear when you're reviewing multiple
25 papers is that when people look at a series of publications

1 that have been done and then look at the findings of those
2 publications, they'll do a review paper, if you will, looking
3 at all those and seeing what the common findings are.

4 And when you look at studies where they know the cause of
5 the trauma, meaning that someone who -- who caused this
6 actually admitted to it, they tell them exactly what happened.
7 When you look at that and there's been causes of severe head
8 trauma, what you find is the most common thing in the
9 literature is you see diffuse bilateral retinal hemorrhages,
10 meaning both eyes, meaning extensive throughout the retina,
11 and involving multiple layers of the retina, especially the
12 inside layer, but multiple layers, that has been found to be
13 associated with abusive head trauma in a high percentage,
14 depending on which study, somewhere in the order of 94 to 95
15 percent.

16 **Q.** Are there other things that could possibly explain
17 some of these findings?

18 **A.** You know, when we look at these, the hardest thing is
19 to say, could something else do this. And so, again, when we
20 know what happened to cause the death of a child and then
21 looked at their eyes in the literature to try to figure out
22 what caused this, one thing that -- that can cause changes
23 like this is a severe automobile accident. And they really
24 say unrestrained. So this isn't a child in a -- in a car
25 seat. This is a child that's bounced around the inside of a

1 car during an accident, and that can cause changes like this,
2 but it has to be an unrestrained automobile accident.

3 A fall of greater than one story has been found to do
4 this, also. So we're not talking rolling off the couch or the
5 changing table. It has to be a fall of greater than one story
6 to cause changes of this significance, of this magnitude, in
7 the eyes.

8 Q. And these are all literature and studies that you
9 review during the course of your normal practice.

10 A. Correct. These are called peer-reviewed studies,
11 meaning that before they're accepted to a journal, then
12 multiple reviewers with expertise in that field have looked at
13 these papers before they're -- they're published.

14 Q. Okay. And, again, you -- you had indicated that you
15 had -- you had indicated that you would find it doubtful that
16 a three-year-old -- you're not testifying based as -- as a
17 biomechanic --

18 A. I'm certainly -- I'm not an expert in biomechanics,
19 I'm not an expert in force, but to cause these findings that
20 we found, the diffuse bilateral retinal hemorrhages, the
21 macular folds and the hemorrhages underneath that optic nerve
22 sheath, would -- would need a severe trauma to do this.

23 Q. Something that would have been noticed?

24 A. Something that -- again, I -- I can only speculate,
25 but it would be a severe trauma, something that would have

1 likely have been noticed.

2 Q. Okay. And what about if a child is rocking back and
3 forth. Is -- are these things that could be self-inflicted,
4 like rocking back and forth and bumping your head?

5 A. A child of this age rocking back and forth would not
6 be able to generate enough trauma to cause changes like this.

7 Q. Okay. So I think we've talked about with the macular
8 folds, in particular, that it would be some type of
9 acceleration-deceleration. Is that a fair characterization of
10 your testimony?

11 A. Yes. When the -- the vitreous is -- is adherent in a
12 child to the area over the macula. So when, you know, there's
13 an acceleration-deceleration, sudden movement of the head,
14 then that vitreous will actually move -- all sloped back and
15 forth like jello would. And so it puts traction. It pulls on
16 that macula, which again leads to those folds that we see.

17 Q. And in your training, expertise, studies, all the
18 years of experience that you've been doing this, what was your
19 opinion of the cause of these injuries to Lincoln Penland?

20 A. My opinion, with all of the findings that we had
21 and -- and the review of the literature and the cases that
22 I've looked at is that this was a non-accidental trauma. This
23 is consistent with abusive head trauma.

24 MS. TOOMBS: If I may have one moment?

25 (Off-the-record discussion)

1 **Q.** (BY MS. TOOMBS) I think we've talked a little bit
2 about the fact that these findings would be something that
3 would be consistent with an unrestrained motor vehicle
4 accident. Is that fair to say?

5 **A.** That's correct.

6 **Q.** Okay. So when you're talking in terms of
7 acceleration-deceleration, can you explain to the jury just a
8 little bit more how that correlates, what that means?

9 **A.** Acceleration-deceleration means when somebody is --
10 is rapidly moving forward and backward. So shaking can do
11 this, banging can do this, hitting can do this. There's a
12 severe trauma that causes the -- the whole head and the eye
13 within it to move forward and backward rapidly. So we call
14 that acceleration-deceleration.

15 **Q.** And simply -- you're -- you're moving your head back
16 and forth in the stand. Have you just created macular folds
17 in your eyes?

18 **A.** No. No, that's not enough of an
19 acceleration-deceleration to do that.

20 **Q.** What does the literature say is sufficient?

21 **A.** Again, the sufficient thing would be an abusive head
22 trauma where there's been significant either shaking or
23 hitting or banging or something like that, or an automobile
24 accident or a fall of greater than one story.

25 **Q.** Okay. Let me just clarify one thing. Is it -- is it

1 sufficient -- so if the head is stable and something hits it,
2 is that -- is that going to cause this
3 acceleration-deceleration that you're seeing?

4 **A.** The head would have to move from the hit. And, I
5 mean, you know, a young child, if you look at a child of --
6 of, you know, under a year of age, their head is very big. I
7 mean, their head is about a fourth of their body and their neck
8 muscles aren't, you know, really strong at that point. And so
9 that head would definitely move, even if it was hit by
10 something. It's not going to be completely stationary like it
11 may be in an adult.

12 **Q.** So if, for example, the head is in a door and being
13 slammed, would that be sufficient to cause these macular
14 folds?

15 **A.** If there was sufficient force on that door hitting
16 the head, you know, enough to cause the vitreous to move,
17 theoretically, it could.

18 **Q.** But, again, we're talking the equivalent of a motor
19 vehicle accident.

20 **A.** Of a motor vehicle accident, yes. It would be
21 significant trauma.

22 **MS. TOOMBS:** I don't think I have any more questions
23 at this time, Your Honor.

24 **THE COURT:** From the defense?

25 **MR. BUSHELL:** We do. Give me just one moment.

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THE COURT: Okay.

CROSS-EXAMINATION

BY MR. BUSHELL:

Q. Good morning, Doctor.

A. Good morning.

Q. It's nice to -- well, thank you for being here.

A. You're welcome.

Q. It is nice to put a -- a face to a name at long last.

A. (Unintelligible) Uh-huh.

Q. Doctor, I -- I want to talk to you a little bit about, well, what -- what you've testified to here, but before we do that, I want to just go over a few things. So I'm -- I'm a bit confused. How is it this matter came to you?

A. The medical examiner, when they receive an -- an autopsy, a body that has got any question of something wrong with the eyes, during the autopsy they remove the eyes and they send them to my laboratory.

Q. Does that -- does it always go to your laboratory?

A. If it is something to do with the eyes, it does, because I'm -- I'm the only ocular pathologist for, as I said, six and a half states.

Q. You are?

A. Yes.

Q. Okay. So at the Moran Eye Center, it's you. You're the guy.

1 **A.** Yes. I'm it.

2 **Q.** Okay.

3 **A.** For -- I mean, we got a set of eyes last week from
4 Idaho. From Idaho, Wyoming, Montana, Nevada, they all come to
5 me.

6 **Q.** That's a great monopoly. So that -- that's the
7 reason. It was not -- there's not any other ophthalmologist
8 who it could have gone to, even in your office. It's you.

9 **A.** There's -- there's no other ophthalmic pathologist,
10 that is correct.

11 **Q.** Okay. And are you an expert in pediatric
12 ophthalmology?

13 **A.** No, I'm not.

14 **Q.** You're not. Okay. So prior to your examination, you
15 indicated you had a conversation with Dr. Ulmer, the medical
16 examiner?

17 **A.** No. I just received paperwork from her, and on the
18 paperwork they will provide us a history of what had happened
19 to the -- you know, to the child before they send the eyes to
20 us.

21 And so the eyes will come from the medical examiner after
22 the autopsy. They'll be in jars with -- with -- with
23 fixatives to keep it from spoiling and then there'll be
24 paperwork saying, this is the history we received on this
25 particular patient.

1 Q. And what did that paperwork say from Dr. Ulmer?

2 A. I can read it, if you'd like.

3 Q. Sure.

4 A. I can read it directly what we received. And it
5 said -- and this is from the paper we got: Father picked
6 infant up from daycare. Infant with altered mental status and
7 abnormal respirations. Transported to McKay-Dee Medical
8 Center by private vehicle and life-flighted to Primary
9 Children's Medical Center. Patient was remarkable for
10 bilateral subdural hemorrhages and right temporal parietal
11 skull fracture and encephalopathy.

12 Q. And that's it?

13 A. That's what -- that's what we got for the clinical
14 history.

15 Q. Okay. And the only time -- the only reason this
16 would have ever occurred is because there was -- I think in
17 your words -- suspicion for abusive head trauma?

18 A. Correct.

19 Q. So, otherwise, it's not as though every autopsy that
20 comes in, the eyes are sent to you.

21 A. That's correct. Only if --

22 Q. The only time they're sent --

23 A. Only --

24 Q. I'm sorry. Go ahead.

25 A. I'm sorry. No. Only if there is some suspicion of

1 something in the eyes, either on examination or by history.

2 Q. Okay. So right out the gate there is suspicion.
3 That's the only reason they would involve you.

4 A. Correct.

5 Q. Correct? Okay.

6 Let me ask you this, Doctor. In preparation for today's
7 testimony, what materials did you review?

8 A. I reviewed my reports, of course --

9 Q. Sure.

10 A. -- and we looked at the slides, once again. Took
11 photographs that -- that you were shown. The gross
12 photographs were taken prior to preparation, so that was in
13 2014. The microscopic photographs we took last month, and so
14 I -- I took those myself. And, then, of course, I always
15 review the literature, pertinent articles on the topic of
16 abusive head trauma.

17 Q. Backing up a minute, you said "we" as in plural.
18 Who's we?

19 A. Oh, I sit down at the microscope with my fellows when
20 I'm taking the picture.

21 Q. Okay.

22 A. So with my research fellows.

23 Q. Did you at any point meet with members of law
24 enforcement on this case?

25 A. I did not.

1 **Q.** You did not. At any point did you have conversations
2 with law enforcement about this case?

3 **A.** I did not.

4 **Q.** Did you meet with the prosecuting attorneys?

5 **A.** Only by email. But, no, I just met the prosecuting
6 attorney this morning.

7 **Q.** Okay.

8 **A.** Email and telephone call. I'm sorry.

9 **Q.** Okay. And that -- that telephone call occurred when?
10 Today?

11 **A.** No. I just met the -- the prosecutors today. We've
12 had probably three telephone calls in the last couple of
13 months.

14 **Q.** Okay. In preparation for the trial?

15 **A.** Correct.

16 **Q.** After doing your review, I'm assuming you then
17 contacted Dr. Ulmer to report your findings?

18 **A.** What we do is we -- we provide a report to Dr. Ulmer,
19 a direct report, and then we send her representative glass
20 slides of the eye once it's been processed. And then we also
21 send her the photographs that we took grossly.

22 **Q.** And did you ever -- other than that, did you then
23 have conversations about what your thoughts were?

24 **A.** No, I did not.

25 **Q.** Okay. Did you speak with a Dr. Bruce Herman?

1 **A.** Not to my knowledge.

2 **Q.** Are you familiar with Dr. Herman?

3 **A.** No.

4 **Q.** Okay. Well, let me ask you this, Doctor. Are you
5 being financially compensated for your involvement in this
6 case?

7 **A.** No. In fact, I canceled out a half day of, you know,
8 my time today and I'm not compensated a penny.

9 **Q.** So who -- who pays you for your services?

10 **A.** I don't get paid for doing this.

11 **Q.** But the Moran Eye Center employs -- the University of
12 Utah employs you, correct?

13 **A.** Correct.

14 **Q.** Okay.

15 **A.** But we're not salaried. I mean, it's not like we get
16 a salary. We earn our income by seeing patients and doing the
17 work that we do.

18 **Q.** So that was a yes. You do get compensated by the
19 University of Utah. This is your employment. This is your
20 career, your profession, true?

21 **A.** Correct. Correct.

22 **Q.** Thank you. Well, I -- this stuff is -- I'm going to
23 be honest. It's -- it's like rocket science to me and I'm
24 assuming most people, so I'm just going to walk -- walk you
25 through. I'd like to talk about retinal hemorrhaging,

1 specifically in infants, and their supposed correlation to --
2 to child abuse.

3 Let me just ask you right out the gate, in fact, when you
4 were testifying here in your conversation with Ms. Toombs,
5 your -- your -- your direct words were, quote, "You would need
6 a severe trauma to do this." However, I noticed when you said
7 that, you would need -- you would need severe trauma to do
8 this, your hands were doing this. Do you view this as a
9 shaken baby situation?

10 **A.** I don't know what -- what caused this, but in the
11 literature when people have looked at when the perpetrator has
12 actually said, okay, this is what I did, this is what happens,
13 the most thing that was noted was -- was shaking, but also it
14 would be hitting, it would be banging on something, it would
15 be a significant, you know, trauma to the head and then
16 subsequently to the eyes.

17 **Q.** Okay. So when you did "this," that implies a
18 rocking -- I think you said acceleration-deceleration.

19 **A.** Acceleration-deceleration. Correct.

20 **Q.** Okay. And you would agree that
21 acceleration-deceleration is a rocking motion.

22 **A.** Well, no. Acceleration-deceleration can occur inside
23 the eye, and so something smashing into a head could cause the
24 vitreous to move back and forth because it's in that closed
25 eye.

1 Q. Okay.

2 A. And so that could also cause the vitreous to move
3 back and forth.

4 Q. That's interesting. So just to confirm that I
5 understand, it's true that something smashing into the head,
6 and not this back and forth, back and forth motion, could
7 cause (overtalking).

8 A. It -- it's both.

9 Q. It could be both.

10 A. Correct.

11 Q. Okay. Thank you. Let me ask you, so discussing
12 literature, you indicated that, you know, prior to today you
13 review, you know, the most up-to-date and current
14 peer-reviewed publications and, you know, empirical data. Who
15 do you rely upon to form your opinions? Who do you
16 consider -- in other words, who do you consider, you know,
17 leading experts in this field to instruct you?

18 A. It's usually coming from the literature.

19 Q. Which is from who?

20 A. From anybody who writes the papers.

21 Q. Anybody who writes the papers.

22 A. It would be people -- okay. Let's step back. All
23 right. There's a group at Children's Hospital in Toronto who
24 has done research on this. There's groups in New York.
25 There's groups at Hershey, Pennsylvania, who have done

1 research on this. I've gone to multiple conferences when
2 they've talked about non-accidental trauma. The most recent
3 one was at Deer Valley a couple of years ago, put together by
4 the group in Hershey, Pennsylvania. There is a Ph.D. who does
5 research on acceleration-deceleration at the University of
6 Utah, Brittany Coats. And so there's a wide variety of -- of
7 people who are involved in this that I look to.

8 Q. Do you consider the American Academy of Ophthalmology
9 one of these organizations?

10 A. I do.

11 Q. Okay. In fact, looking through your CV, you're a
12 member of the American Academy of Ophthalmology, correct?

13 A. I am.

14 Q. Okay. And you -- you've presented several times for
15 them or at conferences with them --

16 A. I have.

17 Q. -- correct? Okay.

18 Are you aware of any experimental testing on retinal
19 hemorrhages in infants?

20 A. Experimental testing -- I'm not sure what you mean by
21 that.

22 Q. Are you aware of any experiments in which a child, or
23 an infant, more specifically, is injured to the point of
24 causing these retinal hemorrhages?

25 A. Well, indeed. I -- I -- I just brought a couple of

1 papers here. I have a folder of probably 150 papers on this
2 topic, yes.

3 Q. So there are testing -- there is tests that have --

4 A. There's no -- there's no tests. You can't take a
5 child and -- and abuse them and see what happens. What you
6 can do is you can take a history of what was happening when it
7 happened and then you can examine the eyes. And then if it
8 comes to autopsy, then you can look at the eyes under the
9 microscope and grossly to see what the findings are.

10 Q. So it would be unethical to do an actual test.

11 A. Correct.

12 Q. Correct.

13 And it's your belief, Doctor, that retinal hemorrhaging
14 often occurs in shaking cases?

15 A. Retinal hemorrhage to this extent has been shown to
16 occur in shaking cases.

17 Q. Okay. You would agree that the word "shaking,"
18 "shaken baby," more specifically, is a bit of a misnomer,
19 correct?

20 A. Oh, I agree. And, in fact, I -- I purposely don't
21 like to use the word "shaken baby" because there are multiple
22 areas of abusive head trauma that can involve other things
23 besides shaking.

24 Q. That's right.

25 Are you -- you're aware that this case -- in this case

1 shaking is alleged?

2 **A.** I'm just aware of what -- actually what I read in the
3 newspaper yesterday and what I was told about a door hitting
4 the child and the child being kicked.

5 **Q.** But that wasn't my question. Are you aware that
6 shaking is being alleged by the State of Utah in this
7 particular case?

8 **A.** In this particular case, no, I wasn't.

9 **Q.** Okay. You feel comfortable providing your expert
10 opinion to a case involving shaking?

11 **A.** These findings that I see are consistent with
12 shaking, also, among other things, yes.

13 **Q.** Okay. So you would agree with me, Doctor, that
14 because there -- because it is unethical to actually do any
15 tests of this nature, the link between abuse or shaking and
16 retinal hemorrhaging is purely correlation, true?

17 **A.** Yes. You cannot do --

18 **Q.** I'm sorry. Just yes or no.

19 **A.** Yes.

20 **Q.** Thank you.

21 **A.** Uh-huh.

22 **Q.** So you would agree that retinal hemorrhaging in
23 infants alone is not dispositive of shaking or child abuse.

24 **A.** It depends on how extensive and how you define
25 retinal hemorrhages.

1 Q. Okay. Would you agree that the presence of retinal
2 folds in infants alone is not dispositive of shaking or child
3 abuse?

4 A. The presence of significant macular folds, such as
5 what we're seeing here, is not something you would normally
6 see in a child who has not had a significant head trauma.

7 Q. Okay. Well, there's clear -- clearly a distinction,
8 correct? That between significant head trauma and intentional
9 head trauma, wouldn't you agree?

10 A. Correct.

11 Q. Can shaking alone cause retinal hemorrhaging?

12 A. There have been reported cases that shaking alone has
13 caused hemorrhaging like this, yes.

14 Q. Okay. But there's also, it's true, correct, that
15 there are reported cases of retinal hemorrhaging that did not
16 involve shaking?

17 A. That is correct.

18 Q. And isn't it true, Doctor, that retinal hemorrhages
19 have many nontraumatic causes?

20 A. You can get retinal hemorrhages from nontraumatic
21 causes, that is correct.

22 Q. Thank you.

23 So, again, like I said, this -- a lot of this is way over
24 my head and pay grade, for that matter, but the vitreous --
25 explain to me what the vitreous is.

1 **A.** Vitreous is what fills the inside of an eye and the
2 consistency of vitreous is that of jello. It's like a
3 gelatin-like substance.

4 **Q.** In children, correct?

5 **A.** Well, in adults, too. It's just in adults it becomes
6 more liquified. And so in adults it doesn't have as tight
7 adherences as it does in children, but in children, the
8 vitreous is -- is like a solid jello, if you will, like a
9 gelatin.

10 **Q.** Okay. So your opinion is that retinal hemorrhaging
11 arises from shearing forces between the vitreous and the
12 retina, correct?

13 **A.** That's the most likely cause, yes.

14 **Q.** And what -- what data do you base that opinion on?

15 **A.** That's very difficult to do because, again, you can't
16 shake a child. But some of the studies that have been done
17 have tried to look at a model to try to get something where
18 the eyes are very similar to a human child to see if they
19 could -- could look at this. And so one of the models is
20 they've taken young fetal pigs and anesthetized them and then
21 rotated them and twisted them and changed them to see what
22 that does in terms of the forces inside the vitreous and the
23 retinal -- retinal vessels.

24 **Q.** And when did that experiment occur?

25 **A.** There have been several experiments that have been

1 done actually at the University of Utah --

2 Q. Specifically the one with the pigs?

3 A. Uh-huh. Well, she's done -- Dr. Brittany Coats has
4 done several different ones trying to set up a model to try to
5 model what goes on in a -- in a human infant.

6 Q. Okay. Are these retinal hemorrhages in infants such
7 as Lincoln Penland confined to the -- what's called a
8 posterior pole?

9 A. No. They're both anterior and posterior.

10 Q. So let me ask you this. In cases -- well, let me
11 back up.

12 As you indicated, the only time the eyes are sent to your
13 lab and to you to examine is when trauma has been suspected --
14 or when abuse has been suspected. I'm sorry.

15 A. From the medical examiners?

16 Q. Yes.

17 A. Yes. Well, unless there's -- there's specific tumors
18 inside the eye that they wanted us to look at or there was
19 some question as to what kind of pathology was going on. So
20 we also get autopsy eyes that had -- have had tumors or have
21 had certain treatments to them why we look at them. But the
22 majority of them that come from the medical examiner's office,
23 at least in terms of the autopsy eyes, are in cases of -- of
24 suspected head trauma.

25 Q. Okay. So in cases with confirmed nonabuse, in other

1 words, where we know there was not an abusive situation, and
2 you've examined the eyes and you've seen retinal hemorrhaging,
3 have you seen hemorrhages that were bilateral?

4 **A.** I've not seen situations where there's definitely not
5 been any kind of a question and there are findings like this,
6 no.

7 **Q.** So every time you examine eyes and you see retinal
8 hemorrhaging, there has been abuse?

9 **A.** When I see cases of bilateral diffuse multilayer
10 retinal hemorrhages, to the best of my knowledge, that's been
11 associated with abuse.

12 **Q.** Okay. And surely you've seen retinal hemorrhages
13 develop in a hospital, right?

14 **A.** Correct.

15 **Q.** Okay. And is it true that -- well, actually let's
16 back up.

17 **MR. BUSHELL:** Tish, Branden, do you mind if I -- I
18 don't know how to toggle between your slides.

19 **MS. TOOMBS:** Which one are you looking for?

20 **MR. BUSHELL:** Start with 109, please.

21 **MR. MILES:** 109 enter.

22 **MS. TOOMBS:** Yeah.

23 **MR. BUSHELL:** 109 enter?

24 **Q. (BY MR. BUSHELL)** So, Doctor, when you were testifying
25 here with Ms. Toombs, you were looking at Exhibit 109. and

1 looking at this slide you indicated I -- what I wrote down
2 was, quote, this raises suspicion for abusive head trauma. I
3 believe those were your words; is that correct?

4 **A.** Correct.

5 **Q.** Okay. And isn't it true that there isn't any
6 characteristic features here that distinguish abuse from
7 nonabuse? In other words, accidental trauma?

8 **A.** Given the degree of an accidental trauma -- again,
9 hemorrhages like this have been reported in the literature,
10 unrestrained automobile accidents, falls greater than one
11 story.

12 **Q.** And those are the only two scenarios that you can
13 think of that could have caused this extensive (overtalking).

14 **A.** Could cause extensive hemorrhages like this,
15 bilateral in -- you know, anterior and posterior in all layers
16 of the retina, yes.

17 **Q.** Okay. Same question, Doctor, for this slide. You
18 said the same thing. These macular folds indicate a suspicion
19 of abusive head trauma. It's your opinion that you
20 cannot distinguish -- that you can distinguish this from
21 accidental or just regular head trauma?

22 **A.** Again, you don't see macular folds in minor trauma.
23 It has to be a severe trauma in order to get macular folds in
24 a child.

25 **Q.** In other words --

1 **A.** You just don't see that normally.

2 **Q.** In other words, two scenarios: a car accident,
3 unrestrained, and a fall of a story or more.

4 **A.** Those are examples of a severe accidental trauma,
5 yes.

6 **Q.** Any other examples?

7 **A.** I don't know.

8 **Q.** Okay. You can have a seat. That's all with the
9 slides.

10 Are there not any features of the eyes themselves that
11 allow you to distinguish abuse from disease?

12 **A.** In what -- in what context?

13 **Q.** In the context -- this context.

14 **A.** Okay.

15 **Q.** Not -- not -- well, clearly Lin -- nobody's asserting
16 that Lincoln Penland had diseases, but, in general, can you
17 distinguish based on the features of the eyes, abuse from
18 disease?

19 **A.** There are no disease entities that will cause this
20 constellation of findings that we saw here in a child's eyes.

21 **Q.** Okay. So it's your opinion, Doctor, that crushing
22 could not cause these types of injuries?

23 **A.** Crushing of what?

24 **Q.** Of the head.

25 **A.** Crushing of the head.

1 **Q.** Correct.

2 **A.** It would have to be, again, a significant enough
3 injury to -- to cause, you know -- a crushing of the head,
4 yes. So you could say if a head is crushed, you know, with --
5 with a high-impact trauma of some kind, that could cause
6 these.

7 **Q.** A -- a television falling onto an infant's head could
8 cause these, for example?

9 **A.** A television, if it was high enough and had enough
10 force to crush a head, could cause something like this.

11 **Q.** And, again, you are not trained in biomechanic
12 engineering --

13 **A.** I'm not. I'm not.

14 **Q.** Okay. But just to reiterate, depending where it fell
15 from and how much force and the weight, it could cause these.

16 **A.** Again, I'm not a -- I'm not a biomechanics person,
17 you said that. It would have to be a significant enough
18 trauma, you know, that -- that would be like the equivalent of
19 a fall from one story, if you -- if you want to put it that
20 way -- it could cause this.

21 **Q.** Okay. And can the sudden increase in chest or head
22 pressure cause retinal hemorrhaging?

23 **A.** There is an entity called Purtscher's retinopathy
24 where you can have a severe chest trauma that can cause
25 hemorrhaging; however, it occurs in adults. It does not occur

1 in children. And it has hemorrhaging that breaks into the
2 vitreous, not just in the retina. And not anteriorly, just
3 posteriorly.

4 Q. Okay. Let me ask you this, Doctor, because of your
5 heavy -- heavy involvement with the American Board of
6 Ophthalmology, you're aware that in 2003 the American Academy
7 of Ophthalmology had an official view -- in fact, I'll just
8 read it to you and see if you're familiar with it. Their
9 official statement that was, quote, "When extensive retinal
10 hemorrhage" -- such as this -- "accompanied by perimacular
11 folds and schisis -- and schisis cavities is found in
12 association with intracranial hemorrhage or other evidence of
13 trauma to the brain in an infant."

14 In other words, what we're seeing today. I think you
15 would agree, those things are met in this -- Lincoln Penland's
16 case?

17 A. Uh-huh. Go ahead.

18 Q. Shaking -- quote, "Shaking injury can be diagnosed
19 with confidence regardless of other circumstances."

20 That was their -- their position in 2003. You're
21 familiar with that?

22 A. Yes.

23 Q. You're also familiar with the shift, their change in
24 wording there in 2010?

25 A. Well, I think that the problem with the change in

1 wording is is that --

2 Q. I'm sorry, I don't mean to cut you off.

3 MS. TOOMBS: Objection.

4 Q. The question was --

5 A. I can't answer your question --

6 MS. TOOMBS: Objection.

7 A. -- if I can't expound upon exactly what it is that
8 you're asking me because I can't answer a yes or a no
9 sometimes on these questions.

10 Q. I can rephrase the question.

11 A. Okay.

12 Q. Are you familiar with their change in language in
13 2010?

14 A. I am.

15 Q. And what was that change?

16 A. The reason for the change was that we didn't -- we --
17 we, meaning the entire profession -- did not want to get
18 fixated on just shaking. And the term shaken baby -- you
19 know, there are other things that can cause this trauma
20 besides just shaking. And so they wanted to go to the
21 terminology which we're using now about abusive head trauma
22 and getting away from the term shaken baby because there are
23 other things, significant head traumas, that can cause these
24 findings aside from just shaking.

25 Q. So can you tell me, Doctor, what that -- what the

1 exact language is now?

2 **A.** I can't read it verbatim, no. I wish I had a
3 photographic memory. I do not.

4 **Q.** Well, tell me if this sounds familiar. I'll read it
5 to you.

6 **A.** Uh-huh.

7 **Q.** "When extensive retinal hemorrhages accompanied by
8 perimacular folds and schisis cavities is found in association
9 with intracranial hemorrhage or other evidence of trauma to
10 the brain in an infant" -- and this is added now -- without
11 another clear explanation, abusive head trauma" -- in other
12 words, striking the shaking language," can be diagnosed with
13 confidence regardless of other circumstances."

14 Does that sound accurate?

15 **A.** Yes. That's exactly what -- what the academy's
16 position was.

17 **Q.** So the academy in 2010, then, you would agree,
18 explicitly recognized that alternate causes of retinal
19 hemorrhages are possible, correct?

20 **A.** Correct.

21 **Q.** Falls can call it -- falls can cause retinal
22 hemorrhages, correct?

23 **A.** Severe falls, the equivalent of greater than one
24 story.

25 **Q.** Increased cranial pressure can cause retinal

1 hemorrhaging, correct?

2 **A.** Increased intracranial pressure can cause retinal
3 hemorrhages, but not to this degree and not to what was
4 described here.

5 **Q.** That was an affirmative. It is correct. It is
6 possible.

7 **A.** Correct.

8 **Q.** Thank you.

9 Can diabetes cause retinal hemorrhaging?

10 **A.** Yes, it can.

11 **Q.** Thank you.

12 And direct injury to the eye can cause retinal
13 hemorrhaging, true?

14 **A.** That is correct.

15 **Q.** Conditions present at the time of birth like
16 retinopathy -- I'm sure I'm mispronouncing that -- can cause
17 retinal hemorrhaging, true?

18 **A.** Retinopathy --

19 **Q.** Retinopathy.

20 **A.** Yes.

21 **Q.** Doctor, are you familiar with a A.K.Ommaya in your
22 profession? Publishes quite a bit of literature?

23 **A.** Just -- just by name. Uh-huh.

24 **Q.** Okay. Have you read his -- his works, his
25 publications, peer-review research?

1 **A.** Once, I think, yes.

2 **Q.** Okay. Are you aware that Mr. Ommaya found through
3 research that the level of force for retinal hemorrhaging from
4 shaking is biomechanically improbable?

5 **A.** I'm not a biomechanic -- biomechanical expert, so I
6 cannot ask -- I can't answer that, no.

7 **Q.** Okay. Ommaya also found -- tell me if you're just
8 familiar with this -- that case studies confirm that retinal
9 hemorrhaging and other ocular findings also found -- were also
10 found in accidental injury and natural diseases. Are you
11 familiar with that?

12 **A.** Hemorrhages can occur in both accidental and
13 non-accidental diseases, that is correct.

14 **Q.** And you're in no way able to tell whether this was
15 accidental or not, correct?

16 **A.** What I can say, again, is when I see bilateral
17 extensive multilayer retinal hemorrhages, reviewing the vast
18 literature that's been done on this, that is highly
19 significant -- greater than 94 percent -- for abusive head
20 trauma or non-accidental trauma.

21 **Q.** You're familiar in your research and you staying
22 apprised within your field of -- of recent changes and the
23 most up-to-date objective empirical data, are you familiar
24 with a -- again, I'm probably going to mispronounce his name.
25 It's either Leuder or Luder (phonetical spellings)?

1 **A.** This is the Swedish paper --

2 **Q.** Correct --

3 **A.** -- that looked at it? Yes, I am.

4 **Q.** Okay.

5 **A.** Uh-huh.

6 **Q.** And you're aware that in that -- that research they
7 found that a four-month-old child was killed when a
8 six-year-old fell on him? And on examination, that
9 four-month-old had severe retinal hemorrhages? Are you aware
10 of that?

11 **A.** Just from the paper, yes.

12 **Q.** Okay. So, Doctor -- well, give me just one moment.

13 **A.** Uh-huh.

14 **Q.** Just give me one quick second, Doctor. I appreciate
15 your patience.

16 Well, let me just -- I'll just leave it at this. In --
17 in sum, you would agree, Doctor, that shaking -- well, you
18 would agree that you cannot say that shaking is the only
19 explanation for the injuries you've seen here?

20 **A.** That is correct. Shaking is a potential explanation,
21 but not the only one.

22 **Q.** And your testimony was that an object hitting the
23 child could cause this -- these damages?

24 **A.** With significant enough force to cause significant
25 acceleration-deceleration, yes.

1 Q. So that was a yes to my question.

2 A. That's correct.

3 Q. Correct? Okay.

4 And you can't possibly opine on whether these were
5 intentionally inflicted.

6 A. I cannot.

7 MR. BUSHELL: Thank you, Doctor. That's all I have.

8 THE COURT: Okay. From the State?

9 MS. TOOMBS: Yes, Your Honor.

10 I'm going to -- if I may retrieve what's been marked
11 State's Exhibit something -- oh, 149.

12 THE COURT: Okay.

13 REDIRECT EXAMINATION

14 BY MS. TOOMBS:

15 Q. Doctor, you probably are not at all familiar with
16 this doll, are you?

17 A. Only when we do CPR certification.

18 Q. Okay. It probably doesn't have the additions that
19 we've put into it when you do CPR certifications.

20 A. Uh-huh.

21 Q. I'm going to demonstrate, if I can, without dropping
22 him, I'm -- you've talked with defense counsel quite
23 extensively about shaking alone causing retinal hemorrhaging,
24 these injuries. If I were to take this baby and go -- and
25 slam him into the table, would that be significant enough

1 force to cause what you're seeing?

2 **A.** In looking at the literature with what's been
3 reported, yes, it would.

4 **Q.** Okay. Counsel talked to you an awful lot about
5 retinal hemorrhaging, and I just want to make sure that the
6 jury is clear. Are there different levels of retinal
7 hemorrhaging?

8 **A.** There are, indeed. And -- and there are many
9 different things that can cause retinal hemorrhages. You
10 know, the -- the attorney brought up the idea of diabetes, you
11 know, diabetic retinopathy can cause hemorrhaging in the
12 retina, blocked blood vessels can cause hemorrhaging in the
13 retina.

14 There are many different causes of retinal hemorrhages,
15 but when we look at them, we don't just look at hemorrhages.
16 We look at where they are, what part of the eye they involve,
17 what layers of the eye they involve, and what other factors
18 that we see when we're looking in there. And so we don't just
19 look at, is there hemorrhage? Yes or no. We look at where
20 the hemorrhage is, what part of the retina it's located in,
21 how extensive it is, is it in one eye or both eyes before we
22 make an opinion on -- on what could be causing the retinal
23 hemorrhages.

24 **Q.** And in -- in the case of some of these things that
25 counsel has talked to you about, the intra -- increased

1 intracranial (sic), the diabetes, and I think he also talked
2 about -- I can't remember all the things that he listed --
3 like a birth defect, for example. Are those the kinds of --
4 the injuries, are those the kinds of hemorrhaging that you see
5 in Lincoln Penland?

6 **A.** No. We don't -- we don't see other things that would
7 be involved with hemorrhaging that could be caused from some
8 of the other entities that were discussed, no.

9 **Q.** Okay. So would you feel comfortable saying those
10 things are not the cause of these injuries?

11 **A.** Yes, I would.

12 **Q.** Okay. Now, you talked about dif -- I think counsel
13 indicated -- or asked you, are you -- surely you're familiar
14 with retinal hemorrhaging showing up in the hospital. I'm not
15 sure I understood your answer to that question.

16 **A.** I'm -- I'm not sure I understand what that question
17 means. I mean, I guess that means can you see retinal
18 hemorrhages in patients who are in a hospital. And, again,
19 yes, you can see retinal hemorrhages from multiple different
20 causes.

21 **Q.** Okay. And would it -- would it surprise you that --
22 well, let me ask you, do you know Dr. Robert Hoffman?

23 **A.** Yes. He's one of my associates at Moran Eye Center.

24 **Q.** Are you familiar -- does he practice up at Primary
25 Children's?

1 **A.** He does. He -- his specialty is pediatric
2 ophthalmology and he practices both at the University and at
3 Primary Children's.

4 **Q.** To be fair, you haven't consulted with him on this
5 case?

6 **A.** I have not, no.

7 **Q.** Okay. Would it surprise you to find that he examined
8 this child and raised concerns about the retinal hemorrhaging?

9 **A.** It would not surprise me at all because when we
10 showed the gross pictures, that's basically what you would see
11 if you dilated the child's eyes and looked inside, you know,
12 with -- with the devices that we use to look at children's
13 eyes. And so you would get a view very similar to what we saw
14 in the gross pictures.

15 **Q.** And he doesn't do pathology, correct?

16 **A.** No, he does not.

17 **Q.** You're not certified pediatric.

18 **A.** Correct.

19 **Q.** But you are a pathologist.

20 **A.** Correct.

21 **Q.** And, in fact --

22 **A.** I'm an ophthalmic pathologist.

23 **Q.** An op -- specifically --

24 **A.** Specifically. Yes.

25 **Q.** -- for the eyes.

1 **A.** For the eyes.

2 **Q.** And the expert in your field in this area.

3 **A.** Correct.

4 **Q.** Okay. You talked -- or counsel talked with you a
5 little bit about compensation. And you indicated you are
6 compensated by the Moran Eye Center, but I believe you
7 indicated you're not salaried, right?

8 **A.** Correct.

9 **Q.** So today, being here, are you being compensated by
10 Moran Eye Center --

11 **A.** I'm -- I'm not.

12 **Q.** -- for today?

13 **A.** I'm not.

14 **Q.** Are you -- are you being compensated by anyone for --

15 **A.** No, I'm not.

16 **Q.** -- for being here today? In fact, did you have to
17 cancel some --

18 **A.** In fact, I had to cancel a half day today. I did,
19 indeed.

20 **Q.** Okay. And you did speak with myself a couple of
21 times on the phone.

22 **A.** That's correct.

23 **Q.** Did anything about our conversations change your --
24 the opinion that you reached back in 2014?

25 **A.** No, it did not.

1 **Q.** In fact, if I were to read your conclusion in 2013
2 (sic), your conclusion is that these -- these injuries are
3 consistent with non-accidental trauma.

4 **A.** That is correct.

5 **Q.** And is that your conclusion today?

6 **A.** That is my conclusion today.

7 **Q.** One last thing. We talked an awful lot about retinal
8 hemorrhaging. And you came back to, at one point, with
9 counsel, the constellation. Is it important to look at all of
10 the injuries as a whole in the eyes?

11 **A.** In terms of that, it is -- it is very important
12 because you don't want to look at just a specific one part of
13 the eye. You look at the eye globally, meaning the entire
14 globe, the entire part of the eye. So it's very important
15 that you evaluate the entire eye.

16 **Q.** And, yes, maybe something could cause retinal
17 hemorrhaging, maybe something could cause this, but when you
18 look at all of what you see going on in Lincoln Penland's
19 right eye and left eye and the nerve sheaths, what is your
20 conclusion?

21 **A.** My conclusion when you see bilateral, meaning both
22 eyes; diffuse, meaning anterior and posterior, retinal
23 hemorrhages involving multiple layers of the retina associated
24 with macular folds and associated with the hemorrhaging
25 underneath the nerve sheath, subarachnoid hemorrhage, we'd

1 call it, that constellation is very suspicious for significant
2 non-accidental trauma.

3 Q. And I think that you had cited -- you had indicated
4 that for retinal hemorrhaging, diffuse bilateral retinal
5 hemorrhaging alone, the studies say 94 percent.

6 A. That is correct.

7 Q. Does that number go up even when you add in the
8 macular folds and the nerve sheath damage?

9 A. You know, because they are seen less commonly it --
10 it doesn't go up any more than that, but those are
11 significant.

12 Q. They are significant?

13 A. Correct.

14 Q. So confident that this was not an accident?

15 A. Very confident.

16 MS. TOOMBS: No further questions.

17 THE COURT: Okay. From the defense?

18 MR. BUSHELL: Just one.

19 **REXCROSS-EXAMINATION**

20 **BY MR. BUSHELL:**

21 Q. Just to verify, Doctor, your final diagnosis in your
22 report: Autopsy globes with superficial retinal hemorrhage,
23 macular folds, and areas of subarachnoid optic nerve
24 hemorrhage consistent with non-accidental trauma, correct?

25 A. That is correct.

1 **Q.** Yet it is true that you cannot say who caused that.

2 **A.** No, I cannot.

3 **MR. BUSHELL:** Thank you, Doctor.

4 **THE COURT:** From the State?

5 **MS. TOOMBS:** No further questions, Your Honor.

6 **THE COURT:** Does any member of the jury have a
7 question? Okay. It looks like we have one. If you'll write
8 it down and bring it over.

9 Doctor, you might not be familiar with our process
10 today, but we're -- the attorneys and I have stipulated that
11 the jurors can ask questions. So they write it down, they
12 bring it up to me, we review it as a team to see if it's
13 proper, and then I'll ask it if it is.

14 **THE WITNESS:** I -- I've been teaching for 30 years,
15 so I'm happy to answer any questions.

16 **THE COURT:** You're used to questions?

17 **THE WITNESS:** Yes.

18 **THE COURT:** Okay. Counsel, if you'll join me at the
19 bench.

20 (Discussion at the bench at 10:20:51)

21 **THE COURT:** Before we read this question, I've got
22 a -- I'm a little concerned about the exhibits.

23 **MS. TOOMBS:** Yeah.

24 **THE COURT:** The clarity on what's (unintelligible)
25 was really fuzzy and he was really specific, and those slides

1 were really clear, but these aren't. So some of the things
2 that he was pointing out are not very visible on the actual
3 exhibits. Is that a concern?

4 **MS. TOOMBS:** And we -- we have prepared a disk that
5 is -- we've prepared a disk of the PowerPoints that we can --
6 I mean, there's nothing other than what was showing.

7 **MR. BUSHELL:** The ones that are going to go back?

8 **MS. TOOMBS:** Yeah. So we --

9 **THE COURT:** So that we could send in lieu of these or
10 with these?

11 **MS. TOOMBS:** With those.

12 **MR. MILES:** Yes. If they want to look closer at that
13 board.

14 **THE COURT:** Okay. I just didn't know before he left
15 if this was a concern. Okay.

16 Then, let's see, is this --

17 **MR. WIDDISON:** (Unintelligible)

18 **MR. MILES:** Should we (unintelligible)?

19 **THE COURT:** (Unintelligible) really good. Really
20 interesting.

21 **MR. BUSHELL:** That's fine with us.

22 **MS. TOOMBS:** Okay.

23 **MR. BUSHELL:** (Unintelligible)

24 **MR. MILES:** Just make that note -- (unintelligible).

25 **MR. BUSHELL:** I don't want to confuse them as they go

1 back and deliberate.

2 **MR. MILES:** Maybe on the originals we cross out the
3 OS and put --

4 **MS. TOOMBS:** OD.

5 **MR. MILES:** -- or the OD and put OS on those that
6 were supposed to be of the left eye.

7 **MS. TOOMBS:** Is that fair, Your Honor?

8 **THE COURT:** Huh?

9 **MS. TOOMBS:** Would that be acceptable if we were to
10 have him go through on the original slides and cross out where
11 it says OD where it should have been OS, mark in OS?

12 **MR. BUSHELL:** We're fine --

13 **MS. TOOMBS:** We can do that on the record.

14 **MR. WIDDISON:** He could initial next to each change
15 he makes.

16 **THE COURT:** Okay.

17 **MR. WIDDISON:** If the doctor would make those
18 changes.

19 **THE COURT:** On -- on these?

20 **MR. WIDDISON:** On these exhibits.

21 **MS. TOOMBS:** Yes.

22 **THE COURT:** Okay.

23 **MS. TOOMBS:** I -- I'll have him do that.

24 **MR. WIDDISON:** (Unintelligible)

25 **THE COURT:** Okay.

1 **MS. TOOMBS:** I think I've got them.

2 **THE COURT:** While he's doing that, then, why don't
3 you look at these questions and see what you think.

4 **MR. MILES:** Yeah, those are all good.

5 **THE COURT:** You're okay with all of those?

6 **MR. MILES:** Yeah.

7 **THE COURT:** You okay if I ask them?

8 **MR. WIDDISON:** Yeah.

9 **MR. BUSHELL:** Yeah.

10 (Proceedings resume in open court at 10:22:53.)

11 **THE CLERK:** We probably should do it on record.

12 **MR. MILES:** No. That's what I'm saying
13 (unintelligible).

14 **MS. TOOMBS:** Your Honor, do you want to ask the
15 jurors' questions or should I go through what we had talked
16 about on the change of the exhibits?

17 **THE COURT:** Why don't we go through those just before
18 we release him -- Dr. Mamalis.

19 **MS. TOOMBS:** Okay.

20 **THE COURT:** Okay. Doctor, here's the question
21 from -- questions from the jury: Would there be visible
22 damage to the eye from the child's parents' point of view?

23 **THE WITNESS:** That's a good question, and -- and it
24 would be very unlikely because these findings are all inside
25 the eye. And unless you were to dilate the eye and look in

1 with a special instrument called an ophthalmoscope, the parents
2 would not be able to see this. They would not be aware of any
3 changes within the eye.

4 **THE COURT:** Okay. Next question: Can the
5 hemorrhaging occur during extraction of the eye or the testing
6 process?

7 **THE WITNESS:** That's a good question -- yeah. That's
8 a good question. No. We don't see that because what happens
9 is is the body gets fixed as if -- you know, when -- when a
10 patient goes to a mortuary when they pass away, they get
11 formaldehyde and other fixatives in there that fixes the
12 tissue as it is. And so when you are actually removing the
13 tissue after it's been fixated, that would not cause any
14 additional hemorrhaging or any changing that we would see.

15 **THE COURT:** Okay. Is the testing of the eye time
16 sensitive? What is the critical time frame?

17 **THE WITNESS:** It's not so much how soon we test the
18 eye, but how soon that the eye is preserved. And so if -- you
19 know, if the body has been preserved so that the medical
20 examiner can then begin to do their autopsy, when the eyes are
21 removed, that's -- so long as it's preserved it's not
22 important that that be done in a timely manner.

23 What's important is that -- that the body not just
24 be -- not preserved for a large period of time because that
25 can cause some changes.

1 **THE COURT:** Who validates the test procedures?

2 **THE WITNESS:** My lab is certified by what's called
3 the College of American Pathologists. And what that means is
4 that every two years they will actually send a team of
5 pathologists to come and inspect my laboratory, inspect the
6 processes that we do to cut and section this tissue and how --
7 and then they'll actually even look at our reports that we do
8 to see how we report it out. And then they will actually do a
9 certification that -- that we are a certified laboratory from
10 the College of American Pathologists.

11 **THE COURT:** Thank you.

12 Were there any other questions from the jury -- any
13 member of the jury? Okay. Seeing none, I think the attorneys
14 have a few housekeeping matters about the exhibits before you
15 leave, Doctor.

16 **THE WITNESS:** Yes.

17 **FURTHER EXAMINATION**

18 **BY MS. TOOMBS:**

19 **Q.** Okay. I'm going to hand you the paper copies of what
20 has been marked State's Exhibit 115, 116, 117, 118, 119, and
21 120. And I believe -- and if you'll compare these with your
22 photos --

23 **A.** Yes.

24 **Q.** -- I believe these are all the ones that were of the
25 right eye and they were mismarked OD.

1 **A.** Of the left eye, yes.

2 **Q.** Or, excuse me, of the left eye.

3 **A.** Yeah. And if that's okay, I've got my notes here
4 definitely saying because we took the pictures that these are
5 the eyes. So I can double-check --

6 **THE COURT:** Yeah. If you'll just compare them, and I
7 think they want you to initial the changes so that when these
8 go back to the jury they'll know which eye they're looking at.

9 **THE WITNESS:** Certainly.

10 **MS. TOOMBS:** So I'll have you just mark out -- and
11 then probably up above just so that we can see it.

12 **THE WITNESS:** So I should put here OS and then
13 initial?

14 **MS. TOOMBS:** Yes.

15 **THE WITNESS:** Okay. Okay. Okay.

16 **MS. TOOMBS:** Thank you.

17 **THE COURT:** Anything else?

18 **MS. TOOMBS:** Just briefly, Your Honor.

19 **THE COURT:** Okay.

20 **Q. (BY MS. TOOMBS)** You -- you have had the privilege of
21 explaining the images that you're seeing from the -- the
22 PowerPoint itself projected, and fair to say, my printer maybe
23 isn't as good a quality as the projection.

24 **A.** Correct.

25 **Q.** Okay.

1 **A.** The -- the projection is of a higher quality than is
2 the printer. The PowerPoint's a better -- you know, better
3 picture than what shows up on the page or on your printer.

4 **Q.** Okay. So if we were to send the projection back with
5 the jury --

6 **MS. TOOMBS:** Just so that there's absolute clarity in
7 the record, Your Honor, I think it would be the State's
8 request that during a break prior to deliberation at some
9 point we make the change on the title that would correspond
10 with what Dr. Mamalis has just done on the paper copy.

11 **THE COURT:** Are you anticipating that will go back
12 with the jury, then?

13 **MS. TOOMBS:** We would anticipate that the
14 PowerPoint -- the digital version of it would go back.

15 **THE COURT:** Okay. From the defense?

16 **MR. BUSHELL:** We have no problem with that.

17 **THE COURT:** Okay. We were worried about that because
18 the exhibits that we've received are much fuzzier than what
19 you're watching there and you'd have to rely on your memory,
20 so that -- that will fix that. Thank you both.

21 Anything else for Dr. Mamalis? Yes, please?

22 **MS. TOOMBS:** I don't believe so. May I approach?

23 **THE COURT:** Yes. Thank you.

24 Anything else from the defense?

25 **MR. BUSHELL:** No, Your Honor.

Addendum C
Physician's testimony

1 **THE COURT:** Okay. Any other business to take care of
2 before we break for lunch, then?

3 **MR. MILES:** Nothing from the State.

4 **THE COURT:** From the defense?

5 **MR. WIDDISON:** No, Your Honor.

6 **MR. BUSHELL:** No.

7 **THE COURT:** Okay. Thank you all. We'll be in recess
8 then until 1:25. Hopefully we can start with the -- the
9 evidence at 1:30. We can go off the record, Debbie.

10 (Lunch recess taken from 11:49:40 to 1:29:15.)

11 **THE COURT:** Ms. Toombs, who is our next witness?

12 **MS. TOOMBS:** Dr. Bruce Herman.

13 **THE COURT:** Okay. And are you doing the questioning?

14 **MS. TOOMBS:** Yes, Your Honor.

15 (Pause in proceedings)

16 **THE BAILIFF:** The jury is present, Your Honor.

17 **THE COURT:** Okay. Thank you, Dave.

18 Welcome back, members of the jury. We'll now turn to
19 the State and they'll call their next witness.

20 Ms. Toombs?

21 **MS. TOOMBS:** Yes, Your Honor. The State would call
22 Dr. Bruce Herman.

23 **DR. BRUCE HERMAN,**

24 being first duly sworn, testifies as follows:

25 **MS. TOOMBS:** I took a mint just as I was coming in

1 from lunch and -- so forgive my slurring.

2 **DIRECT EXAMINATION**

3 **BY MS. TOOMBS:**

4 **Q.** Dr. Herman, will you -- that -- just so you know,
5 that doesn't amplify. It simply records.

6 **A.** Okay.

7 **Q.** Would you please state your name, for the record?

8 **A.** Bruce Herman.

9 **Q.** And what is your current occupation?

10 **A.** Physician.

11 **Q.** All right. Do you have any -- well, let me go back
12 to training. Do you have any special training that you
13 underwent to become a physician?

14 **A.** I do.

15 **Q.** And what was that?

16 **A.** I -- I went to college and then medical school at the
17 University of North Carolina. And subsequent, did my
18 pediatric residency here at Primary Children's -- or in Salt
19 Lake.

20 I then -- excuse me -- did a pediatric emergency medicine
21 fellowship in the early '90s, and subsequent to that, began
22 working in the area of child abuse and have subsequently
23 become board certified by the American Board of Pediatrics,
24 which is our certifying board, in pediatrics, pediatric
25 emergency medicine, and child abuse pediatrics.

1 Q. Okay. So you said -- you kind of answered this, but
2 how long have you been working as a doctor?

3 A. Thirty-one years.

4 Q. Thirty-one years. Okay.

5 A. I became a physician when I was 10.

6 Q. I like that.

7 MR. MILES: Remember the oath.

8 Q. (BY MS. TOOMBS) Are you -- and you indicated already
9 that you do hold license here in Utah.

10 A. Yes, ma'am.

11 Q. And you have also mentioned that you are board
12 certified pediatric and also a child abuse pediatrician; is
13 that correct?

14 A. Yes, ma'am. Yes, ma'am.

15 Q. Can you explain to the jury a little bit more about
16 what those specialties or subspecialties are?

17 A. Specialty -- neither of those specialties existed
18 when I first finished my training in 1989. I began working in
19 the pediatric emergency department at Primary soon after that.
20 And then pediatric emergency medicine became its own
21 significant subspecialty, the practice of emergency medicine
22 related to just children. And then became board certified in
23 that in approximately 1996. And then I began working in child
24 abuse in 1997 with this -- what's called the Safe and Healthy
25 Families team at Primary Children's where we evaluate children

1 when there are concerns of inflicted injury.

2 And then child abuse pediatrics became its own board in I
3 believe 2009, and I was part of the first group of
4 pediatricians to become board certified in child abuse
5 pediatrics. And the significance of board certification
6 indicates that you have specialized training and/or skills in
7 that subspecialty of pediatrics.

8 Q. Okay. So you're pretty much a first in your field,
9 if you would say, one of -- one of the firsts.

10 Have you also published any works as far as in those
11 specialties?

12 A. Yes, ma'am.

13 Q. Any papers?

14 A. I've had the opportunity to work with many very good
15 researchers and most of my research has been in the area of
16 child abuse, specifically trying to screen for, develop ways
17 that we can more accurately and more -- and earlier screen for
18 inflicted head injury and try to pick up children with more
19 subtle findings.

20 And then, also, have worked on some studies in which we
21 have tried to create what are called clinical decision rules
22 which help people who are not child abuse pediatricians decide
23 when they should consult with a child abuse pediatrician.

24 Q. And why is that important?

25 A. It can or it cannot -- I mean, it -- I have

1 experience within the field and have worked with what I would
2 consider the premiere people in our field.

3 Q. And is it important for the -- the protection of
4 children to have a specialty and study that, then?

5 A. Yes, ma'am.

6 Q. Okay.

7 A. I think if I was a -- I have children and when I --
8 they are sick I want them to be cared for by specialists in
9 that field, so when our children have needed emergency care
10 I've gone to Primary to get that care.

11 Q. Okay. You've also indicated that you've done some
12 research. Is that fair to say?

13 A. Yes, ma'am.

14 Q. Specifically, have you done research in what's now
15 termed abusive head trauma?

16 A. Yes, ma'am.

17 Q. Okay. Can you explain to the jury some of what
18 you've done?

19 A. There's been a -- a few things. I was involved in a
20 study of the literature that existed up to that time, late
21 '90s, early 2000, looking at the frequency of falls and how
22 often children died from accidental falls versus abusive head
23 trauma.

24 When children sometime come into the ED, we don't always
25 get the straight story and they may say they fell off a couch

1 or they fell off a small height. And so what -- that research
2 was done was to look at documented accidental falls and find
3 out how frequently those children died.

4 I've done research on looking at blood tests that
5 would -- when children sometimes present with abusive head
6 trauma or inflicted head injury, they sometimes have subtle
7 findings. They don't always come in really, really sick. And
8 sometimes it is missed. It's well known that approximately a
9 third of children who have had abusive head trauma don't get
10 picked up on their first visit. And part of my research has
11 been to help give a scoring scale for subtle symptoms and,
12 then, also a blood -- developing a blood test that may screen
13 for head injury that we would prompt a physician to, for
14 instance, get a CT scan.

15 My most recent work has been part of a -- well, two
16 different things. One has been looking at -- I was part of an
17 expert panel where we looked at injuries, bruises
18 specifically, and then looked at what were the injuries
19 associated with bruising and -- and tried to delineate or
20 determine, you know, what bruises are more characteristic of
21 inflicted injury and may be -- may warrant or prompt further
22 evaluation for child abuse or inflicted trauma.

23 And then what I'm working on still is -- it's a
24 multi-center trial, so a trial of multiple hospitals in which
25 we are trying to determine and now what we'd call validate or

1 prove that these -- that certain findings are predictive of
2 abuse -- of the diagnosis of abusive head trauma. And the
3 hope is that we will allow pediatric intensive care doctors to
4 more -- more accurately and more appropriately consult with a
5 child abuse pediatrician, if needed, and also give them tools
6 to say that if the child doesn't have these findings that they
7 don't need to consult with a child abuse physician.

8 Q. Okay. Do you have a current title?

9 A. I am presently professor -- which is -- you start out
10 as an assistant professor, then become an associate professor,
11 then become a full professor. I've become a full professor.
12 And I am vice chair of our Department of Pediatrics at the
13 University of Utah, specifically in charge of education. I
14 direct the training program for pediatric residents. So after
15 you graduate from medical school and you go into pediatrics,
16 I'm their boss -- for lack of a better term -- when they come
17 and get their training at Primary Children's.

18 Q. Okay. In addition to all of your research and -- and
19 your teaching, do you also see patients in a clinical setting?

20 A. Yes, ma'am. I still do a very small pediatric
21 practice. I've practiced general peds -- general pediatrics
22 like a regular pediatrician since I finished and just enjoy
23 it. It's very part time now. My main job now is in the
24 emergency department at Primary which I've worked in,
25 essentially, since 1986 with the exception of a couple of

1 years in Chicago where I also worked in a pediatric emergency
2 department.

3 Q. Okay. And I think earlier you had talked about the
4 ED. I -- I call it ER. Is that the same thing?

5 A. The emergency department.

6 Q. Okay.

7 A. The emer -- the ER.

8 Q. Okay. All right. When was the last time you were
9 involved in the treatment of a patient?

10 A. Last Monday.

11 Q. Last Monday? And that would have been at the
12 emergency --

13 A. In the emergency department.

14 Q. Okay. Is it -- would it be a fair characterization
15 to say that you have treated a large number of injured
16 children over the last 31 years?

17 A. Yes, ma'am.

18 Q. Okay. Were all of those children victims of abuse?

19 A. No, ma'am. Thankfully.

20 Q. Thankfully. And so you're -- one of the things that
21 you do is rule out abuse. Is that fair?

22 A. Yes, ma'am. I mean, we -- it's not like every child
23 who comes in to the ER we are saying, oh, we need to rule out
24 child abuse. When -- and I may be getting ahead of you,
25 but --

1 **Q.** Go ahead.

2 **A.** -- when a child comes into the ER, let's say the
3 chief complaint is vomiting. We -- as a physician, come up
4 with what's called a differential diagnosis. A differential
5 diagnosis is what could possibly be causing vomiting. If you
6 bring a child to our ER, my job is to try to figure out why
7 they are vomiting. And so we start with a broad differential.
8 Many, many, many, many things can cause vomiting, so my job is
9 to take a history, find out what are the symptoms associated
10 with that vomiting, and perform appropriate testing.

11 The vomiting can be caused by something very benign or
12 mild, like the flu, or vomiting can be caused by more serious
13 things such as intestinal blockage or appendicitis. And,
14 occasionally, vomiting can be caused by abusive head trauma or
15 child abuse. And so we try to do -- we don't check for
16 everything with every child. We -- based upon the history
17 given to us, we try to narrow -- narrow that differential
18 diagnosis and then do the appropriate -- do appropriate
19 testing to try to determine what is causing the vomiting.

20 **Q.** Okay. So you did cover quite a few things, in
21 particular, histories.

22 **A.** Yes, ma'am.

23 **Q.** You indicate that you -- you get a history. What
24 does that mean?

25 **A.** We take -- say the mom or dad brings in the child.

1 We will obtain a history from them about what's been going on,
2 for instance, vomiting, do they have fever, do they -- when do
3 they vomit, how much, what color. We ask them the questions
4 that we feel appropriate at that time to try to determine
5 what's -- what's going on.

6 Q. Okay. And you also mentioned earlier in your
7 testimony that you began -- I think it was back in 1997 --
8 working with an organization called Safe and Healthy Families.

9 A. Yes, ma'am.

10 Q. Let's talk a little bit about what Safe and Healthy
11 Families is.

12 A. Safe and Healthy Families is a team of physicians --
13 there are other associated people. We have social workers; we
14 have clinical psychologists. The role of the physician is to
15 consult with other physicians or other agencies to help them
16 determine whether a child's injuries are accidental or
17 inflicted and -- and then try to protect the child or help
18 work with the various agencies to protect that child.

19 Q. Okay. And were you working with Safe and Healthy
20 Families in 2014?

21 A. Yes, ma'am.

22 Q. Okay. On -- I'm going to draw your attention to
23 February 19th, 2014. Were you asked to consult on a patient
24 by the name of Lincoln Penland?

25 A. Yes, ma'am.

1 Q. Now, I noticed you've come up without any notes.
2 This is three years ago, so are you -- you're familiar with
3 Lincoln Penland, who he is.

4 A. Yes. Yes, ma'am.

5 Q. Are you familiar with how old he was?

6 A. Rather than me -- as I recall, he was approximately
7 eight months old.

8 Q. Okay.

9 A. That said, if I may have my report to refer to?

10 Q. Yes. Did you bring a copy or shall I provide you --

11 A. You can provide me with them.

12 Q. If you recall from the prelim, it's scanned in, it's
13 small, so --

14 A. Oh.

15 Q. Do you --

16 A. That's why I brought my glasses.

17 Q. Okay.

18 **MR. BUSHELL:** Which one are you providing, Tish?

19 **MS. TOOMBS:** I'll -- I'll show you here in just a
20 minute. I'll be giving him both of them.

21 **MR. MILES:** This one?

22 **THE WITNESS:** How small? I do have my report in my
23 bag, but --

24 **MS. TOOMBS:** Oh, okay. May we -- may the witness
25 step down and just retrieve his report?

1 **THE COURT:** Is it just right here?

2 **MS. TOOMBS:** Yes.

3 **THE COURT:** Oh, okay. Sure. I was worried it was in
4 the car.

5 (Off-the-record discussion)

6 **Q. (BY MS. TOOMBS)** All right. Yes. Your print is much
7 larger than mine.

8 **A.** Just so I have -- I had two separate reports and
9 that's what I have here and I'm happy to --

10 **Q.** And those would be the entirety of the reports that
11 you prepared in this case?

12 **A.** Yes, ma'am.

13 **Q.** Okay. Can I just retrieve them really briefly?
14 We're not going to be admitting them as exhibits, but I just
15 want to make sure that --

16 **A.** Okay.

17 (Off-the-record discussion)

18 **Q.** Okay. So when did Lincoln -- when did you first see
19 Lincoln Penland?

20 **A.** My day of service, as it were, is Thursday. And I
21 believe Lincoln came in on the 19th, which is Wednesday, and
22 then I saw him on Thursday.

23 **Q.** Okay. So when you say "day of service," is that when
24 you do, I guess -- in TV they call it rounds or something of
25 that nature?

1 **A.** Yeah.

2 **Q.** Okay. I always hate to refer to TV, but --

3 **A.** Yeah.

4 **Q.** So you saw him on the 20th. He arrived at your
5 hospital on the 19th.

6 **A.** Yes, ma'am.

7 **Q.** Okay. Explain to the jury what information that you
8 had going into this, please.

9 **A.** Very -- I won't say very little, but that Lincoln had
10 been admitted to the intensive care and they were concerned
11 that his injuries were -- they were worried about the
12 possibility of abusive trama or inflicted trauma and so they
13 consulted our team.

14 **Q.** Okay. And when you say "they," who is "they"?

15 **A.** The consulting service was the ICU and the trauma
16 service.

17 **Q.** Okay. So the -- the hospitals and the doctors.

18 **A.** Yes, ma'am.

19 **Q.** Okay. And as you are coming into it, you've already
20 talked about the fact that you obtain a history. Did you do
21 that in this case?

22 **A.** I reviewed some of the radiology that had been
23 performed the night before with our radiologist at Primary
24 Children's.

25 **Q.** Okay. And did you also consult with anybody about

1 the -- about the patient himself and what his baseline health
2 was or anything like that?

3 **A.** Ultimately I spoke to many different specialists and
4 subspecialists. Prior to talking to the family I -- I -- I
5 can't remember exactly with whom I spoke. Generally we like
6 to just obtain a little background, what the injuries are to
7 have some idea, and then talk with the family and obtain a
8 more detailed history.

9 **Q.** Okay.

10 **A.** And then work as -- as -- our role is that we take
11 history from the family and then work with them and the
12 subspecialists at Primary and other agencies to try to clarify
13 history and then make our assessment.

14 **Q.** Okay. And that was done in this case?

15 **A.** Yes, ma'am.

16 **Q.** Okay. What did you learn about Lincoln Penland and
17 how he had been on February 19th?

18 **A.** From recollection of my report, on Tuesday, the 18th,
19 he had a normal day. And on Wednesday, it says February 20th,
20 but that was wrong. It was the 19th. He played, smiled, and
21 went back to sleep, and then went to the baby-sitter as his,
22 quote, unquote, normal self.

23 **Q.** Okay. And then at some point he became not his
24 normal self, fair to say?

25 **A.** Yes. Yes, ma'am.

1 **Q.** Okay. And you've already said you did have access to
2 the other medical records that -- that Lincoln had -- had he
3 had some testing done or was he undergoing testing at that
4 point?

5 **A.** At Primary?

6 **Q.** Yes.

7 **A.** Yes, ma'am. I mean, he had -- he received a bunch of
8 blood tests on the night he came in. He did -- had scans
9 performed, I believe at McKay-Dee, and then subsequently had
10 further -- further X-rays performed at Primary Children's. He
11 was evaluated by the ophthalmologists at Primary Children's,
12 as well as the neurosurgeons.

13 **Q.** Okay. And are those part of the team, if you will,
14 that you -- you consult with and -- and talk to about --

15 **A.** Yes, ma'am.

16 **Q.** -- about his condition?

17 **A.** Yes, ma'am.

18 **Q.** What did you learn about Lincoln's injuries at that
19 point?

20 **A.** On the -- on the day that I saw Lincoln he had not
21 yet had his eye exam, and so we had evidence of intracranial
22 bleeding in the head. We had evidence of -- I can't remember
23 the order of -- he had -- he had not yet -- oh, yeah.

24 He had a skeletal survey on that -- on the 20th, the day
25 I saw him, and he had evidence of a significant skull

1 fracture. He had swelling of his scalp noted. He had
2 evidence of intracranial hemorrhage in specific areas of his
3 brain, and there was some mild edema noted initially. He had
4 some CTs of his abdomen and pelvis which did not show any
5 evidence of injury, and he had a CT, fancy scans, of his
6 cervical and lumbar spine which at that time were read as
7 normal.

8 Of note is that there are two different kinds of scans.
9 We generally perform a CT scan and -- and an -- and an MRI
10 scan. If any of you have had an MRI scan, it takes
11 significantly longer to obtain than a CT scan and it gives
12 us -- more specifically, it gives the radiologist better
13 information with which to make determination of injury or
14 disease or other things. An MRI is a much more sensitive and
15 specific scan than a CT scan.

16 **Q.** Okay. And as the -- as Lincoln is at the hospital
17 and -- he is continuing to receive treatment, fair to say?

18 **A.** Yes, ma'am.

19 **Q.** And you did also prepare a report from
20 February 27th --

21 **A.** Yes.

22 **Q.** -- of 2014 --

23 **A.** Yes, ma'am.

24 **Q.** Is that true?

25 **A.** Yes, ma'am.

1 **Q.** At that point, did you have a much better idea of the
2 extent of Lincoln's injuries?

3 **A.** Yes, ma'am.

4 **Q.** And, in fact, what is -- what was significant about
5 the 27th in Lincoln's treatment?

6 **A.** Excuse me. By that time, he had his eye exam and he
7 had evidence of what are called -- I mean, retinal hemorrhages
8 are bleeding at the back of the eye. And this is an
9 opportunity to talk about differential diagnosis, which we've
10 talked about before.

11 The differential diagnosis of retinal hemorrhages, in
12 other words, what we consider when a child has retinal
13 hemorrhages, is pretty -- I won't say way wide, but is
14 significant. You can have retinal hemorrhages from leukemia;
15 you can have retinal hemorrhages from some other disease
16 processes. You can have retinal hemorrhages from accidental
17 head injury, although very infrequently. And so when we look
18 at retinal hemorrhages, we want to know how many,
19 distribution -- and I'll say so forth and so on, but we want
20 to know how extensive the retinal hemorrhages are.

21 And the retinal hemorrhages that Lincoln had were
22 widespread, out to the ora serrata. Fancy term, but at the --
23 the back of the eye is the retina and the ora is essentially
24 side-to-side. So it's the entire extent of the retina.

25 And then subsequent to that -- and not in my report, but

1 Dr. Mamalis talked about retinal folds.

2 Q. And Dr. Mamalis testified here this morning and so
3 the jury's had a mini lecture on -- on some of the findings
4 that he found on pathology, but these are findings that are
5 found prior to Lincoln's death. Is that true?

6 A. Yes, ma'am.

7 Q. And that was -- let me ask you, I think that -- well,
8 let me make sure that we clarify. At this point what is
9 Lincoln's condition?

10 A. Fairly grave at this point.

11 Q. Okay. And on February 27th, is that the day that he
12 was removed from the ventilator?

13 A. I -- I believe so.

14 Q. Okay. Fair to say -- do you -- do you have in your
15 notes when the retinal exam was done at Primary Children's?

16 A. February 23rd and 24th.

17 Q. Okay. So within --

18 A. A couple of days after.

19 Q. -- couple of days after he arrives?

20 A. What -- what happens is the -- the pupils are an idea
21 to tell -- (unintelligible) they're a window to the brain, but
22 they're a window to the brain. And the neurosurgeons don't
23 want us -- specifically the ophthalmologists -- to dilate the
24 eyes which is the way you prepare -- if you've ever had a eye
25 exam you get the drops that make the light really bright

1 because your pupils get dilated and that allows the
2 ophthalmologist to have a much better view of the eye.

3 And Lincoln was ill those first couple of days and they
4 didn't want to dilate the pupils because they didn't want
5 to be able -- they wanted to be able to look at how his pupils
6 were reacting while in the intensive care unit, so there was a
7 couple of days between when he came in and when they were able
8 to look.

9 **Q.** And by the 23rd they'd made the determination that
10 there was nothing really that they were watching for?

11 **A.** He had -- I won't say stabilized, but had gotten to
12 the point where they felt like we could safely dilate the
13 eyes.

14 **Q.** Okay. And that -- is that a test that was performed
15 by an ophthalmologist at Primary Children's?

16 **A.** Yes, ma'am. Dr. Hoffman, I believe.

17 **Q.** Dr. Robert Hoffman?

18 **A.** Yes, ma'am.

19 **Q.** Okay.

20 **A.** And he felt --

21 **MR. BUSHELL:** Objection, Your Honor. I don't think
22 there's been a foundation laid for the doctor to opine on
23 ophthalmology quite yet.

24 **MS. TOOMBS:** I'll go through a few more questions and
25 lay some foundation.

1 **THE COURT:** Okay.

2 **Q. (BY MS. TOOMBS)** Doctor, as part of this consultation
3 process with Safe and Healthy Families --

4 **A.** Yes, ma'am.

5 **Q.** -- do you rely extensively -- well, do you consult
6 with other physicians in the field in order to form your
7 opinion?

8 **A.** Oh, my gosh -- I mean, yes, ma'am. I don't mean to
9 say it like that, but the way our team works at Safe and
10 Healthy is that we -- I am the consulting physician, so I will
11 obtain history from the family. I will talk to the various
12 subspecialists involved in Lincoln's care, including
13 ophthalmology, neurosurgery, ICU, trauma team, I'm sure the --
14 radiology.

15 And then we as a team, the Safe and Healthy Family team,
16 we have weekly review conferences and we review the cases that
17 have been -- that have come in the previous week. And when --
18 my name is at the bottom of this -- of my report and I fully
19 acknowledge and accept that, but the assessment is a group
20 assessment of our entire team. This is not -- it is Bruce
21 Herman signing this, but it is also reflecting the feeling of
22 all those physicians I consulted with and, specifically, our
23 Safe and Healthy Family team.

24 **Q.** Okay. And so throughout the course of Lincoln's stay
25 at -- at Primary Children's, he -- you spoke with the various

1 different doctors in the various different fields and you
2 relied upon those fields.

3 **A.** Yes, ma'am.

4 **MS. TOOMBS:** Okay. Your Honor, I think that the
5 foundation has been laid as to how he's forming his opinion
6 and he -- we would ask that he be allowed to testify to how
7 he's forming his opinion.

8 **MR. BUSHELL:** That's fine.

9 **THE COURT:** Okay.

10 **MS. TOOMBS:** Okay.

11 **Q. (BY MS. TOOMBS)** I believe you started to talk about
12 Dr. Hoffman.

13 **A.** Uh-huh.

14 **Q.** Go ahead and --

15 **A.** I mean, Dr -- it was Dr. Hoffman's opinion and,
16 ultimately, our opinion. I'm more than happy to discuss that
17 further. But Dr. Hoffman felt that the retinal hemorrhages
18 were most consistent with abusive head trauma by shaking or
19 shaking with impact.

20 **Q.** Okay. Now, there's been some discussion here today
21 about the term "shaken baby."

22 **A.** Okay.

23 **Q.** And are you familiar with the concept that there's a
24 controversy about "shaken baby"?

25 **A.** Yes, ma'am.

1 Q. Okay. Has there been a change in what you call it?

2 A. Several years ago because of -- when the word
3 controversy is used, there really is no controversy --

4 Q. Okay.

5 A. -- in what I would consider the mainstream medical
6 fields. For instance, the American Academy of Pediatrics, the
7 American Academy of Ophthalmology, Pediatric Radiology
8 Society. I -- I don't think there is any controversy about
9 whether shaking in and of itself can cause injuries. There's
10 no question in my mind that shaking can cause injuries.

11 That is -- I won't say not related to this case. It --
12 it can be if you want it to be, but Lincoln had evidence of
13 shaking and shaking with impact. Specifically he had what I
14 would consider a very significant skull fracture. Where his
15 skull fracture is is what's called the base, a basilar skull
16 fracture at the base of the skull.

17 Q. Would it -- I don't mean to interrupt. Would it be
18 helpful if I brought a model out?

19 A. Sure.

20 Q. Would that help?

21 (Pause in proceedings)

22 Q. Dr. Herman, are you familiar with this model?

23 A. I've seen many models, but --

24 Q. Many models. Does that look like --

25 A. Sure.

1 Q. -- something that you -- will that be helpful to you?

2 A. Yes, ma'am, because Lincoln's skull fracture sort of
3 started down here beneath his ear. And as I recall, if I may
4 refer to my report --

5 Q. Uh-huh.

6 A. Let me put my glasses back on. But at the time that
7 I saw him he had an area of bruising and swelling back here
8 associated with, presumptively -- and there's no reason to say
9 that there were two different injuries -- but he had bruising
10 of his scalp overlying the significant skull fracture which is
11 way down here and extended posteriorly along the base of the
12 skull.

13 And why the base of the skull is significant is that the
14 base of your skull is thicker. It's, therefore, likely harder
15 to break and certainly less common. My experience in the
16 emergency department, basilar skull fractures are often seen
17 with car crashes or big falls or things like that. The most
18 common fracture we see with kids from falls is what's called a
19 parietal skull fracture, up here on the main vault of his
20 skull.

21 But his skull fracture extended from the petrous bone up
22 into the occipital bone along what are called the sutures
23 where is -- it's where the bones grow together as the child
24 grows older. And it sort of -- it was a very what we call
25 diastatic and extensive and long fracture, implying that it

1 likely caused -- or was caused by a very significant impact
2 and not just a fall.

3 Q. Okay. Now, when you say very significant impact,
4 there's different definitions. I mean, if I -- if I put that
5 skull up on -- on top of this, is that a very significant
6 impact?

7 A. A fall from there to there?

8 Q. From this to here.

9 A. I think it would be unlikely that a fall of that
10 degree would have caused this fracture.

11 Q. What about multiple stories, for example?

12 A. Ma'am?

13 Q. If the -- if the fall were from multiple stories?

14 A. Sure.

15 Q. Okay.

16 A. I mean, I -- I -- my experience in the emergency
17 department where we see basilar skull fractures -- not
18 frequently, by any means. They're pretty uncommon in kids
19 because the base of the skull is pretty protected, but we see
20 them in car crashes. We'll occasionally see them in auto-bike
21 accidents where a child's riding his bike and hits -- gets hit
22 by a car or goes down a -- a hill on a bike and crashes and
23 burns. It's -- it's a significant -- and as far as -- like I
24 can't put a degree of force or a measurement. All I can say
25 is based upon my experience with both accidental and inflicted

1 head injury, this implies significant impact.

2 Q. Okay. And there's also been talk this morning about
3 other causes of retinal hemorrhaging, not -- not to go too far
4 down that road, but one of the things that was brought up is
5 crushing.

6 A. Uh-huh.

7 Q. If -- if the baby's head is crushed, would that
8 possibly cause these kinds of -- that -- that was dealing with
9 the eyes, the question that I have for you is is that -- is
10 the fracture that you're seeing a crush kind of fracture?

11 A. It wouldn't -- it would not be typical of a crush
12 injury. A crush injury -- and if I may, a crush injury could
13 very possibly have caused his retinal findings. There is --
14 we rely -- when we make decisions or assessments, we base upon
15 our clinical experience and that available literature that
16 exists. That's why we do research. We try to find out how
17 frequent or -- or what causes various things.

18 And there are two very -- well, what we know for retinal
19 hemorrhages, severe retinal hemorrhages with retinal folds, we
20 can see those in fatal car crashes. We can see those in a --
21 there's a good case report of a child in, I believe,
22 New Zealand that fell 10 meters which is 30 feet. And then
23 there is one very good case report of a crush injury causing
24 these kind of retinal hemorrhages when a TV fell -- one of the
25 large TVs fell over and crushed a child's head. That caused

1 these findings.

2 That said, the crush injury usually causes -- I hate to
3 be -- crushing of the skull. So you see -- typically, a crush
4 means it's getting force from both sides and so you usually
5 see bilateral fractures. You'll see indentations because of
6 the actual crush and the force from the TV, and you'll see
7 associated brain injury.

8 Q. Okay.

9 A. And that -- it was, you know, was not the case in --
10 in Lincoln.

11 Q. Not the case in Lincoln.

12 A. No, ma'am.

13 Q. Okay. Now, we've -- so we've talked about the -- the
14 retinal findings; we've talked about the -- the fracture. You
15 indicated that there was bruising here.

16 A. Yes, ma'am.

17 Q. In your examination of Lincoln, did you find any
18 other bruising?

19 A. Double check. Oh, he had some marks on his leg and
20 groin from the attempts for IVs. And then he had what's
21 called an intraosseous, an IO needle placed in one of his --
22 in his left tibia, his left shin.

23 Q. Okay. I am going to show you --

24 **MR. MILES:** It's been admitted so it's not going to
25 be --

1 **MS. TOOMBS:** Oh, it's already been admitted.

2 **MR. MILES:** Uh-huh.

3 **Q. (BY MS. TOOMBS)** I'm going to try and show you what's
4 been previously marked Exhibit 60. No?

5 **MR. MILES:** Strike one.

6 **MS. TOOMBS:** Strike one. And now he's turned off the
7 lights so my tiny little eyes can't see.

8 **MR. MILES:** 90.

9 **MS. TOOMBS:** I was close. Just a six upside down.

10 **Q. (BY MS. TOOMBS)** Okay. If it's more comfortable, you
11 can step down and take a look at that. What we've got here is
12 a -- a photograph of Lincoln Penland's legs. Can you describe
13 for the jury what we're talking about?

14 **A.** That was -- those pokes are from when they tried --
15 during the resuscitation process, I believe at McKay-Dee, they
16 poked what's called an intraosseous needle is when you can't
17 get a IV then you have to get access any way you can. The
18 bone marrow is a -- a good place to be able to give medicines
19 as needed.

20 **Q.** Okay. And so aside from the bruise on his head and
21 the medical artifacts, injuries, if you will, did you see any
22 other signs of external trauma on Lincoln?

23 **A.** No, ma'am. Not that I recall.

24 **Q.** And I'm -- I'll have you look also at his
25 Exhibit 91.

1 **THE COURT:** Ms. Toombs, I don't show that Exhibit 60
2 has been entered.

3 **MR. MILES:** No, we're on 90.

4 **MS. TOOMBS:** We're not -- we're on 90, Your Honor.
5 I -- I --

6 **MR. MILES:** We had the number wrong.

7 **THE COURT:** Oh, okay. So that was 90?

8 **MS. TOOMBS:** Yes. That was 90.

9 **THE COURT:** All right.

10 **MR. MILES:** We've done 90 and we've done the one
11 before this one, but we haven't done the one that's up next.

12 **Q. (BY MS. TOOMBS)** I'm going to show you a paper copy of
13 what's been marked proposed State's Exhibit 91.

14 (Off-the-record discussion)

15 **MS. TOOMBS:** Okay. Move to admit Exhibit 91.

16 **THE COURT:** From defense.

17 **MR. BUSHELL:** No objection.

18 **THE COURT:** Okay. Exhibit 91 is received.

19 **MS. TOOMBS:** Permission to approach?

20 **THE COURT:** You may. Thank you.

21 **MS. TOOMBS:** And permission to publish.

22 **THE COURT:** Any objection from defense?

23 **MR. BUSHELL:** Not at all.

24 **THE COURT:** Okay. You may publish to the jury.

25 **MS. TOOMBS:** Thank you.

1 **Q.** (BY MS. TOOMBS) Exhibit 91 shows another view of
2 Lincoln Penland in the hospital. Is this his condition when
3 you observed him as well?

4 **A.** As reflected by my report, this is very consistent
5 with what I saw.

6 **Q.** Okay. And we're not seeing any bruising on his back
7 or anything like that.

8 **A.** No, ma'am.

9 **Q.** Okay. You had also indicated that there -- in a --
10 well, let me back up.

11 Did Lincoln have brain injury?

12 **A.** Yes, ma'am.

13 **Q.** Okay. Can you explain to the jury what kinds of
14 injuries he's presenting with?

15 **A.** Initially on the CT scan, he had some mild cerebral
16 edema or swelling of the brain. That can be from direct
17 trauma; it can be from lack of oxygen. But more importantly
18 to our assessment, he had significant intracranial hemorrhage
19 initially and then had associated injuries that we saw later
20 on the MRI.

21 **Q.** Okay. And when you say "significant," can you use
22 that model to explain to the jury where the hemorrhaging was?

23 **A.** Okay. I'll read it --

24 **Q.** Okay.

25 **A.** -- and then I'll show you.

1 **Q.** Okay.

2 **A.** They were high-density subdurals. And radiologists
3 and non-radiologists use colors on the X-rays or black and
4 white on colors -- or on X-rays to determine findings like
5 blood in the -- and high density would be consistent with
6 acute injury, bleeding, although the CT is not the best way to
7 date the bleeding.

8 That's a -- there were high-density subdurals noted along
9 the falx. And that's the area between the two sides of your
10 brain is called the falx.

11 And there was also subdural blood. Subdural blood means
12 underneath the dura. There are two kinds of intracranial --
13 extracranial -- intra -- inside -- not inside the brain, but
14 outside the brain but inside the skull. Sorry. I don't want
15 to confuse -- but subdurals mean underneath the dura which is
16 the thick lining of the skull.

17 Subdurals diffusely along the right frontal convexity.
18 And that means, basically, along the anterior part of the
19 brain, along the falx, in between the two sides of the brain.
20 And then there was also some subarachnoid blood.

21 What we believe happens with severe shaking and/or
22 shaking with impact is that there are vessels called bridging
23 vessels that go from the brain into the bigger vessels around
24 the brain. And there's a shearing -- lack of better word --
25 tearing of those vessels with the brain moving back and forth

1 and stretching and tearing those vessels. And the -- when you
2 tear those vessels, some of that blood gets into the spinal
3 fluid which is the subarachnoid fluid as well. So it's not at
4 all unusual to see subdural and subarachnoid blood inside, and
5 that was what was seen on the CT.

6 Q. Okay.

7 A. If I may go to the MRI and talk about the additional
8 blood.

9 Q. Yes. Please do.

10 A. He had a MRI performed on February 22nd so a little
11 over two days after he came in. And this showed a number of
12 different findings. It showed extensive cytotoxic edema in
13 both cerebral hemispheres consistent with hypoxic-ischemic
14 encephalopathy. So there was a diffuse lack of oxygen to his
15 brain for a period of time after the initial trauma occurred.
16 And so we saw that.

17 There were extensive -- at that time -- subacute subdural
18 hemorrhages noted over both convexities -- so along both sides
19 of the brain -- in posterior falx -- which is the area in
20 between the brain in the back, and parafalcine areas that sort
21 of layers out back here. The falx goes back here and this is
22 the cerebellum, and he had a little blood sort of in this
23 parafalcine area here and over the tentorium. And the
24 tentorium is that -- the membrane above the cerebellum beneath
25 the cortex.

1 Then he had an MRI of the cervical spine which is here.
2 We talked about how his initial CT of his cervical spine was
3 read as normal. I would -- I don't see discordancy between
4 the initial CT -- I don't see inconsistency in that the
5 initial CT was read as normal and this MRI was significantly
6 not normal. I've -- but I defer -- I've talked to the
7 radiologists about it and they say this is not at all unusual
8 because of the different modal -- the way they scan.

9 That said, the MRI of the cervical spine showed evidence
10 of ligamentous strain extending from the first to the fourth
11 vertebrae. So this is high in the neck. And this is very
12 consistent with stretching of those ligaments, straining of
13 those ligaments, which I believe came during significant
14 hyperflexion and extension likely secondary to shaking. We
15 can see it in car crashes, things like that, where you have a
16 hyperflexion-hyperextension event, but in this case, I believe
17 it was due to shaking and with the impact.

18 There was a moderately large collection of blood,
19 posterior epidural hematoma, in the mid-sacral area extending
20 up to the lower thoracic area. If I --

21 **Q.** You may stand and show them exactly what you mean.
22 Yes.

23 **A.** And I'll take this off. I (unintelligible) coat off,
24 but it's hot.

25 **Q.** I'm not sure I warned you there would be no air

1 conditioning today.

2 **A.** So you're -- you have your cervical spine; you have
3 your thoracic spine, which is your thorax, where your rib cage
4 is; then you have your lumbar area here; and then your sacrum
5 is sort of down here. And his extended from the mid-sacral
6 area up to the lower thoracic area. And this is also quite
7 consistent with hyperflexion and extension, presumptively, and
8 in this case, there -- and the lack of an explanatory history
9 for that hyperflexion-extension, and we have other evidence of
10 shaking that is consis -- quite consistent with -- with
11 shaking.

12 It's not -- a couple of things. This is not -- having
13 discussed this with radiology, this was not blood that just
14 drifted down from his head to the spine. These are separate
15 injuries, and this is a separate injury from this.

16 And so he had evidence of hyperflexion-extension of the
17 spine at the neck and the back. And we have -- that's been
18 seen both in my clinical experience at Primary Children's and
19 reported in the literature to occur with abusive head trauma
20 by shaking or shaking with impact.

21 **Q.** Okay. Now that I've given you an opportunity to take
22 off your -- your jacket, I'm going to show you what's -- what
23 we've got as Exhibit 92. Would that be helpful for you to
24 explain to the jury what you have just described using your
25 own --

1 **A.** It -- excuse me. It might.

2 **Q.** Okay.

3 **MS. TOOMBS:** Move to -- before I have you do that --
4 move to admit Exhibit 92.

5 **MR. BUSHELL:** No objection.

6 **THE COURT:** Okay. State's Exhibit 92 is received.

7 **MS. TOOMBS:** And I'll put it up on the screen.

8 **THE WITNESS:** Okay.

9 **MS. TOOMBS:** Permission to approach?

10 **THE COURT:** Yes. Thank you.

11 **Q. (BY MS. TOOMBS)** All right. Again, with the
12 microphone -- okay. So Exhibit 92, what are we looking at
13 here?

14 **A.** This is the vertebral column. I don't want to say --
15 but this is the cervical spine and his -- evidence of
16 ligamentous strain was up here. And then this is the sacral
17 area, and it extended from the midsacral area up to -- up to
18 here. And you can see the curve of the spine and how those
19 areas are -- would be susceptible to those hyperflexion-
20 extension areas with significant forces.

21 Again, we will see this in car crashes or severe injuries
22 where a child is unrestrained and or their neck may go forward
23 and backwards very forcefully. We will -- this is pretty
24 unusual in accidental trauma. That's -- we do see it, but,
25 again, it requires significant flexion and extension.

1 **Q.** Okay. And I think you indicated those are two
2 distinct injuries, fair to say?

3 **A.** Yes, ma'am.

4 **Q.** And those two injuries are distinct from the skull
5 fracture, the brain injury --

6 **A.** And the retinal hemorrhages.

7 **Q.** -- and the retinal hemorrhaging. Okay.

8 Now, are -- are you aware -- well, you were a consulting
9 physician. Were you aware that Lincoln Penland passed? He --

10 **A.** Yes, ma'am.

11 **Q.** -- know he died. And after he passed, he was taken
12 over for an autopsy. Is that something that's common in cases
13 of --

14 **A.** Certainly death at Primary, yes, ma'am.

15 **Q.** Okay. So were you also aware that there were
16 additional fractures that were possibly spotted at Primary,
17 but confirmed at autopsy?

18 **A.** Yes, ma'am.

19 **Q.** Okay.

20 **A.** Well, at Primary, on the first skeletal survey there
21 was some irregularity noted of his, I believe, left proximal
22 humerus, but let me just -- before I -- yes. Left proximal --
23 your humerus is your upper arm. He had an irregularity noted
24 And then he had a postmortem CT -- after he died -- and then
25 that showed -- confirmed a fracture of the left proximal

1 humerus. Then the pathologist also found an associated
2 fracture in very similar area on the right side.

3 Q. And would those injuries also be distinct from the
4 ones that we have already previously described: The brain,
5 the fracture, the cervical, the lumbar?

6 A. Yes, ma'am.

7 Q. Okay. Given your -- the injuries that Lincoln
8 Penland sustained, how would you expect him to present
9 clinically?

10 A. What we know --

11 Q. Here, if -- do you want me to take that?

12 A. I can just put it aside.

13 Q. Okay.

14 A. The problem with symptomatology after abusive head
15 trauma is that they don't usually come in right afterwards.
16 So we, as clinicians, have to rely upon what we see with
17 accidental head injury and what we see with -- for lack of
18 better term -- confessions of those that have caused -- done
19 abusive head trauma.

20 And what we know from fatal abusive head trauma, all
21 abusive head trauma, and then all abusive head trauma in those
22 people that have admitted to causing it, all describe some
23 acute change in the child's level of consciousness afterwards.
24 It can go from stunned to unconsciousness. There's a fairly
25 significant body of literature that collects these stories.

1 There is -- in a fatal abusive head injury, there are --
2 there's two articles, actually. One is looking at all
3 children who died of both accidental and abusive head trauma,
4 and all those children who died were abnormal after the injury
5 was incurred. They were not awake, alert, certainly not
6 smiling, making good eye contact, that sort of thing. That's
7 all comers.

8 With abusive head trauma, again, we -- we cannot -- and
9 this is where some of the "controversy" -- and I'm going to
10 put it in quotes because in my mind it's not a controversy --
11 about how much force, how much -- what children are like after
12 these injuries, you cannot ethically experiment so we have to
13 rely on our best clinical observations.

14 And what we know from the literature, what I have had the
15 opportunity to -- I've had two cases of abusive head trauma in
16 which the perpetrator subsequently -- as part of a study,
17 they -- we did a research study and had them recreate what
18 they did to their child. Both of these were a father. Sorry.
19 And in both of those re-creations, the fathers said the child
20 was never normal after they did what they did. In both cases
21 it was a variation of shaking or shaking with slamming.

22 So I feel that there is a fairly large and significant
23 medical evidence for the timing of injuries and what children
24 appear -- appear after those injuries, and not to -- but those
25 two studies I was part of we presented at two or three

1 national conferences I believe in 2012 or around -- around
2 about, it's in my CV, but --

3 Q. And your CV is -- I'm not surprised you don't
4 remember every --

5 A. A CV is a resume. Sorry.

6 Q. But it -- it was fairly -- fairly recently.

7 A. But, in other words, it wasn't -- it's not something
8 I just say happened. We presented this to national scientific
9 bodies and added to what I feel is a strong medical body --
10 body of medical evidence that allows me and us to make the
11 assessments that we make.

12 Q. And -- and those were -- you were actually
13 participating, speaking with the perpetrator in those events?

14 A. Yes, ma'am.

15 Q. And --

16 A. One was through an interpreter so, I mean --

17 Q. For what it's worth.

18 A. But -- yeah.

19 Q. Okay. But in those cases, the -- the report from the
20 person who was immediately there, the perpetrator, not ever
21 normal again.

22 A. Correct.

23 Q. And what would you expect in Lincoln's case, then?

24 A. He would -- I would say that any child -- in this
25 specific case, Lincoln, but any child who suffers this degree

1 of trauma, would not be normal afterwards. Would he be
2 completely unconscious? I can't say. There is -- there is
3 certainly a known variance of how far gone they get, but I can
4 say with certainty that he would not have been normal
5 afterwards, would not have been able to sit up on his own and
6 eat on his own, based upon my clinical experience and what I
7 feel is a fairly good medical evidence base.

8 Q. Now, you -- are you aware that Lincoln was at the
9 daycare just prior to dad coming and -- and finding him in
10 this nonresponsive state?

11 A. Yes, ma'am.

12 Q. Okay. And are you -- were you informed or are you
13 aware that there was a timeline that was created by the --
14 well, let me back up.

15 Were you aware that there was a text message sent by the
16 baby-sitter to mom?

17 A. I think I -- I put something in my: How are the boys
18 doing?

19 The sitter texted back at 4:19 that the patient had eaten
20 two or three times during the day, not wanting to take the
21 bottle at lunch. Slept from 1:00 to 3:00 p.m. and then took 1
22 ounce and finished some beans from lunch and went back to
23 sleep.

24 Q. And based on that text message and the -- the
25 symptoms that you would expect Lincoln to be seeing, do you

1 have an idea of when this injury would have occurred based on
2 that text message?

3 **A.** Based upon my experience and what I feel is a pretty
4 good medical evidence, a broad medical evidence based upon the
5 literature, clinical experience and so forth and so on, I -- I
6 find that -- I would find that -- I do not believe that
7 Lincoln could have done this after the injuries occur.

8 **Q.** So if he was in that condition at 4:19 p.m., he could
9 not have eaten the beans or -- excuse me. If he had sustained
10 these injuries before lunch, for example, at 4:19 he would
11 certainly be displaying symptoms.

12 **A.** I am not omniscient.

13 **Q.** Right.

14 **A.** I -- I wasn't there. Alls I can say is based upon
15 what I know from my experiences and from the medical
16 literature that I would think it close to inconceivable that
17 the injuries -- that he could have done all that stuff after
18 those injuries occurred.

19 **Q.** Okay. What if you were also told that he was playing
20 in his highchair rocking back and forth --

21 **A.** I cer -- that one I feel totally -- this child would
22 not have been playful after this injury.

23 **Q.** So let me make sure I've -- I -- I can -- everybody
24 understands a couple of terms that you have used. You talk
25 about acute and subacute injuries. What -- what do those

1 mean?

2 **A.** I --

3 **Q.** I guess in --

4 **A.** There's -- when we date bleeding in the head -- and
5 I -- I am going to date that. I rely upon my radiology
6 colleagues and even they will hesitate, but it goes from
7 hyperacute to acute to subacute to chronic. And there's a --
8 sort of a evolution of time. When -- at how many hours does
9 it go from hyperacute to acute and acute to subacute and acute
10 to chronic, I -- let's just say that there's a period of time
11 during that and I'm not -- I would hesitate to say that it's,
12 oh, at 36 hours it becomes subacute. I -- I would defer to my
13 radiology colleagues and ask them to help me guesstimate. And
14 it is a guesstimate. There's no definitive X-ray that comes
15 with a time stamp.

16 **Q.** It doesn't. So let me ask you, if someone said, for
17 example, referring specifically to the injuries that you saw
18 in Lincoln Penland: Well, I've seen kids that can last for
19 months without symptoms with brain injuries. Would that be
20 consistent with what you would expect in Lincoln's case?

21 **A.** No, ma'am.

22 **Q.** Okay. What -- what -- what would you -- I mean,
23 would you expect him to present -- would you expect him to do
24 anything? Would there be some --

25 **A.** This is -- he would be -- this is where, again, I --

1 I hesitate to say what degree he could or couldn't do.

2 Q. Sure.

3 A. I can say very comfortably that after these injuries
4 occur that he would not have been able to be playful -- he
5 would not have been playful. I feel that his symptoms would
6 likely have progressed relatively rapidly after -- because of
7 the degree of injury he had, because of the extensive -- on
8 the MRI that was performed three days later, that he had
9 diffused extensive hypoxic-ischemic encephalopathy, basically
10 he wasn't -- a lack of oxygen because once he got to medical
11 care he was given oxygen and supported. So we know that his
12 lack of oxygen had to occur prior to that. And the degree of
13 extensive damage to his brain would indicate that it was
14 pretty significant and that, again, he -- in my experience, he
15 would have been significantly altered.

16 Q. Okay. Do you -- would you expect to see vomiting
17 with this?

18 A. You can. I mean, yes. You certainly can see
19 vomiting. Vomiting is one of those symptoms that we talked
20 about earlier that in our research on subtle findings of
21 abusive head trauma, vomiting is one of them. So if --
22 Lincoln could have vomited after this. That said, I don't
23 think he would have been able to be awake and alert and/or eat
24 spontaneously and -- and that.

25 Q. Okay. So definitely something a normal caregiver

1 would have noticed.

2 **A.** Yes. Oh, yes. I mean, from, again, what I feel is a
3 fairly robust large body of literature in the medical
4 research, what I see in my practice in 30 years in the ER, my
5 17 years of child abuse experience and, then -- I won't say
6 the best, but in those -- my two cases of our research study
7 where the perpetrator admitted to causing these things and
8 what they described, yes, I have no -- he would have been
9 significantly altered.

10 **Q.** Not something that could have just been passed off
11 as --

12 **A.** Yeah. And both -- both -- both parents, in my
13 case -- and it's consistent with what the literature says,
14 they are not normal after they appear. In the milder cases
15 they can sometimes appear normal. I've had -- I've had cases
16 where that's how kids get repeated head injury -- repeated
17 abusive head trauma. Some kids come in with evidence of
18 previous injury, so there's a degree or a susceptibility with a
19 certain degree of violence -- for lack of better term -- a
20 child may briefly lose consciousness and then subsequently
21 return to normal and appear normal until they are reinjured at
22 a subsequent time. That's how we know that we miss it
23 sometimes.

24 **Q.** But that wouldn't be the case with Lincoln.

25 **A.** Not in a -- not in a -- not in a fatal case and not

1 with the extent of damage that Lincoln had.

2 Q. Did you see any evidence that would indicate that he
3 had suffered previous injuries?

4 A. No, ma'am.

5 Q. Would you say --

6 A. But, I mean, you can't -- like, for instance, his
7 fractures, by the time he had his follow-up skeletal survey
8 which is approximately -- well, he didn't have a follow-up
9 skeletal -- or did he? I -- that it takes about a week for
10 healing to show up on X-rays. And at no -- at no point at
11 Primary did he show evidence of -- like, for instance, his
12 fractures were not healing. His brain injuries all appear to
13 be of a single age, of a single event -- consistent with a
14 single event.

15 Q. So consistent with having all been inflicted on
16 February 19th?

17 A. Yes, ma'am.

18 Q. Okay. Now we talked -- I believe you talked a little
19 bit about differential -- well, actually I think you talked
20 quite extensively about differential diagnoses, particularly
21 with your example about vomiting and what you do. Are -- do
22 the differential diagnoses start to narrow considerably when
23 you are looking at a constellation of injuries?

24 A. Yes, ma'am. So we talked about the differential
25 diagnosis of retinal hemorrhages, fairly broad, but

1 significant with trauma or significant disease. We talked
2 about the differential diagnosis of significant retinal
3 hemorrhages with retinal folds being extremely narrow: fatal
4 motor vehicle crashes, crush injury, and a huge fall. The
5 constellation and the degree and the number of injuries that
6 Lincoln had I feel are very consistent with and specific for
7 abusive injuries by shaking or shaking with impact. I -- I
8 see no other -- in my experience, I have not seen this degree
9 and types of injury from accidental head injury or
10 accidental -- yeah, accidental head injury without -- with the
11 exceptions that I already mentioned, fatal -- fatal crashes
12 and -- and that.

13 Q. So if we were to take these injuries and separate
14 them out there could be all kinds of explanations for that.
15 Is that fair to say?

16 A. Yes, ma'am. I mean, I think, for instance, his
17 bilateral humeri fractures, those are pretty significant too.
18 We don't see those in infants, certainly, from accidental or
19 something they do on their own. We see it from grabbing,
20 wrenching, pulling, or direct force upon those areas.

21 Q. So, for example -- once again, now this is -- I'm
22 going to let you feel this. This is a fixed spine, correct?

23 A. Yes, ma'am.

24 Q. So we're not going to see the shaking back and forth
25 that you've described in Exhibit 92. Correct?

1 **A.** Correct.

2 **Q.** What -- but if I were to try and, say, give a
3 differential diagnosis for all of the injuries -- I'm just
4 going to leave the legs off because they don't want to work
5 with me today.

6 If I were to say I'm going to explain all of these
7 injuries that occurred, and the -- the explanation is provided
8 that a three-year-old child picked up the baby, what would you
9 expect to find from picking up the baby? Would you expect to
10 find the fracture that you see in the brain?

11 **A.** Most -- most likely no injuries. And, again, my
12 experience would -- in the ER would support that.

13 **Q.** So no injuries from picking up the baby.

14 **A.** From -- in and of itself, yes, ma'am.

15 **Q.** What about dropping the baby from a toddler height?

16 **A.** It's conceivable you -- it depends on the surface the
17 baby was dropped onto.

18 **Q.** Carpet.

19 **A.** It's -- it's unlikely that the child could have had
20 a -- we can see some parietal skull fractures from minor
21 falls, most common -- the best is a parent who picks up their
22 infant in the car seat and the handle's not buckled in so the
23 child launches out of the car seat and falls onto a linoleum
24 or tile or concrete floor. Occasionally those kids will have
25 a little bit of a -- I mean, a little bit -- they will have a

1 parietal linear skull fracture.

2 Q. Would they cry when that happened?

3 A. Oh, yes.

4 Q. Now, but that is, again, the parietal.

5 A. Correct. Now down --

6 Q. And that's not where we're seeing Lincoln.

7 A. Not -- not down where he had his fracture.

8 Q. Okay. If I were to, say, take a baby, grab him by
9 the upper arms, shake and slam him down onto that table beside
10 you, would that explain the injuries that we see in Lincoln
11 Penland?

12 A. The entire constellation of his findings, that is a
13 very plausible, and in my opinion, a very likely cause of his
14 injuries.

15 Q. And, again, when we're looking at Lincoln's injuries,
16 is it important to look at all of his injuries?

17 A. We -- we talked about differential diagnosis and how
18 we create a differential diagnosis. And you have to, as best
19 you can, try to come up with a single or a series of events
20 that could explain his injuries. And with the number and
21 types of injuries that he had that are significant for -- or
22 have evidence of significant impact, his skull fracture, with
23 the multiple signs and findings consistent with shaking, or
24 shaking with impact: his eyes, his brain, his blood, his back,
25 his neck, and then with his bilateral humerus fractures the --

1 the differential is extremely narrow. And I've -- in my
2 clinical experience, in my review of the literature have not
3 found a case that this has been caused by a three year old.

4 Q. So unlikely to have been caused by a three-year-old?

5 A. Yes, ma'am. I mean, no, ma'am. I don't think so.

6 Q. Okay.

7 A. I don't believe so.

8 Q. And consistent with, at least, an adult grabbing him
9 by the arms, shake, slam.

10 A. Again, it is very consistent with what I've seen,
11 what I have -- very consistent with the injuries that occurred
12 from some of the confessions that -- that -- that I have been
13 part of and have been reported in the literature.

14 Q. So, Doctor, after all of your review of this case,
15 after consulting with your colleagues at Safe and Healthy
16 Families, as well as all of the other experts, the ped -- the
17 experts in their fields at Primary Children's, what was your
18 conclusion in this case?

19 A. It's my assessment, three years ago, is the same
20 as -- we review -- we re-reviewed this case a few weeks ago
21 just because I wanted to make sure that I felt very
22 comfortable saying this, but his -- I'll just go to my summary
23 statement. Sorry.

24 Q. You're fine.

25 A. Where is my -- the 27th --

1 Q. Summary statement from the 27th?

2 A. Uh-huh.

3 Q. Let's see, I believe, right here? Does that look
4 familiar?

5 A. Yes, ma'am.

6 Q. Okay.

7 A. They're very consistent with and specific for abusive
8 head trauma and very consistent with significant abusive head
9 trauma by shaking and/or shaking -- well, we know we have
10 impact, but the brain injuries could have conceivably occurred
11 from shaking alone or shaking with impact.

12 Q. Okay. And could Lincoln have survived these
13 injuries?

14 A. I -- I don't know. I -- if he would have come
15 immediately to medical atten -- I can't answer -- I wish I
16 could answer that, but I can't.

17 Q. Fair to say, you always want to be able to say yes?

18 A. Oh, yeah. I mean, when we see kids who are really,
19 really, really sick in the ICU or in the ED, I always say,
20 let's -- let's hope for the best and deal with what we have
21 to.

22 Q. Okay. And in this case, we had to deal with what?

23 A. With death.

24 **MS. TOOMBS:** Might I -- may I have just one moment?

25 **THE COURT:** Uh-huh.

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(Off-the-record discussion)

MS. TOOMBS: It's about 3:00 o'clock. Your Honor, we've been at this for about an hour and a half. I'm wondering if we can take a quick break at this point?

THE COURT: From the defense?

MR. BUSHELL: That's fine with us. I'm just curious, is the State done on direct?

THE COURT: I don't know.

MR. BUSHELL: Do we intend on coming back after the break and -- directing still?

MR. MILES: We might have a couple of questions.

MS. TOOMBS: We might have just a couple of questions, but I think -- I need to confer with Mr. Miles really quickly, but I think I can -- I think that I'm done for --

MR. MILES: Direct.

MR. BUSHELL: I would prefer to finish up the direct, let's take a break, we'll come back and cross.

MS. TOOMBS: Certainly.

THE COURT: Can we do that? Okay?

MS. TOOMBS: Certainly.

(Off-the-record discussion)

Q. (BY MS. TOOMBS) We've talked at length about the -- the fractures. I don't know that we've talked, really, about the pain that Lincoln would have been. It's hard for a baby

1 to tell us pain, but what would you expect him to be telling
2 us as to his pain levels?

3 **A.** Depends on his level of consciousness after it
4 occurred.

5 **Q.** Okay. So if he's awake, for example, if he's
6 conscious.

7 **A.** These are -- the actual injuries themselves, the
8 mechanism and force required to cause them would cause
9 significant pain. He would have cried very hard. For how
10 long, I can't say, but he -- he would have been symptomatic
11 from the injuries in and of themselves, the cause of those
12 injuries. Fractures can and are painful and for how long
13 depends on the type of fracture and -- but they're
14 certainly -- when the fracture occurs, it's very painful.

15 **Q.** Okay. And would further manipulation -- for example,
16 if you're holding that baby by his head to lay him down or
17 manipulate him or do anything, would that also cause pain?

18 **A.** If you are possibly touching another part of the
19 skull, but if you're touching right over that area, I would
20 expect it to be significant. That's one way we can find skull
21 fractures is when we palpate a baby's head and when they cry
22 and -- when we palpate that area. And if there's associated
23 swelling, it would indicate to us in the ER, for instance,
24 that they have a fracture in that area. Arm, head, whatever.

25 **Q.** So, again, a normal caregiver taking care of Lincoln

1 for 10 hours, if she had -- if -- if he had those injuries,
2 she should have known about it.

3 **A.** Depends on -- yes. But it depends on what movements
4 were performed.

5 **Q.** Okay.

6 **A.** For instance, we see sometimes poster rib fractures
7 with inflicted injury and they are very symptomatic when they
8 occur, but afterwards if babies don't move much they wouldn't
9 necessarily have a ton of symptoms after. With these
10 fractures, it depends on how much -- if his arms would have
11 been manipulated afterwards, I would have expected him to
12 express pain.

13 **Q.** Okay.

14 **A.** If the skull was palpated or felt over, I would
15 expect to be pain (sic).

16 **Q.** And, certainly, when that arm is broken, he's going
17 to be --

18 **A.** There's going to be --

19 **Q.** -- letting you know that hurts, right?

20 **A.** There's going to be pain.

21 **Q.** Okay. I just had another thought and I've lost it
22 completely.

23 Oh. Given Lincoln's condition and the level of injuries
24 that he sustained, would you have expected him to survive if
25 left unattended for six hours -- medically unattended?

1 **A.** Again, I'm being asked to look at a crystal ball and
2 I apologize.

3 **Q.** Right.

4 **A.** In that he didn't survive, I don't know at what point
5 from the time he was symptomatic and when the injuries
6 occurred, how long after that, if things would have intervened
7 differently, could he have survived, I -- I can't answer that,
8 unfortunately. I mean, I just -- I just don't know.

9 **Q.** Okay. But he clearly would have been symptomatic.

10 **A.** Yes, ma'am.

11 **Q.** Okay.

12 **MS. TOOMBS:** No further questions.

13 **THE COURT:** Good time for a break, then?

14 **MR. BUSHELL:** Perfect time.

15 **THE COURT:** Okay. Members of the jury, we'll take a
16 15-minute break. We'll try to have you back here by 3:20.
17 Same instructions apply to your conduct during the recess.

18 And if you'll follow Dave, he'll take care of you.

19 (Pause in proceedings)

20 **THE COURT:** Okay. We're still on the record, but
21 we're outside the presence of the jury. Any other business to
22 take care of before we take our own recess? From the State?

23 **MR. MILES:** Nothing, Your Honor.

24 **THE COURT:** From the defense?

25 **MR. BUSHELL:** No, Your Honor. Thank you.

1 **THE COURT:** Okay. We'll take our own recess. If
2 everybody would be back at 3:20, I would appreciate it.

3 Dr. Herman, you can step down and stretch, put your
4 coat back on or off, whichever way you want to do it. Loosen
5 your tie.

6 We can go off the record, Debbie.

7 (Recess taken from 3:02:18 to 3:19:17.)

8 **THE COURT:** Okay. We're back on the record. We're
9 outside the presence of the jury, but we're retrieving them
10 immediately.

11 (Pause in proceedings)

12 **THE BAILIFF:** The jury is present, Your Honor.

13 **THE COURT:** Okay. Thank you, Dave.

14 Members of the jury, welcome back. We're doing all
15 we can to cool down the room so you know what to expect
16 tomorrow and Friday. It's going to get worse. We're doing
17 what we can, so there might be a little fussing around as we
18 go. That's what's causing the door to slam, as well.

19 Dr. Herman, if you'll take your seat again. You're
20 still under oath -- unless they want you -- do you want him up
21 for the --

22 **MR. BUSHELL:** Cross. Standing up?

23 **THE COURT:** Yeah.

24 **MR. BUSHELL:** No, he's --

25 **THE COURT:** Standing. Okay.

1 **A.** Uh-huh.

2 **Q.** -- who do you consider, I guess, leading experts in
3 your field?

4 **A.** I would consider the leaders in our field of child
5 abuse pediatrics and associated subspecialties.

6 **Q.** Okay. Any organizations, in particular?

7 **A.** The American Academy of Pediatrics is one, right off
8 the bat.

9 **Q.** I think you indicated that you -- you try to stay
10 current on case studies, you try to stay current on recent
11 research --

12 **A.** Yes, sir.

13 **Q.** -- as it pertains to your field.

14 **A.** Yes, sir.

15 **Q.** That's -- that's accurate?

16 **A.** Yes, sir.

17 **Q.** Okay. As a doctor, empirically driven data is
18 crucial, correct?

19 **A.** Yes, sir.

20 **Q.** Okay. Well, let me -- let's back up a bit. So how
21 did this -- so I'm a bit confused. Tell me again, how did
22 this specific matter come to you?

23 **A.** I was on service for Safe and Healthy Families on --

24 **Q.** Okay.

25 **A.** -- Thursday, February whatever that was.

1 Q. 20th?

2 A. 20th.

3 Q. 19th. Well, I guess the 19th?

4 MS. TOOMBS: Thursday was the 20th.

5 Q. (BY MR. BUSHELL) Okay. So that was the first time
6 you had heard about this -- this issue with Lincoln Penland
7 was Thursday.

8 A. I believe so. I don't think -- I don't have direct
9 recollection. I was -- I don't recall if I was on call the
10 night before or anything like that.

11 Q. Well, I guess the better question, then, with that
12 being said, how did this matter come to Safe and Healthy
13 Families?

14 A. I'm sorry?

15 Q. How or why did this matter come to you via Safe and
16 Healthy Families? So the question is, why did this matter
17 come to Safe and Healthy Families?

18 A. Because there were physicians involved in his care
19 that were concerned about inflicted injury.

20 Q. Okay. So is the only time a matter is referred to
21 Safe and Healthy Families when there is a certain -- when
22 there's a -- well, a concern for abuse?

23 A. Yes, sir.

24 Q. Okay.

25 A. I mean, if there wasn't a concern, they wouldn't call

1 us.

2 Q. Okay. So the only time that --

3 A. If they felt very comfortable that there were
4 accidental injuries, they would not have caused -- called us.

5 Q. Okay. So when -- and you're no longer with Safe and
6 Healthy Families, correct?

7 A. No, sir. I mean, correct. I -- when I became the
8 residency program director I had to give up a part of my
9 practice and that was --

10 Q. That was the part you gave up?

11 A. -- (overtalking).

12 Q. Okay. And how long were you with Safe and Healthy
13 Families?

14 A. Seventeen years.

15 Q. Quite a -- quite a long time. Okay. So Safe and
16 Healthy Families is never involved in a case or the treatment
17 of a patient unless there is suspected abuse? Is that fair?

18 A. Yeah. I mean, yes, sir. I -- I -- I'm trying to
19 imagine a case when we were consulted -- yeah, I mean,
20 correct. There is a concern and they want us to check it out
21 and make sure it's okay or not okay, as the case may be.

22 Q. Sure. And within Safe and Healthy Families, I'm
23 assuming there are other pediatricians such as yourself?

24 A. Yes, sir.

25 Q. So why this case to you? Just random?

1 **A.** Yes, sir.

2 **Q.** Okay.

3 **A.** I mean, in the sense that I was -- Thursdays were my
4 day.

5 **Q.** Just luck of the draw.

6 **A.** Yes, sir.

7 **Q.** Did Dr. Ulmer specifically ask for you?

8 **A.** No, ma'am -- sir. She did -- she -- she is a ma'am;
9 you are a sir. Sorry.

10 **Q.** That's debatable. I've been told otherwise
11 sometimes. Just kidding.

12 Let me ask you this. In 17 years with Safe and Healthy
13 Families, many, many other years in other areas but often
14 involved in the same -- same issues, you have quite a -- quite
15 a bit of experience in cases such as these? That's fair to
16 say?

17 **A.** Yes, sir.

18 **Q.** Okay. However, you've never testified in a criminal
19 case on behalf of the defense in child abuse homicide cases;
20 isn't that correct?

21 **A.** Correct. I have testified for the defense in child
22 abuse cases, but not a child abuse --

23 **Q.** Not in a child abuse homicide case.

24 **A.** Correct.

25 **Q.** Okay. This is the only one. Well, I'm sorry -- this

1 is -- you have done it many times on behalf of the State of
2 Utah or at least called by the State of Utah.

3 **A.** I -- I don't know how many times I have, but yes,
4 sir.

5 **Q.** Okay. So it's accurate, then -- you agree with me
6 when I say that your experience as a witness in -- in criminal
7 cases, criminal proceedings when you're called by the
8 prosecutors to testify far outweighs those scenarios where
9 you're called by the defense?

10 **A.** I've definitely testified for the prosecution more so
11 than I have for the defense, yes. I have -- I have testified
12 for the defense.

13 **Q.** Okay. Doctor, prior to today -- prior to today's
14 anticipated testimony and preparation for today, what is --
15 what materials did you review?

16 **A.** I reviewed my reports. I reviewed radiology. I
17 reviewed, I believe, the autopsy. I reviewed records supplied
18 by law enforcement. I -- and then, like I said, I reviewed --
19 re-reviewed the case with our team.

20 **Q.** When you say "our team," who does that consist of?

21 **A.** Generally our case review is each week with our child
22 abuse physicians, our nurses, our social workers, and a
23 representative from radiology.

24 **Q.** All right. You mentioned that you were -- you
25 reviewed materials provided to you from law enforcement.

1 **A.** Yes, sir.

2 **Q.** What materials would those be?

3 **A.** Specifically I think the timeline.

4 **Q.** The timeline provided by our client, Ms. Morley?

5 **A.** Yes, sir.

6 **Q.** Okay. Any other materials provided by law
7 enforcement?

8 **A.** I had conversations with them, but I don't recall any
9 materials that they provided me.

10 **Q.** Okay. But when you reference materials provided by
11 law enforcement, you're talking about the timeline that
12 Ms. Morley filled out.

13 **A.** I -- yes. Yes, sir.

14 **Q.** Okay.

15 **A.** I believe so.

16 **Q.** Okay. But at the -- well, at the time of your
17 initial reports, you had not reviewed prenatal records. Is
18 that -- is that true?

19 **A.** I believe I had reviewed prenatal records.

20 **Q.** You had?

21 **A.** I -- I'd have to look at my report, but --

22 **Q.** If you wouldn't mind.

23 **A.** I talked about the Apgars and the birth weight and, I
24 mean, some of that I may have gotten from the families, but I
25 don't -- I -- I know they -- that the child was given a dose

1 of caffeine and my guess is that likely came from records.

2 Q. Okay. What about delivery records? Did you review
3 those? Lincoln Penland's birth and delivery records?

4 A. I don't independently recall. I describe a
5 spontaneous vaginal delivery with no forceps or vacuum
6 augmentation.

7 Q. Is it possible that that information just came from
8 the mother herself?

9 A. It's conceivable.

10 Q. Okay. What about the well child or the pediatric
11 records of Lincoln Penland? Did you review those?

12 A. I have reviewed them at some point. I talked -- in
13 my note I -- I discussed his general health with Dr. Stokes.

14 Q. Okay. Give me just one second.

15 Doctor, turning your attention to your report from the
16 27th, do you have that in front of you? Under the -- the
17 title is Assessment.

18 A. Yes, sir.

19 Q. Okay. The second to last line, I'll just read it to
20 you, "There is no obvious medical condition that would have
21 predisposed this patient to these injuries." You wrote that,
22 correct?

23 A. Yes, sir.

24 Q. Okay. And it's possible you made that statement and
25 determination without -- based on your own admission --

1 without -- it's potential that you made that -- that comment
2 without having fully reviewed the actual record and only
3 relying on the words of the parents?

4 **A.** No. I -- because I -- I mean, I've -- I've -- I
5 generally will review available medical record, and I mention
6 that in my initial report. I -- but I can't tell you
7 specifically today which part of the medical record I
8 reviewed. I generally try to review it all, but if you're
9 going to ask me did I specifically look at page 2 or page 3 --
10 or if you have a question about his previous medical record
11 and whether I took that into account, I'm more than happy to
12 address that.

13 **Q.** Okay. How many -- on how many occasions did you
14 examine Lincoln Penland before he passed away?

15 **A.** Probably once -- the initial exam very thoroughly and
16 then subsequent to that I may have superficially examined him.

17 **Q.** Okay. So a few times?

18 **A.** Yes, sir.

19 **Q.** Okay. Doctor, can I have you take a look at this --
20 Exhibit 91. This is the picture of Lincoln the State walked
21 you through. Let me ask you this, Doctor. In your -- from an
22 expert pediatrician perspective, (unintelligible), assuming
23 that Lincoln Penland -- let -- let's say that this -- this
24 picture right here, but assuming that Lincoln Penland didn't
25 have, you know, the wire and the tubing and hospital gown,

1 assuming he wasn't in a hospital there, does anything look
2 abnormal to you on the surface?

3 **A.** Looks like he has a little red line here. Then I
4 recall in my report he had a history of plagiocephaly or
5 flattening of the skull, and I believe I had talked about some
6 asymmetry -- asymmetry in his skull exam.

7 **Q.** Okay. And that's coming from you as an expert
8 pediatrician. You would agree with me, you wouldn't expect
9 the average layperson to -- again, removing the hospital
10 garb -- to see that and think, on the surface, something is
11 wrong?

12 **A.** In that he was eight months old and children at that
13 age don't usually have significant bruising like that, I would
14 say it was unusual.

15 **Q.** Okay. Well, so -- so there's something there that's
16 obviously unusual to a layperson? Is that -- that's your
17 testimony?

18 **A.** There was -- I mean, this photograph may not be the
19 best, but this bruising was fairly clear to all observers in
20 the hospital.

21 **Q.** Okay.

22 **A.** I mean, you know --

23 **Q.** Medical observers, correct?

24 **A.** Yes, sir.

25 **Q.** Thank you.

1 **A.** And I believe the family noted it as well and -- and
2 they are presumptive lay people.

3 **Q.** But for the average person observing Lincoln, the
4 average layperson, non -- not trained in medicine, what's --
5 what would likely -- the way this internal turmoil is going
6 on, the way that would manifest itself is through outward
7 behaviors, correct?

8 **A.** Yes, sir.

9 **Q.** Okay. You noted -- kind of shifting gears here so we
10 can -- we'll just leave it at that.

11 Let's shift gears a bit. You noted in your report that,
12 I believe, Lincoln, quote, "had some marginal weight gain,"
13 and at the six-month visit, they discussed, quote, "failure to
14 thrive?"

15 **A.** Yes, sir.

16 **Q.** Can you explain to me what "failure to thrive" is?
17 More importantly -- I'm sorry -- explain to the jury.

18 **A.** If you have -- his weight curve it's pretty
19 self-explanatory. If you guys have had children and have
20 taken them to their well-child checkups, children are plotted
21 along a growth curve. There's a head circumference growth
22 curve, there's a height growth curve, and there's a weight
23 growth curve. And he had gone below the third percentile,
24 which is the bottom of the -- the lower end of the growth
25 curve. And by definition, when you're -- unless it's

1 symmetric, and even then some people would still call it,
2 quote, unquote, "failure to thrive." It just means not -- not
3 growing -- not gaining weight well, in his case, because his
4 head and his height, as I recall, were -- were not
5 significantly off the curve.

6 Q. Okay. And you also noted, Doctor, in your report,
7 that Lincoln had a, quote, "history of plagiocephaly." And
8 I'm sure I mispronounced that.

9 A. That's fine. Plagiocephaly.

10 Q. Okay.

11 A. A flattening of the skull. We see it -- since I
12 don't know how many years ago we -- we, the pediatricians of
13 the world, suggested that children sleep on their back and not
14 their tummies. Because they're on their back, their head is
15 dependent and it's not at all uncommon to see some flattening
16 of the skull because that's where they are.

17 Q. I see. And you also indicated that -- that no
18 intervention was implemented, meaning they didn't -- there was
19 no need for any sort of a forming --

20 A. Correct. Sometimes -- and it's not -- most kids,
21 once they become more upright, their skull will reshape and --
22 and be fine. Sometimes they put a little helmet on them.

23 Q. Okay. Well, speaking of sitting upright, you also
24 noted that at Lincoln's six month -- six-month visit,
25 well-check visit, he was not sitting up spontaneously at that

1 point.

2 **A.** Uh-huh.

3 **Q.** True? Okay.

4 **A.** I believe I noted that.

5 **Q.** I believe you're -- yeah, you noted also that at
6 eight months -- in other words, shortly before he sustained
7 these injuries, he could sit up on his own for short periods
8 of time, but that required some support, I believe your report
9 said?

10 **A.** Uh-huh.

11 **Q.** Okay. In your estimation, nothing too concerning,
12 but just a bit behind in development?

13 **A.** We try to take development, again, in a global
14 manner. Dr. Stokes, I believe, in her six-month visit noted
15 normal development. And in my -- again, I'm going to his --
16 in my report -- of history obtained from the family. Here we
17 go. Family states, "He's now able to sit up on his own for
18 short periods of time but requires some support. He's able to
19 stand up holding onto fingers or the edge of a chair," which
20 is very appropriate. "He is not crawling," which is not --
21 crawling is a very poor milestone.

22 **Q.** Sure.

23 **A.** Some kids will walk without crawling. Rolling over
24 is similar. "He rolls from stomach to back, but not back to
25 stomach." No big deal. "He laughs, chatters, and says ba ba.

1 He uses his hands appropriately and is able to rake at things,
2 transfer, and hold two objects," which is very appropriate.
3 Actually I won't say precocious, but nine months is when kids
4 are usually able to do some of those things.

5 Q. Okay.

6 A. "Parents state that he grabs at his feet."

7 Q. Okay.

8 A. All are -- all are -- so I -- I feel that his
9 development at the time, it was normal.

10 Q. Okay. Head circumference, I believe you indicated
11 was in the 15th percentile at 42.9?

12 A. Uh-huh.

13 Q. A bit below average, I would say? Is that accurate?

14 A. It's -- you have to look at -- for instance, if a
15 child's percentiles are all the 25th percentile, I would say
16 they're doing fine. Someone has to be in the 25th percentile.
17 In that his head circumference was the 15th, his height was
18 the 25th, and his weight was less than a third, I would say,
19 you know, his weight, again, was below where his other
20 parameters -- growth parameters were.

21 Q. Okay. Let's shift gears just a bit. So Doctor, in
22 your conversation here this afternoon with Ms. Toombs in her
23 direct testimony -- I'm sorry, in her direct examination and
24 your -- your testimony, Ms. Toombs asked you if you have an
25 extensive history and experience in what she said is, quote,

1 "what's now termed abusive head trauma." Do you recall
2 that --

3 **A.** Yes sir.

4 **Q.** -- question? And your response was -- was,
5 "yes, ma'am." That term used to be called shaken baby
6 syndrome, true?

7 **A.** The -- if I may --

8 **Q.** Well --

9 **A.** -- the purpose of changing the term was to be
10 more inclusive --

11 **Q.** Doctor, I don't mean to cut you off. I'm sorry.

12 **A.** Okay.

13 **Q.** I'm not trying to be combative.

14 **A.** All right. You may.

15 **Q.** Just is it true that the term used to -- the term
16 "shaken baby syndrome" has been replaced with abusive head
17 trauma. The reasons why, we can get into, but is that true?
18 Is that a true statement?

19 **A.** If that's my -- if my only choices are yes and no,
20 then the answer is yes.

21 **MS. TOOMBS:** Your Honor, it seems like the witness is
22 indicating that he can't answer that fully. We would ask that
23 he be allowed to answer the question and explain his
24 qualifi -- qualified answer.

25 **THE COURT:** Mr. Bushell, any response to that?

1 **MR. BUSHELL:** Well, several. There's a reason why on
2 cross-examination counsel is allowed to ask these sort of
3 questions. The State will have an opportunity, if they so
4 desire, to redirect and flesh out some of these details.
5 There's a reason why we can ask leading questions with yes or
6 no answers.

7 **THE COURT:** I agree, Doctor. You can -- on those
8 kind of questions that bother you, you can say yes or no, and
9 if you feel you can't do either of those, simply say that.
10 Say I can't answer that question yes or no. And then you'll
11 have to rely on the State to bring out the explanation for
12 that, if they -- if they choose to.

13 **THE WITNESS:** Could you re-ask the question?

14 **Q. (BY MR. BUSHELL)** Well, I didn't -- we're okay to move
15 on.

16 **A.** Okay.

17 **Q.** You indicated that there is a bit of a controversy.
18 Is it a fair statement, Doctor, that you would fall squarely
19 in the camp that believes that the science supports shaken
20 baby syndrome?

21 **A.** I can't answer that entirely, but I -- I -- I would
22 say that, yes, I believe that the evidence exists from -- if I
23 may -- from clinical experience, from confessions, from
24 available research. Again, we talked a while ago about the
25 true sciences to experiment and re-create injuries with

1 various models. You --

2 Q. That doesn't exist with shaken baby syndrome, true?

3 A. You obviously --

4 Q. I'm sorry, I thought you were done.

5 A. No, sorry. If -- if I can, and you can interrupt me
6 and tell me to stop, if you want.

7 Q. Keep going.

8 A. We talked about how you cannot shake children and see
9 what happens to them. We have resorted to -- "we" being the
10 medical field -- have resorted to using various models,
11 biomechanical models, one of which -- I won't say I, but we
12 used in one of our confession experiments, computer models and
13 animal models. It is my belief that -- that we -- the science
14 has shown that you can, indeed, cause injury to babies by
15 shaking alone.

16 So if you're asking me specifically, do I believe that
17 shaken baby exists, I -- I would say you can shake -- I would
18 state that, yes, I believe that you can shake children --
19 shake -- shake infants hard enough to cause injury.

20 Q. Is it your belief that these injuries sustained by
21 Lincoln Penland were caused by shaking alone?

22 A. That was not my assessment.

23 Q. Okay.

24 A. I said it was either -- if -- shaking or shaking with
25 impact. I didn't rule out -- that said, he had significant

1 evidence of both.

2 **Q.** But you do feel comfortable, Doctor, attaching your
3 professional medical opinion to a case such as this where the
4 State is specifically alleging shaking.

5 **A.** I'm sorry?

6 **Q.** Do you feel comfortable attaching your professional
7 medical opinion to a case such as this where the State of Utah
8 is specifically alleging shaking?

9 **MS. TOOMBS:** Objection. I don't know that the State
10 of Utah is alleging shaking. We're --

11 **MR. MILES:** Alleging homicide.

12 **MS. TOOMBS:** -- looking at the science and that's him
13 deciding the science.

14 **THE WITNESS:** That's not --

15 **THE COURT:** Mr. Bushell --

16 **THE WITNESS:** That's not this case.

17 **THE COURT:** Wait just a second, Doctor. When there's
18 an objection, you -- you've got to stop so I can hear from
19 them.

20 **THE WITNESS:** I'm sorry.

21 **THE COURT:** No. You're fine. It's just -- it's an
22 awkward way of communicating, but that's how we do it here.

23 **MR. BUSHELL:** Your Honor, I respectfully disagree
24 with the State. From the moment we started opening
25 statements, opening arguments, the State has very clearly made

1 it known that they believe shaking occurred here. It couldn't
2 be more explicit.

3 **THE COURT:** I think with that reference, you could do
4 it. In terms of the charge, it doesn't indicate shaking.

5 **MR. BUSHELL:** That is true. Let me rephrase the
6 question.

7 **Q. (BY MR. BUSHELL)** Are you aware that the State of Utah
8 is alleging -- the prosecuting attorneys are alleging that
9 shaking happened here?

10 **A.** I believe shaking did occur here. And I believe he
11 has several injuries that are quite consistent with shaking
12 without impact.

13 **Q.** Again, Doctor, I would just ask that maybe your
14 responses just be confined to the questions.

15 **MS. TOOMBS:** Objection. He's answering the question.
16 If -- it wasn't a yes or no question.

17 **THE COURT:** I -- I disagree. I don't think he was
18 answering the question.

19 **THE WITNESS:** I'm sorry.

20 **THE COURT:** Just stay with it. It -- you're doing
21 fine. Don't worry about it. This -- this is normal trial
22 banter.

23 **THE WITNESS:** Give and take.

24 **Q. (BY MR. BUSHELL)** Doctor, would you agree that retinal
25 folds can be attributed to causes other than abusive head

1 trauma?

2 **A.** Yes, sir.

3 **Q.** Thank you. And isn't it true that retinal folds can
4 be caused by crushing?

5 **A.** Yes, sir. I --

6 **Q.** Fall?

7 **A.** I'm sorry? Okay. I'll -- I'll limit it.

8 **Q.** I'll do it this way.

9 **A.** I'll sit on my hands and try to --

10 **Q.** And I -- and I'm not trying to be combative, Doctor,
11 but we'll do it this way. True or false --

12 **A.** Okay.

13 **Q.** -- falls can cause retinal hemorrhaging.

14 **A.** True.

15 **Q.** True or false, increased cranial pressure can cause
16 retinal hemorrhaging.

17 **A.** True. I'm assuming -- if I may -- that I'm limited
18 to answering true or false?

19 **THE COURT:** Well, you asked him if you may. Let's
20 see what he answers.

21 **MR. BUSHELL:** I -- I don't know the -- I don't
22 know what he asked. Let -- again, there'll be opportunities,
23 maybe, to -- to tease out some of these details.

24 **Q. (BY MR. BUSHELL)** You would agree that crushing can
25 cause retinal hemorrhaging?

1 **A.** Yes, sir.

2 **Q.** Thank you.

3 **A.** True. Sorry.

4 **Q.** You would -- well, true or false, direct injury to
5 the eye can cause retinal hemorrhaging.

6 **MS. TOOMBS:** And, Your Honor, can we insert a --

7 **A.** I -- I -- I can't answer that one.

8 **MS. TOOMBS:** Okay.

9 **THE WITNESS:** I -- I --

10 **MR. BUSHELL:** That's fair. Fair enough.

11 **THE WITNESS:** That's fine.

12 **Q. (BY MR. BUSHELL)** Would you agree that diabetes can
13 cause retinal hemorrhaging?

14 **A.** Yes.

15 **Q.** Would you agree that conditions present at the time
16 of birth or shortly thereafter, such as retino -- retinopathy?
17 I don't know how --

18 **A.** Retinopathy of prematurity?

19 **Q.** Yes. Can those cause retinal hemorrhaging? Yes or
20 no?

21 **A.** Birth can cause retinal hemorrhages.

22 **Q.** Okay.

23 **A.** Is that okay?

24 **Q.** Sure.

25 **A.** Okay.

1 Q. All right. Well, let's shift gears.

2 A. Okay.

3 Q. Doctor, in cases alleging non-accidental head trauma
4 or in cases where, for example, Safe and Healthy Families is
5 contacted and brought in, you would agree that it is very
6 important to establish what's called a baseline state of good
7 health?

8 A. Yes, sir.

9 Q. Can you explain to the jury what that is?

10 A. All right. There's two -- two scenarios that I -- if
11 I -- if I may --

12 Q. Sure.

13 A. -- talk about baseline. One is long-term baseline,
14 what's this child's general health. Have they been in the
15 hospital multiple times, have they had multiple surgeries, do
16 they have multiple pre-existing conditions? That would be
17 what I would consider long-term baseline.

18 And then short-term baseline, what is -- what is he --
19 what -- how was Lincoln on the day that the injuries occurred.
20 Short-term baseline.

21 Q. Okay. What about the days preceding the day of the
22 injury? Would that be long term or short term?

23 A. Probably be a -- a transition to that.

24 Q. Okay. A middle term?

25 A. Yes, sir.

1 Q. Okay. Why is this so important?

2 A. I'm sorry?

3 Q. Well, your testimony was that that's -- establishing
4 these baselines is critical. Why?

5 A. Okay. For instance, we know that, for instance,
6 meningitis can cause vomiting or extremely rarely it can cause
7 actual bleeding. It would be important to know whether
8 Lincoln had been ill in the preceding days like with fever,
9 was he extremely fussy, that sort of thing. In my report --

10 Q. Sure, of course.

11 A. -- if I may. We had -- at least I hope I addressed
12 that. I felt I did, "Lincoln has been in his baseline state
13 of good health over the last several days. Mother states for
14 the last three days he has had some sneezing, but no fevers,
15 vomiting, diarrhea, or runny nose. On Tuesday, February 18th,
16 mother stayed home from work and watched him and he had a
17 quote, unquote, normal day. He was playing, happy and was his
18 normal calm demeanor. He went to sleep in his crib at
19 approximately 8:00 p.m. He awoke at 4:00 a.m. on Wednesday,
20 February 19th" -- I -- in my report it says 20th. I apologize
21 for that -- "to feed and took 2 ounces. This was the third or
22 fourth night in a row that he had done this. Mother states
23 that he wanted to play, smiled, fed, took his binky and went
24 back to sleep. At 6:30 a.m., mother woke him and took him to
25 the parents' room and laid him on his (sic) bed to get ready

1 for daycare. Father was also in the bedroom at that time and
2 states that the patient was laughing and grabbing at his feet
3 and was his quote, unquote, normal self."

4 What I believe I -- if -- interrupt me, please, if --

5 **Q.** And keep going. I (unintelligible).

6 **A.** He is in his -- in a baseline state of health that I
7 feel very, very confident that the injuries occurred after
8 this time, if I may.

9 **Q.** Okay. Sure. So in a nutshell, the reason why you do
10 this, not just in Lincoln Penland's case, but in any case, is
11 to really find out when was the child last okay. Is that fair
12 to say?

13 **A.** Yes, sir.

14 **Q.** And you do that through talking with parents,
15 inquiring into eating habits.

16 **A.** Yes, sir. I mean, I'm sorry. I know I nodded and I
17 shouldn't have. Yes, sir.

18 **Q.** Inquiring into, you know, bowel movements and peeing.

19 **A.** Yes. Yes, sir.

20 **Q.** That's not scientific, I know, but
21 (unintelligible) --

22 **A.** It works for me. I'm a pediatrician.

23 **Q.** Sleeping habits, who the person was with -- or the
24 child was with most recently. That's -- those are the
25 questions you ask --

1 **A.** Yes, sir.

2 **Q.** -- in establishing the baseline.

3 **A.** Yes, sir.

4 **Q.** Okay. And that's pretty standard, you would say?

5 **A.** Yes, sir.

6 **Q.** Doctor, you're familiar with the term lucid interval,
7 I'm assuming?

8 **A.** Yes, sir.

9 **Q.** Okay. And you and Ms. Toombs talked about that
10 issue, but I don't think anyone ever used the term lucid
11 interval. Can you explain to the jury what that means in this
12 context -- well, not -- just in con -- in general what that
13 means in a head trauma issue.

14 **A.** Yeah. Classically, lucid interval was seen in
15 children and adults who fell, appeared okay, and then had a
16 later deterioration. And it's most classically seen in what's
17 called an epidural hematoma. So someone can have a --
18 actually one of our residents, her husband -- they were
19 walking back from dinner, he slipped on ice, fell and hit his
20 head. Seemed fine. They walked back to the hotel and he died
21 subsequent to that from an epidural hematoma.

22 We talked earlier a little bit about the subdural and the
23 epidural. Epidural -- why the -- why lucid interval exists is
24 that they seem fine and then later deteriorate. In the case
25 of epidural it is because they have bleeding and a rapidly

1 expanding mass lesion. So in other words, the bleeding pushes
2 on the brain rapidly and causes a subsequent deterioration in
3 their function.

4 It has been -- lucid interval, that's the classic term or
5 the classic use of lucid interval. It is more broadly applied
6 to after an injury, a period of lucidness in -- pardon, but
7 lucidness in some people's minds means awake, interactive.
8 Other people's minds, lucid is non-comatose. I hope I'm not
9 confusing you, but people use lucid interval loosely and when
10 I -- I'm not sure it's the quote, unquote, use of the classic
11 term.

12 There -- interrupt me. I'm happy to keep talking.

13 **Q.** Well, let me -- and I -- I appreciate all that
14 information. That is actually very useful. So let's stop
15 there with that being said. The reason I bring this up, the
16 conversation with Ms. Toombs was that -- I believe you
17 indicated that Lincoln Penland would have been immediately
18 symptomatic or if not immediate, within minutes.

19 **A.** Yes, sir. I'm nodding, but yes, sir.

20 **Q.** Okay. You also -- you also indicated that prior to
21 today you reviewed some documents, some materials provided by
22 law enforcement which was the timeline provided by Ms. Morley.
23 Your indication is that there's no way Lincoln Penland -- or
24 your testimony, your opinion, is that there's no way Lincoln
25 Penland would have had a lucid interval. Is that accurate?

1 **A.** No sir.

2 **Q.** It's not --

3 **A.** It's not -- it's not -- again, lucid -- if -- if I
4 may?

5 **Q.** Well, let -- I would -- I would prefer you not. Let
6 me just ask a question. Isn't it true that Lincoln Penland
7 could have had a lucid interval?

8 **A.** I can't answer that without being able to explain.

9 **Q.** Okay. We'll leave it at that. But it is true that
10 your opinion here today is that Lincoln Penland would have
11 been immediately symptomatic.

12 **A.** Correct.

13 **Q.** Okay. Doctor, do you recall coming here to this very
14 courtroom and testifying back in May, May 7th, 2015, to be
15 exact, at a preliminary hearing?

16 **A.** Vague -- I mean, yes, sir.

17 **Q.** Okay. Doctor, I'm going to hand you and have you
18 turn your attention here --

19 **MR. BUSHELL:** For the State's reference on page 100
20 of the preliminary hearing transcripts beginning on line 18
21 and bleeding over into lines 1 and 2 of the next page.

22 If I may approach?

23 **THE COURT:** You may.

24 **Q. (BY MR. BUSHELL)** Doctor, I'm going to have you look
25 here on -- I know this is not bending well -- but line 18. In

1 fact, it was a conversation between you and I, it was on --
2 similar to right now. Cross-examination, I asked you,
3 quote -- well, let me -- let me get some context.

4 What we were discussing here -- let me just help you
5 recall what was going on. We were discussing this timeline,
6 the exact timeline that you just testified to about reviewing.
7 And I asked you -- if I could -- if I could see it, as well.
8 This is my only copy. I had it right in front of me.

9 But on line 18, Doctor, but your general -- quote,
10 "But your general consensus, your overall feeling of that
11 timeline when you looked at it, did it comport with what you
12 were seeing, with what you were examining with your medical
13 opinion?"

14 To which you responded, quote, "If my assessment of
15 the timeline is that Lincoln ate lunch, he was fussy, he was
16 banging his head around in the highchair, later on in that
17 afternoon he was able to finish his lunch and take a bottle,
18 and then when his father came at 5:00 o'clock was ac -- was
19 acutely symptomatic, yes, I'm comfortable with that timeline."

20 **A.** Yes, sir. And I --

21 **Q.** Doctor, did I ask you that question and did you give
22 me that answer?

23 **A.** Yes, sir. And I'm --

24 **Q.** Thank you, Doctor.

25 Assuming arguendo that Lincoln Penland did experience a

1 quote, unquote, lucid interval, symptoms you would see are
2 vomiting, correct?

3 A. It could be.

4 Q. It could be vomiting?

5 A. Yes, sir.

6 Q. It could be that Lincoln was very lethargic?

7 A. Yes, sir.

8 Q. It could be that he was inconsolably crying?

9 A. Yes, sir.

10 Q. It could be that he didn't have an appetite, didn't
11 want to eat?

12 A. Yes, sir.

13 Q. It could be that he was very fussy?

14 A. Extreme -- yes, sir.

15 Q. You also testified here today, Doctor, that based on
16 the constellation of injuries, I believe your exact words were
17 "not typical of a crush injury."

18 A. Yes, sir.

19 Q. The word "typical" jumped out at me -- jumped out to
20 me. Not typical, but possible. Is that fair?

21 A. I don't know how I'm allowed to answer.

22 Q. Yes or no. Is it possible that these injuries could
23 have been caused by crushing?

24 A. Yes.

25 Q. Thank you. You indicated as well that you like to

1 stay up-to-date on recent case studies?

2 **A.** Yes, sir.

3 **Q.** You also stay current on recent literature in your
4 profession?

5 **A.** Yes, sir.

6 **Q.** You stay apprised of the most recent --

7 **A.** Try to, yes, sir.

8 **Q.** You're aware -- well, are you familiar with Ommaya?
9 Does that name ring a bell?

10 **A.** Ommaya was a bio -- is a -- I don't if -- was/is a
11 biomechanist.

12 **Q.** And you're aware that Ommaya produced a study
13 indicating that the level of force for retinal hemorrhaging
14 from shaking is biomechanically improbable. Did you know
15 that?

16 **A.** I would have to read the study.

17 **Q.** Okay. And did you know that Ommaya --

18 **A.** And know when the study was.

19 **Q.** Okay. Well, did you know that Ommaya's case studies
20 confirmed that retinal hemorrhaging and other ocular findings
21 are also found in accidental injury and natural disease
22 processes?

23 **A.** I would not disagree with that in the least.

24 **Q.** You would not. Okay.

25 What about the name Lu -- I'm going to mispronounce this.

1 It's either Luder or Leuder. L-E-U-D-E-R.

2 **A.** Patrick Leuder or something?

3 **Q.** I believe so. You're familiar with that name, it
4 sounds like?

5 **A.** (Inaudible)

6 **Q.** Okay. You're aware that he found that a
7 four-month-old child was killed when a six-year-old fell on
8 top of him? And that upon examination, that four --
9 four-month-old had severe retinal hemorrhages?

10 **A.** I am aware -- I -- I am not specifically aware of
11 that case. I am aware of a crush -- if I may.

12 **Q.** Sure.

13 **A.** Of a -- of a -- I want to say a 12-year-old was
14 running across and accidentally stepped on his infant's
15 head -- infant sibling's head and had retinal hemorrhages.

16 **Q.** Okay. So that's another scenario --

17 **A.** Yes, sir.

18 **Q.** -- that you're familiar with. Do you consider
19 yourself trained in biomechanics?

20 **A.** No, sir.

21 **Q.** You're not a biomechanic engineer?

22 **A.** No, sir.

23 **Q.** Okay.

24 **A.** I have worked with biomechanists --

25 **Q.** Sure.

1 **A.** -- in -- specifically in one of our compression
2 studies I worked with a biomechanist at the U.

3 **Q.** Okay. Well, do -- as a pediatrician, wouldn't you
4 agree that the properties of the skull change rapidly during
5 development?

6 **A.** Yes, sir.

7 **Q.** Now, what's the -- at what point in -- in life, what
8 stage in life does that development kind of solidify in?

9 **A.** Eight to 12, most people would say that your -- your
10 skull gets a little thicker and a little harder as you age.
11 And when does it transition -- an infant's skull is -- is
12 pretty pliable. I won't say mushy, but it's not -- it will
13 have some bending capabilities whereas your and my skulls have
14 very little bending capabilities.

15 **Q.** Okay. And then when it gets really, really hard,
16 that's when you become a defense attorney.

17 As a pediatrician -- how much does the average
18 three-year-old weigh?

19 **A.** 30 pounds.

20 **Q.** Okay. That's on average, you would say?

21 **A.** I'd have to look at a growth curve, but --

22 **Q.** Sure. I think you're qualified to say on -- on
23 average. Around 30 pounds? Fair assessment?

24 **A.** I said approximate. Again, I want to look at a
25 growth curve. I don't want to be quoted on that one.

1 **Q.** That's fine. Doctor, prior to your testimony here
2 this afternoon there was some conversation of law enforcement
3 of this -- this thing called -- well, they called it a
4 roundtable discussion. Are you familiar with what that would
5 be? And I think that the -- Lieutenant Smith testified that
6 it was a -- a meeting of professionals down at -- well, I'm
7 assuming at Primary Children's or perhaps at Safe and Healthy
8 Families with a team staffed with some doctors, law
9 enforcement?

10 **A.** Uh-huh.

11 **Q.** Do you recall that happening and were you there?

12 **A.** It's not unusual at all for us to sometimes have law
13 enforcement come to our case reviews or a part of our case
14 review when their specific case is being discussed. And -- or
15 if we may try to figure out what's going on, it's not at all
16 unusual to -- I don't -- I don't -- I apologize --

17 **Q.** That's fine.

18 **A.** -- I don't have a specific recollection of a
19 roundtable discussion.

20 **Q.** Okay. And I think that -- and I might have misspoke.
21 I think it was actually done at the ME -- the medical
22 examiner's office.

23 **A.** Okay.

24 **Q.** Is that usually where those occur when you've been
25 involved with those?

1 **A.** I've honestly not gone to a -- to ME talks with law
2 enforcement.

3 **Q.** You have not.

4 **A.** Not to my knowledge. I may have in the past, but I
5 don't know -- I know -- if you want to be specific here, I
6 don't recall going to a discussion with law enforcement and
7 the medical examiner, Dr. Ulmer, in this case.

8 **Q.** Okay. But in the past, have you gone to roundtable
9 discussions where there's a medical examiner, there's perhaps
10 you and other doctors, and law enforcement?

11 **A.** There -- there's something called fatality review
12 where the state puts a panel together that involves the
13 medical examiners. There are pediatricians on the panel. Law
14 enforcement comes, attorneys sometimes come, and --

15 **Q.** What kind of attorneys? I'm sorry to interrupt.

16 **A.** As I recall it was a -- he -- I mean, as far as
17 defense versus prosecution?

18 **Q.** Yes. Prosecutor?

19 **A.** I'm assuming so, but I don't recall. I just remember
20 there being a lawyer there. And that -- the child fatality
21 review does -- I have been to those before so -- where there
22 was all those people there present, yes, sir.

23 **Q.** In your -- and I know you're -- I know that you're no
24 longer working for or with Safe and Healthy Families, but when
25 you were with them, you were considered part of law

1 enforcement's investigation, correct?

2 **A.** I'm sorry?

3 **Q.** You were considered part of law enforcement's
4 investigation, correct?

5 **A.** No, sir. We -- we work with law enforcement. I
6 won't deny that in any shape or form. We work with them to
7 obtain history. We provide them with history, we provide them
8 with assessments, we provide them with information, but I --
9 I -- I don't work for law enforcement.

10 **Q.** No, and -- and that's not what I'm implying. I did
11 not -- the question was not, do you work for law enforcement.
12 The question is whether you, in your capacity at Safe and
13 Healthy Families, consider yourself part of the criminal
14 investigation. Would you agree with that statement?

15 **A.** I can't answer that.

16 **Q.** That's fair. Would you be surprised to hear that
17 Detective Fusselman -- at the preliminary hearing -- did say
18 that you were part of the criminal investigation?

19 **A.** I mean, I wasn't there. I don't know what he was --
20 I apologize. I'm not trying to be --

21 **Q.** Oh, I know.

22 **A.** But I'm quite fine because we -- I -- I talked to
23 Detective Fusselman during this case. I have no problems with
24 that.

25 **Q.** You have no problems being categorized as part of the

1 criminal investigation?

2 **A.** That's not what I said. If I may --

3 **Q.** Okay. Sure.

4 **A.** -- I said I have no problem saying I talked to
5 Detective Fusselman. We work with law enforcement to obtain
6 information and we try to fit that into our assessment. And
7 sometimes we're able to get valuable information that helps us
8 make an assessment. But in no way, shape, or form do I work
9 or feel compliant with or that Detective Fusselman tells me
10 how to -- I -- law enforcement does the investigation and we
11 talked to them. I have no problem saying that.

12 **Q.** Okay. You're -- as a doctor, as a medical
13 professional in your training, you're objective and unbiased.

14 **A.** Yes, sir.

15 **Q.** Doctor, do you recall -- well, you mentioned here
16 that you -- throughout this -- your involvement you had
17 conversations with Detective Fusselman.

18 **A.** Yes, sir.

19 **Q.** And on February 20th, 2014, the day that you
20 generated this report, you did have a phone call with
21 Detective Fusselman around 4:18 p.m. Do you recall that phone
22 call?

23 **A.** Not independent recollection, no. I -- I know I
24 talked to him.

25 **Q.** Okay. And you spoke with him one-on-one, just the

1 two of you?

2 **A.** I want to say it was probably on the phone. I mean,
3 he could have come to the hospital. Sometimes they do;
4 sometimes they don't.

5 **MR. BUSHELL:** Your Honor, the defense moves into
6 exhibit -- moves into evidence an exhibit marked Number 1 from
7 the defense.

8 **MS. TOOMBS:** Objection, Your Honor. What's the
9 foundation for this exhibit that is being presented?

10 **THE COURT:** I'm not sure. I'm not sure what it is
11 even.

12 **MR. BUSHELL:** Your Honor, the doctor just -- if I
13 may. The doctor indicated that during his involvement he did
14 have conversations with Detective Fusselman. This is -- we're
15 now more three years removed. Detective Fusselman -- or, I'm
16 sorry, the doctor can't recall exactly when, but there was
17 materials provided of recordings of that phone call. I want
18 to play that for the doctor to jog his memory.

19 **THE COURT:** Okay. From the State?

20 **MR. MILES:** I mean, I guess, is he asking him
21 specific statements?

22 **MS. TOOMBS:** There is -- yeah. Are you asking about
23 specific statements that he's --

24 **MR. MILES:** And he hasn't even been confronted with
25 it. He hasn't been asked about it. He's just playing it, for

1 what?

2 **MS. TOOMBS:** -- he's -- are you -- I guess what is it
3 that you're asking him? Because I -- he's not been -- he's
4 not indicated that he doesn't recall a specific statement so
5 you're not -- what is the basis for offering it? There's
6 not a --

7 **MR. BUSHELL:** There will be follow-up questions. I
8 can't ask those questions until the doctor has -- his memory
9 has been refreshed.

10 **MS. TOOMBS:** Well, how do you know his --

11 **THE COURT:** And this is a recording of a telephone
12 conference between the detective and Dr. Herman?

13 **MR. BUSHELL:** The doctor -- correct.

14 **THE COURT:** Okay.

15 **MR. BUSHELL:** To which he has agreed --

16 **THE COURT:** And it's on February 20th?

17 **MR. BUSHELL:** Exactly.

18 **THE COURT:** Okay.

19 **MS. TOOMBS:** And I guess the -- the State would say
20 there's not been a question asked that needs to be refreshed
21 at this point. Typically, refreshing of memory comes after
22 the witness has said, no, that didn't happen or I don't recall
23 that happening. The doctor has testified that he -- he knows
24 he talked to him, so until Mr. Bushell wants to ask a question
25 that -- that the doctor doesn't recall, I don't know that we

1 have a recollection -- a refreshing.

2 **THE COURT:** Well, I -- I thought the doctor says he
3 has no independent recollection of the conversation. He does
4 recall talking with the detective.

5 **MR. BUSHELL:** He did.

6 **MS. TOOMBS:** Okay. But, again, he does recall
7 talking with the detective. If Mr. Bushell wants to ask his
8 questions and then allow the doctor to determine whether or
9 not he recalls that, then we can -- then perhaps it would be
10 appropriate to play if the doctor doesn't recall it. But I
11 think the -- that the appropriate procedure is to ask the
12 question and allow the doctor to have an opportunity to
13 hear -- to -- to respond to it at that point.

14 **THE COURT:** Okay. Mr. Bushell?

15 **MR. BUSHELL:** Well, I think that has been
16 established. I agree with the Court. I think that the
17 comment of, I had lots of con -- he said -- and I don't mean
18 to paraphrase the doctor, but the comment was: I had lots of
19 conversations. I don't remember the dates and times and
20 exactly what was said.

21 This is an exact recording from February 20th, 2014,
22 at 4:18 p.m.

23 **MS. TOOMBS:** Okay. But there's not a question that
24 makes the exact date and time -- and I don't think that the
25 doctor is disputing the exact date and time. So what in the

1 recording does the doctor need to be refreshed about? That
2 would be the request of the State, that he be given an
3 opportunity to answer the question before his recollection is
4 refreshed.

5 **MR. BUSHELL:** Aside from refreshing recollection, the
6 doctor has also testified that he does not in his -- his view
7 consider himself a member of law enforcement's investigation.

8 **MS. TOOMBS:** That's correct. And --

9 **MR. BUSHELL:** There is --

10 **MS. TOOMBS:** -- and you -- and counsel countered with
11 the fact that Detective Fusselman may have thought he was part
12 of the investigation. That doesn't -- those two are not
13 exclusive of each other. One is the opinion of a detective
14 who thinks that as part of his investigation he talks to a
15 doctor; the other is as a doctor who says, yeah, I consult
16 with law enforcement.

17 **THE COURT:** Well, but what is the objection?

18 **MS. TOOMBS:** I --

19 **MR. MILES:** Foundation.

20 **MS. TOOMBS:** I'm not showing that there's any four --
21 I'm not seeing any foundation for playing a recording. The
22 only other basis would be refreshing recollection, and at this
23 point there hasn't been a recollection that needed to be
24 refreshed.

25 **THE COURT:** Okay. Further response to that?

1 **MR. BUSHELL:** I'll let the Court rule.

2 **THE COURT:** Okay.

3 **MS. TOOMBS:** And, Your Honor, I would also add that
4 this is -- this would be hearsay at this point. It's an
5 out-of-court statement that is assuming, allegedly, to be
6 offered for the truth of the matter asserted which makes it
7 inadmissible as well.

8 **THE COURT:** But this is the doctor's statement, isn't
9 it?

10 **MR. BUSHELL:** It is.

11 **MS. TOOMBS:** That is correct, but it's an out of
12 court -- it's not the defendant's statements which are
13 admissible. It's an out-of-court statement by a nonparty.
14 Neither Detective Fusselman, nor the doctor -- in particular,
15 the doctor, are parties to this case. They're simply
16 witnesses and those are --

17 **THE COURT:** But he's here to be cross-examined.

18 **MS. TOOMBS:** -- not admissible. He can be
19 cross-examined, but he -- but the --

20 **THE COURT:** On the out-of-court statement.

21 **MS. TOOMBS:** He can be cross-examined about it, but
22 the out-of-court statement itself doesn't come in.

23 **THE COURT:** Okay. I disagree. I'm going to overrule
24 the objection. We'll receive Defendant's Exhibit 1 over
25 objection.

1 **Q. (BY MR. BUSHELL)** Doctor, this is about a -- a
2 nine-minute recording. It should be quick. We'll listen to
3 it and we'll pick up where we left off.

4 (Defendant's Exhibit 1 is played from 4:19:53 to
5 4:29:35.)

6 **Q. (BY MR. BUSHELL)** Doctor, is that your voice? Does
7 it sound like you?

8 **A.** You never know what you sound like on the phone
9 versus -- but I -- I said Bruce Herman, so yes, sir.

10 **Q.** Yes or no, true or false, when Detective Fusselman
11 said to you, "We have the suspect locked into a statement,"
12 your response was, quote, "You did good work there."

13 **A.** Yes, sir.

14 **Q.** Doctor, isn't it true that based upon the medical
15 findings, you cannot definitively say who injured the child?

16 **A.** Based upon the medical findings --

17 **Q.** I -- I'm sorry. That's a -- a rather close-ended
18 question. Can you say?

19 **A.** No.

20 **Q.** Is it true, Doctor, true or false, based upon the
21 medical findings, you cannot definitively say when the child
22 was injured?

23 **A.** No.

24 **Q.** Lincoln Pen --

25 **A.** Or was it -- did I --

1 Q. You did. Thank you.

2 A. Was that a true or false? I can't remember.

3 Q. The answer was sufficient.

4 Doctor, Lincoln Penland could have been injured by
5 somebody else, correct?

6 A. Lincoln Penland was injured by someone else.

7 Q. Someone other than Ms. Morley, that's possible,
8 correct?

9 A. It's --

10 Q. Yes or no?

11 A. Yes.

12 Q. Thank you, Doctor. That's all the questions I have
13 for you.

14 A. Okay.

15 **THE COURT:** Okay. From the State?

16 **MS. TOOMBS:** Yes, Your Honor.

17 **MR. BUSHELL:** Your Honor, may I approach?

18 **THE COURT:** Yes. This would be Defendant's
19 Exhibit 1?

20 **MR. BUSHELL:** Yes.

21 **THE COURT:** Debbie, where do you -- do you want to
22 keep them separate or how do you want to --

23 **THE CLERK:** (Unintelligible)

24 **THE COURT:** I'll keep it here, then.

25 Okay. Ms. Toombs?

1 Ms. Morley's timeline on -- on line 7.

2 Would you review that and see if that better informs what
3 your -- what the answer was intending as opposed to that
4 narrow window that Mr. Bushell had you quote?

5 **A.** Okay. Question --

6 **Q.** And you don't have to -- you don't have to quote it.
7 Just --

8 **A.** Oh, okay.

9 **Q.** Just if you will review it and -- and then --

10 **A.** There was a -- there was a question, was I aware of
11 the timeline --

12 **Q.** Yes.

13 **A.** -- and I said, "Yes, I have seen it. It
14 essentially -- it essentially corroborated the history that I
15 obtained from the parents, via text and that sort of thing."
16 Not the smoothest of English, but --

17 "Okay. Do you have an opinion about whether this
18 timeline is consistent with the evidence, the medical
19 evidence?"

20 I said, "I'm sorry, I would have to look at the timeline.
21 You'd have to ask me about a specific point in the timeline."

22 "Okay. Your" --

23 **Q.** Does he ever ask you about a specific point in the
24 timeline?

25 **A.** "Your general" -- I'm reading. I'm finding out.

1 Q. Okay.

2 A. "Okay. But your general consensus, your overall
3 feeling of the timeline when you looked at it, did it comport
4 with what you were seeing, what you were examining with your
5 medical opin -- opinion." Sorry.

6 "If my assessment of the timeline is that Lincoln ate
7 lunch, he was fussy, he was banging his head around in the
8 highchair, later in the afternoon he was able to finish his
9 lunch and take a bottle. and when -- then when father came at
10 5:00 o'clock he was acutely symptomatic, yes, I'm comfortable
11 with that timeline."

12 Q. Okay. So --

13 A. I wouldn't dis -- would not disagree.

14 Q. Does -- does anything in that exchange alter what you
15 said earlier today that --

16 A. No, ma'am.

17 Q. -- he wouldn't have -- he wouldn't have been normal
18 after these events.

19 A. No, ma'am.

20 Q. In fact, I'm going to ask you to look at page 66 of
21 the preliminary hearing transcript. And, again, I'm narrowing
22 you down. This is direct examination. I've marked line 6
23 through I think it's line 16 or 17. Can you review that area?

24 A. "So the symptoms that Mr. Penland described to you
25 when he picked up Lincoln consistent with" -- I interrupted

1 Ms. Toombs.

2 "Yes, ma'am, very."

3 And she finished, "that he has sustained that injury."

4 I said, "Very consistent with having had suffered these
5 injuries."

6 "And the onset of that would have been" -- question from
7 Ms. Toombs?

8 "After the -- I mean, essentially immediate. Whether it
9 would have been that nanosecond, but after the injuries that
10 Lincoln suffered, he would not have been able to do normal
11 baby activities."

12 Q. So the symptoms would have been onset almost
13 immediately.

14 A. Yes, ma'am.

15 Q. And does that --

16 A. Based upon all those things we talked about earlier.

17 Q. And now having listened to your opinion on
18 February 20th, was your opinion any different on
19 February 20th than it was on May 7th or today?

20 A. No, ma'am. I mean, I -- when it started playing I
21 was a little nervous, but I'm quite comfortable with what I
22 said.

23 Q. And, essentially, even then you -- you were -- you
24 were hes -- you were hedging your bets. You said, "I don't
25 have all the medical information yet." Fair?

1 **A.** Yes, ma'am.

2 **Q.** In fact, you were looking particularly for the
3 retinal examinations.

4 **A.** Yes, ma'am.

5 **Q.** And you --

6 **A.** And the MRI --

7 **Q.** -- now --

8 **A.** We mentioned that he needed an MRI.

9 **Q.** And the MRI. And now you've looked at the MRI --

10 **A.** Oh, and that -- and what I did here, I said the
11 skeletal survey was no additional fractures, which in the
12 original reading it was and then they -- they mentioned an
13 abnormal contour that was subsequently confirmed to be a
14 fracture on the postmortem CT.

15 **Q.** Let me explore that just a little bit while we're
16 talking about it. Is it uncommon, especially when a -- in a
17 small child, to not see a fracture right away?

18 **A.** Is it uncommon? It depends. I have a hard time --

19 **Q.** Those are hard words, right?

20 **A.** -- answering, but I -- we have -- there's something
21 called a toddler's fracture that occurs in toddlers and they
22 will usually jump off of something or twist their leg and
23 start to limp. They'll be symptomatic immediately, but
24 sometimes we can't see the fracture immediately. And
25 sometimes we can't see them until they -- until they start to

1 heal.

2 As I recall in his initial skeletal survey it said
3 irregularity of the left proximal humerus which we
4 subsequently discussed and found out was a fracture on the CT
5 and then --

6 Q. On the postmortem --

7 A. -- on postmortem exam.

8 Q. So you do see -- would it be fair to say that you see
9 fractures better after there's been a period of healing, even?

10 A. Yes, ma'am.

11 Q. Is that because there's new growth?

12 A. Yeah. It -- fractures heal in kids and that's the --
13 we see it. If you ever had a child or broke your own
14 collarbone, you can feel sometimes the bump and then you get
15 the hole, and then you feel this big bump as it starts to heal
16 and then it smooths out. And that's just how bones heal,
17 typically.

18 Q. Okay. Now -- and -- and, again, you -- let's see.

19 Let me find the -- the area that -- I think in that call you
20 reiterated this is -- this isn't a normal household fall.

21 On February 20th, did you have any information that would
22 have indicated there was an allegation that a toddler had
23 inflicted these injuries?

24 A. No, ma'am. I -- I asked a couple of times, is there
25 any history of trauma?

1 Q. Okay.

2 A. Which at that time, we did not have.

3 Q. As of February 20th, no history of trauma whatsoever?

4 A. Yes, ma'am.

5 Q. Okay. And to your knowledge, the only history of
6 trauma is this -- this subsequent statement that a toddler
7 gave. Is that -- are you aware of that, I guess I should ask?

8 A. Not -- I mean, I -- I -- no, I'm not aware of
9 specific --

10 Q. Okay.

11 A. -- allegations. I have come to understand that
12 there's concern that Boston did it. Yes, ma'am.

13 Q. Okay. And when -- now that you know that there's
14 some concern that Boston, who was three years old at the
15 time -- and actually pretty good on you -- you estimated a
16 three-year-old would weigh about 30 pounds. I'm going to go
17 through some of the specific claims that were made and ask if
18 these comport with the -- the -- well, let me ask it this way.

19 **MR. BUSHELL:** Your Honor, I'm -- I'm going to object
20 at this point that this is exceeding the scope of
21 cross-examination. At no point did I get into on
22 cross-examination the specifics of what one of the toddlers is
23 alleging, the -- the acts that she was alleging that she
24 observed. That was never brought up in cross. Ms. Toombs is
25 now exceeding that scope.

1 **THE COURT:** Ms. Toombs?

2 **MS. TOOMBS:** The cross-examination did talk about
3 trauma inflicted by toddlers. In fact, he -- he cited several
4 case studies of trauma inflicted by toddlers. I think it's
5 only fair that Dr. Herman, having been forced to sit on his
6 hands during some of that cross-examination and not answer, be
7 able to answer specific to this case. It's fine to say in
8 theory, but I -- I would like him to be able to answer,
9 specific to this case, his findings.

10 **THE COURT:** I think -- I think it's within the scope
11 of cross. The problem I have is there's -- there's no
12 evidence at all that's been introduced about what Boston has
13 said.

14 **MS. TOOMBS:** Okay. Okay.

15 **THE COURT:** So I -- I'm curious how you'll ask the
16 question. I think it's within the scope, but I don't know how
17 you'll do it.

18 **MS. TOOMBS:** Okay.

19 **THE COURT:** So I'll overrule the objection, but I --
20 I don't think you can just refer to Boston's statements when
21 they're not in evidence.

22 **MS. TOOMBS:** Okay. To be fair, I don't think it's
23 Boston's statement.

24 **MR. BUSHELL:** Brylee.

25 **MS. TOOMBS:** But --

1 **MR. BUSHELL:** Brylee.

2 **MS. TOOMBS:** -- Brylee's statements.

3 **THE COURT:** Well, I think you know what I mean. I --

4 **MS. TOOMBS:** Yeah, sure.

5 **THE COURT:** That -- those tapes are not in.

6 **MS. TOOMBS:** Sure. Okay. So -- well, let me go back
7 and -- and do it this way.

8 **Q. (BY MS. TOOMBS)** We have a fractured skull. Would a
9 kick to the head by a toddler fracture this skull,
10 particularly the basilar fracture that you see in Lincoln
11 Penland?

12 **A.** It would be extremely unlikely. I think there are
13 some -- I won't say some -- if, per chance, they were wearing
14 steel-toed boots or something that would be a lot more than
15 what -- essentially would be hitting with a baseball bat or
16 something like that, it's conceivable. A toddler with bare
17 feet or a toddler wearing tennis shoes or -- I think it would
18 be extraordinarily unlikely to cause the fracture that Lincoln
19 suffered.

20 **Q.** Okay. And then let's talk about if you assumed that
21 this fracture occurs, would that kick -- would that fracture
22 cause the bleeding in the lower lumbar spine that you found in
23 Lincoln?

24 **A.** No, ma'am. We talked about earlier that the -- there
25 were three different injuries: Skull fracture, neck strain,

1 sacral thoracic epidural hema -- spinal hematoma.

2 Q. Okay. And the fracture is a direct type of impact.

3 A. Yes, ma'am.

4 Q. Is that fair?

5 A. Very much a direct impact.

6 Q. And would you also classify the lower -- lower lumbar
7 and the cervical injuries as direct?

8 A. No, ma'am. I --

9 Q. Why not?

10 A. Okay. Direct, indirect. A direct blow, a hit with a
11 baseball bat, a hit onto a corner, that's direct impact.
12 Indirect would be the hyperflexion extension injuries that we
13 talked about in that they were not -- I do not believe that
14 they were the result of direct impact. I believe they were
15 the result of his back hyperextending and hyperflexing during
16 a period of -- of shaking, similar to the neck.

17 You could conceivably have bent him and caused those
18 injuries causing hyperflexion or extension, but that would
19 still be somewhat indirect. In other words, I don't feel
20 direct impact caused this -- I'm pointing to my neck. Sorry.
21 I do not believe that direct impact would have caused either
22 the neck injury or the back injury. We discussed earlier that
23 we see those in children who are in motor vehicle crashes and
24 are unrestrained and their head jerks forward and back or --
25 yeah, direct impact is typically -- I'm pointing to a blank

1 screen, but --

2 Q. Sorry.

3 A. -- you've seen the picture a few times of the
4 bruising behind Lincoln's ear. That's what we would typically
5 see with direct impact.

6 Indirect trauma, you often don't see injuries to the
7 outside because it's the inside that is injured from the
8 hyperflexion and extension. That is suggestive of direct
9 impact. I'm pointing to the bruise behind Lincoln's right
10 ear.

11 Q. On Exhibit 89. Now, you don't see any bruising on
12 the lower back.

13 A. No, ma'am.

14 Q. So no direct impact there.

15 A. I think it would be -- if -- if you -- okay. You had
16 to have a lot of hyperextension-hyperflexion. If the
17 supposition is that this was from direct impact that caused
18 such severe -- and, also, it's two ways. It's not likely one
19 bend. It's likely a hyperflexion-hyperextension, a
20 back-and-forth kind of thing that caused these injuries, which
21 also is inconsistent with a direct blow.

22 Q. Okay. And some of these -- you're going -- you're
23 going to think I'm nuts, but I'm going to ask these questions
24 anyway. Broken left -- broken left arm. It's not going to
25 cause bleeding on the brain, correct?

1 **A.** No, ma'am.

2 **Q.** Broken right arm isn't going to cause the bruise here
3 behind the right ear?

4 **A.** No, ma'am.

5 **Q.** Essentially, in order to have these injuries
6 inflicted by a child -- could a child inflict all of these
7 injuries with one -- in one single mechanism?

8 **A.** No. I -- I -- no. That which -- the -- literature
9 on sibling abuse is pretty scant because it's so
10 extraordinarily rare. There are some case reports of kicking
11 and hitting and biting that leave superficial bruises and
12 injuries, with the exception of an accident like the
13 12-year-old running across and accidentally stepping on an
14 infant's head or the case that Mr. Bushell mentioned which
15 was -- I think he said five-year-old step -- or sitting or
16 something like that. And/or a three-year-old shooting --
17 accidentally picking up a gun and accidently discharging it.

18 These, to my knowledge and experience, I have -- I just
19 find it -- inconceivable is a -- is a good word; impossible, I
20 can't say, just because I can't say it. But I -- I have never
21 ever seen or seen reported a three-year-old causing this
22 constellation of findings.

23 **Q.** So even assuming we have a history -- which we don't
24 have a history of this -- even assuming we have a history of a
25 five- or six-year-old accidentally tripping on or stepping on

1 the baby's head as discussed by Mr. Bushell, that wouldn't
2 cause the lower lumbar injury, though, would it?

3 **A.** No, ma'am.

4 **Q.** Would it cause the fractures to the -- the bilateral
5 humoral fractures?

6 **A.** No, ma'am.

7 **Q.** Okay. Now, if -- you talked about this causing --
8 this being -- if -- if -- potentially if the child was wearing
9 steel-toed boots -- I don't know that they make them that
10 small -- but if a three-year-old is wearing steel-toed boots
11 and kicks right here, possibly that could cause -- but if the
12 child is barefoot --

13 **A.** I think it would be -- oh, sorry. I'll let you ask
14 the question. Sorry.

15 **Q.** Okay. If the child is barefoot, would you also
16 expect to see some injury to the kicker as well as the kickee?

17 **A.** I would -- I would expect it -- I -- I -- this is
18 such a far end of my -- we just don't -- I have not seen this
19 so I can't say that it is, again, impossible. But if -- this
20 is a significant blow that we see from assaults with baseball
21 bats and I've not seen it even from direct blows with fists
22 from adults, really, because they usually have to have
23 something to hit them with.

24 So a three-year-old -- I just -- I can't answer it
25 because I just -- it's -- it'd be --

1 Q. Somewhat like --

2 A. -- I've just not experienced it in my career, so I
3 can't -- again, I can't say it's impossible. I -- I just --
4 alls I can say is that I've never seen it.

5 Q. Somewhat like pink unicorns?

6 A. I can't say that, but I just -- it's just -- I -- I
7 would love to say that it's -- what the kicker's foot would
8 look like, but I think that this is a significant impact and I
9 just can't imagine that a bare foot of a three-year-old could
10 cause it because we don't see it even with adults hitting each
11 other with fists. I've seen it, certainly, like I said, with
12 a -- an object, a bat, a baseball, those -- those kind of
13 things. They usually have to hit with an object and not --
14 and not their own.

15 Q. Okay. So moving on to the -- some of the things that
16 you were asked -- well, one more thing, before we go into some
17 of the specific things that we talked -- that counsel talked
18 about, you were shown Exhibit, I believe, 91, yeah. And
19 counsel asked you, what about this with the average layperson
20 would lead the average layperson to believe that this child is
21 in distress, if you took away all the trappings? And I
22 believe your answer was nothing, from the picture, right?

23 A. Well --

24 Q. Oh, excuse me, the --

25 A. -- I talked about the bruise.

1 **Q.** -- the bruise. The bruise.

2 **A.** Yes, ma'am.

3 **Q.** Behaviorally, though, do you also anticipate that
4 there would be some behavioral changes in this child or mental
5 state changes in this child that a average layperson should be
6 able to see?

7 **A.** I hope that I've been able to get across -- we've
8 talked about medical literature, we've talked about
9 confessions, we've talked about clinical experience. A child
10 who suffered the injuries that Lincoln had would be
11 symptomatic extremely proximate to the injury, if not
12 immediately, and that he -- that he died would make it that
13 he -- as opposed -- in the tape I said he -- I hoped he -- I
14 thought he might live. I -- I always -- we talked about
15 hoping for the best, but in that he died and that we know with
16 fatal inflicted trauma and with fatal head injury, regardless
17 of whether it was accidental or not, those kids are not normal
18 afterwards.

19 And we talked a little bit about lucid interval.
20 Lucid -- in the classic -- we talked about the classic
21 epidural where the husband hit his head, was able to walk
22 home, and then subsequently died from the epidural. That's
23 the classic lucid interval.

24 Lucid interval gets put into abusive head trauma as if
25 every child who has an injury stays that way forever. And we

1 know from what we talked about earlier that -- that from the
2 confession literature and from -- we know that roughly a third
3 of abusive head cases are missed, at some point after those --
4 I'm quite comfortable saying that they at some point were
5 symptomatic, and then depending on the degree of magnitude of
6 the injury, they may have appeared normal afterwards.

7 In this case, in that this was fatal abusive head trauma,
8 he would have been persistently symptomatic after. Would he
9 have been in a coma for the entire time? I -- I honestly
10 can't say. I -- I do feel extremely comfortable saying he
11 would not have been sitting up, playful, looking around. At
12 what degree: vomiting, lethargic, inconsolable, those are all
13 very good descriptors, but it would have been persistent
14 afterwards and not returned more to a normal baseline.

15 If that -- that -- lucid interval gets applied to, well,
16 were they comatose right after and did they stay comatose? I
17 can't say that. That's -- but I also think that's a poor
18 application of lucid.

19 If I very briefly may say, there was a good study looking
20 at fatal head -- head in -- I think I talked about it -- fatal
21 head injury of all causes. They looked at a database and they
22 looked at what their coma scores were after the injury and by
23 paramedics. Not all of them were an eight, which is comatose,
24 but none of them were a 15 or a 14, which is either an awake
25 happy child or an awake fussy child.

1 So, again, I think that the -- that the evi -- medical
2 evidence is such that it -- it supports, I feel, what I have
3 said and what my assessment is -- our assessment. Again, it's
4 our team.

5 **Q.** So even -- even fussy normal baby things is not what
6 you would expect on this child?

7 **A.** Could fussy have been part of it, yes, but it would
8 have been a persistent fussy, a persistent crying, a not
9 return to normal and sit up and eat and things like that.

10 **Q.** Okay. All right. So shaken baby, a term replaced by
11 abusive head trauma --

12 **A.** Okay.

13 **Q.** -- and -- and whether or not there's a controversy.
14 I think we talked a little bit in -- in direct examination
15 about whether or not there's a -- in your opinion, there's
16 truly a controversy. I guess, can you expand on --

17 **A.** Okay.

18 **Q.** -- on both of those?

19 **A.** In -- in the early 2000s there used to be a con -- a
20 consensus statement -- in other words, this is what our field
21 believes -- published by the American Academy of Pediatrics
22 that changed it from consensus statement on shaken baby
23 syndrome to consensus statement on abusive head trauma. It
24 was basically to say that abusive head trauma is a bigger
25 umbrella than shaken baby syndrome.

1 It didn't say that you can't shake children hard enough
2 to cause injuries. It just said that abusive head trauma
3 includes abusive skull fractures like this or -- and/or that
4 the injuries -- they didn't say -- the statement didn't say
5 that children couldn't be injured by shaking alone. It just
6 said that it could be shaking or shaking with impact. And
7 clearly we have evidence of impact here. And in my mind, the
8 neck injury and the back injury are pretty good evidence of --
9 of -- of shaking.

10 **Q.** Okay. All right -- oh, back to lucid intervals. And
11 I think you talked about this. They're associated with
12 epidural hematomas, correct?

13 **A.** Typically, yes, ma'am.

14 **Q.** In --

15 **A.** And they -- in the classic sense. You can have a --
16 I know we're getting a little deep here, but you can have
17 subdural hemorrhages that bleed very quickly and act like
18 epidurals. And, also, in my -- in the tape I talked about you
19 can sometimes see a little bleeding under a skull fracture,
20 not unusual at all to see a little bleeding underneath the
21 impact injury.

22 An impact injury, a skull fracture in and of itself would
23 not have caused the diffuse subdurals that Lincoln had which
24 were in between both sides of the brain, along both sides in
25 the tentorium and then around the cerebellum. Those are

1 diffuse subdural hemorrhages which would not be typical -- or
2 what I would expect to see with a skull fracture.

3 Q. Okay. Retinal folds can be caused by crushing.

4 A. Yes, ma'am.

5 Q. I think you -- you answered true to that one.

6 A. Yes, ma'am.

7 Q. With qualification. Let's go ahead and let you
8 expand on some of these qualifications.

9 A. I was asked a bunch about what can cause retinal
10 hemorrhages. Again, we go back to the differential. The
11 differential, quote, unquote, retinal hemorrhages is very
12 wide. By far the most common cause of retinal hemorrhages
13 is -- is birth. Approximately 20 to 30 percent of all babies
14 have retinal hemorrhages after they're born, but they're gone
15 by a month, six weeks, two months at the most. And those
16 retinal hemorrhages are -- are very different than the kind of
17 retinal hemorrhages that Lincoln had.

18 Increased intracranial pressure can cause retinal
19 hemorrhages, but not the -- they do not cause retinal folds,
20 they do not cause the kinds of retinal hemorrhages that
21 Lincoln had which were diffuse and ora to ora.

22 So, yes, lots of things can cause retinal hemorrhages,
23 but the -- to the degree of retinal hemorrhages that Lincoln
24 had and the addition of the retinal folds are very specific
25 for ret -- crush injuries. Specifically, there's been a

1 couple -- I don't know if it was the case that Mr. Bushell
2 mentioned with the sitting on it, but I do know the TV crush
3 injury and the 12-year-old who accidentally stepped on his
4 infant brother's head and then the fall from 10 meters and
5 fatal motor vehicle crashes, I have no problem saying that
6 those -- there is a differential for that, but not -- not a
7 skull fracture, not -- those are very specific for inflicted
8 trauma and -- and certainly in this case where you have all
9 the other stuff.

10 Q. And, again, we talked earlier about the fact that
11 this is not -- this fracture is not what you would expect to
12 see in a crush.

13 A. Correct. We talked about how -- a crush injury,
14 you -- it's like in a vice. You're getting squeezed from both
15 sides. The TV falls on the head that's on the floor. The
16 six-year-old or five-year-old sat on his infant brother's
17 head, I think -- I don't know if it was a brother. The
18 12-year-old was running and stepped -- so you get a --
19 basically a smooshing from both sides and you're going to see
20 usually depressed fragments because you're getting crushed and
21 you're going to see some usually associated brain injury
22 because, again, the whole head is being crushed. You don't --
23 this skull fracture here is much more consistent with an
24 impact as opposed to a crush.

25 Q. Okay. So assume for a moment crushing, if I've got a

1 vice on this side of my head behind my right ear I should have
2 something approximately my left eyeball, that sort of area --

3 **A.** Well, you would -- usually a crush is from two
4 opposite and opposing forces. If one force is here, you
5 would -- it's got to be somewhere up here. I can't say
6 exactly where, but I would expect to see, again, injuries up
7 here --

8 **Q.** And --

9 **A.** -- be it a skull fracture or that -- evidence of
10 impact or squeeze or crush, which we don't -- he doesn't have
11 a skull fracture. He does -- has the subdurals, but no --

12 **Q.** But he doesn't have --

13 **A.** -- nothing over it -- overlying it.

14 **Q.** So no opposite side injury that you -- that would be
15 consistent with a crush.

16 **A.** Yes, ma'am.

17 **Q.** Okay. And I apologize, it is very warm in here.

18 Any evidence that Lincoln sustained a fracture from
19 diabetes?

20 **A.** The retinal -- I believe -- sorry. The fractures --
21 oh, I'm sorry. No, ret -- diabetes did not cause his
22 fractures.

23 **Q.** Okay. All right. Now, you indicated that -- with
24 counsel that medical findings can't say when Lincoln was
25 injured.

1 **A.** Correct. I -- we talked about -- we talked about
2 timing of symptoms and we talked about that timeline. I'm
3 quite comfortable with that the timeline was -- said that he
4 was okay in the morning and he was not okay when dad got
5 there. The injury occurred somewhere in that interim. I
6 can't say based upon what he looked like at Primary or at
7 McKay-Dee, what time the injuries occurred.

8 What I do feel comfortable saying is that when those
9 injuries occurred, he would have been immediately and, in my
10 mind, persistently symptomatic afterwards. So whatever time
11 that was, which I can't say, that's what I -- that's that I
12 can say about the timing. But I can't say what -- did it
13 happen at 3:00, did it happen at 4:00. It happened sometime
14 before 5:00 when dad got there because he was symptomatic at
15 that time.

16 **Q.** And in -- in theory, if he ate lunch and was rocking
17 and playing in his highchair at lunchtime, it would have
18 happened sometime after that.

19 **A.** If -- if it happened after he was last seen awake and
20 interactive in some manner.

21 **Q.** Okay.

22 **MS. TOOMBS:** One moment. I have no further
23 questions, Your Honor.

24 **THE COURT:** Okay. From the defense?

25 **MR. BUSHELL:** We have no questions. Thank you.

1 **THE COURT:** Okay. Does any member of the jury have a
2 question for Dr. Herman? Looks like we do.

3 Dr. Herman, I don't know if we explained this to you,
4 but this is kind of a rare experiment we're trying where we're
5 allowing jurors to ask questions. So they write them down,
6 they bring them up here, and counsel join me at the bench. We
7 see if it's legally proper, and if it is, we'll ask it and if
8 not, we won't.

9 **THE WITNESS:** Should I address them?

10 **THE COURT:** With the answer, but kind of look this
11 way for the question.

12 Okay. Counsel, if you'll join me here at the bench.

13 (Discussion at the bench at 5:07:55)

14 **THE COURT:** Okay. Here's one. Here's another one.
15 Here's a third one.

16 Can you hear me?

17 **MR. BUSHELL:** I'm fine with all of them.

18 **MS. TOOMBS:** Yeah. Yeah.

19 **THE COURT:** I was talking to Debbie.

20 **MS. TOOMBS:** Oh.

21 **THE COURT:** She's making me move the microphone.

22 **MR. BUSHELL:** And we never win. Every time.

23 **MS. TOOMBS:** (Unintelligible)

24 **MR. BUSHELL:** That's true. Look, the defense
25 (unintelligible).

1 **MS. TOOMBS:** (Unintelligible)

2 **THE COURT:** Are both sides okay with me asking these
3 questions?

4 **MS. TOOMBS:** Yes.

5 **MR. BUSHELL:** That's fine.

6 **THE COURT:** Okay.

7 (Proceedings resume in open court at 5:09:57.)

8 **THE COURT:** I've had some microphone problems.
9 Debbie is teaching me here.

10 Okay. We're going to ask all three questions --
11 well, they're on three papers.

12 Dr. Herman mentioned that there was additional
13 bruising beyond the skull fracture and said the words, quote,
14 second impact, closed quote. Were you implying that there was
15 indeed more than one impact based on your experience?

16 **THE WITNESS:** No. And if I may stand? I hope I'm --
17 but we definitely saw bruising here and then the other -- only
18 other place I recall seeing bruising was in his groin and in
19 his -- when they were trying to put the line in his legs. So
20 I -- I don't believe that there was a second impact.

21 Second impact syndrome is something that -- I don't
22 know if I -- I don't know if that was the question. But
23 second impact syndrome is something that you see in football
24 players or boxers that will get hit and knocked out and/or
25 have a concussion or something and then get hit a second time

1 and have a spiraling out of control cerebral edema. I see no
2 evidence in any way, shape, or form that Lincoln had second
3 impact syndrome.

4 **THE COURT:** Okay. Next question: Dr. Herman
5 mentioned they had to wait a few days to dilate his eyes due
6 to illness. What was the illness?

7 **THE WITNESS:** Oh, his trauma. He was so sick that --
8 again, we talked earlier about neurosurgery wants the PICU,
9 the ICU staff, to be able to look at Lincoln's eyes and make
10 sure they were still reactive. If you dilate the eyes, they
11 don't react because they're dilated. So that's why
12 neurosurgery didn't want them to dilate the eyes because they
13 wanted to be able to look at his -- how his eyes were
14 responding and see -- see how the swelling in his brain was
15 going.

16 When you -- when your brain swells to the point of
17 what we call herniation where it actually squeezes out the
18 bottom, you get fixed and dilated pupils. So they need to
19 know and they need to have that ability to -- to look at the
20 pupil reaction to see how the edema is going. So that's why
21 there was a delay in a couple of days of being able to dilate
22 his eyes.

23 **THE COURT:** Okay. Thank you.

24 Next question: In your opinion, were the three
25 injuries; that is to say, skull fracture, spine injury, and

1 bilateral broken arms, caused by a single traumatic event?

2 **THE WITNESS:** That's a great question. In -- which
3 constellation again? Sorry, the --

4 **THE COURT:** It was skull fracture, spine injury, and
5 bilateral broken arms.

6 **THE WITNESS:** Okay. I think that it -- it -- it
7 fits. You can -- you can combine them all into a single
8 injury, but I can't say with 100 percent degree of certainty
9 that he wasn't shaken and then subsequently slammed or shaken
10 and subsequently impacted because I feel that the retinal
11 hemorrhages, the subdural hemorrhages, the back and the neck,
12 could conceivably have occurred from shaking alone.

13 And that said, I -- I -- I think it makes more sense
14 in that we know impact increases forces, so shaking with
15 subsequent impact makes the brain stop that much more abruptly
16 and have more torque. So the head is shaking back and forth,
17 the brain is moving within the skull, and when you hit -- stop
18 abruptly with an impact, the brain keeps going and -- and
19 those forces are more than just shaking alone as been seen.
20 And there's some -- of those children who died from inflicted
21 head trauma, more of them have associated evidence of impact
22 and those -- if you look at all abusive head trauma, those who
23 die more frequently have evidence of impact; i.e., a skull
24 fracture, than those that don't.

25 These -- these fractures, I can't say that they

1 couldn't have occurred at a separate time. Someone -- I think
2 that the bilateral nature of it make sense that they were --
3 in that I cannot -- I think it is extremely unlikely that --
4 that a three-year-old could certainly create both those forces
5 at the same time. An adult can and could, but whether they
6 did it one arm and then the other, I -- I can't -- again, I
7 don't have, unfortunately, the crystal ball to say exactly
8 what.

9 **THE COURT:** Okay. Next question: After the injury,
10 would it be true that Lincoln would be -- would either be
11 unconscious or crying in great pain at all times afterward?

12 **THE WITNESS:** I think we've talked a little bit about
13 that. I -- I feel that with the degree of injuries that he
14 had, he would have been immediately symptomatic, and then
15 persistently the symptoms would have stayed afterwards. He
16 certainly would not have recovered from these injuries to be
17 awake and alert and happy. There would have been some
18 significant degree of lethargy, crying, inconsolability.

19 And I think with the degree of actual brain damage he
20 had, I -- I think it's extremely unlikely that he could have
21 been able to sit up and eat and act normal -- well, in a
22 sense, I do not feel he could have sat up and acted normal.
23 Whether someone could have put something in his mouth and it
24 drooled out, I can't say that.

25 Sucking is a brainstem reflex. Babies can sort of

Addendum D
Radiologist's testimony

1 **THE COURT:** Just as what was shown, right?

2 **MR. MILES:** Correct.

3 **THE COURT:** Okay.

4 **MR. MILES:** Yes.

5 **THE COURT:** Okay. Anything else from the defense?

6 **MR. BUSHELL:** Nothing from the defense.

7 **MS. TOOMBS:** Do we need to bring an easel?

8 Permission to bring the easel up so that he can --

9 **THE COURT:** To what?

10 **MS. TOOMBS:** The easel --

11 **THE COURT:** Easel? Oh, yeah, that's fine.

12 **MR. MILES:** It will be easier just to attach it to it

13 or something.

14 **THE COURT:** Okay. Anything else?

15 **MR. MILES:** No. We're ready to proceed.

16 **THE COURT:** Okay. Go ahead and call --

17 (Proceedings resume in open court at 9:22:48.)

18 **MR. MILES:** Gary Hedlund to the stand.

19 (Off-the-record discussion)

20 **GARY HEDLUND,**

21 being first duly sworn, testifies as follows:

22 **DIRECT EXAMINATION**

23 **BY MR. MILES:**

24 **Q.** Good morning, Doctor.

25 **A.** Good morning.

1 Q. Could you please state your name for the record?

2 A. Gary Hedlund.

3 Q. And could you spell your last name for the record?

4 A. H-E-D-L-U-N-D.

5 Q. Doctor, where are you currently employed?

6 A. At Primary Children's Hospital, Salt Lake City.

7 Q. All right. What is your current field of medical
8 specialty?

9 A. Pediatric neuroradiology and pediatric radiology.

10 Q. All right. What is a pediatric neuroradiologist?
11 What do you do?

12 A. Well, beyond the training and diagnostic radiology
13 and a general fellowship in pediatric radiology, I took a year
14 fellowship in pediatric neuroradiology. So we focus on
15 diseases and disorders of the brain and spine, head and neck
16 in children, and usually that's under 17 years of age.

17 Q. And then pediatric radiology, I guess how is that
18 distinguished from the neuroradiologist?

19 A. Well, it's -- it's a broader field of training, and
20 that was the sort of first certification I gained after my
21 diagnostic radiology training. And it really would deal with
22 all facets of the -- the child's body and related to medical
23 imaging. So it might be X-ray, CAT scan, ultrasound, MRI,
24 nuclear medicine studies --

25 Q. Those kinds of --

1 **A.** -- anything that really relates to how a child might
2 be undergoing a test that requires medical imaging.

3 **Q.** Okay. And you indicated you were certified. Is that
4 board certifications in each of these areas?

5 **A.** So the certification for diagnostic radiology, that's
6 put forth by the American Board of Radiology. I certified
7 with a lifetime certification in 1988, but every 10 years I
8 recertify, and just did so last March.

9 In pediatric radiology, there is a certificate of added
10 qualification which is a board certification also offered by
11 the American Board of Radiology. And I have certified in that
12 and recertified every 10 years. Again, last March,
13 recertified.

14 Pediatric neuroradiology does not in and of itself have a
15 board certification. So I trained at Children's Hospital
16 Medical Center of Cincinnati where the fellowship -- which was
17 approved by the American Graduate Medical Education
18 Departments -- was offered, but there is currently no board
19 certification for pediatric neuroradiology.

20 **Q.** In general, how important, I guess when it's offered,
21 is it to be board certified within a particular area? What
22 does it allow you to do?

23 **A.** Well, I think it's like any -- any job, the more you
24 do the job, the more specific a job you do, I think you gain
25 expertise. And so I think what we have found in many areas of

1 medicine, including radiology, is that the more we focus, for
2 example, myself on brain and spine disease in children, the
3 more expertise I gain through time as I do that more.

4 And so I think subspecialization has allowed us to
5 understand fields of medicine more deeply and understand them
6 more completely.

7 **Q.** And does the certification demonstrate your level of
8 competence in that particular area?

9 **A.** Well, there's standards set forth, yes, by the
10 American Board of Radiology. So we have not only to meet
11 certain CME requirements, and we have an examination every
12 time we recertify, but we also must show other fields of
13 competency in the general clinical work we do and our
14 acceptance by our clinical colleagues.

15 So there's a few prongs to our certification. So
16 examination, CME, and, then, you know, sitting for about a
17 six-hour examination every 10 years.

18 **Q.** Can you describe for the jury your educational
19 background that kind of led you to the position that you are
20 now?

21 **A.** Well, I grew up as a kid going to public schools in
22 Arizona, in Phoenix, Arizona. I attended Northern Arizona
23 University in Flagstaff, Arizona, for my undergrad and studied
24 graduate studies at Arizona State University.

25 I took my medical training at the Chicago College of

1 Osteopathic Medicine. I graduated first in my class of 105.
2 I enrolled in the Air Force to help pay for my -- my
3 schooling.

4 And so when I finished my schooling, I did my internship
5 in Washington, D.C., at the Air Force Medical Center there,
6 which was a broad or general internship. Then I was a flight
7 surgeon for two years, and I worked in the emergency
8 department, worked in flight medicine, and in family practice.
9 And I did that for two years.

10 And then in 1984, I entered my residency with the Air
11 Force at its Worldwide Medical Center in San Antonio, Texas,
12 and that was a four-year program. And once I completed that
13 radiology residency program, I went to Children's Hospital in
14 Cincinnati where I took my first fellowship in pediatric
15 radiology. And that was a year long.

16 And then I had a couple of years to pay back to the Air
17 Force for my training, so I went back as a faculty member in
18 pediatric radiology, back to Texas to their main medical
19 center and provided pediatric radiology faculty services.

20 Then I took a job at the University of Alabama,
21 Children's Hospital of Alabama, where I worked for about eight
22 years as a pediatric radiologist doing all facets of pediatric
23 radiology, including neuroradiology.

24 And because my interest was very strong in the area of
25 the brain and spine for children, I went back and did a second

1 fellowship after about eight years of practice in Alabama,
2 went back to Cincinnati, took that fellowship in advanced
3 brain imaging and then came out to Salt Lake to Primary
4 Children's Hospital where I tried to establish some new and
5 innovative programs that relate to brain imaging in children,
6 and have worked there for about -- almost now 20 years.

7 **Q.** I was going to say, all told, then, in the area of
8 pediatric radiology and then encompassing the neuroradiology,
9 I mean, how many years' total experience are we talking about
10 here?

11 **A.** Well, I mean, I guess I really started taking care of
12 children and adults, you know, when I became an intern, so
13 that was 1981. My first fellowship I concluded in 1990. But
14 all the way along when I was working as a resident, you know,
15 I'm dealing with adults and children with a variety of
16 different diseases. But in terms of really gaining my
17 certification for pediatric radiology, that fellowship would
18 be 1999.

19 **Q.** Do you also teach in these areas of radiology and
20 neuroradiology?

21 **A.** I do. Currently we have an obligation or a
22 commitment to the University of Utah, and so I'm an adjunct
23 professor in radiology at the University of Utah. And what
24 that means is that I'm not -- I'm not paid by the University
25 of Utah, but they've acknowledged my research and my training

1 with a professor classification. So we treat -- teach the
2 residents and the fellows that are training there. So we do
3 have a training commitment to the University.

4 **Q.** What about publications? Do you do any of that?

5 **A.** I've enjoyed publishing throughout my whole career
6 and have published in a number of areas relating to children
7 and predominantly diseases of the brain and spine in children.

8 **Q.** What about child abuse? Do you research or publish
9 in the area of child abuse in children?

10 **A.** I have. Most recently in 2016, I was asked by a
11 group of physicians at Harvard to join them in leading the
12 organization in publication in a book called Diagnostic
13 Imaging of Child Abuse which is, I think, internationally
14 strongly regarded. And so I -- I led the writing and
15 organization of the abusive head trauma part of that.

16 And, specifically, my work related to bleeding that
17 occurs around the brain in the context of injury and
18 particularly inflicted injury in children. So I have -- I
19 have recently published in that area.

20 **Q.** And then do you also -- as part of your employment,
21 then, with Primary Children's Hospital, for example, do you
22 deal with cases that have abusive head trauma as components of
23 them?

24 **A.** Well, I -- first, I will just tell the jury that I
25 don't make the diagnosis of abusive head trauma.

1 **Q.** Okay.

2 **A.** It's made by a multidisciplinary team, and I'm a
3 participant in that in terms of analyzing imaging information
4 and then taking my experience and conveying concern about what
5 we see and its specificity in how that might relate to other
6 factors in the case.

7 But the diagnosis is typically rendered by a physician,
8 like a pediatrician who is involved in the child protective
9 services team who collects all that information trying to come
10 to a point of a decision in a diagnosis. But I interface in
11 this area of injury of children, both accidental and
12 nonaccidental injury, all the time.

13 **Q.** Okay. And, in fact, I guess, what do you do day to
14 day at Primary Children's as far as -- as far as what you're
15 (overtalking)?

16 **A.** So a common workday for me is about 12 hours and I
17 work mostly in the MRI arena, but also reading a lot of CAT
18 scans. And so I might read anywhere between about 40 and 50
19 brain MRIs. Because we are actually not only servicing the
20 children at Primary Children's Hospital, but the children at
21 McKay-Dee Hospital, Utah Valley, Dixie Regional, Intermountain
22 Medical Center.

23 Because a lot of our work is done digitally, through a
24 PACS workstation, we're now providing the neuroradiology, or
25 brain and spine imaging services, for children for these

1 intermountain hospitals. So, really, we have many
2 institutions feeding information to us that we're responsible
3 to interpret.

4 So I would probably read about 35 to 50 MRIs a day and
5 maybe a dozen CTs a day in a variety of different conditions.
6 It might be tumor or infection or trauma that we're looking
7 at, inherited diseases. So it really covers any imaginable
8 spectrum of disorders that occur in children.

9 **Q.** Okay. Would that -- so that's 35 to 50 a day. I
10 mean, over the course of your career, how many -- do you have
11 an estimate as to how many imagings, MRIs, CT scans that
12 you've looked at?

13 **A.** Well, in -- in preparation for this trial I went back
14 and tried do a conservative estimate on how many CTs of the
15 brain I have looked at since I started really becoming
16 responsible to do that, and I estimate it's probably about
17 20,000 CT exams.

18 **Q.** Do you know -- I guess, is there a certain percentage
19 or amount of your work that relates to trauma in children as
20 opposed to disease and those other kinds of things, that you
21 could estimate?

22 **A.** I mean, if I looked at kind of a typical day at
23 Children's Hospital in Salt Lake City, I would say about half
24 of our cases would reflect some type of trauma that's
25 occurred.

1 **Q.** And that's not distinguishing accidental from abusive
2 from anything. It's just traumatic causes.

3 **A.** Right. Well, it would depend on the age category,
4 typically, but I would say about half of what we're seeing
5 would relate to pediatric trauma.

6 **Q.** And then in terms of this case, you were contacted by
7 me --

8 **MR. WIDDISON:** Objection, Your Honor. At this point
9 the defense is objecting to the foundation and would request
10 an opportunity to voir dire the expert.

11 **MR. MILES:** We haven't even finished qualifying him.

12 **THE COURT:** Do you want to wait until --

13 **MR. WIDDISON:** The objection I made right now is
14 because he started talking about this case, and so I figured
15 that the foundation had been laid. And we are making an
16 objection to foundation because we believe this is an improper
17 rebuttal witness and would like an opportunity to voir dire
18 the expert.

19 **THE COURT:** Are -- are you done with your foundation
20 then, Mr. Miles? Are you starting to get into the -- this
21 case?

22 **MR. MILES:** We -- probably within the next few
23 minutes would, I guess, get there, but there's at least --
24 well, I mean, we're -- we think he's qualified there. So, I
25 mean, if they want to ask the questions, let's ask the

1 questions because we're prepared to sort of move.

2 **THE COURT:** Okay. Mr. Widdison.

3 **VOIR DIRE EXAMINATION**

4 **BY MR. WIDDISON:**

5 **Q.** Morning, Doctor.

6 **A.** Good morning.

7 **Q.** You're not a medical doctor, are you?

8 **A.** Yes. I'm a medical osteopathic physician.

9 **Q.** So you're a doctor of osteopathy, right?

10 **A.** That's correct.

11 **Q.** But that's not the same as a medical doctor --

12 **A.** Well, in our --

13 **Q.** -- is it?

14 **A.** -- in our country, there are two pathways to full
15 medical practice and surgical rights, the allopathic path or
16 the osteopathic medical path. I'm an osteopathic physician.

17 **Q.** Okay. So safe to say you consider yourself a
18 radiologist, right?

19 **A.** I am.

20 **Q.** And as a radiologist, you read medical imaging,
21 describe the imaging findings in detail, including the
22 pattern, distribution, and severity of injury, correct?

23 **A.** That is correct.

24 **Q.** As a radiologist, do you treat patients personally?

25 **A.** I don't prescribe pills or do surgery.

1 Q. As a radiologist, do you examine patients personally?

2 A. Yes.

3 Q. Tell me about that.

4 A. Well, it depends on the circumstance. To really gain
5 insight into the imaging interpretation, if the patient is
6 available, I often will go in to look at the patient.

7 Let's just take, for example, if they have struck their
8 head or maybe they've broken their leg or have a complaint at
9 their hip. If a patient is available physically for me to go
10 and see, that is, they're still in our department, I commonly
11 would go in to see them.

12 Q. But that's in context of doing imaging to then read
13 those images and --

14 A. That's correct.

15 Q. Okay. And as a radiologist, do you sign death
16 certificates?

17 A. No.

18 Q. As a radiologist, do you perform autopsies?

19 A. I do not.

20 Q. As a radiologist, do you handle brain tissue?

21 A. Sometimes.

22 Q. Tell me about that.

23 A. Well, often I'll go over to the medical examiner
24 office when an autopsy is being done. They'll notify us if
25 it's a case we have been involved with, then I have the

1 opportunity to be present when that's done. In my field,
2 perhaps (unintelligible) very closely, even physically be able
3 to touch brain tissue during that process.

4 **Q.** So then you examine brain tissue under a microscope?

5 **A.** No.

6 **Q.** Okay. And as a radiologist, do you handle the brains
7 of children who have had fatal falls in childhood?

8 **A.** Do you mean actually touch?

9 **Q.** Yes.

10 **A.** I have. It's not always done.

11 **Q.** Okay.

12 **A.** But I occasionally do that.

13 **Q.** Occasionally.

14 **A.** Uh-huh.

15 **Q.** And as a radiologist, you do not make determinations
16 of cause and manner of death, correct?

17 **A.** That is correct.

18 **Q.** So in your day-to-day practice when X-rays or other
19 images are submitted to you for evaluation in the radiology
20 department, do you get anything other than a request form?

21 **A.** Yes. Often I have a direct conversation. It depends
22 on the criticality of the patient. I might be talking
23 directly with the neurosurgeon or they might be actually
24 physically in my presence looking at imaging studies with me
25 in a case that, for example, will require going to surgery.

1 At other times I'm talking with an emergency doctor on
2 the phone. Or if it's an outpatient sent in, I might just be
3 looking at a history that's typed on a requisition.

4 **Q.** So that would be like the patient chart? You're
5 given the patient chart when you're asked to read an image or
6 an X-ray?

7 **A.** If it's an inpatient, but if it's an outpatient it
8 would be history information entered on the patient
9 information registration.

10 **Q.** So you talked about some conversations, but do you
11 get any specific documents or records that are provided to you
12 in order to perform your duty as a radiologist?

13 **A.** If it's an inpatient and their chart is accompanying
14 the patient, we have that to review.

15 **Q.** Okay.

16 **A.** And we have an electronic patient information system
17 at our fingertips on the workstation called a HelpSystem which
18 we're able to immediately look up clinical information.

19 **Q.** So how often would you say that you get the chart
20 with the patient for a request to examine images?

21 **A.** It's a hospital requirement, actually a federal
22 requirement, the chart come with the patient into our
23 department for imaging if it's an inpatient.

24 **Q.** Okay. But if it's not an inpatient, they just send
25 you the imaging and not the chart.

1 **A.** If it's not an inpatient?

2 **Q.** Yes.

3 **A.** That's correct.

4 **Q.** So when reading an X-ray or other image to determine
5 whether there's a subdural hematoma or not, what information
6 beyond the imaging itself do you need to make that
7 determination?

8 **A.** Do I need to make the determination if it's a
9 subdural?

10 **Q.** What information beyond the imaging itself do you
11 need to make the determination of whether there's a subdural
12 or not?

13 **A.** I make that determination by the imaging.

14 **Q.** Okay. In this case, you were provided by the State
15 with, among other things, CSI photographs, autopsy
16 photographs, the autopsy report, police reports, the
17 preliminary hearing transcript, the video of Boston and the
18 CPR doll, the video of Brylee's interview with police, a
19 biomechanical engineering report, Dr. Ophoven's forensic
20 pathologist report, and the prosecutor's written summary of
21 Dr. Ophoven's --

22 **A.** Uh-huh.

23 **Q.** -- sworn testimony before this court; is that
24 correct?

25 **A.** Yes, sir.

1 **Q.** In your day-to-day practice as a radiologist, when
2 reading an X-ray, are you asked to make a determination of
3 whether an injury was inflicted or accidental?

4 **A.** Oftentimes the clinical question comes from the ER,
5 what do I think? Yes.

6 **Q.** But are you asked to make that determination based on
7 the imaging, of whether it's inflicted or accidental?

8 **A.** Yes.

9 **Q.** You are asked to make that determination.

10 **A.** Yeah. There are some physicians that ask that
11 question, yes.

12 **Q.** Now, is that a -- they're asking for your opinion or
13 is it that they're asking for an actual diagnosis?

14 **A.** They're asking for my opinion.

15 **Q.** Okay. And in your day-to-day practice as a
16 radiologist, do you ever write in a report that the imaging
17 that you review definitively shows inflicted trauma?

18 **A.** I might say this --

19 **Q.** But do you -- but do you put that in your report,
20 that the imaging definitively shows inflicted trauma?

21 **A.** I don't typically put those words in.

22 **Q.** Okay. And in your day-to-day practice as a
23 radiologist, are you ever asked to render a medical
24 determination about how an injury occurred?

25 **A.** No.

1 **Q.** And do you have any formal education or training in
2 determining how a specific injury took place?

3 **A.** Well, just the aggregate of many years of working
4 with clinical and surgical colleagues and being very
5 up-to-date on the literature.

6 **Q.** Okay. And you're not a forensic pathologist,
7 correct?

8 **A.** I am not.

9 **MR. WIDDISON:** Your Honor, permission to approach the
10 bench with opposing counsel?

11 **THE COURT:** Okay.

12 (Discussion at the bench at 9:44:32.)

13 **MR. WIDDISON:** Your Honor, at this point we're going
14 to move to exclude Dr. Hedlund as an inappropriate rebuttal
15 witness, and I'm prepared to make arguments on that. I can do
16 it here at the bench or I can do it outside the presence of
17 the jury, however the Court would prefer.

18 **THE COURT:** Before we get into that, can you tell me
19 the expected testimony so I kind of have a heads-up of where
20 we're going? Do you mind if I hear that?

21 **MR. WIDDISON:** No, that's fine.

22 **THE COURT:** Because I think both of you know, but I'm
23 not sure I know.

24 **MR. MILES:** So Dr. Hedlund will be explaining the
25 different injuries that Lincoln Penland suffered that

1 Dr. Ophoven and all the other doctors have described, and he
2 will be describing the significant features of these injuries
3 and -- in terms of their neurological effects on Lincoln
4 Penland. He will describe those as well as -- and we'll
5 probably want to ask more questions dealing with this -- this
6 idea of how injuries are inflicted in -- in his clinical
7 experience, in his research and that sort of thing, as I do
8 think he can opine on not like a biomechanical kind of a
9 thing, but in his clinical experience and research, the
10 severity of the injury and the severity of -- of general
11 trauma needed to cause certain kinds of injuries. And -- and
12 then -- and why that's a fact.

13 So, for example, when Ophoven says there's no direct
14 injury to the brain, he can explain why there is direct injury
15 to the brain. When Ophoven opined, you know, certain
16 fractures are not painful in terms of that, he can opine and
17 explain why they are painful in -- in terms of that. And
18 so --

19 **THE COURT:** Is that the portions of Dr. Ophoven's
20 that he's expected to rebut, then?

21 **MR. MILES:** That's partial. I have to go get all my
22 notes to sort of talk it out, but he's going to walk through
23 each -- each injury he'll explain, for example, the different
24 pathways of -- of blood and how it can get into certain areas
25 and how it can't get into other areas.

1 For example, Ophoven opined that everything in the
2 spine was just bleed down. He can say, no, that's not bleed
3 down. She opined on lucid intervals, and as a
4 neuroradiologist, he can explain what lucid intervals are
5 associated with and what they're not. And so he can explain
6 how this is not a case where a lucid interval would be
7 expected because the injuries don't match up with the -- those
8 cases where lucid intervals are.

9 So he's going to rebut all of those conclusions that
10 are drawn by that. And the law basically allows any rebuttal
11 testimony which tends to dispute, explain the meaning, or
12 effective evidence that has been given by the opposing party.
13 So he can qualify all of those answers to Ophoven. She opined
14 probably beyond where she should be. This is his specialty.
15 He specializes in brain and spinal trauma and diagnostic
16 imaging of that trauma.

17 **THE COURT:** Okay. Do you want to -- you said that
18 you wanted to do argument either in front of or outside the
19 presence of the jury. Are you expecting it to be long? Is
20 that why you asked that question?

21 **MR. WIDDISON:** I -- I don't know. I mean, if I
22 have -- Mr. Miles already did some of his argument, but I -- I
23 don't know how long it would be because I don't know how long
24 the back-and-forth is going to take. But my comments will be
25 pretty limited.

1 **THE COURT:** Okay.

2 **MR. BUSHELL:** Twenty minutes.

3 **MR. WIDDISON:** Less than that.

4 **THE COURT:** I'm always having trouble hearing, so --
5 but I heard all of that. I'm fine with doing it here --

6 **MR. WIDDISON:** Okay.

7 **THE COURT:** -- and keeping everybody here unless you
8 think it's going to be a real long time.

9 **MR. WIDDISON:** No, I -- I can give you our arguments
10 on that.

11 **THE COURT:** Okay. But wait for Mr. Miles to come
12 back. Are -- are you going to be responding?

13 **MR. MILES:** I -- I don't know. Just in case the
14 Court has questions --

15 **THE COURT:** Okay.

16 **MR. MILES:** -- about areas of inquiry and that sort
17 of thing.

18 **MR. WIDDISON:** So, your Honor, our medical expert,
19 Dr. Ophoven, did not disagree with nor contradict Dr. Ulmer's
20 medical findings and the underlying imaging findings that
21 Dr. Ulmer relied on. In fact, when asked by Mr. Bushell,
22 Dr. Ophoven emphatically agreed with Dr. Ulmer, and by
23 extension, the imaging Ulmer relied on in her diagnosis of a
24 diastatic skull fracture, subdural hematoma, and subarachnoid
25 hemorrhaging in Lincoln Penland.

1 She agreed with the findings of all the medical
2 professionals in this case. Her opinion and testimony in
3 trial was about the possible causes of those findings, in her
4 capacity as a pediatric forensic pathologist.

5 Dr. Hedlund is not a forensic pathologist and he
6 cannot opine about the causes of specific imaging findings.
7 Neither can Dr. Hedlund rebut Dr. Ophoven's testimony, her
8 opinion about the causes of those findings. Dr. Ophoven did
9 not even explicitly address the imaging in her testimony.

10 When -- where Dr. Hedlund is a radiologist, he would
11 be an appropriate rebuttal witness if the defense had
12 presented testimony from a radiologist. In fact, I think
13 that's why Dr. Hedlund was retained by the State to -- and we
14 were given notification of expert rebuttal witness because
15 they were anticipating that we would call a radiologist in our
16 case in chief. We did not.

17 **THE COURT:** Was that Dr. Haber?

18 **MR. WIDDISON:** Yes. And forensic pathology is not a
19 subdiscipline of radiology. Dr. Hedlund is not an appropriate
20 expert rebuttal witness to rebut our pediatric forensic
21 pathologist, and he should not be allowed to testify.

22 Our concern is that he's coming in here to opine
23 about cause of injury, mechanisms of injury, and that is the
24 exclusive prerogative of a forensic pathologist, not a
25 radiologist. He doesn't treat patients. He doesn't normally

1 rely on forensic pathologists to perform his work as a
2 radiologist. He said so during voir dire. Yet, in this case,
3 he was given a lot of documents that he normally doesn't rely
4 on to perform his duties as a radiologist: Police reports,
5 forensic pathologist reports, the videos.

6 A lot of evidence was given to him, including a
7 written summary of all of Dr. Ophoven's testimony. A
8 radiologist is a -- is a perfectly fine rebuttal witness for
9 defense testimony from a radiologist. Testimony from a
10 radiologist is not appropriate testimony to rebut a
11 pathologist.

12 Furthermore, as -- well, I'll just reiterate that
13 Dr. Ophoven clearly stated in court that she didn't disagree
14 with the medical findings of the pathologist, and that's what
15 she was opining about is with the pathologist, Dr. Ulmer, in
16 this case. She disagreed about what the possible causes of
17 those findings would be, but not the actual findings
18 themselves.

19 **THE COURT:** Okay. Response then?

20 **MR. MILES:** Dr. --

21 **THE COURT:** You need to come closer because I'm
22 older.

23 **MR. MILES:** Sorry. Dr. Ophoven went actually far
24 beyond just simply saying I agree with Dr. Ulmer and then
25 stopped there. She went on to talk about all of the different

1 imaging things and the features that it revealed during the
2 course of Lincoln Penland's stay in the hospital and why those
3 were significant to her.

4 She listed all kinds of findings, for example, that
5 started in the hospital that were verified at autopsy and then
6 explained how those findings impacted Lincoln's course of --
7 his progression in terms of ultimate death and why they
8 resulted in -- in certain death and what those features would
9 have clinically -- she didn't testify like a pathologist, she
10 testified like a clinician -- what she would expect
11 clinically: How he would behave, why he would act lucid, why
12 he wouldn't react painfully to certain things.

13 She went and started opining about not just that she
14 found these things. She took those and went several steps
15 further than that about why subdural hemorrhaging wasn't a big
16 deal, that there was no direct injury to the brain and how it
17 would have done these sorts of things. So she didn't just
18 confine herself to Dr. Ulmer.

19 She testified against Dr. Ulmer. She testified
20 against Dr. Herman. She testified against Dr. Mamalis,
21 talking about retinal hemorrhages and everything else and the
22 significance of those findings. She took it -- you know,
23 basically everybody on in terms of that testimony and then
24 explained in her opinion why certain things happened and why
25 the causes for those things could happen in terms of that. So

1 she testified far afield.

2 And nothing in the rules requires that rebuttal be
3 matched one for one. If they call a certain kind of expert to
4 opine on something but we call a different expert that we feel
5 is better qualified to opine on those issues, that is
6 perfectly allowed for by the rules because the rules allow any
7 rebuttal testimony to come in to rebut the facts and
8 assertions made by their witness.

9 And he can do exactly that. This is his area of
10 specialty. It's children -- pediatric neuroradiology and the
11 imagings of the brain, and he can talk about the injuries to
12 the brain, their significance, the mechanisms that are
13 associated with certain kinds of injuries to the brain and the
14 significance of those because that's part of what he does
15 day-to-day. And he's testified to that, that he's asked for
16 his opinion.

17 He's looked at tens of thousands of these sorts of
18 things. Abusive head trauma is an area that he has researched
19 and specialized in for a number of years. He's published in
20 this particular area. And so I think he has met that
21 702 threshold requirement to opine on all of those things.

22 **THE COURT:** What -- what about testifying to the
23 causes of injuries?

24 **MR. MILES:** I think he can talk about in his clinical
25 experience the significance of events that are associated with

1 levels of injuries versus -- you know, for example, we're
2 going to talk about household falls of, you know, a few feet
3 which was testified to by Ophoven as to whether or not it
4 could cause a certain skull fracture, subdural hemorrhaging,
5 and all of those kinds of things.

6 And he can testify in terms of his experience as a --
7 as a diagnostic radiologist and clinician that these are not
8 associated with that, that you won't see these when you get
9 great falls. Ophoven hasn't even treated patients, but she
10 opined generally based upon her experience on these things,
11 talked about personal experience with that.

12 He can do the exact same thing in terms of testifying
13 about all of the thousands and thousands of patients he's seen
14 in terms of their reported histories and what associated
15 injuries are that these kinds of injuries are associated with
16 and suspicious for, in addition to what his research has
17 revealed regarding the level of injuries that are associated
18 with certain kinds of medical findings in terms of that
19 because that's part of the abusive head trauma, child
20 abuse-type research that he's done in terms of trying to
21 distinguish one from the other.

22 **THE COURT:** What about mechanisms of injuries? Same
23 response?

24 **MR. MILES:** I think it's the same sort of thing.
25 We're looking at certain kinds of things to -- to cause

1 certain kinds of injuries in his clinical experience and his
2 diagnostic experience.

3 **THE COURT:** What about -- Mr. Widdison says a
4 radiologist can't rebut a pathologist?

5 **MR. MILES:** That's why I said, it's not a one for
6 one. The rebuttal rules do not say just because you call a
7 certain kind of doctor means that we can't call a different
8 kind of doctor. If we think there's a doctor that specializes
9 in this area that we think would be better qualified to
10 address those concerns, then we're not limited to just saying,
11 well, if you picked a -- a certain quality of a witness that
12 we think is lesser, we're stuck with lesser quality witnesses
13 to rebut.

14 If we think there's a better person, better trained
15 specifically in this area of cerebrospinal injury, which is
16 what we're going to be talking about here, then that expert
17 should be the one to be heard on these issues, not other
18 experts. And the jury can then weigh out which one do they
19 believe and which one will they consider to be the more
20 credible witness.

21 So there's no -- there's no requirement under the
22 rules. It's any fact that is testified to is subject to
23 rebuttal. Those were all things that Dr. Ophoven testified
24 to, and they're all subject to rebuttal. As long as he's
25 qualified under 702 in these areas of any testimony that tends

1 to dispute, explain the meaning of, or effective evidence that
2 has been given by an opposing party is admissible in rebuttal.

3 **MR. WIDDISON:** Your Honor, he testified just now that
4 he has no education or training in determining causes of
5 injuries. He also testified that he is not asked to make a
6 determination of a cause of an injury when he -- when a
7 request is made of him to view imaging. He -- he reads
8 images, that's what he does. The pathologist is the one who
9 then takes the information from the radiologist and uses their
10 training and experience to determine what the possible causes
11 of those injuries are.

12 He admitted that he -- and on direct examination, in
13 fact, said he doesn't make any diagnoses. That's not what a
14 radiologist does. A radiologist looks at the images and
15 determines what injuries are present. And Dr. Ophoven agreed
16 with the injuries that were present in this case, in her
17 testimony. Her opinion was about what the possible causes of
18 that are.

19 We believe this is an improper rebuttal. This
20 witness would have been perfectly appropriate during the
21 State's case in chief, but right now what is going on is that
22 they're trying to -- well, I mean, the law says that the
23 purpose of rebuttal evidence is not to merely contradict or
24 corroborate evidence already presented, but to respond to new
25 points or evidence first introduced by the opposing party.

1 Pathologists, forensic pathologists routinely rely on
2 biomechanic engineers, on radiologists, on ophthalmologists,
3 and that's what Ophoven testified to and that's why she was
4 able to talk about those areas, despite not contradicting or
5 finding any errors in the medical findings. But a radiologist
6 does not -- well, forensic pathology is not a subset of
7 radiology, so I don't think it goes both ways.

8 **THE COURT:** Okay. Are you planning on asking any
9 further questions of him, either side, about his
10 qualifications or foundation?

11 **MR. MILES:** We had a few more. I mean, we were going
12 to talk to him about his experience in some of this area, in
13 terms of that.

14 **THE COURT:** Are they going to the things we're
15 talking about now?

16 **MR. MILES:** Some of it will, yes, I believe so. And
17 just to look at Dr. Ophoven's testimony, the question was
18 asked of her by the jurors, is much of your testimony drawn
19 from the autopsy and from that --

20 **THE COURT:** I can't quite hear you.

21 **MR. MILES:** Sorry. The question asked of her by the
22 jurors was, was much of your testimony, is it drawn simply
23 from the autopsy and the opinions of that person? And she
24 said no. She was looking at the whole constellation of other
25 evidence and this evidence is part of that.

1 **THE COURT:** Okay. Did you want to ask these other --

2 **MR. MILES:** I still would like to talk to him about
3 more of these things.

4 **THE COURT:** Did you want to ask these further
5 foundation questions before I rule?

6 **MR. MILES:** That's fine.

7 **THE COURT:** And do you have further or you may have?

8 **MR. WIDDISON:** Just that he just said that he can't
9 determine the mechanism of injury by looking at an image, that
10 he can't determine the cause of an injury by looking at an
11 image. He can't do that because he's not a pathologist. He's
12 a radiologist. He tells the pathologist what injuries are
13 present, and that's it.

14 **THE COURT:** Okay. Do you want to ask your questions
15 first?

16 **MR. MILES:** We'll ask the questions.

17 **THE COURT:** Okay. And then come back?

18 **MR. MILES:** That's fine.

19 **THE COURT:** And then come back to the bench?

20 **MR. MILES:** I guess that's fine.

21 **MR. WIDDISON:** That's fine.

22 **THE COURT:** Okay.

23 (Proceedings resume in open court at 10:01:03.)

24 **DIRECT EXAMINATION, CONT'D**

25 **BY MR. MILES:**

1 **Q.** Doctor, sorry about that delay. We've got some
2 further questions that we want to talk to you about, sort of
3 your background --

4 **A.** All right.

5 **Q.** -- and your experience here. Particularly, you've
6 talked about kind of what your training is in. You explained
7 at some point if you were asked about your opinion on
8 inflicted versus accidental types of injuries. Can you
9 explain more about your experience in this particular area
10 dealing with children and making that kind of a determination?

11 **A.** Sure. Well, it's a common question that is posed --
12 it might be posed by an emergency department physician or
13 maybe a neurosurgeon about what my opinion is as to how these
14 injuries came about, and based on the patterning or the -- the
15 number of injuries, how severe they are, the age of the
16 patient, the history that is presented to me, all these things
17 are taken to try to make a thoughtful response to the question
18 about what my observation of the images shows and how it might
19 tie in to whether the problem is an accidental problem or an
20 inflicted problem. So that's a common scenario that I'm
21 dealing with in -- in my practice and have for many years.

22 **Q.** You were asked if you would ever write in your report
23 the words "inflicted trauma," and you were going to explain
24 what you might actually write in that. Can you explain? I
25 guess, what is it that you might make a determination of?

1 **A.** Sure. So when the attorney asked me that question, I
2 would not use the words that he proposed. So I might say, for
3 example, if I was rendering a report, an opinion or conclusion
4 on a report, where the combination of the findings present,
5 based on my practice-based experience, based on my knowledge
6 of the literature, and based on the situation that I was
7 facing, I might say something like this if I felt that
8 inflicted trauma was strongly suspected. I might just say:
9 The presence of subdural hemorrhage, subarachnoid hemorrhage,
10 a diastatic fracture of the skull, injuries of the soft
11 tissues, in combination, these findings are strongly
12 suspicious for inflicted injury. That might be a report that
13 I would render.

14 **Q.** Okay. In terms of the -- the question regarding, I
15 guess, the mechanisms of injury, in your training and
16 experience, is it something that you actually have experience
17 in -- in looking at in determining what are likely general
18 causes of certain types of injuries over others?

19 **A.** Well, yes.

20 **Q.** So if you could --

21 **A.** I mean --

22 **Q.** -- explain a little bit more --

23 **A.** Sure.

24 **Q.** -- about --

25 **A.** Sure.

1 **Q.** -- kind of how you get to that point or why you are
2 capable of knowing that.

3 **A.** So, first of all, I -- I work with a lot of other
4 doctors. I don't really work in isolation. We want to
5 cooperate and share our knowledge. And so I'm working with
6 clinical pediatricians. I'm working with neurosurgeons. I'm
7 working with rehabilitation doctors. I'm working with special
8 pediatricians that only deal with problems of trauma in
9 children. And I'm not only learning from them and have done
10 so now for about 30 years, but I'm -- I'm deeply invested in
11 studying the literature, and that's part of it as well.

12 And so it's what I'm gaining -- on the job work and
13 experience through time, my collaboration with my colleagues
14 and their experience, their disciplines, bringing and
15 complementing what I do, and I'm complementing their work by
16 sharing the information I've gathered. And together we're
17 pooling that information to try to make the most accurate
18 diagnosis, whatever condition we're dealing with, whether it's
19 a new tumor of the brain or if it's trauma. So it's really an
20 aggregate of many inputs.

21 **Q.** Have you also, then, taken a special interest in the
22 study and the field of, I guess, inflicted trauma, how to
23 distinguish inflicted trauma from accidental trauma?

24 **A.** Yes. I -- in the last years of prior practice that's
25 been an area that I have been spending a lot of time and

1 research and writing, and in my clinical practice. So it is
2 an area of -- one of the areas of my interests.

3 Q. In terms of the -- that being an interest, then, you
4 talked about a number of the different types of experts that
5 you -- you work with or even consult with. What about --
6 we'll just sort of throw out the broader biomechanical experts
7 or expertise. What is your experience in that area?

8 A. Well, when I was working on this current project and
9 textbook, I had a close affiliation with Dr. Brittany Coats,
10 who is a biomedical engineer in the department of engineering
11 at University of Utah. She is extensively published in the
12 area of skull fractures particularly, and head trauma in
13 children. And so we worked together.

14 She and another doctor, Lori Frasier, I had them do the
15 biomechanical part of the abusive head trauma section of that
16 textbook. So she's readily accessible. We have communicated
17 on several projects. She is a -- I would say a very special
18 and -- and wonderful consultant as we're dealing with
19 challenging problems. She is another person in a
20 multidisciplinary arena that can bring her expertise into
21 discussion, clinical discussions and surgical and medical
22 imaging discussions.

23 So it's -- it's a collaboration. But I've worked -- I've
24 worked closely with her on a clinical and on a research and
25 writing basis.

1 **Q.** All right. Have you been asked -- or as part of your
2 occupation, then, do you often opine on whether a certain set
3 of injuries is consistent with a history or explanation of
4 causes for those injuries?

5 **A.** It's taken into consideration, absolutely. The
6 history -- we -- we want to have an accurate and thorough
7 history. It's very important. I think it's part of being
8 a -- a complete physician. So even though I'm a medical
9 imaging doctor, having a good history is really critical.

10 **Q.** And -- and do you also assist as part of that
11 multidisciplinary team, then, in determining how injuries are
12 caused, what their likely effects would be, and that --

13 **A.** Yes.

14 **Q.** -- sort of thing?

15 And just kind of explain, I guess, a little bit more
16 about how you're able to do that.

17 **A.** Well, I'm able to do that because, again, I'm
18 bringing to bear to that point where those decisions are being
19 made by a group of doctors -- not just one doctor, but a group
20 of doctors coming together. I'm bringing -- I'm bringing my
21 experience and my training and I'm also bringing my knowledge
22 of the literature.

23 So I think it's the best combination of what I would call
24 practice-based evidence. What I've been learning for nearly
25 30 years working only with children and what I understand from

1 the literature -- you know, over 60 years, there's been over a
2 thousand peer-reviewed papers published about abusive head
3 trauma, published by more than a thousand authors from 25
4 different countries.

5 There's a large body of literature that has dealt with
6 these problems. And these papers can vary in their quality of
7 how the paper was done. But nonetheless, there's been a large
8 aggregation of research over the -- the few decades.

9 **Q.** Okay. Do you feel, then, that you would be, based
10 upon your training and experience, qualified -- and we'll kind
11 of get into the -- the nuts and bolts of this particular case,
12 but in general, about the nature of the injuries suffered by
13 Lincoln Penland, the severity of those injuries, and its
14 likely effects on him neurologically?

15 **A.** Yes.

16 **MR. MILES:** Any additional questions?

17 **THE COURT:** Any further voir dire from the defense?

18 **MR. WIDDISON:** No, Your Honor.

19 **THE COURT:** Okay. Do you want to approach, then, and
20 make final comments?

21 (Discussion at the bench at 10:09:23.)

22 **THE COURT:** Okay. Now, we're talking about Rule 702,
23 right?

24 **MR. MILES:** Uh-huh.

25 **THE COURT:** So let me pull it. Everything is always

1 in a different place (unintelligible).

2 **MR. MILES:** Which book you grab.

3 **THE COURT:** Okay. What is the final comments?

4 **MR. WIDDISON:** Your Honor, I think just the last
5 question that Mr. Miles posed to the doctor is very telling.
6 The question was, based on your training and experience, what
7 can you tell from -- I'm paraphrasing. I can't remember the
8 question exactly. But his answer was that he can talk about
9 the injuries, the severity of the injuries, and the effects of
10 those injuries, but conspicuously absent from that is the
11 ability to talk about the causes and mechanisms of those
12 injuries.

13 **MR. MILES:** He previously testified to that three
14 minutes before when he talked about (unintelligible).

15 **THE COURT:** I thought that as well. I thought he
16 ended with the nature and extent and severity of injuries
17 which I don't think there's really a dispute that he could
18 find, but I thought you started with the other, so -- okay.

19 Okay. Based on what I've heard, I think there is a
20 threshold showing and that he can go ahead and testify --

21 **MR. MILES:** Thank you, Your Honor.

22 **THE COURT:** -- to rebut Dr. Ophoven. But you've got
23 to stay within --

24 **MR. MILES:** We're getting there.

25 **THE COURT:** -- what she said because that was the

1 only witness.

2 **MR. MILES:** Right. We're trying to get there.

3 **THE COURT:** Okay.

4 **Q. (BY MR. MILES)** Okay. I think we're finally ready to
5 kind of start moving into the substance of -- of the case
6 we're here to discuss today.

7 **A.** All right.

8 **Q.** You were asked a question during the voir dire
9 process -- you were provided a number of records by my
10 office --

11 **A.** Yes.

12 **Q.** -- in an effort to have you consult on this case.
13 And I -- and I think that's where I kind of left off before we
14 kind of got diverted.

15 This was a case where we reached out to you and asked you
16 for your professional opinion; is that correct?

17 **A.** Yes.

18 **Q.** And so during the course of this case, is this a case
19 that you are being compensated for as a hired professional?

20 **A.** Yes.

21 **Q.** All right. And is this an area that you normally
22 derive your primary source of income from, though?

23 **A.** No.

24 **Q.** I mean, how often are we talking about that you
25 actually come out and -- and consult on a case?

1 **A.** I think in the last -- in the last decade -- I've had
2 three trial testimonies in the last 10 years.

3 **Q.** Okay. And so do the opinions that we're going to
4 discuss here reflect your own judgment and opinions and
5 knowledge of the subject matters that we're going to be
6 talking about here?

7 **A.** Yes.

8 **Q.** You're not compensated one way or another or
9 differently because you hold certain opinions or don't, from
10 our perspective?

11 **A.** No, I am not.

12 **Q.** All right. In terms of the information you were
13 given, I guess one of the things that wasn't discussed is did
14 you have access to the imaging that was performed on Lincoln
15 Penland during the course of his hospital stay at Primary
16 Children's and McKay's from February 19, 2014, up through the
17 28th, his date of death, 2014?

18 **A.** Yes.

19 **Q.** And how do you gain access to those images?

20 **A.** Through a PACS workstation. These are high
21 resolution imaging monitors in our department.

22 **Q.** All right. So you have direct access to those
23 without having to be provided by us?

24 **A.** Yes.

25 **Q.** And did you review those in preparation for your

1 testimony here today?

2 **A.** Several times.

3 **Q.** Okay. What kinds of imaging and scans are we talking
4 about here that you reviewed? What are they called?

5 **A.** CAT scans, or CTs, MRI examinations.

6 **Q.** All right. And can you briefly kind of explain --
7 let's start with CTs.

8 **A.** Sure.

9 **Q.** What are CT scans? How do they generally work?

10 **A.** I think everybody is familiar with an X-ray, and,
11 really, a CAT scan is an X-ray technology, but we're able to
12 make cross-sectional images, sort of like we're slicing
13 through the body. But it is still principally an X-ray
14 technology and so it gives us real good information about
15 bone. It gives us very good information about blood, the
16 presence of blood.

17 And an MRI, which is another technology that I reviewed
18 for this case, is a completely different kind of technology,
19 but it gives us very good information about soft tissues and
20 very good information about blood and anatomy, for example,
21 anatomy of the brain. It's very exquisite in being able to
22 tell us about that. But it's based on a -- just a very
23 different kind of physical principle of making the images than
24 X-ray technology.

25 **Q.** All right. The images that you viewed and examined

1 in this case, are they used in the normal course of your
2 professional practice?

3 **A.** Every day.

4 **Q.** Okay. So I want to move into a discussion of that
5 imaging and the findings from that imaging in this case.

6 Can you describe, based on your review of the imaging in
7 this case, the significant findings of Lincoln Penland in
8 terms of, I guess, abnormalities or injuries that you
9 discovered?

10 **A.** Well, the first imaging study I had to look at was
11 the study that was performed at McKay-Dee Hospital about
12 quarter till 6:00 p.m. on the 19th, and that was a head CT.
13 So it was being done principally to investigate the brain and
14 the skull, and that showed a fracture in a part of the skull
15 that would be sort of around the ear, the mastoid part of the
16 skull.

17 And it showed swelling of the tissues overlying the
18 fracture. And then it showed blood in a space around the
19 brain tissue that we would call the subdural compartment. So
20 there's a few different potential spaces where blood can
21 occur, and so we could see blood in the subdural compartment.

22 And then there's another space right next to the brain
23 tissue called the subarachnoid space, and -- and there was
24 quite a bit of blood there as well. A very tiny epidural
25 amount of blood was seen near the fracture.

1 So there's really three different sort of components or
2 spaces where blood was appearing on that initial study. And,
3 also, there was some very early signs of swelling in the right
4 side of the brain tissue on that initial study.

5 **Q.** And that's just as Lincoln initially presented to the
6 McKay ER on the 19th.

7 **A.** Correct.

8 **Q.** All right. Were further studies or examinations done
9 with imaging tools done with him throughout the course of his
10 stay through Primary Children's?

11 **A.** Yes. The patient was transferred to Primary
12 Children's, and there were many studies performed there.
13 There were CT examinations of the spine that were performed.
14 And about 15 hours after the first head CT, they repeated that
15 at Children's Hospital.

16 And, really, the -- I think the most traumatic findings
17 there were more and more swelling of the brain. Still, we
18 could see other areas where the blood was present as I
19 described to you, but the real striking change was the fact
20 that the brain was swelling in that interval.

21 **Q.** And why is that significant or striking?

22 **A.** Well, it poses for the clinical doctors a lot of
23 management problems, how to control that, because when the
24 brain is swelling, it can start to compress really critical
25 structures that relate to how respiration and cardiac function

1 works and regulation of temperature.

2 And blood vessels that are supplying nutrients and oxygen
3 to the brain can become compressed if the brain is swelling
4 too much, and then that's only going to lead to more swelling.
5 So you get into a -- a vicious cycle of swelling causing more
6 swelling and eventually the compression of all of that can --
7 can lead to death.

8 **Q.** All right. What were the significant findings of the
9 other imaging? You described that one was of the -- the
10 spine, in that area, and I guess were there other surveys done
11 that revealed other significant findings from those?

12 **A.** So kind of sticking with the neuro, the brain and
13 spine imaging, one of the -- the insights that was described
14 by one of my colleagues, Dr. Boyer, in the -- the evaluation
15 with MRI of the spine was the presence of swelling in the
16 ligament structures in the back of the neck. So between the
17 bone -- so when you touch the back of your neck sometimes you
18 can feel the little bony prominences, and there's ligaments
19 that kind of help bind those structures together. And there
20 was evidence of swelling there on his -- his study. I concur,
21 certainly.

22 Also, in the lower part of the spine -- if you kind of
23 think about the spine like a big sack, the spinal cord sits in
24 that sack. And there are also a few compartments or spaces
25 that are present around that sack. And there was quite a bit

1 of blood on imaging that was present and was -- was described
2 as the epidural space of the lower spine, so down in the lower
3 part of the back quite a bit of hemorrhage there.

4 I think the significance of the findings were that in the
5 neck area, to be able to see that on the imaging -- an MRI is
6 a very good way to look for swelling in those tissues, would
7 be an implication that there had been abnormal motion. By
8 that I mean in the course of our normal moving of our neck,
9 that wouldn't incite swelling in those tissues.

10 But in this setting where there's fracture and blood and
11 swelling of the brain, to see the swelling in those tissues
12 would strongly implicate that there had been stretching or
13 tearing of those tissues. The presence of blood in the
14 position of the spine that I have described, and perhaps has
15 been described earlier in this trial --

16 Q. And I'll show you -- we've admitted previously
17 Exhibit 92. Would this be helpful to maybe explain where
18 we're looking at as far as the findings go?

19 A. Could I approach that?

20 Q. Yes. I think we have a microphone. This just
21 records for the record.

22 A. Thank you, sir.

23 Well, what I'm -- what I'm getting at here is if you
24 look -- so the head would sit up here on top of the spine.
25 And when you look at all these bony structures, that's what

1 you would feel in the back of your neck. Well, connecting all
2 of those bony structures and wrapping around them are
3 ligaments and soft tissues and that helps to give us some
4 stabilization. And then we have muscle on the outside of
5 those ligaments that help us to keep our -- our head upright
6 and to help us control our head position. So the MRI
7 demonstrated swelling in what we would call the interspinous
8 and paraspinous spaces. That's not a normal finding.

9 Now, in a patient who's hospitalized and laying on their
10 back for some time, it's not uncommon, be it a child or be it
11 an adult, that if you looked at the skin and imagine the skin
12 as running back where my pen is tracing, that you could get
13 swelling or fluid accumulating in the skin and in the fat
14 right under the skin, that would not be uncommon. And we
15 actually see some of that in the lower part of the back in
16 Lincoln's case when we look at the MRI down lower.

17 So the finding of the edema very close to the bone would
18 be an indicator that there was -- there was trauma, that there
19 was probable flexion and extension stretching and probably
20 partially tearing those tissues. I don't think the medical
21 examiner actually, in a detailed way, examined that tissue, to
22 my understanding in reading the report.

23 The other point I made was about the description that
24 Dr. Boyer generated -- that I agree with -- that a lot of
25 blood was accumulating. And if you kind of see these white

1 spaces, that's sort of the level where if you looked on the
2 cross-section you see a space, and that space is where the
3 spinal cord runs and it is bathed by fluid. And then there
4 are some coverings on the outside of the fluid that help to
5 create, if you will, sort of a sack in which the spinal cord
6 lives.

7 And beginning at about this level and extending down
8 quite low was blood. The blood by imaging looked to be in the
9 epidural compartment. And I just make that distinction
10 because a lot of the blood we're talking about inside of the
11 head is in a compartment called a subdural compartment. And,
12 again, these are -- these are sort of layers that relate to
13 the brain. From the inner part of the bone to the edge of the
14 brain, there are different compartments or potential
15 compartments, and they have very characteristic imaging
16 appearances that help us to understand where they are, where
17 the blood is.

18 And I just make the distinction because the subdural
19 compartment of the brain is not in direct connection with the
20 epidural compartment of the spine. They're really two
21 separate compartments.

22 So the finding of blood in the spine without blood
23 collecting in this curve -- so if you imagine the patient
24 spent much of the time on their back in a hospital bed once
25 they were transferred to Children's Hospital, if all the blood

1 was in the subdural compartment, where would it like to go by
2 gravity? Where would gravity take it?

3 Gravity would take it into this curve, right? Because
4 the front of the body would be here, the back of the body
5 would be here, and by gravity, blood would settle into the
6 lowest point. And we really -- we don't see that. On the
7 imaging, the blood is not accumulating in the lowest point.
8 It's starting about here and it's coming down into this
9 position.

10 So I think the finding of the epidural blood, to my
11 experience, in the context of all the other injuries would be
12 an indication that veins that live in this space surrounding
13 the core called the epidural space -- and there are many, many
14 veins there -- could be stretched or torn in the context of
15 flexion/extension and bleed. And the blood would accumulate
16 in that space as a result of trauma to the veins.

17 You wouldn't necessarily even have to see any fracture or
18 bony trauma. In fact, at this age, where there's such great
19 flexibility of the spine, in the context where these kinds of
20 injuries occur, oftentimes there would be no bony injury seen
21 at all. That's why the CAT scan that was done of the spine,
22 it really did not show any bony injury. And then the MRI
23 showed to very good advantage of the presence of the blood in
24 the lower part of the spine.

25 So there's really two spinal problems. One is the

1 interspinous ligaments showing edema, and then blood inside of
2 the spinal canal in the space of the epidural space. And I
3 think both of those represent trauma to the spine with
4 probably a strong flexion component or flexion/extension
5 component, so forward, backward kind of movement.

6 **Q.** So earlier, we had testimony from a -- a forensic
7 pathologist who had indicated that the blood found in the
8 spinal cord was simply blood that had drained from the head
9 and just down. It did not reflect an independent area of
10 energy -- of injury, sorry.

11 And so your conclusion is what? With respect to that
12 comment, what would you say?

13 **A.** Well, first of all, when the child first presented
14 with the very first CAT scan, there was really no blood -- no
15 blood below a structure that's in the brain called the
16 tentorium. And the tentorium is like a real thick piece of
17 cellophane that is dividing the upper part of the brain from
18 the back of the brain.

19 So when Lincoln first came to McKay-Dee Hospital and had
20 the CAT scan, the blood that was seen was really on top of
21 that membrane over the top of the brain. We call that
22 supratentorial blood. There was no evidence on the CAT scan
23 initially that blood was below that level.

24 Subsequently, on the next CAT scan, we started to see
25 some blood accumulating down below that level. Interestingly,

1 and also reported by Dr. Boyer in his MRI report of the spine,
2 you could see blood -- if you imagine the head sitting up
3 here, you could see some of the blood coming right to what we
4 call the foramen magnum. That's the connection of the head
5 with the spine where the spinal cord comes into the brain.
6 And you could see blood adjacent to the bone come right up to
7 that space and stop. And, again, there was no gravitational
8 settling of the blood in the subdural space.

9 Now, if one is to imply that blood made this percolation,
10 first of all, on imaging, the subdural space has a distinctive
11 appearance in how it looks, its shape. And I agree with
12 Dr. Boyer's assessment that the blood being found much lower
13 had the appearance of blood in the epidural space.

14 And just to reemphasize what I said, if one was to
15 surmise or believe that the blood was a percolating down
16 effect or movement from the brain, it would make most sense
17 that the blood would -- would want to accumulate where gravity
18 was taking it.

19 We see that in the head on the subsequent imaging studies
20 that are done on Lincoln. From the first CT to the MRI, we
21 can see the effect, how gravity is making the blood move in
22 the subdural compartment. And that's something that we
23 commonly see, whether it's an accident problem or -- or not.
24 But in the spine, I don't see the accumulation of blood in the
25 position where, first of all, I would expect sub -- subdural

1 blood to be because it's in the epidural compartment, and,
2 secondly, because it's not really abiding by gravity.

3 The blood is, in large part, accumulating in this part
4 which is sort of antigravity, if that make sense. In other
5 words, this is the lowest part, this is relatively higher.
6 And so blood is a heavy fluid that's going to lay down in its
7 lower part if you're laying on your back.

8 **Q.** Thank you.

9 I think -- was there anything, I guess, else that we
10 failed to cover with respect to the injuries to the -- to the
11 spinal column, in terms of that?

12 **A.** I don't believe so.

13 **Q.** Okay. I want to go above that, again, and -- and
14 talk about -- maybe working with the injuries to the head. I
15 guess starting from outside in, you've described the skull
16 fracture that was viewed on the initial CT of the head and
17 then you described things called subdural hemorrhaging,
18 subarachnoid hemorrhaging, epidural hemorrhaging, and -- and
19 edema.

20 In terms of your -- and just taking a step back from --
21 from Lincoln's case for a second, though, have you in your --
22 in your clinical experience and research found the presence of
23 subdural hemorrhaging to be significant?

24 **A.** Absolutely. I think in large part the way we look at
25 the presence of subdural blood as it relates to the brain is

1 we see it as a red flag. We see it as a red flag for
2 underlying brain trauma or brain injury. So that's the first
3 thing is we look at it as an indicator that something may be
4 really wrong with the brain.

5 Secondly, again, we try to take all this information in
6 the context in which it's occurring. So in the context of a
7 fracture that we have here with the presence of the
8 subarachnoid blood, the subdural blood, the early swelling of
9 the brain in a patient of this age, taken collectively, these
10 are very concerning findings for trauma.

11 And if there is not an appropriate health history to
12 really explain that, then we would be strongly suspicious that
13 there's been an infliction of trauma on the child to explain
14 all those findings in a child of this age.

15 **Q.** Okay. With respect to the -- I guess let's start at
16 the -- the bony injuries, then, to the head, the skull
17 fracture here.

18 **A.** Uh-huh.

19 **Q.** We've had prior descriptions of it from a number of
20 different witnesses, but in terms of the significance, I mean,
21 do you deal with, in your -- your daily practice, then,
22 imagings that reveal skull fractures --

23 **A.** Yes.

24 **Q.** -- from a number of different types of causes and
25 mechanisms and those kinds of things?

1 **A.** Yes.

2 **Q.** And, in fact, as part of your research in the
3 writing, I think you indicated the book for Diagnostic Imaging
4 and Child Abuse, then, did you associate those kinds of
5 injuries, skull fractures, subdural hemorrhaging, and these
6 other kinds of findings in terms of when you say it gives you
7 concerns for trauma or infliction of trauma --

8 **A.** Yes.

9 **Q.** -- can you explain sort of what your research and
10 your experience has revealed to you?

11 **A.** Yes. Well, first of all, in dealing with children,
12 skull fractures are pretty common, both accidentally and
13 inflicted trauma cases, so it's a very common finding that we
14 can see.

15 There's a couple of things that we know and there's a
16 very strong body of literature to help us not only support our
17 clinical practice in the work we do, but also just to know
18 what other researchers have found. And so we know that you
19 can certainly, from what I would call a household fall, a fall
20 under 4 feet of height, you can get a skull fracture. Those
21 tend to be more what we call simple or linear in type. And
22 they are rarely -- and I would just emphasize rarely --
23 associated with intracranial bleeding or intracranial
24 problems. That is, they have a fracture and probably swelling
25 of their scalp, you know, bleeding and swelling of the tissue

1 overlying the fracture.

2 And so those kinds of incidences where a child might be
3 falling from a chair or climbed up on a counter or falling to
4 a hard floor, we see those all the time. Again, the child
5 usually has extremely good outcome. Fracture may be present,
6 but the underlying brain looks good. Maybe there's a -- a
7 tiny trace of blood, but that's even not particularly common.

8 There's other types of fractures. Lincoln's fracture is
9 what we would call a diastatic fracture. That means the edges
10 are separated. Normally a simple fracture, it's just like a
11 little line. Like if you took an ink pen and just drew a line
12 on the skull, that would be a simple linear fracture.

13 Lincoln's fracture occurs in a place of the skull that is
14 pretty thick bone in the mastoid part of the temporal bone.

15 So when you compare it to the top parts of the skull that
16 are thinner, those are the areas that usually when a child has
17 a fall, they would fracture quicker. This is an area where
18 the bone is thicker and then the fracture is separated.

19 There is a body of literature and knowledge that when we
20 see diastatic fractures, it has a correlation with the amount
21 of energy deposited. So it might be a more -- it might be a
22 more severe injury. I mean, for example, maybe a child has
23 fallen from a first-story window onto the concrete driveway,
24 something like that, or perhaps it's a child who was
25 unrestrained in a motor vehicle accident and either was thrown

1 into the body of the car or outside, or maybe a child who was
2 hit by a car, a pedestrian accident.

3 So it implies a significant deposition of energy, more so
4 than one might see, let's say, with a, quote, simple household
5 fall.

6 **Q.** With respect to that deposited energy, then, there's
7 been testimony in this particular case that -- from that
8 pathologist that indicated, well, Lincoln suffered a skull
9 fracture, but that in and of itself did not cause injury to
10 the brain itself.

11 Do you have an opinion as to whether Lincoln's brain was
12 injured as a result of the deposited energy you've just
13 described and the -- and the effects as far as actual injury
14 to the brain?

15 **A.** I think -- I think what's important to keep in mind
16 is if you imagine a moment when the fracture occurs. In your
17 mind, if you can imagine the head striking an object or having
18 an object strike the head to deposit energy into the tissues
19 and into the bone, fracturing the bone, separating the bone.

20 We also have other associated problems here. We have
21 bleeding that's occurred around the brain. And I -- I want to
22 emphasize, I would say that there's this simultaneous event.
23 There's a process happening where the head is experiencing
24 trauma. It's breaking bone. There are veins being injured
25 that are bleeding. They're bleeding into the space called a

1 subdural space. They're bleeding into the subarachnoid space.

2 And another important thing is the brain at this age is a
3 relatively soft material. It has not yet matured in its,
4 quote, stiffness, end quote, like an adult brain. It is still
5 in a -- a fairly soft substance category.

6 So at the moment this -- this trauma occurs, there's a
7 generation of energy through these tissues, including energy
8 coming into the brain. And even though the brain tissue isn't
9 torn or ripped open at the time of pathology evaluation, even
10 though that is not seen, you have to understand that we've
11 started a cascade of a problem where the brain has likely
12 moved, if you will, jiggled in the container of the skull,
13 blood is now pouring out around the brain. This is going to
14 incite an irritation to the brain.

15 There's going to, perhaps, be a reflexive change in how
16 blood flow is starting to come into the brain. The energy
17 into the soft brain can start to create an effect on the
18 profusion or blood coming into the brain which is going to now
19 be part of what we would call indirect injury in this setting.

20 By that I mean there's not a direct tear that you can
21 observe, but there is a structural shaking or structural
22 agitation to the brain which is going to set in play swelling.
23 And in this case, of course, that just escalates through time.
24 And as I mentioned, swelling can beget more swelling based on
25 how swelling affects the blood flow coming into the brain and

1 compromises it.

2 So that's how I would think of this is that you have to
3 be careful about just isolating every little element. They're
4 all important together and very important as to what might
5 have been involved in just the minutes after the fracture
6 occurred.

7 **Q.** All right. I'm going to show you what's been marked
8 here as -- we've mark it State's Exhibit 178. It's a
9 demonstrative piece of evidence. Can you identify what this
10 is a picture of?

11 **A.** Yes. It's a picture of looking down upon the brain,
12 if it's held like this, the left side --

13 **Q.** (Overtalking)

14 **A.** Okay. The left side, if held horizontally, is the
15 normal appearance of the anatomy of the veins running over the
16 brain. And the right side is an indication of the injury of
17 veins that leads to bleeding in the subdural compartment.

18 And just to put this in context, if you imagine yourself,
19 you know, hiking up in the Wasatch and you know there's all
20 these little streams that -- that we have in the Wasatch, and
21 some of those all come together and form the Provo River
22 which --

23 **Q.** Before you go too far down that river --

24 **A.** Yeah.

25 **Q.** -- when we use the picture --

1 **A.** Yeah.

2 **Q.** -- I just want to lay the foundation to admit it in
3 order for you to show it. Is this a picture of an actual
4 brain?

5 **A.** No. It's a -- a graphic artist who has, by my
6 instruction, studied brain elements. He's a medical
7 illustrator, a physician, and has rendered the drawing based
8 on -- on known anatomy.

9 **Q.** Fair and accurate depiction of the area --

10 **A.** Yes.

11 **Q.** -- that you were just about to describe?

12 **A.** Absolutely.

13 **Q.** And the effects of these vein disruptions.

14 **A.** Yes.

15 **Q.** All right. Would it be helpful to you to use this to
16 explain what we're talking about to the jury?

17 **A.** I -- I think so.

18 **MR. MILES:** All right. Your Honor, permission to
19 publish 178.

20 **THE COURT:** Okay. From the defense?

21 **MR. WIDDISON:** No objection, Your Honor.

22 **THE COURT:** Okay. May be published.

23 **Q. (BY MR. MILES)** So what I'll have you do -- and maybe
24 it's easier since we didn't blow it up -- I'll have you maybe
25 step up to the --

1 **A.** Okay.

2 **Q.** -- the front here, so when you're describing -- I'll
3 give you the microphone again before I ask you to --

4 **A.** (Unintelligible)

5 **Q.** Explain the --

6 **A.** Thank you, sir.

7 **Q.** -- what you were about to explain -- or maybe I'll
8 hold it and you can describe.

9 **A.** Okay.

10 **Q.** I'll come back around here.

11 Describe, then, what you were talking about as far as the
12 disruption that this energy has with respect to the -- the
13 brain, the tissues, the blood flow, and those kinds of things
14 you were just describing here.

15 **A.** If you imagine taking the top of the skull off and
16 you were able to look down on the brain, on the normal brain,
17 let's start with the normal side, what one would see -- and
18 this would be the hemisphere. We have two hemispheres. So
19 this would be one hemisphere.

20 And what we know normally is there's between 12 and 15
21 what we call bridging veins. Where I'm pointing out are these
22 veins. And these veins are common pathways for blood that's
23 draining over the surface of the brain, and it's going to
24 drain into a very large vein that runs from the frontal region
25 back to the back. And this is a way that blood is going to

1 get out of the skull after it's come into the brain and it's
2 going to circulate back out.

3 So as I was saying, it's sort of like small tributary
4 streams. And these small tributaries, or small veins, are
5 going to drain into bigger veins, like the Provo River, and
6 that's going to drain into a big structure like Utah Lake.
7 And if these are disrupted -- and that's what's depicted here,
8 these points of redness, and the red is an indication of blood
9 in the subdural and subarachnoid spaces. If those veins are
10 torn, as might occur in trauma, then bleeding is going to
11 occur into both the subdural compartment and the subarachnoid
12 compartment.

13 Now, this type of trauma is a -- is a common cause of
14 subdural hemorrhage and we know that by direct access to
15 neurosurgical literature. What the neurosurgeon finds, if
16 they have to go emergently and drain that to save the life of
17 a child, and we know that from pathologic analyses. And in
18 the imaging, it's particularly evident on the second CT
19 performed at Children's Hospital that the pattern of the
20 bleeding, the globs of -- or collections of blood over the
21 surface of the brain conform to what many pathologists have
22 reported on as far as the tearing and disruption of these
23 veins. And so I think the disruption of those veins was
24 the -- the cause of the subdural and subarachnoid bleeding in
25 this case.

1 Now, I -- I don't think we have from the medical examiner
2 a detailed description of the interrogation of that region,
3 to -- to my knowledge of reading her report.

4 **Q.** That's okay. (Unintelligible)

5 **A.** Are there any questions that I could answer about --

6 **Q.** They'll have questions right at the end, actually,
7 so --

8 **A.** Okay. All right.

9 **Q.** Thank you, Professor.

10 All right. The other thing I wanted to ask you about is
11 then you also describe, then, this idea of the softness of
12 the -- the pediatric or, I guess, the child's, maybe infant's
13 brain in this particular case -- situation as opposed to
14 maybe, I guess, an adult brain by comparison. Why is this
15 softness significant?

16 **A.** Well, it's vulnerable. So if you imagine a shockwave
17 from trauma, be it accidental or inflicted trauma, where you
18 have evidence, in fact, that there's a fracture, as we have
19 here, where, as I said, energy is being deposited into the
20 skull -- and, of course, we know energy has come through the
21 skull to disrupt veins to lead to bleeding, and it's --
22 it's -- it's very strongly, I think, correlated in this case
23 that almost immediately -- by that I mean when we look at that
24 first CT, we already see the telltale signs of the brain
25 swelling.

1 So that's telling us not only do we have a fracture, but
2 we have bleeding. And we have this brain that's already
3 giving us some signs that it's in trouble. It's swelling.

4 So the infant brain is relatively soft, so it is more
5 vulnerable to the deposition of energy that comes into it as
6 far as it being potentially disruptive. Not so -- not that it
7 has to actually show a tear, as I mentioned. We would call
8 that a direct effect. But the process that I've described and
9 how these things build together to affect the brain leading to
10 swelling, then to massive swelling, then to more swelling is
11 an indirect injury that I believe correlates with the other
12 factors that I've been mentioning.

13 And so if you imagine the brain being very soft, it is
14 more vulnerable than a brain that has more strength and
15 rigidity. A soft brain can just kind of wiggle like a block
16 of jello and create internal disruptions that might only be
17 able to be seen microscopically. They may not be observable
18 to me as a radiologist, nor even to a pathologist grossly
19 evaluating the brain. One would have to have detailed
20 microscopic evaluation in many areas of the brain to come to
21 an understanding of the presence of that kind of disruption.

22 **Q.** All right. Have you had occasion to see injuries, I
23 guess head injuries, that are the combination of the ones that
24 you just described, in your clinical experience prior to this?

25 **A.** Yes.

1 **Q.** And just -- is this an occurrence that has happened
2 how often for you?

3 **A.** You mean a case like this?

4 **Q.** Yes. This -- this significant of injury --

5 **A.** Yes.

6 **Q.** -- this level or severity of injury that you've
7 described, have you seen this level of injury before?

8 **A.** Well, sadly, yes. I would say maybe two to three
9 cases a week that we say -- that are -- that are like this or
10 of this severity.

11 **Q.** All right. And in those cases where you have the
12 history -- I think you indicated you take a history from
13 the -- either the patient or -- or a caregiver or somebody to
14 kind of --

15 **A.** Usually the history is given to us by a caring
16 physician -- a practicing physician caring for the child.

17 **Q.** All right. And in terms of those, for this level
18 of -- of trauma that you've just described here, I think you
19 started to reference kinds of situations, but I want to just
20 clarify. I mean, how severe is this in terms of causes that
21 you normally see associated with this kind of injury?

22 **A.** Well, I think it's -- it's very severe. It -- it
23 ends up being a fatal injury.

24 **Q.** And then in terms of the -- I mean, you described
25 things like -- I mean, are we talking about -- as far as, I

1 know it's fatal, but is it -- I mean, I think you said motor
2 vehicle accident, unrestrained motor vehicle accident or
3 auto-ped kind of thing --

4 **A.** Uh-huh.

5 **Q.** -- where you're hit by a car --

6 **A.** Yes.

7 **Q.** -- that's the level of severity to get this complex
8 of an injury?

9 **A.** Yes.

10 **Q.** All right. Not just falling from standing height or
11 four feet, I think is what you indicated, household fall?

12 **A.** Yes.

13 **Q.** Okay. Now, in your -- we started to discuss this a
14 little bit about the -- the significance of subdural
15 hemorrhaging in your research and experience in distinguishing
16 accidental from inflicted injury.

17 Do we also call, I guess, inflicted injury, abusive head
18 trauma?

19 **A.** Yes.

20 **Q.** Is another way.

21 And you've published and written about distinguishing
22 features of accidental trauma versus abusive head trauma
23 findings?

24 **A.** Yes.

25 **Q.** All right. What are those distinguishing features,

1 in your experience and research, that helps you --

2 **A.** Uh-huh.

3 **Q.** -- separate what is accidental trauma from abusive
4 head trauma?

5 **A.** Well, first of all, the history is really important.
6 What is the history? Is there a history even available? And
7 does the history make sense?

8 So we're collaborating with our clinical colleagues --
9 oftentimes in the emergency department -- who are receiving
10 the history, perhaps from a transferring hospital, like in
11 this case McKay-Dee Hospital. So it's taking the history,
12 trying to understand the history that has been offered, and
13 seeing, basically, does the history match the scope and -- and
14 the magnitude of what we're dealing with.

15 Second thing I think is very critical is the age of the
16 patient we're talking about. I think you can imagine if it --
17 if it's a child who's already running around, it's a
18 two-year-old, a three-year-old, a toddler, we are much more
19 apt to see fractures and injury of the skull from accidental
20 trauma. You know, they're falling off a curb, they're falling
21 off a counter, et cetera. So once the child becomes mobile
22 then we start to see a shift in patterns of the skull fracture
23 to be an accident.

24 Under a year of life, seeing a combination of injuries --
25 and we haven't even yet really talked about the arm fractures.

1 But when you start to take the combination of these injuries,
2 in this case the diastatic fracture, the subdural blood, the
3 subarachnoid blood, the early indication, and, of course, we
4 know the brain becomes massively swollen and I would imply
5 that's an indirect injury. The injury I believe is present in
6 the cervical tissues, the blood in the spinal canal. When
7 we -- when we take those, and then if we add onto it the
8 fractures in the right and left humerus, each of those build
9 upon one another to increase what we call the positive
10 predictive value.

11 That is, if you took one alone, it might have less
12 strength in helping you distinguish accidental from inflicted
13 or abusive trauma. But when you take those in aggregate, as
14 should be done in this case, it -- it's -- it so strongly
15 points to abusive trauma or inflicted injury.

16 Q. There was testimony from, we'll call her Dr. Ophoven,
17 that there is, you know, you're familiar with the term. We
18 call it abusive head trauma now.

19 A. Uh-huh.

20 Q. Used to be known as shaken baby syndrome. And -- and
21 there's been testimony from her about a Swedish study known as
22 the SBU study. And she had testified that this basically
23 ended any discussion that shaking an infant can cause subdural
24 hemorrhaging, retinal hemorrhaging, and edema in children.

25 Are you familiar with that publication?

1 **A.** I'm familiar with the preliminary results. The
2 entire English translation of that full report has -- has yet
3 to be distributed. But I feel that I -- I know some things
4 about the organization and about what they have surmised to
5 date.

6 **Q.** All right. Based upon your research and familiarity
7 with that study, what would your comment be about the validity
8 of the findings in that study?

9 **A.** Well -- well, first of all, this is an organization
10 in Sweden that -- if I could just give some background -- that
11 in 1992, it became a government organization and -- and their
12 job or their interest, if you will, is to look at many areas
13 in health care. And like our country, they're trying to
14 figure out what's the best way to treat things and how -- how
15 is it best to spend money taking care of certain medical
16 problems. And so their charter is to try to look into some of
17 the health-related issues for their country and to make
18 recommendations and to try to do that based on evidence and
19 literature that might be available.

20 So in this area of what is called the shaken baby where
21 this really described a term used by a physician coined a
22 number of years ago, but to imply that there was not only some
23 subdural hemorrhage, but that there was bleeding in the eyes,
24 retinal hemorrhage, and then effect on the brain -- we call
25 that encephalopathy, so the baby's brain was also affected.

1 And they took a charter to look at literature. They initially
2 studied around 3,000 papers. And from that, they whittled
3 down their consideration of 30 papers. And from that, they
4 picked two papers that they felt had been published that they
5 felt had real strength in their opinions and conclusions.

6 The concern about that, and I've circulated to defense
7 and to -- to Branden, the recent commentary that came about
8 last month in the Journal of Pediatric Radiology were 17
9 leading physicians from European and American children's
10 hospitals have expressed a great concern because they have not
11 been able to vet or analyze the full English translation of
12 that project, of that paper.

13 But what do I mean by that? It's not to mean there's not
14 going to be very helpful information in that paper, but what
15 it means is in October of 2016, a group of European and
16 American doctors, leaders in their field, were expressing a
17 great concern to this body, could they be part of the
18 evaluation process as the data was being accumulated? Could
19 they be part of that review? Could they help in that review?
20 Recognizing that the outcome would be very important to know
21 about. And they were denied, if you will, admission or access
22 to be part of that committee.

23 So all I can say now is I don't think I can really answer
24 your question completely because I don't think, if you will,
25 the jury's in on that issue. We're waiting to really receive

1 the full -- the full embodied report translated from Swedish
2 into English.

3 But I'll just say that in the case we're talking about
4 here, this is -- this would not be in the classic
5 consideration of what we call shaken baby where there is
6 typically no evidence of trauma; that is, you might not see a
7 fracture, you might not see swelling of the tissues, you know.
8 It was just talking about blood around the brain, blood in the
9 eyes, and effect upon the brain.

10 So I -- I think it's a little different situation, but
11 it's -- it's going to be important information for us to all
12 look at carefully.

13 **Q.** All right. In terms of the subdural hemorrhaging and
14 the subarachnoid hemorrhaging into the brain, would that
15 affect, I guess, the function of the brain?

16 **A.** Absolutely.

17 **Q.** And can you -- I guess, can you explain how it would
18 do that?

19 **A.** Well, blood is a very irritating substance. So the
20 blood, particularly in the subarachnoid space, that's right
21 against the brain. It's laying right on top of the brain. So
22 blood can irritate the brain and that can affect not only how
23 the -- the brain functions, in other words, a seizure could
24 occur. Seizures can manifest in many ways, not only from
25 jerking but from sort of not moving normally. So it can

1 irritate the brain.

2 It also can affect circulation, how blood flow comes into
3 the brain. And it can start a cascade of what we call a
4 cytokine reaction. It's like an inflammatory reaction. So
5 after trauma occurs, inflammatory cells and inflammatory
6 chemicals start to -- to migrate and accumulate in the area
7 where trauma has occurred. And this can also affect blood
8 supply to the brain.

9 And then the brain's natural smart mechanisms of being
10 able to control how much blood flow comes in can start to
11 become disordered, and that can allow too much blood flow to
12 come in which can then accentuate swelling of the brain. So
13 blood can play an important, as I said, red flag seeing it for
14 what's going on underneath.

15 **Q.** Okay. And would that then, in turn, that -- those
16 effects you've just described, then, have an effect on Lincoln
17 Penland on how he would behave after the infliction of this
18 injury?

19 **A.** I think very likely so.

20 **Q.** All right. I guess, what -- what would be the
21 effects of having sort of a diastatic fracture, the shockwave
22 that goes through, and now we've got blood and swelling
23 occurring within the brain? What -- what would you expect him
24 to behave like after this injury?

25 **A.** Well, if anybody's ever had a fracture, the tissues

1 that are injured next to the bone can lead to pain. So I
2 could certainly imagine that Lincoln would have experienced
3 pain and that could manifest as irritability or crying. So
4 even though in the bone tissue itself, in the bone itself, you
5 might not be able to localize pain, but remember, the bone is
6 covered by tissue and to get to that bone to break it, you've
7 got to injure the tissue. And there's a lot of nerve fibers
8 in the tissues. So pain would be expected.

9 The transmitted trauma inward that tears veins and starts
10 to affect the softness of the brain, I think one could see
11 other problems. You might see -- you might see vomiting. You
12 might see, again, irritability. You might see lethargy or
13 sort of a, you know, sleepiness, if you will, might be seen.

14 **Q.** Would you expect unconsciousness to be a part of
15 that?

16 **A.** It could be. It -- it really is depending on sort of
17 how rapidly this process is moving along.

18 **Q.** In terms of a -- I'm sorry, let me jump back to
19 the -- the fracture itself. We've described it as, I guess, a
20 diastatic fracture around the basal skull.

21 Are you -- have you seen or are you familiar with the
22 types of, I guess, injuries that come when the skull is
23 either, I guess, impacted or crushed between two objects and
24 that sort of thing?

25 **A.** Yes.

1 **Q.** Can you explain, I guess, how you -- how would you
2 distinguish between those two kinds of fractures or injuries?

3 **A.** Sure. Well, I mean, I think a good analogy might be
4 if you took a walnut and put it in a nutcracker, compression
5 of both sides leads usually to breakage on both sides of that
6 nut. And if you're compressing the skull on both sides, then
7 you would expect to see what we might call mirror image or
8 fractures on right and left. They might not be precisely
9 looking the same, but you would expect trauma to be deposited
10 on both sides. That's what I would expect.

11 **Q.** All right. Did you see evidence of that trauma, I
12 guess, on both sides in any of the examination of the scans in
13 this particular case?

14 **A.** No, I -- I did not.

15 **Q.** So we had -- we had a biomechanical engineer testify
16 and described one is unconstrained, the single-sided impact,
17 and then the other one is a constrained, the dual-sided
18 impact.

19 From the imaging, then, could you make a determination as
20 to which of those two categories this injury fell into?

21 **A.** I would place it in an -- in an unconstrained
22 category.

23 **Q.** So in terms of the mechanisms for unconstrained or
24 constrained, if -- if the allegation was -- that was testified
25 to by Dr. Ophoven, jumping or falling somehow onto Lincoln

1 Penland's skull while on the ground, would that be a
2 constrained or unconstrained type of situation?

3 **A.** Well, if you were falling and your head was hitting a
4 surface, that would be unconstrained.

5 **Q.** No, Lincoln -- sorry. Another child falling onto
6 Lincoln, not Lincoln falling himself.

7 **A.** Well, that would be constrained because you've got,
8 really, pressure on both sides. The downside, it's against
9 the surface, and the upside which is the surface that you're
10 proposing that there be a contact with.

11 **Q.** Okay. From prior experience -- and this question has
12 come from the jury a number of times. I think I'm going to
13 try to ask it before we -- we get there.

14 From the evidence on the fracture to Lincoln's skull, do
15 you have an opinion or can you determine whether it could be
16 caused by any of the following: First is an impact with a --
17 a flat surface, such as the top of the witness stand, a
18 tabletop, floor, that sort of thing. Could that cause the
19 fracture that we see?

20 **A.** Yeah, I think impact to a flat surface. Yes, I think
21 it could.

22 **Q.** All right. What about an impact to an edge where two
23 surfaces meet, so like the corner -- not the corner, but the
24 edge of the -- the witness stand.

25 **A.** I think -- I think it could. I think if it's very

1 pointed then I would -- I would like to elaborate on that, but
2 if it was a more rounded curve or a corner that was not so
3 sharp.

4 **Q.** I guess, how would that distinguish in your mind
5 between a sharp versus --

6 **A.** Well, if you have a very sharp object, I'm thinking
7 more like the corner, that's apt to create what we call a
8 comminuted -- that is, more than one piece -- depressed
9 fracture. In other words, if you imagine the corner of
10 something sharp or pointed striking the skull, that's apt to
11 create a more focused depression of the skull. We don't see
12 that, so I would be thinking more of a -- a linear or curved
13 or flat surface.

14 **Q.** Okay. And I think that actually answered the next
15 part of the question about the corner of the -- of the witness
16 stand where the three surfaces would meet, that's where the
17 depression would occur.

18 **A.** I would expect that an impact was upon that, that you
19 would see a depressed, comminuted fracture, which I -- I don't
20 see.

21 **Q.** The fracture to Lincoln Penland's skull, Dr. Ophoven
22 had opined that this could be caused easily by something as
23 simple as a -- as a fall from a couch. Your thoughts on
24 whether that kind of a scenario -- and the environment, I
25 guess, in this particular case we're talking about, onto a

1 carpeted floor.

2 **A.** I would disagree.

3 **Q.** There was discussion by Dr. Ophoven about what we
4 would call, I guess -- or we used the term lucid interval.
5 Are you familiar with that term?

6 **A.** Yes.

7 **Q.** And -- and, I guess, what does that mean to you when
8 we talk about a lucid interval?

9 **A.** Well, it means there's a period of time between an
10 event of trauma and the -- and the manifestations of that
11 clinically when it kind of really shows up to an observer, a
12 mom or dad or a doctor. So that's what that term implies.

13 **Q.** Is there, I guess, medically an association or a type
14 of injury that is associated with when you have a lucid
15 interval versus where you wouldn't have a lucid interval?

16 **A.** Well, it's -- it's not only been my experience that
17 it's more commonly seen in the context of an -- of an epidural
18 bleed, but the literature supports that. And the epidural
19 bleed -- this is between the inner edge of the bone of the
20 skull and then the membrane that sticks tightly to that that
21 we call the dura. So when blood accumulates there, it usually
22 comes from a high pressure blood vessel, or an artery, and so
23 it usually can be growing at a pretty good pace.

24 So the child could have a trauma and the bleeding could
25 start in that space. And they might be complaining, you know,

1 that their head hurts and all. And it might be, you know,
2 hours before they maybe start to become lethargic or maybe
3 they start to become weak because their brain is starting to
4 shift. Then that would be the lucid interval between the
5 event and the presentation.

6 But it -- it's been my -- my experience over the years,
7 and I think the experience of others and written about, that
8 we see that usually in a -- in a growing epidural hemorrhage.

9 **Q.** All right. Is there evidence for that in this
10 particular case that would indicate that Lincoln Penland would
11 have had a lucid interval after the infliction of these
12 injuries?

13 **A.** No.

14 **Q.** Okay. I mean, do we see epidural hemorrhage, I
15 guess? I think it was part of the original --

16 **A.** There's a -- there's a very tiny epidural near the
17 fracture which is not uncommon, but it's -- I would say in the
18 scope of the other components of blood, the subarachnoid, the
19 subdural, it's very small. And we certainly -- we do not see
20 an evolution of its growth.

21 So I think it's a finding near the fracture, but it's
22 actually quite tiny. I had a pretty hard time distinguishing
23 it from the subdural blood, frankly, so it's a small amount.

24 **Q.** Let's see. I think we talked about the neck, so I'm
25 going to move forward.

1 Did you also see signs, and then from further information
2 from the autopsy report, get more information about
3 metaphyseal fractures to Lincoln Penland's arms?

4 **A.** I -- I reviewed the imaging that was performed. They
5 actually performed CAT scan images of the bone, and I reviewed
6 the images.

7 **Q.** All right. Have you seen these types of injuries
8 before in your practice?

9 **A.** Yes.

10 **Q.** And then are you familiar with the types of
11 mechanisms or forces that kind of cause these particular
12 injuries?

13 **A.** Yes.

14 **Q.** All right. Dr. Ophoven opined that these are the
15 result of a yanking or pulling motion, that they could be
16 easily caused by a three-year-old child trying to pick Lincoln
17 Penland up by his arms. From an examination of the evidence
18 in this case, in your experience, do you have an opinion as to
19 whether that would be reasonable?

20 **A.** I do not think that's reasonable.

21 **Q.** And can you explain why?

22 **A.** Well, on a practical basis, we see lots of children.
23 I think anybody who has ever seen a parent pull up a toddler
24 by their arm, we'll see a lot of those children come -- and
25 that's a traction injury. We'll see a lot of those children

1 come to the emergency department, usually they're complaining
2 they can't move their elbow. And they have incurred what we
3 call a nursemaid's elbow. And it's -- it's a little
4 dislocation at the elbow. So in that context of yanking --
5 and I would say we see quite a few of those cases -- we would
6 rarely ever see anything at the shoulder.

7 Now, what you're implying is more of a -- I would call it
8 a longitudinal force that's along the long access of the bone.
9 You're pulling the arm. It's stretching out the shoulder.
10 And, of course, a child of Lincoln's age, much of the -- much
11 of the shoulder, it's very -- kind of redundant. There's
12 ligaments and muscle, of course, and a lot of cartilage that's
13 still present at that age, so a lot of the bone hasn't, you
14 know, completely formed yet.

15 And so if any injury was to occur there -- and I would
16 just tell you that I think it would actually be common.
17 That's not the -- the most common place. The most common
18 place would be the elbow with that kind of an injury.

19 Then if the injury was to occur, I would expect, number
20 one, it might be either more like strain of the ligaments and
21 soft tissues or muscle, or the cartilage that separates what
22 we call the epiphysis, which is like the cap of bone from the
23 shaft of the bone, that cartilage might be stretched.

24 Well, we don't even see that on an X-ray or even a CT.
25 You can't see that cartilage. But what we see here is an

1 actual breakage of the bone.

2 Q. And so what -- and when you describe that it's more
3 of a longitudinal injury from the yank or the pull, then, what
4 kind of energy causes this? I guess this is latitudinal or --
5 or it's sort of --

6 A. Sure.

7 Q. -- not against the long axis but the short axis?

8 A. Right. So you're at the -- you're -- the fracture is
9 occurring at the edge of the bone. So you can imagine the --
10 the length of the bone and up near the shoulder it kind of
11 stops, what we see at X-ray. And we call that the metaphysis.
12 That's just a description of the area. And there's terms that
13 are used called corner fractures or bucket-handle fractures,
14 and those are simply radiographic terms.

15 What the pathologist typically will find when they look
16 microscopically is the fracture is a near through and through,
17 a complete fracture. We don't always see it completely
18 because of the X-ray technology, but the pathologist depicts
19 it and shows it as a complete fracture.

20 So the work of many authors in this field, particularly
21 Dr. Paul Kleinman, has elegantly worked with pathologists
22 and -- and done his radiological work and shown more of what I
23 would call a transverse orientation, so it's across the bone,
24 like this.

25 And a shearing force, imagine a -- where, you know, the

1 shoulder is sort of holding to some degree the upper part of
2 the arm, but if the arm is moved in a transverse way -- and
3 that could be something externally, a blow against the arm
4 depositing a transverse force that's causing a shearing effect
5 on the bone or a grabbing of the bone below the point of
6 fracture where shaking occurs and shearing is generated as a
7 consequence of that. That would be -- that would be a much
8 more plausible explanation for the fractures.

9 Q. Based upon the information and evidence that has sort
10 of come out during the course of this case, if I told you that
11 the allegation was that the injuries sustained -- we're
12 focusing -- we'll keep focusing on these metaphyseal fractures
13 to the arms -- were sustained sometime between 10:00 and
14 10:30 in the morning. And, ultimately, as -- as you're aware
15 from medical records, Lincoln does not get to the hospital
16 until in the 5:00 o'clock hour, so some six, six and a half
17 hours after the injuries to the arms would have been
18 inflicted.

19 Focusing on those metaphyseal fractures, how would you
20 expect Lincoln to react if those arms or -- or the areas of
21 the fracture were moved or grabbed during the course of
22 handling Lincoln during the day?

23 A. Well, first of all, several of the comments I made
24 about the skull fracture I think would apply here. Again,
25 any -- any of us who have ever had fractures know that a

1 fracture is painful, so I think irritability or pain would be
2 present. And, of course, if you're touching an area that has
3 been injured or fractured, that just makes pain worse. So I
4 think manipulation, if you will, movement, I think would be
5 painful.

6 Q. Would you expect -- so if the description was after
7 these fractures were inflicted, Lincoln is described to have
8 been put into a highchair for feeding and puffs were given to
9 him and graham crackers and that he was eating puffs and
10 graham crackers using his arms in that capacity, would you
11 expect him to do that and not show any signs of injury?

12 A. I would not expect that.

13 Q. Okay. Dr. Hedlund, collecting together all of the
14 injuries, understanding the -- the nature and the extent that
15 you've just described, your -- your experience clinically and
16 in research with comparative cases and how Lincoln would have
17 been acting in this situation, do you have an opinion as to
18 how he would have reacted based on the constellation of
19 injuries in this case?

20 A. Clinically reacted?

21 Q. Or -- yes, or just practically reacting to a -- to a
22 normal person, what would we see in him?

23 A. Well, I may be repeating myself from some of the
24 earlier comments, so I apologize for that, but I -- I would
25 really -- I would really expect that really within minutes of

1 the injury, particularly to the skull and brain, that the
2 child would be manifesting some clinical changes. And I
3 mentioned several of those, so I'll just repeat a few.

4 So I think the child could have been irritated, agitated,
5 crying. I think the child could have even have been -- could
6 have even had a seizure that might not -- you know, maybe they
7 were just trembling. I think a child could have pretty
8 quickly started being somewhat lethargic, maybe alternating
9 with irritability. And I think that lethargy would likely
10 progress or the sleepiness would likely progress through the
11 day.

12 And I think if you were to handle or move the arms, I
13 think that would be irritating. If you were to touch the head
14 where the fracture was, I think that would be irritating and
15 the child, again, would probably be cranky or fussy if that
16 happened.

17 So those are some of the things, and I think that they
18 would likely -- some of those features, particularly
19 sleepiness or lethargy, would just get worse in the -- in the
20 hours that followed the event. And I would expect things to
21 start pretty immediately after the injury to the head.

22 **Q.** Would you expect him at any point after these
23 injuries were inflicted to be laughing and playing?

24 **A.** I -- I would not expect that.

25 **Q.** Would you expect that these injuries would have been

1 obvious to a reasonable person?

2 **A.** I think so.

3 **Q.** Okay. Have you ever heard of, in your I think over
4 three decades of experience and research, of a three-year-old
5 causing this significant or magnitude of injuries to an
6 infant?

7 **A.** I've -- I've not heard of that, nor have I
8 experienced it in my practice. And I've only always just
9 dealt with children, so, no, I'm not aware of that.

10 **Q.** One moment, Doctor.

11 So, Dr. Hedlund, I guess, if Lincoln Penland presented to
12 you on February 19th in the evening with the constellation of
13 injuries that you've just described here in court today, and
14 then the history that you were given is that the caregiver
15 told you up until the point that he finally fell unconscious
16 around 5:00 o'clock and was brought to the hospital, that
17 Lincoln Penland was only acting fussy, cried inconsolably a
18 couple of times but stopped, vomited a couple times, but he
19 was otherwise alert, conscious to the end, appeared normal,
20 ate food several times, acted happy at different times from
21 the period of 10:30 to 5:00 o'clock when he was suddenly not
22 arousable and vomited, what would you make of that history
23 compared to the injuries suffered by Lincoln Penland?

24 **A.** Well, I would find that they're not matching. I
25 would find that the history is inconsistent with what I'm

1 observing. And I would fully recognize, of course, there'd be
2 a clinical physician, such as an ER physician, you know, part
3 of this inquiry. But I would find that there's a mismatch
4 between the history given and the magnitude of injuries that
5 we're seeing.

6 **MR. MILES:** Thank you.

7 And we've been going for probably over two hours at
8 this point. I don't know what the Court's preference is for a
9 break? Cross-examine?

10 **THE COURT:** From the defense, is this a good point
11 for our break?

12 **MR. MILES:** Finish it up? I don't know.

13 Doctor, are you doing okay?

14 **THE WITNESS:** Yes, uh-huh. Thank you.

15 **MR. WIDDISON:** Your Honor, that -- we're fine with a
16 break, but we'll just leave it up to the Court.

17 **THE COURT:** Okay.

18 **MR. MILES:** A short one?

19 **THE COURT:** Okay. Let's take a 15-minute break.

20 We'll try to resume at 11:40, then.

21 Members of the jury, same instructions about your
22 conduct during the recess. If you'll follow Paul, it looks
23 like.

24 (Pause in proceedings)

25 **THE COURT:** Okay. We're still on the record. We're

1 outside the presence of the jury. Any business from the State
2 before we take our own recess?

3 **MR. MILES:** No, Your Honor.

4 **THE COURT:** And from the defense?

5 **MR. WIDDISON:** No, Your Honor.

6 **THE COURT:** Okay. We'll take a recess. We'll see
7 you all back at 11:40.

8 We can go off the record, Debbie.

9 (Recess taken from 11:22:43 to 11:39:32.)

10 **THE COURT:** Okay. We are back on the record. All
11 parties and counsel are present and we're outside the presence
12 of the jury, but the jury is being summoned right now.

13 (Pause in proceedings)

14 **THE BAILIFF:** The jury is present, Your Honor.

15 **THE COURT:** Okay. Members of the jury, welcome back.
16 We'll start with cross-examination from the defense.

17 Now I'm a little bit worried. One of the side
18 effects of being a jury on a long trial is you'll expect
19 people hereafter to stand when you enter a room, so be careful
20 about that.

21 Okay. Mr. Widdison.

22 **MR. WIDDISON:** Thank you, Your Honor.

23 **CROSS-EXAMINATION**

24 **BY MR. WIDDISON:**

25 **Q.** Doctor, when were you first contacted by the State

1 regarding your testimony in this case?

2 **A.** I think it was 10 or 12 days ago, thereabouts.

3 **Q.** And when did you first receive the materials that you
4 reviewed in this case?

5 **A.** Shortly thereafter. Maybe a few days after that.

6 **Q.** Okay. I just want to go over some of the things that
7 Mr. Miles talked to you about.

8 When talking about direct brain injury, you said that
9 there was no tissue torn or broken in the brain; is that
10 correct?

11 **A.** Yes.

12 **Q.** So --

13 **A.** We certainly had no imaging evidence of that.

14 **Q.** Okay. So no imaging of direct injury to the brain.

15 **A.** Correct.

16 **Q.** And you did talk about some other maybe not
17 observable damage to a radiologist, but damage that may be
18 discovered upon microscopic evaluation, correct?

19 **A.** Yes, sir.

20 **Q.** And you did not do that microscopic evaluation in
21 this case?

22 **A.** No.

23 **Q.** Okay. You also said that -- something to the effect
24 of when intracranial pressure becomes too much in a child with
25 a head injury that a neurosurgeon oftentimes will perform a

1 procedure to drain the fluid off the brain to save the child's
2 life, correct?

3 **A.** They may.

4 **Q.** And in this case, no such procedure was done on
5 Lincoln Penland; is that correct?

6 **A.** That is correct.

7 **Q.** You reviewed the autopsy report that was prepared by
8 Dr. Ulmer; is that correct?

9 **A.** Yes.

10 **Q.** And isn't it true that she reported that sectioning
11 through the spine cord reveals no gross abnormalities?

12 **A.** The spinal cord? That's correct, she said that.

13 **Q.** And elsewhere in her report, isn't it true that she
14 reported that upon examination of the soft tissues of the
15 neck, including the tongue, strap muscles, and large vessels
16 reveals no abnormalities?

17 **A.** She reported that.

18 **Q.** Okay. You talked a little bit about the fact that
19 you keep up on the current literature on child head injuries
20 and radiology in your field; is that correct?

21 **A.** Yes, sir.

22 **Q.** And are you familiar with the peer review journal,
23 Topics in Magnetic Resonance Imaging?

24 **A.** Yes, I am.

25 **Q.** And are you familiar with the Barnes and Krasnokutsky

1 2007 article in that same journal called Imaging of the
2 Central Nervous System in Suspected or Alleged Nonaccidental
3 Injury, Including the Mimics?

4 **A.** Yes, I am.

5 **Q.** So then you are aware that Barnes and Krasnokutsky
6 found that a number of reports from multiple disciplines have
7 challenged the evidence base, i.e., the quality of the
8 evidence analysis for nonaccidental injury/shaken baby
9 syndrome as the causes in all cases of the triad. Such
10 reports indicate that the triad may also be observed in
11 accidental injuries, including those associated with short
12 falls, lucid intervals, and re-hemorrhage and in nontraumatic
13 or medical conditions; is that true?

14 **A.** I'm aware of their work.

15 **Q.** And you are aware that Barnes and Krasnokutsky in
16 that same report indicated that, in general, the morphology of
17 a fracture does not differentiate nonaccidental injury from
18 accidental injury. Complex or bilateral skull fractures in
19 this age group, the age group that we're talking about today,
20 can arise from a single event under circumstances other than a
21 two-story fall or a motor vehicle accident. Such examples
22 include a fall or a drop with impact to the skull vortex,
23 impact against more than one surface, fall or drop downstairs,
24 and an adult or an older child falling with or onto a smaller
25 child; is that true?

1 **A.** I'm aware of their opinion.

2 **Q.** Okay. So Dr. Ulmer and -- and Dr. Herman and
3 Dr. Ingebretsen -- or Mr. Ingebretsen, excuse me, testified
4 earlier in this case when you weren't here, but I want to ask
5 you whether you agree or disagree with some of the statements
6 that they made.

7 Do you agree or disagree with Dr. Ulmer that the findings
8 in this case are inconclusive whether Lincoln was forced into
9 something or something was forced into him?

10 **A.** Could you elaborate what you mean by "forced"?

11 **Q.** That is a quote from Dr. Ulmer, so I can't elaborate
12 on her words. Do you agree with that statement or do you
13 disagree with it?

14 **A.** Sir, I -- I can't answer that without knowing some
15 context. Are you talking about the head injury?

16 **Q.** I believe Dr. Ulmer was talking about the head
17 injury, although, her quote is "the findings in this case."

18 **A.** So I would just need more context to be accurate in
19 answering your question.

20 **Q.** That's okay. We'll -- we'll move on.

21 So do you disagree or agree with Dr. Ulmer that you can't
22 say for sure how this happened and that something could have
23 impacted him, being Lincoln?

24 **A.** Again, are you speaking of the head injury?

25 **Q.** I believe that's what Dr. Ulmer was referring to.

1 **A.** If we're speaking of the head injury, I would say
2 that there was something that impacted or his head impacted
3 upon something.

4 **Q.** So you agree with Dr. Ulmer that you can't say for
5 sure how the head injury happened?

6 **A.** I can't say specifically, no.

7 **Q.** And do you agree or disagree with Dr. Herman that
8 grabbing, wrenching, and pulling can cause the injuries to the
9 humerus that Lincoln had?

10 **A.** Pulling in a longitudinal way like dis --
11 distracting, as I described, no, I don't believe that would.
12 Grabbing and shaking, yes.

13 **Q.** But as far as --

14 **A.** So I guess I have to disagree with the way you
15 phrased that.

16 **Q.** Well, with Dr. Herman and his words, that grabbing,
17 wrenching, and pulling can cause injuries to the humerus that
18 Lincoln had.

19 **A.** Grabbing and wrenching, I agree. Pulling, I would
20 disagree.

21 **Q.** Disagree? Okay.

22 And do you agree or disagree with Dr. Ulmer that
23 Lincoln's injuries in his arms are consistent with twisting
24 when the arm is extended?

25 **A.** I think that is possible, yes, I agree.

1 different as far as the -- the strain and the bleeding that
2 you observed.

3 **A.** Well, to my understanding and looking at the medical
4 examiner's report, I do not believe that there was a -- a
5 detailed dissection of all those tissues deep to the bone, and
6 I -- if I need to be -- if I need to stand corrected, please
7 correct me. But in reading the report, I don't believe that
8 the ME had detailedly dissected the tissues that are evident
9 to us on the MRI scan.

10 So I was speaking about an injury to the ligamentous
11 structures in the cervical region that are evident on the MRI
12 scan. I'm not apprised or aware from what I've been presented
13 with that that was actually directly examined by the medical
14 examiner.

15 **Q.** Is there a difference or would you expect a
16 difference between -- I mean, Lincoln Penland spent up to
17 nine, almost 10 days between his initial admission to the
18 hospital to his autopsy. Would that affect findings that you
19 would see from a -- from the scans that were performed in the
20 days of his care versus what existed at the time of autopsy?

21 **A.** Oh, absolutely.

22 **Q.** Okay.

23 **A.** Would you like me to --

24 **Q.** Please elaborate.

25 **A.** -- speak to that?

1 So as was mentioned, this child exhibited a very rapid
2 escalation of the swelling of the brain. And I suspect at the
3 time of autopsy the brain was in a near state of -- of
4 liquefaction, or being like liquid. And so I think it would
5 be an extremely challenging task for the pathologist to be
6 able to derive useful information about some of the
7 microscopic structural parts of the brain because of the
8 length of time from admission to autopsy and the severity of
9 brain swelling that had been occurring to that time.

10 And the disruption of normal cell function that even by
11 imaging, we had strong evidence that the brain was very
12 dysfunctional from the perspective of its normal mechanisms of
13 regulating how water moves in and out of the cells was very
14 disturbed. This is part of the global brain swelling.

15 And so I -- I just -- to answer your question, I think at
16 the time of autopsy, the brain would have been very difficult
17 to analyze microscopically.

18 **Q.** Okay. You were asked a question about an article by
19 an author Barnes. I didn't get the full title, but you had
20 indicated you were familiar with this particular article?

21 **A.** Uh-huh. Yes.

22 **Q.** You're aware that that was their, I guess, statements
23 made in the article, but what do you -- how would you comment
24 on that article?

25 **A.** Well, first, I would just say that none of us that

1 work in this field, working with children, working with
2 children in trauma, and working with children who have had
3 inflicted trauma, none of us take this lightly. And I -- and
4 I hope that you've appreciated that from all the experts who
5 have spoken.

6 And so we don't -- we don't rush to a judgment about
7 inflicted trauma. We try to weigh the elements of our
8 observations and evidence and our -- and our knowledge and
9 background, looking at all the things we've talked about
10 today.

11 There are, quote, "mimics" of some of the aspects of
12 inflicted injury; however, to be very fair in this regard,
13 either the health history or other associated findings are
14 usually very helpful to the clinical doctor and to the
15 radiologist to help us sort out mimics of child abuse from
16 child abuse.

17 And, again, I would just restate that there is a
18 magnitude and a collection of abnormalities here from shoulder
19 or humerus fractures to skull fracture to multiple sites of
20 bleeding in the head, around the spinal cord, and injury to
21 the soft tissues around the neck that have to be taken as the
22 big picture, have to be taken together. One should never
23 isolate one finding and just talk about -- that doesn't
24 reflect what has happened here.

25 So the aggregate of these findings and the absence of

1 other features suggesting a nontraumatic problem is something
2 that is going through our mind. We work in the realm of what
3 we call differential diagnoses. We see something as
4 radiologists. We observe it. We chronical our findings. And
5 then we try to order, based on our training and experience and
6 knowledge of the literature, what -- what most likely is
7 explaining this.

8 That's what we do every day. That's how we become
9 helpful to our surgical colleagues, to our medical colleagues.
10 If we can't do that, we -- we really can't be of any help in
11 caring for children. So that's -- that's the process.

12 Q. Okay. You were asked the scenario of whether hitting
13 Lincoln Penland's head with a door would cause the fracture.
14 You indicated you disagreed with that statement. I guess, I
15 want you to maybe elaborate, why is it you disagree with that
16 statement?

17 A. Well, my understanding to this point in this case
18 is -- is that there is an offered -- offered history that a
19 roughly three-year-old child would have been the child, or the
20 person, who swung the door into the head. Am I correct?

21 Q. Correct.

22 A. Well, my opinion, given the history that I understand
23 and the scope and spectrum of the injuries that we see here
24 are inconsistent.

25 Q. Inconsistent in what way, I guess?

1 **A.** That I would not expect the scope of intracranial
2 injuries, brain swelling, bleeding in multiple compartments, a
3 diastatic fracture to result from a three-year-old swinging a
4 door onto a head.

5 **Q.** And that kind of gets to that final question you were
6 asked about whether or not you had a belief whether this was
7 caused by an adult or caused by a child. And I want you --
8 please explain, your opinion was adult. Why?

9 **A.** Well, again, I'm coming to you with a personal
10 experience. I've only worked in children's hospitals. I've
11 only cared for children after my training. And I've seen a
12 lot of trauma at three major, well-respected institutions and
13 a lot of trauma to the head. And I've never encountered a
14 case like this, or even approximating this, where a child was
15 implicated as -- as the causative person involved in causing
16 the injury.

17 So that's my experience. And so I would call this my
18 practice-based evidence for you to consider. I've never,
19 never experienced that.

20 **Q.** Thank you.

21 **A.** Uh-huh.

22 **THE COURT:** From the defense?

23 **MR. WIDDISON:** No further questions, Your Honor.

24 **THE COURT:** Okay. Does any member of the jury have a
25 question they'd like to ask Dr. Hedlund? It looks like we

1 have some.

2 Counsel, if you'll join me here at the bench.

3 (Unintelligible) this like the air-conditioning.

4 **THE WITNESS:** Do you want me to stay here?

5 **THE COURT:** Yes, please. We allow the jury to ask
6 questions. They write them down, hand them to the bailiff --

7 **THE WITNESS:** Okay.

8 **THE COURT:** -- and then they're brought to the bench
9 and I review them with counsel. If they're appropriate
10 legally, then I'll ask it.

11 **THE WITNESS:** Okay.

12 **THE COURT:** If not, then we don't.

13 **THE WITNESS:** That sounds just fine.

14 **THE COURT:** Okay. Counsel, if you'll join me.
15 Thank you, Dave.

16 (Discussion at the bench at 11:56:58.)

17 **MR. MILES:** Just to be clear, did your evaluation
18 confirm the trauma that trauma caused the (unintelligible)?

19 Fine with it. Okay. I think we're all good with
20 that one.

21 **MR. WIDDISON:** Is it true that whether the skull
22 strikes an object or an object strikes the skull, the impact
23 and, thus, the trauma, would be about the same?

24 **THE COURT:** Any objections to either question?

25 **MR. MILES:** None.

1 **MR. WIDDISON:** No objections.

2 **MS. TOOMBS:** Can I see this just for a second? I
3 think that he would add a sixth, so --

4 **MR. MILES:** (Unintelligible)

5 **MS. TOOMBS:** Yeah.

6 **THE COURT:** No objection?

7 **MR. MILES:** No.

8 **THE COURT:** No objection?

9 **MR. WIDDISON:** No.

10 **THE COURT:** Okay.

11 (Proceedings resume in open court at 11:57:45.)

12 **THE COURT:** Question from a member of the jury: Is
13 it true that whether the skull strikes an object or an object
14 strikes the skull, the impact and, thus, the trauma, would be
15 about the same?

16 **THE WITNESS:** I think that's -- that's true. I think
17 that can certainly be true. It can be difficult, at least for
18 me, to know from the imaging if an object hit the skull or the
19 child was brought to an object where the -- where the skull
20 struck. That can be challenging to know.

21 **THE COURT:** Thank you.

22 Next question: Just to be clear, does your
23 evaluation confirm that trauma caused the five following
24 separate injuries: One, skull fracture; two, broken left arm;
25 three, broken -- broken right arm; four, spine injury in the

1 cervical region; five, spine injury in the lumbar region?

2 **THE WITNESS:** My opinion is that those items, those
3 topics that have been mentioned in the question, were caused
4 by trauma, that they are very likely related to a solitary
5 traumatic event.

6 **THE COURT:** Thank you.

7 Were there any other questions by any member of the
8 jury?

9 Okay. Seeing none, did either counsel want to follow
10 up on any -- anything that was asked by the jury?

11 **MR. MILES:** I do.

12 **FURTHER EXAMINATION**

13 **BY MR. MILES:**

14 **Q.** Regarding that last question, Doctor, the -- the idea
15 of these five separate areas of injuries: Skull fracture,
16 broken left arm, broken right arm, cervical spine injury,
17 lumbar spine injury, would the single, I guess, cause of the
18 skull fracture, that is, you know, if an object was brought to
19 Lincoln Penland's head or Lincoln Penland's head was brought
20 to an object, break the right arm? I guess, that's --

21 **A.** No.

22 **Q.** I think that's the question.

23 **A.** No. If I misunderstood the question, I apologize. I
24 may have misunderstood the question.

25 So the skull fracture, the injury of tissues that overlie

1 or lie adjacent to the bone, the bleeding and brain issues
2 that we've talked about, I think those relate to an event, if
3 you will, correlated together, trauma to the skull and
4 associated injuries intracranially.

5 The fractures relate to trauma to those regions. The
6 cervical spine and lumbar region injuries that we talked about
7 I think relate to injury.

8 What I was maybe not so accurately reflecting to you is I
9 think that one event, one traumatic event, could explain these
10 findings. And it would -- it would implicate -- and I
11 mentioned some of this before -- I believe particularly the
12 spinal level, the shoulder region fractures, that -- that
13 shaking and shaking impact was -- is, in my opinion, likely
14 mechanism to bring all these injuries to an explanation.

15 **MR. MILES:** Thank you.

16 **THE COURT:** Any from the defense?

17 **MR. WIDDISON:** No, Your Honor.

18 **THE COURT:** Any other question from any other member
19 of the jury? I feel like I'm in an endless loop here.

20 Okay. Thank you, Doctor. You can step down.

21 **THE WITNESS:** My pleasure.

22 **THE COURT:** And is this an appropriate point for our
23 lunch break, for at least the jury?

24 **MS. TOOMBS:** Yes.

25 **MR. MILES:** I think we can do that. We can take care

Addendum E

Child forensic pathologist's testimony

1 **MR. BUSHELL:** We scared her off when the Court made
2 everyone go out.

3 **THE COURT:** Well, get -- get some witness because I
4 promised the jury.

5 **MR. BUSHELL:** Be patient.

6 **THE BAILIFF:** We could put you up there.

7 **MR. BUSHELL:** They don't want that.

8 Your Honor, the defense calls Dr. Janice Ophoven.

9 **DR. JANICE OPHOVEN,**

10 being first duly sworn, testifies as follows:

11 **THE WITNESS:** Morning, Your Honor.

12 **THE COURT:** Morning.

13 **THE WITNESS:** Morning.

14 **DIRECT EXAMINATION**

15 **BY MR. BUSHELL:**

16 **Q.** Good morning, Dr. Ophoven.

17 **A.** Morning.

18 **Q.** How are you?

19 **A.** I'm fine.

20 **Q.** Doctor, would you please state your full name for the
21 record?

22 **A.** My name is Janice Ophoven, O-P-H-O-V-E-N.

23 **Q.** Okay. Doctor -- so when we say Dr. Ophoven --

24 **A.** Uh-huh.

25 **Q.** -- what does that entail? The doctor?

1 **A.** Oh, it means I'm a medical doctor.

2 **Q.** Okay. And in what capacity are you a medical doctor?

3 **A.** I went to medical school, graduated in 1971.

4 Completed post-graduate training and have been in practice
5 ever since.

6 **Q.** Okay. And we'll -- we'll get -- you know, we'll kind
7 of go through your experience and your qualifications to be
8 here, but let's -- before we get there, let me just ask you,
9 did my office contact you and retain you to assist the defense
10 in this matter?

11 **A.** Yes, sir.

12 **Q.** And what did my office ask you to do, specifically?

13 **A.** You asked me to do a comprehensive forensic analysis
14 specific to understanding the cause and manner of death of
15 little Lincoln Penland.

16 **Q.** Okay. Well, let's jump back. So you say you
17 graduated from medical school?

18 **A.** Yes, sir.

19 **Q.** In what year? I'm sorry.

20 **A.** 1971.

21 **Q.** 1971. And where was that?

22 **A.** The University of Minnesota.

23 **Q.** Okay. And do you have any post-graduate education?

24 **A.** Yes. I -- I spent basically a total of nine years
25 after medical school before I entered practice as -- as a

1 forensic pathologist with special training and expertise in
2 injuries in children. That's commonly referred to as
3 pediatric forensic pathology.

4 **Q.** Okay. So lots -- it sounds like a lot of experience
5 in pediatrics, not just medicine and not just pathology. So
6 you specialize in pediatric pathology?

7 **A.** That's -- that's correct. When I was in medical
8 school I realized that I wanted to focus my medical career on
9 taking care of children. I wanted to make a contribution to
10 the body of knowledge having to do with the care and treatment
11 of children.

12 And then as I pursued my special interests, realized that
13 there was one area of medicine back in the '70s that really
14 was undeveloped and underdeveloped and that had to do with
15 trauma, and, specifically, the issues having to do with child
16 abuse.

17 So I -- I did a pediatrics residency; I did a pathology
18 residency to understand how tissue reacts to disease and --
19 and injury. Then I did pediatric pathology, which is the
20 study specifically of how pediatrics applies to making a
21 diagnosis in -- in childhood, and that included not only
22 traumatic things, but also diagnosis of brain tumors and
23 leukemia. I worked in the laboratory. Pathologists are often
24 referred to as kind of a doctor's doctor. We're the person
25 that help the doctors figure out what's wrong.

1 And then because of my interests in -- in trauma and
2 injuries in children, I did the only thing that was left for
3 me at the time to study which was forensic pathology, which is
4 the understanding of the circumstances of how people get sick
5 and die. And -- and when I did my forensic fellowship, they
6 understood that I had already completed my training in
7 pediatrics and pediatric pathology and so forth, so they
8 recognized that I was concentrating on understanding inflicted
9 trauma and traumatic injuries in children, how to make the
10 distinction between accidents and homicide and so forth.

11 And when I finished all of that work, I had also
12 practiced for a number of years during my training under a
13 grant from the American Academy of Pediatrics to deliver care
14 to children in the Ozarks. So I did nine years after medical
15 school and then decided -- started my practice as a forensic
16 pediatric pathologist.

17 **Q.** And that career began back in the '70s, you said?

18 **A.** By the time I got done, it was actually 1980,
19 mid-1980.

20 **Q.** Okay. And since that time, you have been working in
21 this field, in this --

22 **A.** In one venue or another. I started at the Children's
23 Hospital and their -- Charlie Jarvis had been practicing as a
24 solo pathologist for years and so the two of us created a
25 corporation together, pediatric pathologists and forensic

1 specialists. And that's been my umbrella company corporation
2 since 1981.

3 Q. Okay. So in your -- we kind of covered your
4 education, a bit of your experience, but let's talk about -- I
5 guess, tell us more about your professional experience. So
6 you've been trained, educated, studied in pediatric forensic
7 pathology. Talk to us -- tell us a little bit about your
8 actual hands-on day-to-day work. What have you done?

9 A. Well, as I mentioned, I practiced in a lot of
10 different environments. There is no place where you can go
11 and hang a shingle that says pediatric forensic pathology.
12 Most people who practice pediatric pathology are at children's
13 hospitals and most people who practice forensic pathology are
14 in medical examiner's offices, but the majority of their work
15 is adult autopsies and death investigation. So I'm kind of
16 stuck in between there.

17 So my first -- my first job was at the Children's
18 Hospital. And there I -- I joined Charlie and then when he
19 retired I ran the lab at Children's Hospital and began a
20 consulting practice in pediatric forensic pathology.
21 Initially, my work in forensics was with the Bureau of
22 Criminal Apprehension, local law enforcements when they had
23 challenging cases, and then over time grew my practice so that
24 it basically covered the US, a lot of Canada, and occasional
25 high profile cases in the UK and Australia.

1 And then simultaneous with that while I was at the
2 Children's Hospital, I ran the lab. I was responsible for
3 diagnosing cancer, leukemia, brain tumors, worked in the
4 operating room, assisted with blood banking for cardiac
5 surgery, and attended rounds daily in the critical care units
6 to understand what was wrong with the kids there so I could
7 assist with their diagnosis and their -- their
8 minute-to-minute care.

9 And then eventually worked with the -- the chairman of
10 the board of trustees. The board asked me to help coordinate
11 a multidisciplinary -- the development of a multidisciplinary
12 child abuse center across multiple campuses and across
13 multiple venues.

14 I worked with the state in reviewing all of the deaths in
15 the state, looking at cases where the -- where state
16 authorities may have missed opportunities to prevent injuries
17 to children, receiving care and services.

18 I was appointed by the governor to co-chair a medical
19 group on domestic violence, looking at why we miss
20 opportunities to prevent injuries and abuse to vulnerable
21 people, not just children, but adults and -- and vulnerable
22 adults.

23 Over the years worked in a number of environments to --
24 to both contribute and learn. My work with the state Child
25 Mortality Review Panel led me into providing teaching to law

1 enforcement across the state on the investigation of children
2 where there was suspicion --

3 **MS. TOOMBS:** Your Honor, at this point -- I'm sorry.
4 At this point, we would ask for a question.

5 **THE WITNESS:** Sorry.

6 **MS. TOOMBS:** We've -- we've far exceeded the last
7 question --

8 **THE WITNESS:** I'm sorry, Your Honor.

9 **MS. TOOMBS:** -- that we were at.

10 **THE COURT:** Mr. Bushell.

11 **MR. BUSHELL:** Okay. Yeah, I -- actually the first
12 time so far I agree with Ms. Toombs.

13 **Q. (BY MR. BUSHELL)** Well, that's clearly lots and lots
14 of experience, fair to say. Do you -- but your experience has
15 not just been in consultation. As a pathologist -- as I
16 understand it, forensic pathologists conduct -- perform
17 autopsies.

18 **A.** Yes, sir.

19 **Q.** Tell us about your experience doing that -- doing
20 autopsies, performing autopsies.

21 **A.** There are really two environments where autopsies are
22 performed. One is in the hospital where -- when the -- when
23 the patient dies, we then perform an autopsy to make a
24 determination of -- of what -- what was the actual cause and
25 circumstances of the -- of the patient to pass away.

1 And while I was at the Children's Hospital, Charlie had
2 been practicing for years and years so he kind of said I've
3 done my share of autopsies so he kind of handed that -- that
4 service off to me. And we did anywhere between 70 and 100
5 autopsies a year at the Children's Hospital. So I autopsied
6 children of all ages, but predominantly, less than two,
7 during that period.

8 And then in training, as well as a number of times in my
9 professional career, I have worked as a medical examiner and
10 coroner, and there performed autopsies in adults and
11 children -- predominantly adults -- for determination of cause
12 and circumstance of death. And then consulted on a number of
13 occasions to participate either in a second autopsy or to
14 assist the state in making a determination of what happened to
15 a child who died under suspicious circumstances.

16 **Q.** So all told, how many autopsies would you say, over
17 the course of your career, that you've performed?

18 **A.** I don't actually have a count. In today's world they
19 keep a log, you know, the second they do their first autopsy.
20 I don't -- I never did do that. I would say hundreds of
21 autopsies during the time that I was working at the Children's
22 Hospital, somewhere around a couple of hundred autopsies while
23 I was in -- in training and those were predominantly children,
24 and then a lesser number during the time that I was an
25 assistant medical examiner. We -- there's a rule of thumb

1 that it's somewhere between 10 and 15 percent of total
2 autopsies are in children. So out of the -- those, probably
3 20 or 30 during that period of time.

4 **Q.** Okay. And were some of those or a lot of those under
5 suspicious circumstances? I think that's what you said.

6 **A.** Many of the autopsies -- the forensic autopsies were
7 not natural causes. And -- and some of the children that I
8 autopsied during my -- during my work as a forensic
9 pathologist were not natural. Sudden infant death syndrome,
10 overlaying, unsafe sleeping conditions, unexpected deaths with
11 no cause determined, but my -- many (unintelligible) being
12 inflicted trauma or homicide.

13 **Q.** I want to circle back to something you mentioned.
14 Your -- you said that you -- throughout your years of
15 experience that you found yourself, I think maybe you said
16 consult -- consulting or instructing law enforcement --

17 **A.** Right.

18 **Q.** -- in their investigation. Can you talk to us about
19 that?

20 **A.** During the -- the predom -- the first half or more of
21 my professional career, the -- the concept of child abuse was
22 just developing, not well understood, and believe it or not,
23 it was -- it was hard for authorities to suspect that a child
24 had actually suffered injuries or fatality at the hands of
25 their parents or a caregiver.

1 So in the '70s and '80s, a lot of my work was teaching
2 and investigating cases where foul play was obviously present,
3 but where people were really resistant to that consideration.
4 Obviously, things have changed in today's world where child
5 abuse is recognized to be a real risk to child safety and
6 well-being, but back in those days, it was -- it was teaching,
7 providing workshops, and then most importantly, being called
8 in in cases where there was a question as to whether or not
9 foul play was a possibility and participating in the
10 investigation and eventually the adjudication of the fatality
11 in criminal courts.

12 **Q.** I see. So in this capacity, would you find yourself
13 working hand in hand with law enforcement and perhaps, you
14 know, looking at the proper way about -- to go about
15 instructing or investigating or what you're looking for in
16 these sort of situations where abuse is suspected?

17 **A.** Yes. Not only was I working as -- as an
18 investigative arm of law enforcement and the medical
19 examiner's offices, but as -- as people became aware of my
20 special interest and experience, I started to be asked to give
21 workshops to law enforcement, child abuse centers, and so
22 forth around the country. And the various forms of child
23 abuse, originally people thought of it just as the battered
24 child or just as bruising, and then later we looked into --
25 you know, started to realize that the various -- the

1 various -- the wide spectrum of ways -- the ways children
2 suffer injury at the hands of their families: poisoning,
3 medical neglect, sexual violence, malnutrition, fabricated
4 illnesses or the Munchausen syndrome by proxy, covert
5 suffocation of very young infants and so forth.

6 So these were all areas that I taught and investigated
7 cases. And, of course, a lot of the cases were childhood and
8 infant head trauma because it is one of the most common forms
9 of -- of inflicted trauma to children.

10 Q. Okay. Well, in that same vein, can you talk to us --
11 throughout your experience both as a medical examiner, as a
12 pathologist, in this capacity of, you know, assisting or
13 instructing or working side-by-side with law enforcement,
14 would you ever come across situations where there was, in
15 fact, intentional child abuse?

16 A. Oh, there's no question. I made the diagnosis many,
17 many, many, many times over the years and I continue to make
18 that diagnosis in my consulting work today. I review cases,
19 participate in the investigation of cases, and there's no
20 question that many of the cases I do see even today are
21 children injured from inflicted trauma.

22 Q. Doctor, let's talk a bit about, I guess, your
23 professional career. Well, let me back up. You mentioned
24 that current -- your current profession is that you're a
25 consultant.

1 **A.** Yes. I consult on cases of children who
2 predominant -- the predominant cases that I consult in are
3 cases where there is suspicion that a child has suffered
4 inflicted trauma.

5 **Q.** And do you consider yourself an expert in this field?

6 **A.** Well, I've been qualified as an expert hundreds of
7 times and I have achieved as much education as was -- was
8 available and have maintained that expertise over the years.
9 So both from a legal standpoint, I am recognized as an expert
10 and people call me to consult with me regarding injuries in
11 children on a regular basis. So I would -- I would qualify --
12 I would consider myself an expert.

13 **Q.** Do you -- is that consideration based on more than
14 just the fact that you come to court and testify?

15 **A.** Well, I would say that that's -- that's not the
16 reason. The reason is that I have spent my entire
17 professional career learning, teaching, and contributing to
18 the body of knowledge in the field and continue to work on a
19 daily basis on evaluating and making diagnoses.

20 **Q.** So you mentioned "contribute to your field." What do
21 you do -- talk to us about that. What do you do that
22 contributes to this discipline, this profession, this medical
23 field?

24 **A.** Well, I -- I teach whenever -- whenever I can. Over
25 the last few years, most of the people who ask me to teach

1 about understanding inflicted injuries are defense counsel.
2 But up until, say, about 10 years ago, the predominant people
3 who would ask me to teach them were prosecutors and law
4 enforcement, other doctors, emergency room physicians, and
5 even child abuse programs or SCAN teams. So whenever anybody
6 wants to understand the science of interpreting injuries in
7 childhood, I -- I am very anxious to participate in those
8 activities.

9 I have been invited over the years to submit book
10 chapters to pathology texts and other textbooks that
11 specifically focus on pediatric forensic pathology. So in a
12 textbook that has lung disease and heart disease and cancer
13 and leukemia, starting in 1992, they recognized that trauma in
14 children is actually a serious problem in childhood so they
15 started adding chapters on forensic pathology to textbooks.

16 And I have written multiple textbook chapters that were
17 expected to be a comprehensive review of what is known about
18 injuries in children, the different kinds of injuries, how to
19 make a distinction between accidents and inflicted trauma, the
20 various circumstances. And then most importantly, the process
21 for proper death investigation in children who die from
22 traumatic injuries. So a lot of my chapters, a lot of the
23 volume of the chapters has do with how you approach the
24 investigation or the death investigation in children who die.

25 Q. Okay. And those are the publications -- this was an

1 answer to the question asked, how do you contribute to your
2 field, and so publications and committees --

3 **A.** Chapters, book chapters. I lecture and have been
4 formally teaching since I got out of training. And then, like
5 I said, I think the last book chapter was just a couple of
6 years ago. And that one, again, was a -- a handbook on death
7 investigation that specifically had to do with pediatric -- it
8 was a child -- it was a pediatric text, but it had to do with
9 death investigation in -- from a forensic perspective.

10 **Q.** Any peer-reviewed publications?

11 **A.** Sure. Over the years I've had a variety of
12 additional interests in infant nutrition and airway disease
13 and publishing case reports of children who have died under
14 suspicious circumstances with unusual findings, like small
15 airway or salt poisoning, and some of the other kinds of
16 unusual and atypical ways that children present to medical
17 attention.

18 **Q.** Okay. I want to ask you about something you said.
19 You said that oftentimes -- I think what you said was that
20 pathologists are considered the doctor's doctor.

21 **A.** By some, yes.

22 **Q.** By some. Well, talk to us about that. What does
23 that mean when you say that?

24 **A.** Well, from my standpoint it was -- is -- the
25 pathologist resides all the time at the hospital. They don't

1 typically go -- the practicing pediatric pathologist or
2 hospital pathologist lives in the laboratory. In there, we're
3 responsible for making sure the testing is -- is accurate,
4 that we don't send out inaccurate test results.

5 So we have a lot of responsibility in quality control,
6 but we also are people that before surgery or -- or when a
7 child has pub -- has puzzling findings in the critical care
8 unit or an unusual rash or whatever, oftentimes people will
9 collect with the -- the pathologist and say, well, if we want
10 to know why this child would not be able to oxygenate, this
11 child, what's the best approach for us getting a diagnosis?
12 Would we be better off going down the airway and doing BIP
13 biopsies through a bronchoscope or should we actually open the
14 chest and get a piece of tissue for you to look at and tell us
15 what's wrong?

16 Or if the child has problems with their liver function
17 tests, oftentimes the interpretation of liver function tests
18 can be fairly complex. And helping to decide when and how to
19 go about getting tissue for examination, gastrointestinal
20 upsets, and the various collection of various parts of fluids
21 and material from the GI tract, we're the ones that kind of
22 coordinate and, ultimately, are the ones that -- we're the
23 only ones that look under the microscope to say, well, this is
24 actually what's wrong with this tissue.

25 So it's -- it's a consultative practice in the hospital

1 oftentimes with other doctors as opposed to consultative
2 practices where the patient and the doctor are talking
3 together. It's doctors and pathologists that are talking to
4 each other.

5 Q. Are there any -- any areas of medicine that -- that
6 you're -- well, that you consult with other types of doctors,
7 for example?

8 A. Well, sure. As -- from a forensic standpoint, which
9 ultimately is the bottom line for my work, is we have to --
10 our responsibility is to collect the information we need to
11 make a differential diagnosis and to render an opinion about
12 cause and circumstance of death.

13 There are many other avenues of information that we can
14 pull into our analysis. So frequently we will rely on the
15 radiologist to tell us what was wrong with the brain when the
16 child first came to the hospital because as I'm sure you're
17 aware by now, the brain will change over time as the child is
18 hospitalized and the child's maintained on a ventilator.

19 So what that first X-ray looked like or what those first
20 X-rays look like are important and so I will ask the
21 radiologist to give me their input as to what was wrong and --
22 and so forth. I'll consult with other specialists, oftentimes
23 neurologists. We, of course, look at the ophthalmologic
24 reports of what the child's eyes looked like when they first
25 came to the hospital.

1 I frequently consult with biomechanical engineers
2 around -- basically answering a yes/no question: Did this
3 event, as I understand it, have the potential to cause a
4 serious or fatal impact? What were the potential forces that
5 this head could have been subjected to?

6 Pediatric surgeons, often I'll -- I'll talk to them in
7 cases where they've actually gone in and looked with their
8 naked eye so I can see what the pathology looked like to them
9 before I receive it in the morgue and so forth.

10 So I -- I routinely consult with or use other
11 specialists, but at the end of the day, the forensic
12 pathologist is the one that has to answer that final question
13 as to what cause and manner of death occurred.

14 **Q.** And only the pathologist can determine that?

15 **A.** The -- ultimately, the only authorities authorized to
16 sign death certificates about manner of death are -- in cases
17 of anything but natural causes are coroners and medical
18 examiners, and typically medical examiners are forensic
19 pathologists.

20 **Q.** And then these other, I guess, disciplines, other
21 areas of medicine, do you stay current on the literature and
22 the recent, you know, state of the science?

23 **A.** Yeah, I have to. I have to keep --

24 **Q.** Why did you have to?

25 **A.** -- current on all the organ systems and all of the --

1 the evolving techniques for examining tissue, as well as the
2 evolving dialogue around the interpretation of childhood and
3 infant head injury and understanding better what we've learned
4 over the last 20 years about how the brain reflects damage and
5 how the brain changes over time after damage and what are the
6 various causes or mechanisms for damage.

7 And that's been quite a journey. Things have changed
8 substantially since I started back in '71. In '71, the
9 so-called shaken baby syndrome was just starting to be
10 discussed.

11 **MS. TOOMBS:** At this point, can we have a question?
12 We -- we've again gone far afield of --

13 **THE WITNESS:** I'm sorry, ma'am.

14 **MS. TOOMBS:** -- you keep -- the original question.

15 **THE COURT:** Any response?

16 **MR. BUSHELL:** I'll ask a question.

17 **THE COURT:** Okay.

18 **Q. (BY MR. BUSHELL)** You say you stay apprised on the
19 more recent developments in these fields. Is shaken baby
20 syndrome one of those fields that you stay apprised of?

21 **A.** You bet.

22 **Q.** Can you talk to us about that?

23 **A.** Briefly. In '71, the first couple of articles
24 that -- that theorized that shaking could cause damage to a
25 child's brain were published, late '60s, early '70s, Guthkelch

1 and Caffey, across the Atlantic ocean.

2 Without further study, the idea that shaking a baby could
3 be lethal got momentum, although there was never any analysis
4 of the actual damage that shaking caused. It was theorized.
5 Eventually, the theory landed on an idea that said shaking
6 caused damage to the nerve cells by tearing axons, although
7 there was no way to actually demonstrate that. So we just --
8 we just theorized it. It was never tested; it was never
9 validated.

10 A lot of conclusions were drawn about how children would
11 behave if they were shaken, a lot of court cases were
12 determined based on theory. But there was never any way to
13 actually -- to test the theory until the -- the late '80s and
14 '90s. People started studying the biomechanics of -- of
15 injury and the potential forces that could be generated from
16 shaking and serious questions were raised. It's, like,
17 football players from Penn State couldn't generate enough
18 energy shaking a model to -- to theoretically cause damage.

19 So the name changed from shaken baby to shaken impact
20 because the theory was that it requires an impact, really, for
21 damage to take place. We still couldn't see the damage, but
22 the -- the name got changed to shaken impact because of
23 concerns about the -- the amount of force that shaking took.

24 In the late '90s and early 2000s, studies were performed
25 using new techniques on brain tissue, looking for this damage

1 to the brain that was supposed to take place from shaking and
2 it wasn't there. So this diffuse axonal injury, the concern
3 that people had that shaking a child would tear the nerve,
4 shred the nerve cells, actually wasn't there.

5 So, eventually, that led to a change in the language
6 again. So instead of saying shaken impact, the term was
7 changed to abusive head trauma; although people still held on
8 to the belief that some kind of rotational or acceleration
9 damage could -- could cause a child to die, most of us in the
10 forensic field kind of fell back on what we knew about trauma
11 and said, well, it's blunt impact. That's what causes you to
12 have a fatal brain injury.

13 So you look for the impact, and if you don't have
14 evidence of an impact, you look for other things that might
15 disguise themselves as abuse. And we started discovering a
16 long list of things that can be misinterpreted as abuse but
17 really aren't.

18 So we end up focusing on, is there evidence of blunt
19 force trauma or not? That raised some important and
20 interesting secondary questions that had to do with, well, so
21 what does retinal hemorrhages mean? What does the presence of
22 a subdural mean? What does brain swelling mean? How do we
23 put those pieces together?

24 And as of today, the presence of retinal hemorrhage, at
25 least according to some notable studies and international

1 discussions, retinal hemorrhage -- the evaluation of retinal
2 hemorrhage really doesn't answer the question as to how the
3 injury occurred.

4 Q. And Doctor, we'll get to some of these very specific
5 issues because you weren't here the last week and a half,
6 but -- but that is obviously something that has come out and
7 we'll talk about later.

8 A. Okay.

9 Q. But I want to ask you a question. You've used the
10 term "we" as in the medical field; "we" have discovered. Is
11 your experience, for example, in shaken baby syndrome -- and
12 you've given us a great kind of historical development of this
13 theory -- but were you -- I mean, do you have any hands-on
14 experience in this or is this just you've read the literature
15 and kind of followed along but from an -- from an observer
16 standpoint? Or do you actually -- when you say "we," you mean
17 you were in the trenches?

18 A. Yeah, I was in the trenches.

19 Q. Can you talk to us about that, please?

20 A. Well, a number of questions, a number of cases, a
21 number of autopsies where the -- where the question of how the
22 injury took place was at the very heart of the conversation.
23 This child has fatal brain damage. Is it from trauma, yes or
24 no? And is that trauma inflicted, yes or no? Those are the
25 simple questions that -- that we, as forensic pathologists,

1 routinely have to answer in a fatality.

2 So that analysis is a standard -- kind of standard
3 practice, day-to-day practice of forensic pathologists for
4 evaluating a child dead with complications of brain damage, is
5 the damage trauma, yes or no? Is the trauma accidental,
6 inflicted, or you can't tell? Over the years, the science,
7 the available techniques, the interpretation of the science
8 and the techniques has evolved just like everything else, the
9 treatment of heart attacks, the treatment of brain tumors, and
10 so forth.

11 So today when I speak of the "we," I speak of -- I'm
12 speaking as my collective experience in rendering these
13 diagnoses, signing the death certificates, collaborating with
14 others around where the field has evolved and to where the
15 science is today in terms of what you can and can't say about
16 the specific findings in a case.

17 **Q.** Do you have -- well, back up.

18 So you said the late '80s, I think you said early '90s,
19 is when you started to see the development, and that -- as
20 you've discussed your history, late '80s, early '90s, you were
21 a director at Children's Hospital, I believe, you said?

22 **A.** Yeah. Until -- until 1990 I was director of
23 laboratories at the Children's Hospital. I then took some
24 other positions, but continued my -- my consulting work.

25 **Q.** In fact, early '90s, you served as a deputy medical

1 examiner.

2 **A.** Yes.

3 **Q.** And this was while these theories and the science was
4 developing.

5 **A.** Right.

6 **Q.** And so you had some experience hands-on. Is that --

7 **A.** Absolutely. A lot of the time as a deputy medical
8 examiner I was called in to look at cases that someone else
9 had -- the -- the fellow on call or the staff pathologist had
10 a case and because -- because they were having to put the
11 pieces of the puzzle together around what could have happened,
12 oftentimes I would be called in to assist in updating them
13 around where the debate was, around the -- and there was some
14 specific issues: could a short fall cause a serious injury?
15 Can shaking actually, without an impact, cause a fatality?
16 What does retinal hemorrhage mean in a particular case and
17 what are the circumstances under which a retinal hemorrhage
18 appears? What qualifies as a blunt force impact? Is it a
19 bruise or is it something more significant? And what are the
20 alternative explanations that could -- that need to be
21 considered in a particular case?

22 **Q.** Okay. Well, let's back up.

23 So at the very -- I think I asked you, you were retained
24 by my office to assist in this matter?

25 **A.** That's correct.

1 Q. And remind us all again, what did my office ask you
2 to do?

3 A. An independent forensic analysis of the cause and
4 manner and the findings leading to those diagnoses for Lincoln
5 Penland.

6 Q. And did you do that?

7 A. Yes, I did.

8 Q. Did you render an opinion?

9 A. Yes.

10 Q. And what was that opinion?

11 A. It's my opinion that the baby died of complications
12 of blunt force trauma to the head. The manner of -- or
13 circumstance of death is undetermined.

14 Q. Well, let's back up. So you mentioned that our --
15 well, let's back up even further.

16 You're being paid -- you -- you were retained by my
17 office.

18 A. Yes.

19 Q. In other words, you were hired.

20 A. Yes.

21 Q. Let's just get that out of the way.

22 A. Yeah.

23 Q. This is your profession.

24 A. Yes.

25 Q. Have you been paid for today's testimony?

1 **A.** No.

2 **Q.** So going back to what your -- what my office retained
3 you for, what does that process entail?

4 **A.** It's a methodical analysis that is just like any
5 practice of medicine. You first of all consider the complaint
6 or the problem. In this case, unexpected death associated
7 with a skull fracture. The first thing you do is you collect
8 information, both historical as well as physical.

9 **Q.** Okay. So you collect information, both historical
10 and informational (sic). What did you collect? What -- what
11 materials have you reviewed in forming that opinion?

12 **A.** Well, we submit a standard request in fatalities
13 that -- that includes birth records, especially in children
14 less than a year, because of obvious questions relating to
15 congenital and birth-related complications. Well-child
16 visits, every time the child has visited the doctor for
17 regular growth and development. Any other visits to the
18 doctor having to do with illnesses and so forth. And then we
19 ask for everything having to do with the transport and
20 emergency care and in-hospital care of the child at the time
21 of the fatal event, transport services and all of the labs,
22 all of the X-rays, all of the consults, every single document
23 that was generated in the care of the child.

24 We request everything that the medical examiner had
25 requested or had available to them at the time that they

1 performed the postmortem, including the information they
2 received from law enforcement, photographs, the autopsy
3 report, the tissue slides that came from the postmortem exam.
4 We actually want those to examine any special stains and
5 X-rays performed at the time of the autopsy. Any consults
6 that were obtained by the medical examiner or anyone else
7 through the course of the case.

8 And then the last category is all of the information
9 pertaining to the events and environment at the time that the
10 child was brought -- or -- or got sick and brought to medical
11 attention. So all of the police reports, all of the witness
12 statements, all of the investigative efforts and testing that
13 was done by law enforcement pertaining to what might have
14 happened or what did happen to the little boy. And that
15 included the interviews of witnesses and the -- the other
16 children at the daycare.

17 Oh, and also photographs from the scene and the -- the
18 description and other information having to do with the
19 changing table and the layout of the house and what other
20 information there was about the flooring and so forth.

21 **Q.** So, a lot.

22 **A.** Yeah, it's boxes -- it's usually lots of material.

23 **Q.** I want to review a couple of those things you
24 mentioned. Did you review imaging?

25 **A.** Yes.

1 **Q.** Slides? Essentially everything that the medical
2 examiner would have had?

3 **A.** Yes, sir.

4 **Q.** Okay. Everything that the -- essentially from the
5 moment, in this particular case, Lincoln Penland was
6 hospitalized onward, that's important --

7 **A.** Absolutely.

8 **Q.** -- to review (unintelligible) --

9 **A.** I have to consider everything. Not everything has
10 the same scientific weight.

11 **Q.** Sure.

12 **A.** But I consider everything.

13 **Q.** Okay. You mentioned birth records, well-child
14 visits. Why are those critical -- well, let me back up.

15 Do you consider those critical in your evaluation?

16 **A.** Yeah. I -- I work very hard to get -- we -- we don't
17 let up until we're told we can't have it.

18 **Q.** Okay. Why do you need those? Why is that important
19 in -- in your expertise in your field as a pediatric forensic
20 pathologist to have those sort of materials?

21 **A.** Well, it's -- as you'll hear as I proceed through my
22 testimony, a lot of my -- a lot of my analysis comes down to
23 yes/no questions as I'm putting together my findings. And in
24 a case where a child presents with sudden altered
25 consciousness associated with a brain injury, the first

1 question I want to know, is there evidence of preexisting
2 pathology, is there evidence of preexisting trauma. Because
3 that -- if there is preexisting pathology or preexisting
4 trauma, then how things unfold and the kinds of conclusions
5 you draw about them can be very different. So yes or no, is
6 there evidence of preexisting conditions or preexisting
7 trauma?

8 Q. I see. So birth records, well-child visits, delivery
9 records, those would inform those yes/no questions, is that --

10 A. Absolutely.

11 Q. So, in -- in general, those are all -- the -- the
12 list that you provided of materials you reviewed, does that
13 correspond with the materials you reviewed in Lincoln
14 Penland's matter?

15 A. Yes, sir.

16 Q. So what's the next step, Doctor? What did -- where
17 did you go from here in making your determination and your
18 findings?

19 A. The next step after collecting all of the information
20 is to identify the key findings. Key findings are positive
21 and negative elements in the case that, based on science and
22 experience, assist in the analysis. So history, questions
23 about the environment, questions about what was observed,
24 those -- those pieces, there's either positive or negative.
25 Was there CPR? Was there -- was there a history of an event

1 that could explain the problems? Was there evidence of
2 abnormal growth and development? And then what were the
3 findings when the child came to medical attention?

4 And the -- and the important part on that findings
5 analysis is to separate between what is a primary pathology,
6 primary injury, from secondary complications of damage or
7 injury. The person is not in a -- in a fixed state when they
8 arrive at medical attention and, as I'm sure you've heard,
9 pressure goes up, swelling increases, bleeding happens,
10 complications of the chemistries of the body alter,
11 coagulation abnormalities develop, all of these things occur
12 over time. And because the child survived for 10 days then,
13 obviously, what was seen at autopsy is going to be very
14 different than what was present when the child first came to
15 medical attention. So it's separating between primary and
16 secondary damage through the -- the materials you're provided
17 from the medical record as well as the autopsy and the X-rays.

18 So -- and then, of course, the pathology in this case,
19 being 10 days after the child was admitted, is going to be of
20 much less value than the original findings of a fracture and
21 subdural which pretty much tells us that there was an impact.

22 **Q.** Why -- why is that -- why is that of less
23 significance? I don't understand.

24 **A.** Well, what happens over time is, for instance, if you
25 read the pathologist's report or if you look at the slides

1 that I have, one of the key questions that is always present
2 is when did this injury happen? How precisely can we identify
3 when the injury happened?

4 Typically the pathologist is the go-to person to answer
5 that question of when did the injury happen because we can
6 look at the tissue under the mic -- microscope and see how
7 much change has taken place from the body's attempt to heal.
8 We call that vital reaction, and that is if -- if a child
9 comes to the hospital and has only been sick for a little
10 while and dies suddenly, then the amount of vital reaction
11 that's in the tissue at the time of the autopsy is going to be
12 very informative.

13 However, if the child survives 10 days in the hospital,
14 then 10 days of vital reaction can elapse and that will mask
15 the specifics that in a more -- in a more challenging case
16 would allow us to put a finger on the timing of injury.
17 That's not as critical a question in this case, but in many
18 cases it really is important to know how long the child had
19 been ill. So the -- the duration of survival, the presence or
20 absence of cardiac arrest, how long there was lack of oxygen,
21 these are all things that -- that you have to collect as part
22 of the key findings.

23 **Q.** Okay. So let's talk about the key findings.

24 **A.** Okay.

25 **Q.** What were they?

1 **A.** Would you like me to list them or do you want to --

2 **Q.** Sure. That -- that could be helpful.

3 **THE WITNESS:** Is that okay, Your Honor?

4 **THE COURT:** Any objection from the State? Okay with
5 me.

6 **MR. BUSHELL:** Can the jury see that well?

7 **A.** Okay.

8 **Q. (BY MR. BUSHELL)** So Dr. Ophoven, walk -- walk us
9 through your key findings, if you would.

10 **A.** I'll try and talk really loud. How's that?

11 **Q.** This (unintelligible).

12 **A.** Oh, okay.

13 **Q.** It doesn't amplify. It just picks it up for the
14 record.

15 **A.** Oh, okay.

16 **Q.** Do you want me to --

17 **A.** Okay. Key findings. They fall into different
18 categories, and I'm going to try and -- and may clump them by
19 type, but since it's coming off the top of my head, I may have
20 to insert them.

21 The key findings prior to the event, we know that Lincoln
22 was challenged with developmental delay, abnormal head shape,
23 and growth -- they -- they use different terms. Some people
24 use growth failure. I was going to say there's just a little
25 retardation of growth. His weight. His weight didn't keep up

1 with his height and the other growth parameters, so it was --
2 it was serious enough that it was mentioned in the medical
3 record.

4 **Q.** Doctor, I don't mean to -- if I could just interject
5 real quick. I should have asked you this before, but is
6 this -- the key findings, is this just your unique process of
7 determining these questions or is this a pretty standard
8 procedure in your field?

9 **A.** Well, whether you call them key findings or just
10 findings or whatever, but we typically put down our -- our --
11 our analysis in what we call a SOAP format. Every doctor uses
12 some variation on this: subjective, objective, assessment, and
13 plan. They really are how we receive the information. And we
14 put it down in a way that we can communicate to everyone else.

15 So the objective is really where we're -- where we're
16 collecting the science, something I can hand you and show you,
17 as opposed to the subjective. I understand there was
18 developmental delay, abnormal head shape, and growth
19 retardation, but I can't demonstrate that to you with a test.
20 But this was all in the records.

21 **Q.** Okay. Continue on.

22 **A.** Okay. So prior to the event, he -- in answer to my
23 question, was there some -- some preexisting issues, the
24 answer was yes. But in the scheme of things, just to get this
25 out of the way, I don't think they had any -- anything to do

1 with the final analysis -- my final analysis in this case.

2 Q. So let me just clarify that. Lincoln Penland, you
3 noticed in his record, had some developmental delay, some
4 abnormal head shape, some growth or retardation of weight.
5 Just to be clear, you don't -- your opinion is that those
6 three things didn't lead to his death.

7 A. No.

8 Q. They didn't -- they didn't, I guess, exacerbate it?

9 A. No.

10 Q. Okay.

11 A. No.

12 Okay. Then we have the event history. And I know
13 there's been a lot of discussion of some of these things, but
14 as I understand it, my conclusions are -- is that Lincoln
15 suffered an event during the day that he was at the
16 babysitter, based on history, X-rays, and some of the other
17 findings when the child first arrived to medical attention.

18 I can't say absolutely for certain, but there's no
19 evidence that he was in trouble when he arrived to the
20 household. There was a series of descriptions of the child
21 crying out when he was with his brother, Boston -- well, and
22 other children.

23 Q. And, Doctor, let me just ask, how do you know that?
24 Is that --

25 A. From the police reports, from witness statements, and

1 from -- basically, from police reports and witness statements.

2 Q. Okay. Continue on.

3 A. And the children were apparently playing red and
4 green light, as I remember, which, from my childhood, is a
5 running and jumping playing game.

6 From that point forward the history is the child
7 developed symptoms that included episodes of in --
8 unconsolable crying, I'm going to say -- call that IC crying,
9 decreased appetite, lethargy, and vomiting. These, in
10 retrospect, are all symptoms of post-concussion or traumatic
11 brain injury.

12 Q. And this was part of your key findings --

13 A. Yes.

14 Q. -- regarding the event history?

15 A. That's correct.

16 Q. Okay.

17 A. The scene had a broken changing table.

18 There was a -- a reenactment with a doll with Boston.

19 And the child was sent home and then pretty quickly
20 brought to the emergency department. And this -- these are
21 important: breathing, stable vital signs -- in other words,
22 there's not a cardiac arrest with resuscitation required. And
23 he was -- ended up being transferred with evidence of skull
24 fracture, subdural hematoma, developing brain swelling.

25 Over time he developed increased intracranial pressure,

1 which is an important issue having to do with problems with
2 circulation. Brain edema progressed. Retinal hemorrhages
3 that at the time he was examined were to all quadrants, but no
4 folds were described, as I recall.

5 He developed a condition known as DIC which is a
6 coagulopathy. Simply said, this means he could not clot
7 properly which is a common complication of this kind of
8 evolving brain injury.

9 And he went on to the definition of brain death with
10 fairly rapid death following termination. I think it was
11 around six hours. Survived approximately 10 days on critical
12 life support or on critical care.

13 He also developed seizures which is important because
14 seizures cause a kind of edema that he had. And they were
15 subclinical seizures which means you can't see them, but
16 whether you can see them or not they're just as bad because
17 the nerve cell is building up toxic poisons in the cell when
18 the seizures are going on. So seizures, brain swelling,
19 increased intracranial pressure, subdural hematoma, skull
20 fracture were the findings having to do with the evolving
21 brain pathology. In addition, while he was at the hospital I
22 noted that he had an abnormal X-ray of the arm -- I believe it
23 was the right humerus -- that signaled to the pathologist to
24 sample this tissue. And this is what we call a metaphyseal
25 fracture. That's an important distinction between a regular

1 long bone fracture that you get when you fall off your bike or
2 get hurt playing football. This is at the growth plate. It's
3 a different animal.

4 He had minimal evidence -- minimal to no of physical
5 violence to his skin and soft tissue. And as far as I can
6 tell, no preexisting injury that would contribute to the
7 ultimate analysis. So --

8 Q. Can I -- can I back up just real quick?

9 A. Sure.

10 Q. I'm afraid you -- you played right into the
11 stereotype that doctors --

12 A. I can't read it either.

13 Q. -- don't have the greatest handwriting. What does
14 this say?

15 A. There's no -- minimal to no violence to skin and soft
16 tissues.

17 Q. Okay.

18 A. In other words, he didn't have any evidence of
19 battering or physical --

20 Q. Outward, external?

21 A. Outward evidence. I better put that.

22 Q. Okay.

23 A. No. This is no preexisting injury that plays into
24 the analysis of the case.

25 Q. And that was part of your key findings --

1 **A.** Right.

2 **Q.** -- the first key findings were his --

3 **A.** This is a really important issue for those of us that
4 do a lot of this kind of analysis because a child with extra
5 pooling in the head is much more vulnerable to decompensation
6 from lesser events. Not all skull fractures are fatal. As a
7 matter of fact, not all skull fractures make you lose
8 consciousness. Skull fractures don't interfere with brain
9 function.

10 The thing that caused the skull fracture can interfere
11 with brain function, AKA, a concussion or traumatic brain
12 injury, but the fracture itself doesn't tell us anything. And
13 kids can come in with lots worse skull fractures than Lincoln
14 had and be wide awake, upright, no problems whatsoever. So
15 the real issues have to do with what was going on, how
16 significant was the actual impact that caused the fracture.

17 **Q.** Okay. So you've outlined some of the key findings.

18 **A.** That is -- oh, I didn't do -- I didn't finish the
19 autopsy.

20 **Q.** Keep going.

21 **A.** Sorry.

22 **Q.** So this would be also be part of the key findings?

23 **A.** Right.

24 **Q.** Okay.

25 **A.** Nothing new to speak of. The autopsy showed evidence

1 of healing subdural hematoma. It also showed that there was a
2 little epidural hematoma which is blood on top of the fracture
3 bone, on top of the dura. So here's the dura. There was
4 blood under the dura, this is the subdural, there was a little
5 bit of blood on top of the dura where the fracture is. That's
6 not unusual for there to be a little bit of blood here. There
7 wasn't enough for it to interfere with function. Subarachnoid
8 hemorrhage basically is a tagalong, someone who's kept alive
9 on a respirator for 10 days for any kind of brain damage, you
10 can have this, so it doesn't help. Retinal hemorrhage, plus
11 macular folds. By the time you get 10 days out, this is much
12 less helpful. Skull fracture, right sided, but the subdural
13 was bilateral and healing. There was healing metaphyseal
14 fractures of the humerus, both sides. I'm going to just say
15 bilateral, just "bi" there.

16 There were a few bruises sampled, none of them were
17 significant, and they had a little iron in them. So they
18 basically said that they have been there for a little while,
19 but you can't really tell anything from this, and it didn't
20 contribute to my overall findings.

21 There was brain edema, significant. And then I think the
22 most important thing from a pathology standpoint is Dr. Ulmer
23 diagnosed hypoxic ischemic encephalopathy.

24 **Q.** Can you explain to us what that means?

25 **A.** Yeah.

1 **Q.** It's a long --

2 **A.** See this is long and confusing, but the
3 neuropathologists gave a person's name to every tiny little
4 place in the brain. I mean, it's so mean. I mean, for those
5 of us that have to take the test, it's like somebody's name is
6 on thousands of parts. This isn't bad. This means not enough
7 oxygen, this means not enough circulation. Ischemia means
8 that the brain wasn't circulating its blood. Every little
9 cell has its own little highway of capillaries. This is the
10 nerve cell. These are the red blood cells; every one of these
11 guys delivers oxygen and glucose to every nerve cell.

12 So when there's failed circulation from brain swelling
13 and increased intracranial pressure, the nerve cell doesn't
14 get its oxygen and glucose and it turns into a shriveled up
15 little thing like this we call a red neuron. And so at
16 autopsy, you can see that the brain cells either disappear or
17 they turn into the red neurons, and that means that the damage
18 to this brain all over was from lack of circulating oxygen and
19 from buildup of toxic byproducts of metabolism. These
20 byproducts actually damage the cell membrane so that it can't
21 do its job in transporting and functioning and metabolism. So
22 this actually results in what we call excitotoxic edema, and
23 he had this. And you can also get this from a combination of
24 brain swelling and seizures.

25 So both seizures and brain swelling and increased

1 intracranial pressure led eventually to cessation of function.
2 Meaning that when they eventually did the test to see if there
3 was any blood going to anywhere in his brain, it was not -- it
4 wasn't flowing. There was no brain flowing.

5 The other thing that's important here is the absence of
6 trauma to the brain.

7 Q. Why is that important?

8 A. Well, those of us that have seen deaths that occur at
9 the scene, on the way to the hospital, in the emergency room,
10 with or without cardiac arrest, what you're looking for is why
11 the lights went out when they did. And in cases where there's
12 such severe trauma that basically the lights went out
13 immediately, usually there's trauma to the brain substance,
14 contusions, bleeding, tearing, hemorrhage in the actual
15 substance of the brain.

16 Sometimes if the fracture is serious enough, when the
17 fracture occurred, the bone actually goes down into the brain
18 when the fracture occurs and causes fracture contusions and
19 bleeding in the tissue, lacerations of the surface of the
20 brain. If it's a really terrible fracture then you can see
21 this kind of stuff evolving, and there was none of that. So
22 the deformation of the skull bones when the fracture occurred,
23 didn't damage the brain itself. And that's important when
24 you're looking at how bad was the impact.

25 Q. I see.

1 **A.** And then I -- you know, I went through all the
2 slides. She took many, many sections of the -- of the bones.
3 **Q.** Sorry, Doctor, when you say "she," who are you --
4 **A.** Dr. Ulmer, I believe, is that --
5 **Q.** Yes, the medical examiner?
6 **A.** So the fracture of the bone, again, was at the
7 metaphysis, this is at the growth plate, and there is healing,
8 which one would expect since they saw it when the baby came to
9 the hospital. So healing fractures of the upper part of the
10 bone, a fracture of the skull, and then complications of
11 hypoxic ischemic encephalopathy that led to brain death.
12 Brain death is basically cessation of flow, and that's how you
13 know for sure that they're not coming back.
14 **Q.** I see. Any other key findings that you can recall?
15 **A.** Well, right now I can't think of any.
16 **Q.** Okay.
17 **A.** But --
18 **Q.** You can come back to it.
19 **A.** Okay.
20 **Q.** I do just want to follow up, just to make sure that
21 we're all on the same page. You can have a seat, Doctor.
22 **A.** Oh, what do you -- oh, do you want this? Thank you.
23 **Q.** Okay. So let me just -- I have some follow-up
24 questions.
25 **A.** Sure.

1 **Q.** On your key findings. You say -- we've already
2 discussed the prior events, but it is your opinion that the
3 developmental delay, the abnormal head shape, growth or
4 retardation of weight -- there's been some discussion last
5 week about his failure to thrive, not passing a car seat test.

6 **A.** Right.

7 **Q.** Your opinion is that none of that really contributed
8 to Lincoln Penland's ultimate demise and death?

9 **A.** No. I mean, it doesn't -- I can't say that it
10 wouldn't have had long-term implications to the little guy
11 because his delay in development was fairly significant, if I
12 remember. He wasn't -- he wasn't mobile. I don't think he
13 could sit up on his own, wasn't, you know, moving around much
14 on the floor so --

15 **Q.** Is that information important in your analysis?

16 **A.** Well, it is in terms of what are the possible
17 positions his body could be in if he indeed was the victim of
18 rough handling by his brother. It's -- it's probable that he
19 was laying on the floor.

20 **Q.** If he wasn't able to sit up?

21 **A.** And not -- if he wasn't able to sit up. And if he
22 wasn't able to move around, he was probably put where he --
23 you know, he probably was where he was put. And that, you
24 know, of course is part of the understanding. There are some
25 nine-month-old (sic) that, you know, might have been playing

1 red light, green light, you know, in their own fashion,
2 chasing and whatever, but it's -- it's probable that Lincoln
3 was where he was put and it's probable that he was laying
4 down.

5 Q. Immobile --

6 A. Immobile.

7 Q. -- in other words?

8 A. Relatively immobile. And --

9 Q. Got you. And that matters?

10 A. Well, it just means that -- it just means that you
11 can't put into your equation inadvertent clips or, you know,
12 something that was -- that that was -- that would happen to an
13 upright person. Obviously, the skull is going to be
14 vulnerable to some things, more if the skull is on the floor
15 and can be crushed between the body, the butt, the foot, you
16 know, whatever, of children that were in the area.

17 Q. Okay. So --

18 A. And depending on where his body was, whether or not
19 somebody could have jumped off the couch onto him, you know,
20 any of those questions -- and this is separate from the -- the
21 reenactment question. One of the first questions I ask when I
22 get cases like this is, in my environmental questions, is were
23 there other children present, were there other children of an
24 age sufficient to be mobile, what were their relative sizes,
25 and could they have caused or contributed to marks or injuries

1 to the child? Because those of us that do this work recognize
2 that one of the number one perpetrators of physical violence
3 against children is other children. So you have to know
4 that -- you have to ask that question.

5 Q. And would that -- we're going to get to that for
6 sure.

7 A. Okay.

8 Q. But let me just make sure I understand. So you were
9 mentioning that Lincoln Penland's, I guess, lack of mobility
10 at that stage in his life, perhaps, because of that, it made
11 him more vulnerable, is that what you're saying?

12 A. Well, in terms of exposure to other children --

13 Q. I see.

14 A. -- playing, running, racing, whatever. I mean, it
15 doesn't mean that he couldn't have gotten hurt if he was
16 sitting up or crawling. It just means that it's likely
17 that -- it's reasonable to conclude that he was laying with
18 his head on the floor.

19 Q. Gotcha. So let's -- so your next kind of category of
20 key findings, if that's a fair characterization?

21 A. Yep.

22 Q. Was event history?

23 A. Right.

24 Q. And you indicated that most of this event history,
25 especially this early part, you say Lincoln suffered an event

1 during or at the babysitter -- BS stands for babysitter --
2 crying out when around Boston and other children, playing red
3 light, green light, symptoms being, it looks like post
4 concussion?

5 **A.** They were -- yeah.

6 **Q.** Traumatic brain injury, loss of appetite, lethargy,
7 vomiting, all of this information came to you via reports?

8 **A.** The investigative reports, yes, sir.

9 **Q.** You were also provided, it looks like -- thank you --
10 information regarding -- and you noted this as part of your
11 key findings, broken changing table, reenactment of a doll
12 involving Boston Penland, he was brought to the emergency
13 department, breathing, stable vital signs. I want to talk to
14 you about these asterisks. So one asterisk, the first one you
15 see here, is a skull fracture, that's part of your key
16 finding?

17 **A.** Well, yeah. I think -- there are some cases where a
18 child presents for medical attention and they've got altered
19 consciousness, and it may even have nothing to do with the
20 brain, so they just have altered consciousness, it could be
21 belly, it could be lungs, it could be any number of things.
22 In this case, it was pretty easy to shortcut at least some of
23 the analysis to recognize that his unconsciousness may indeed
24 be directly related to an impact of the head, supported by
25 those other things with the asterisks. So that's -- you know,

1 eventually, you look for other contributing problems. There
2 are some times where kids have been beat up and they're --
3 they have a wound in their abdomen as well, but in this case
4 it was pretty much limited to head.

5 Q. Okay. And then the next thing you note is an
6 asterisk with SDH, subdural --

7 A. Hematoma.

8 Q. -- hematoma?

9 A. Right.

10 Q. Can you explain to us in layman's terms, what is --
11 and I'm sure -- this has been presented in the past, but
12 there's been a lot of information presented in this trial.

13 Explain to us what a subdural hematoma is, what it means,
14 why it matters, why you noted it in your key findings?

15 A. Briefly, the -- where blood is in a case, when a
16 person is looked at on the X-ray, is there's a membrane that
17 sits on top of the brain that is connected. It's in direct
18 continuity to the brain. There's -- there's no hole there
19 normally. So subdural hematoma means bleeding occurred in
20 that place between the surface of the brain and the dura, that
21 formed in a space where there hadn't been a space before.

22 There are two sources of blood in that space, typically
23 one is from bridging veins which are fairly large blood
24 vessels that run between the dura and the surface of the
25 brain, and the other is from a small plexus of blood vessels

1 that sits at the bottom of the dura that leak when there's
2 brain damage for a lot of different causes, including hypoxia
3 and increased intracranial pressure.

4 There may have been a torn bridging vein, there may have
5 been just the dural venous sinus leakage. But the most
6 important issue here is that the volume of blood, although
7 very easy to see on the scans, was not sufficient to push the
8 brain sideways or off center, so that the neurosurgeons didn't
9 feel compelled to go in and drain the blood. It was just
10 there. And the source -- it's not that much, and then the
11 pathologist confirms at the time of autopsy that there wasn't
12 a lot of blood present. So the amount of blood that was
13 present in his head probably wasn't a significant factor in,
14 initially, the decreased circulation.

15 Q. And then, Doctor, you -- the next is ICP, increased
16 cranial pressure --

17 A. Right.

18 Q. -- indicating increased, and you also have an
19 asterisk there. Why was this significant?

20 A. Increased intracranial pressure is a -- is linked
21 directly to a system that's specific to the brain called
22 intracranial equilibrium. Intracranial equilibrium is a
23 complex system that we don't understand that well yet, but it
24 specifically speaks to the fact that the pressure in the head
25 has to always be less than the pressure in the rest of the

1 body because, otherwise, nothing would go up there. And it
2 also has to be exquisitely sensitive to changes in position
3 and other things so that when you go to sleep, it can adjust;
4 when you hang by your knees, it can adjust; when you hold your
5 breath it can adjust. All these things have to be exquisitely
6 sensitive to change. So the intracranial equilibrium is the
7 key to maintaining circulation to the brain cells. That
8 pressure has to stay between five and 10 millimeters of
9 mercury all the time. If it goes above that and stays above
10 that, if it goes up to 20 or more, then blood isn't going to
11 circulate in the head. So the brain has a system called
12 intracranial equilibrium, we used to call it the blood
13 approximate brain barrier, that basically maintains pressure
14 in the -- within the system. And if that intracranial
15 equilibrium fails, if the brain can't keep the pressure within
16 a normal range, then you can get fairly rapid increase in
17 pressure and cessation of vital function and flow.

18 So the key issue here is what causes failure of
19 intracranial equilibrium. Many causes, many factors, but
20 traumatic brain injury can be an initiating event. What is
21 also known is failure of intracranial equilibrium can occur
22 delayed, in a delay from when the event was, and that is --
23 can be as much as two to three days. So I might get clocked
24 on the ball field at 6:00 P.M. today and have a headache and
25 go home and be okay with a headache. I may develop some

1 vomiting, I may develop -- I might be sleepy, I might be
2 irritable, but I'm going to still have circulation, and I'm
3 going to still be alive and well until my equilibrium system
4 fails and then I'm in a coma, and eventually I'll stop
5 breathing and I'll die. Two to three days is the interval
6 between which we expect these changes to occur. So there's --
7 in the past, people have suggested that if you have a really
8 terrible brain injury you're going to be out of it and trying
9 to die immediately; that's really not so. It has to do with
10 the status of intracranial equilibrium. And what we know with
11 Lincoln is that his intracranial equilibrium was intact enough
12 for him to keep breathing, to have a blood pressure, to have a
13 pulse. If your intracranial equilibrium has failed, you don't
14 have that anymore.

15 Q. Which -- this question might be a bit of out of turn,
16 but you said you reviewed the autopsy report. You saw
17 Dr. Ulmer's conclusion that it's blunt force trauma to the
18 head. It sounds as though the more accurate description would
19 have been complications from. Otherwise --

20 A. He would have been dead at the scene.

21 Q. Instantly?

22 A. Right.

23 Q. Okay. Well, I want to keep going on this. There's
24 some things I had some questions about.

25 You mentioned brain edema and you put an asterisk there,

1 and also an asterisk regarding seizures. Can you talk to us a
2 bit about why this was noted in your key findings, but
3 especially -- why is that more -- why is that important here?

4 **A.** Always coming back to intracranial equilibrium. It's
5 kind of at the center of everything in terms of the analysis.
6 When there's anything that goes wrong with the system and
7 intracranial equilibrium is disrupted and circulation is
8 altered and oxygen flow is diminished from swelling and blood
9 in the head and so forth, people sometimes forget that the
10 blood vessels themselves are lined by living cells. And those
11 blood vessels also get damaged from lack of oxygen and
12 increased pressure. And when they get damaged, there are
13 tight junctions that keep the cells inside and keeps the water
14 inside and only lets the stuff that the brain cells want
15 through, those tight junctions get damaged and the blood
16 vessels leak water or fluid.

17 Whenever we hurt ourselves, we get a little swelling.
18 That's what happens. Whether you bump your elbow or whatever,
19 you'll get a little swelling. But that's not good in the
20 brain because it's a tight closed box. So the brain doesn't
21 have a lot of latitude when it comes to how much fluid it can
22 handle.

23 When the blood vessels lose their tight junctions and the
24 water starts to leak out from the damage, then it increases
25 the pressure and it increases the fluid which decreases the

1 circulation even more, which decreases the oxygen even more,
2 which damages the tight junctions even more. And of course,
3 this is not only going on in the brain, but it's also going on
4 in the eyes because the eyes are a direct connection. They
5 actually -- the retina is the end point of brain tissue. It
6 starts in the back of the head and goes all the way forward.
7 So whenever there's damage and brain swelling, you're going to
8 have damage to blood vessels as well, and leakage.

9 And so the swelling that we're seeing on the X-rays is
10 the -- is the place where we're going, oh, I hope it doesn't
11 raise the intracranial pressure so much that it causes more
12 swelling which will increase the pressure more, which will
13 decrease the circulation more, until you get to the place
14 where intracranial equilibrium fails completely and brain
15 death.

16 Q. You mentioned this could have impact on the eyes, on
17 the retinas.

18 A. Right.

19 Q. What kind of an impact?

20 MS. TOOMBS: And at this point, Your Honor, I would
21 object. There's been no foundation laid as to her expertise
22 as an ophthalmologist or how -- how she would make that
23 determination. In fact, she did testify that she would rely
24 on other specialists in the case, in other words,
25 ophthalmologists.

1 **THE COURT:** Mr. Bushell?

2 **MR. BUSHELL:** I would respond with exactly that. She
3 does routinely, over the course of decades, in her line of
4 work, consult with ophthalmologists. She reviewed the
5 material. She's certainly qualified to opine on this matter.

6 **THE COURT:** Any final reply, Ms. Toombs?

7 **MS. TOOMBS:** Your Honor, the -- the expert opinion
8 that was offered was by Dr. Mamalis and that would be who
9 in -- if she were performing the autopsy, she would consult
10 with. But her -- her testifying, when she hasn't consulted
11 with him in this case, would be outside the scope of her
12 expertise.

13 **THE COURT:** I'm going to overrule the objection.

14 **Q. (BY MR. BUSHELL)** So back to the question, Doctor.
15 You were talking about all of this and you -- you mentioned it
16 had -- it could have an impact on the eyes.

17 **A.** Right. Understanding that the eyes, the nerves that
18 run through the brain, actually forward from the back of the
19 brain, run forward, cross at the optic chiasm, form the --
20 form the optic nerve outside of the brain and then spreads out
21 across the back of the eyes in the form of the retina. It is
22 actually an extension of the brain itself. The circulation is
23 all the same, and they're all connected. So increased
24 pressure in the brain is also reflected in increased pressure
25 in the eye.

1 What's important to recognize, if you look at the retina
2 under the microscope, there are 10 layers of cells and they're
3 all different. It's exquisitely beautiful, layers of cells.
4 One layer has blood vessels in it. They're all little tiny
5 capillaries that feed the retinal tissue. So if there's
6 increased pressure, if there's lack of oxygen, if there's
7 bleeding in the head, if there's clotting problems, which the
8 boy had all of these things, then you can have leakage of
9 blood out of those little blood vessels.

10 So the question that rests out in the community, of which
11 there are two very strong different opinions, is, can you,
12 when you look at the blood in the eyes, make a determination
13 of why the blood is there or under what circumstances the
14 blood came out of the capillaries, yes or no. For many years,
15 it was assumed that the bleeding came from violent shaking.
16 Now, it's well recognized that there's 30 or more
17 circumstances where bleeding in the eyes can occur.

18 **Q.** Without shaking?

19 **A.** Without shaking. There's never been an experimental
20 model that would create bleeding in the eyes from shaking.
21 And we know that lack of oxygen, increased pressure, clotting
22 problems, bleeding in the head of any cause, like, whether you
23 have a stroke or anything else, any bleeding in the head can
24 lead to bleeding in the eyes. So the two camps are, I can
25 look in the eyes and see a crime versus I look in the eyes, I

1 see blood, are there reasons or cofactors that would explain
2 why there's blood in the eye, and can I safely conclude that
3 blood in the eye allows me to draw conclusions about how the
4 blood got there. Oh, trauma does it, too, sorry, forgot about
5 that one.

6 So, I obviously am not in agreement with the camp that
7 you can look in the eyes and see a crime any more than you
8 could look at a bruise on an arm or blood in a knee or blood
9 in a heart wall or anything else and say I see a crime there.
10 It's just blood and tissue from a single layer of little tiny
11 capillaries. The distribution varies based on the duration
12 and the -- and the -- and a lot of different issues. The --
13 so the interpretation of the blood in the eyes is obviously
14 highly controversial.

15 At this point, Lincoln had many reasons to have blood in
16 the eyes, and we do know that it progressed because the
17 ophthalmologist says -- I don't know whether he testified to
18 this -- but he didn't say there were folds at the time, at
19 least in the report, but there were folds at the time of the
20 autopsy. So it changes just like everything else does, over
21 time.

22 So the leaking blood vessels, like I said, the lack of
23 tight junctions, increased pressure, significant clotting
24 problems, I mean, you can have bleeding in the eyes just
25 because you can't clot your blood. So there are a lot of

1 reasons why there was blood in Lincoln's eyes, and it doesn't
2 help me make a determination as to whether or not the blow
3 that caused his fracture was an accident or not.

4 Q. So what -- how does it help you, the presence of
5 retinal hemorrhaging or retinal folds for that matter, how
6 does it help you as a pathologist?

7 A. It doesn't.

8 Q. It doesn't?

9 A. No. It doesn't help at all. I think that within a
10 few years, this is my opinion, we're going to stop
11 automatically looking because it really doesn't help, in the
12 long run, with the determination of what happened to the
13 child. It's a standard practice now. Pediatricians order the
14 exam, and the eyes are removed at the time of autopsy because
15 that's standard practice. And you would be criticized for not
16 following up at the autopsy if they did an eye exam they
17 didn't like, but I think there are -- there is enough
18 information now coming out of a number of laboratories where
19 they're looking in the eyes of everybody who dies. Dr. Lance
20 does this, he looks in the eyes of everybody who dies. And
21 people have blood in their eyes from drowning and from strokes
22 and from natural diseases and from all kinds of things, so
23 it's not going to be long before, I think, common sense says
24 at least we have to resolve this controversy. The people who
25 believe you can see a crime in the eyes, you know, very

1 strongly believe that. But it hasn't been resolved, and that
2 controversy is now widely recognized as a legitimate
3 difference of opinion that isn't resolved.

4 **Q.** The science -- I'm sorry.

5 **A.** Yeah. The -- the folks at the Karolinska Institutet
6 in Sweden, last fall, published a huge analysis of the
7 evidence linking the interpretation of retinal hemorrhages to
8 shaking and found it to be completely unverifiable.

9 **Q.** And what's the opinion within the scientific
10 community of that Swedish article or findings, studies?

11 **A.** Well, it depends on who you ask. The Karolinska
12 Institutet, based on my, you know, four years of experience,
13 it is a source of pediatric research across the world that is
14 considered absolutely top of the mark. Karolinska Institutet
15 is Mayo Clinic plus, and what they publish is widely read,
16 sought after, and relied on.

17 The child abuse people published letters prior to the
18 release of the -- of the Karolinska Institutet paper in
19 English, because it wasn't available in English in October, it
20 was only available in Acta Paediatrica in March of this year.
21 Prior to the publication, there were complaints from the child
22 abuse people that they had not had an opportunity to attack it
23 and to criticize its techniques in advance. That's not
24 typically how publications work. You don't usually release it
25 to people to criticize before they're published, but there was

1 a great criticism that that wasn't done, and there are people
2 who have pretty adamantly said that the Karolinska Institutet
3 release is of no value to their day-to-day work.

4 So the debate continues. So I will continue to say I'm
5 obviously a person, as a forensic pathologist, who doesn't
6 support the finding that's -- that retinal hemorrhages or
7 folds allow me to make a distinction between an accident and
8 an inflicted injury.

9 Q. Okay. Doctor -- actually --

10 MR. BUSHELL: Your Honor, Dr. Ophoven, and everyone
11 for that matter, we've been sitting and testifying now for
12 little over an hour. We would propose maybe just taking a
13 quick break.

14 THE COURT: Okay.

15 MR. BUSHELL: Use the restroom, get some drinks, come
16 back and --

17 THE COURT: From the State?

18 MS. TOOMBS: That's fine.

19 THE COURT: Okay. How much time are you requesting?

20 MR. BUSHELL: Ten, 15 minutes.

21 THE COURT: Okay. Why don't we take a break.

22 Members of the jury, we'll resume at 11:20. So same
23 instructions apply to your conduct during the break. We'll
24 see you at 11:20.

25 (Pause in proceedings)

1 **THE COURT:** Okay. We're still on the record. We're
2 outside the presence of the jury.

3 Any other business to take care of from the defense
4 end before we take our own break?

5 **MR. BUSHELL:** No, Your Honor. Thank you.

6 **THE COURT:** From the State's?

7 **MS. TOOMBS:** No, Your Honor.

8 **THE COURT:** Okay. We'll go off the record then.

9 (Recess taken from 11:04:56 to 11:21:17.)

10 **THE COURT:** Okay. We're back on the record. All
11 parties and counsel are present. And we're outside the
12 presence of the jury, but they're being summoned as I speak.
13 So they should be in momentarily.

14 And we're continuing with the direct examination of
15 Dr. Ophoven. Is that right, Mr. Bushell?

16 **MR. BUSHELL:** Correct.

17 **THE COURT:** Okay.

18 (Pause in proceedings)

19 **THE BAILIFF:** The jury is present, Your Honor.

20 **THE COURT:** Okay. Thank you, Dave.

21 Members of the jury, welcome back. We'll resume the
22 direct examination by the defense of Dr. Ophoven.

23 **MR. HENDRICKS:** Your Honor?

24 **THE COURT:** Yes? This is Mr. Hendricks? Move the
25 easel so you can see better? Okay.

1 **MR. BUSHELL:** Can I address the jury?

2 **THE COURT:** Huh? Yes.

3 **MR. BUSHELL:** Do you want to see her or the easel?
4 Her. All right.

5 **THE COURT:** And we've got you some ice water, Doctor?

6 **THE WITNESS:** I've got some wonderful water here.
7 Thank you.

8 **THE COURT:** Were you thinking you just weren't
9 acclimated when it was so warm? We're not used to this
10 either.

11 Okay. Go ahead, Mr. Bushell.

12 **MR. BUSHELL:** All right.

13 **Q. (BY MR. BUSHELL)** Try to gather my thoughts. I'm not
14 sure -- okay.

15 We left off, Doctor, talking about retinal
16 hemorrhaging, retinal folds, what they really don't tell you
17 as a pathologist. I wanted to ask you, Doctor, in your key
18 findings, you had mentioned that you noted a reenactment of a
19 doll, a CPR doll, that law enforcement conducted. However, I
20 noticed, before that, you did not mention as to why -- you
21 didn't -- you didn't note as a key finding the reason why that
22 reenactment was even done. So maybe that was just an
23 oversight.

24 Did you have a chance to -- you're familiar with the
25 reasons why law enforcement did that?

1 **A.** Yes.

2 **Q.** Okay. And what is your understanding of why law
3 enforcement did this reenactment of a doll with Boston
4 Penland?

5 **A.** From the medical record -- or from the interviews and
6 the police reports, there's a witness statement by a little
7 girl at the residence, who was there that day, who, as I
8 understand it, volunteered to her mother that she had observed
9 Boston, what I would say physically abusing -- that's not
10 obviously what she said -- but that she -- that she had
11 observed him to be doing things to Lincoln that, in my
12 opinion, sounded like they could have certainly caused one or
13 more (sic) which could have caused the fatal injury.

14 **Q.** Okay.

15 **A.** It's my impression that once that information became
16 known to law enforcement, they made a decision to do some kind
17 of evaluation of Boston using the doll that they had created
18 the picture to show that the weight was in the body of the --
19 of the -- of the doll and that he was asked to --

20 **Q.** And I'll just ask --

21 **A.** -- do something with it.

22 **Q.** I'll just let you know. We will come to that in more
23 detail down the road.

24 **A.** Yeah.

25 **Q.** But I just -- I just noticed that you indicated that

1 that was a key finding, yet you didn't indicate the reasons
2 why -- in other words, the little girl stated --

3 **A.** I forgot to put a key finding up there, that there
4 was a witness statement that said that she had observed the
5 child, Boston, to be doing things to the baby. The term I
6 would have used is inflicting physical forces on the child's
7 head and body of a variety of kinds.

8 **Q.** As a pathologist, you would have noted that as a key
9 finding?

10 **A.** Absolutely. I neglected to do that obviously. That
11 is a major oversight in my key findings' list.

12 **Q.** Would you mind adding that?

13 **A.** No. I would be glad to.

14 **Q.** And just so you're aware, Dr. Ophoven, we moved that
15 easel --

16 **A.** Yes.

17 **Q.** -- because the jury wasn't able to see you as you sat
18 back down and testified.

19 **A.** I think it's Brylee, a child at the residence -- the
20 term I would have used is volunteered, based on what I
21 understand from the record -- volunteered statements to her
22 mother and to law enforcement --

23 **Q.** Okay. Thank you, Doctor.

24 **A.** -- of inflicted events. Let's put it -- I guess
25 that's not my favorite way of saying it, but you understand

1 this.

2 Q. And so going -- continuing on in your key findings,
3 you noted essentially what's -- essentially the findings that
4 were made by Dr. Ulmer, the medical examiner?

5 A. Yes.

6 Q. In your review of the records and her reports, did
7 you notice any key findings that she had made that you didn't
8 agree with?

9 A. No. I -- I -- it was a well-documented autopsy
10 report with more detail than I get a lot of times.

11 Q. Okay.

12 A. And I didn't have any disagreements with the key
13 findings or the elements of the autopsy findings themselves.

14 Q. The materials?

15 A. Right.

16 Q. Okay. Well, let's -- okay. So, you've walked us
17 through, you know, what -- what your role here entails.
18 You've walked us through how you decide what information is
19 necessary, the materials you did review. You've walked us
20 through what your key findings were.

21 A. Uh-huh.

22 Q. What's the next step? Where do you go from -- so you
23 had your key findings in hand, where do you go next?

24 A. The next -- the next step of the forensic analysis is
25 the same thing that any doctor does whenever they see a

1 patient which is to develop the differential diagnosis. It's
2 a term of art that we use to list the reasonable
3 considerations as to what is wrong or why the person is sick
4 or what the diagnosis is. Sometimes there's a differential
5 diagnosis of individual findings and sometimes there's a
6 differential diagnosis of the -- of the findings as a whole.

7 And for the forensic pathologist, at the end of the day,
8 although we may have a differential diagnosis of individual
9 findings, the -- the ultimate differential diagnosis comes
10 down to what are the possible causes of death that a good
11 scientist with good experience would list and what are the
12 considerations for the circumstance or manner of death.

13 Q. Let me ask you, you mentioned, Doctor, differential
14 diagnosis is a term of art you said that "we" use.

15 A. Right.

16 Q. "We" being who?

17 A. All doctors.

18 Q. Specifically forensic pathologists?

19 A. Sure.

20 Q. Specifically pediatric forensic pathologists?

21 A. Sure.

22 Q. So I think I understand the term differential
23 diagnosis, but previously -- again, I know you weren't here --
24 Dr. Ulmer, the medical examiner who performed the autopsy on
25 Lincoln Penland, her testimony and the discussion we had here

1 in court was that when determining the manner of death,
2 pathologists have several options at their disposal.

3 **A.** Yes.

4 **Q.** Is that what you're referring to when you say --

5 **A.** No.

6 **Q.** Okay. So --

7 **A.** Differential -- differential diagnosis is before you
8 get to the -- to your final conclusions. Differential
9 diagnosis, and if I may give an example.

10 **Q.** Please.

11 **A.** Someone comes to the emergency room with a headache
12 and after we've gotten the initial screening information,
13 before we've done any special studies, based on the history
14 and the nature of the complaint and when the pain is worse, if
15 it wakes you up at night or not, the differential diagnosis
16 for a headache could be a long list of migraine and stress
17 headaches and tension headaches and all the way out to malaria
18 and brain tumors and whatever, but you narrow it in pretty
19 quickly, you make a plan, you make a determination.

20 If we do a study and there's no mass or tumor or
21 something in the brain, then the differential diagnosis goes
22 one direction which has to do with, perhaps, external
23 causation, migraines and tension or post-trauma headaches or
24 whatever, and if your studies get you down to there's a white
25 abnormality on the brain, it could either be an infection,

1 like an abscess or a brain tumor. So the differential
2 diagnosis, if you have a positive X-ray, is some kind of
3 infectious mass or a brain tumor. And you don't continue to
4 narrow your differential diagnosis until you have actual
5 scientific evidence to do that.

6 So I show up with chest pain, your first concern is I'm
7 having a heart attack, but I also could have gotten conked in
8 the chest at a softball game, I could have some arthritis in
9 my ribs. There's all -- and so you come down to the
10 legitimate questions or possible answers to the question for
11 the diagnosis, not the manner.

12 **Q.** I see. And so what differential diagnoses, based on
13 your key findings, did you whittle this down to?

14 **A.** For the cause of death, it's just blunt --
15 complications of blunt force trauma to the head.

16 **Q.** Just like --

17 **A.** I don't have -- I don't have other -- it's not like
18 there was an underlying bone disease. It's not like there's,
19 you know, another reason why the child would present with
20 brain swelling and a subdural and a skull fracture. That's
21 just plain blunt force trauma to the head.

22 **Q.** Okay.

23 **A.** So the differential diagnosis for that is just a
24 thing. But the differential diagnosis for how the blunt force
25 trauma to the head occurred, there's two things.

1 Q. And what are those?

2 A. That is that it was complications of inflicted
3 injuries from his brother, as observed by the other child at
4 the residence, or it's complications of an inflicted injury by
5 an adult. And because of the timing, that it would have
6 occurred during the day at the residence. So it would have
7 been considered abusive -- an abusive head injury.

8 Q. So, let's back up just a bit. Your diagnosis, when
9 you look at differential diagnoses, you whittled it down to
10 complications from blunt force trauma to the head.

11 A. Uh-huh.

12 Q. That's on par with Dr. Ulmer's, I believe.

13 A. Yeah.

14 Q. Okay. So the same --

15 A. We're in total agreement.

16 Q. Okay.

17 A. As far as I know.

18 Q. So the next phase, so after whittling it down to your
19 diagnosis, complications from blunt force trauma to the head,
20 where do you go from there?

21 A. Well, the next -- obviously, the next -- the ultimate
22 question is what scientific analysis or test or vehicle do we
23 have available to us to answer the question as to whether or
24 not this could have been a tragic consequence of rough
25 handling by Boston or the consequence of child abuse and

1 inflicted injury.

2 And having been in the field long enough, the ultimate
3 test question, if you have to do an analysis to prove your
4 answer, which sometimes you do, in this case, I don't believe
5 I do based on my past experience, but there are cases where I
6 have routinely requested a biomechanical engineer to answer a
7 yes/no question.

8 **Q.** What's that question?

9 **A.** And the yes/no question is, is there a worst-case
10 scenario in which a 35-pound three-year-old could inflict a
11 fatal blunt force injury to the head from stomping, falling
12 on, crushing, dropping off a couch or slamming a door on the
13 head, or squeezing the head between the door and the wall or
14 something, is there -- is there sufficient injury potential
15 that can be -- that could account for a fatal impact to the
16 head as seen in Lincoln Penland?

17 In those cases, in my consultations, they actually do an
18 analysis so -- and I've had these analyses done enough times
19 that I already know the injury potential for a lot of
20 scenarios, one-foot falls, two-foot falls, crush injuries and
21 the like. And it comes down to simple -- not simple -- it's
22 more complicated than -- the math has a lot of calculus in it.
23 So that stuff has been calculated a lot of times -- force
24 equals mass times acceleration.

25 In head trauma cases, we communicate around the world

1 using different criteria for potentially dangerous forces that
2 could cause injuries to the head which is -- which over the
3 last 10 years has been calculated numerous times under
4 numerous circumstances. And the way that language is
5 communicated is either in G's, which is the one that most
6 frequently -- the information that I receive from the
7 biomechanical engineers who do the calculations for me, and
8 what we know so far is that if -- if the injury potential is
9 anywhere above 50 to 75 G's, it has the potential to be
10 serious or fatal.

11 We know also from calculations that there have been a
12 number of experimental models using different sizes and
13 weights and age-specific conditions to measure the injury
14 potential, and there is no question that one- to two-foot fall
15 is sufficient to cause a fatal injury. So -- that doesn't
16 mean every one- to two-foot fall in an eight-month-old is
17 going to be fatal, but the worst-case scenario fall, it
18 certainly can be.

19 We know that one-foot falls can result in a skull
20 fracture, that work has been done repeatedly. We also
21 communicate in radians per second per second -- I don't. The
22 biomechanical engineers communicate in radians per second per
23 second in terms of acceleration. And there's also another
24 method of communication known as the HIC score, H-I-C, for
25 head injury criteria, and that is just a number. And that is

1 used often across --

2 **MS. TOOMBS:** Your Honor, at this point I would
3 object. She's talking, again, about the biomechanical things.
4 She's not a biomechanical engineer. She's -- she hasn't
5 consulted one in this case. I think the testimony of the
6 biomechanical engineer in this case should be what informs the
7 jury, not --

8 **THE COURT:** Okay. Let's have you approach the bench.

9 **MS. TOOMBS:** Thank you, Your Honor.

10 (Discussion at the bench at 11:40:20.)

11 **MS. TOOMBS:** This is the exact issue that we raised
12 on the start of trial where it was said she's going to go down
13 this road.

14 **THE COURT:** I need you to speak louder because even I
15 can't hear you.

16 **MS. TOOMBS:** Sorry. This is the exact issue that we
17 raised earlier, that she -- she's going to be going down this
18 road. She's clearly starting to talk biomechanics and forces
19 and things like that. But this was the issue that we raised
20 on the 27th.

21 **THE COURT:** Where are you going with this because she
22 kind of took off from your question. So I don't know if
23 she --

24 **MR. BUSHELL:** Well, let's -- that's fine. And I can
25 bring her back in. But let's be clear, what we discussed is

1 that Dr. Ophoven is going to be able to testify so -- to the
2 point of where these two fields overlap. She's already
3 testified that they -- they do -- these two disciplines have a
4 lot in common. She's not a biomechanical engineer. She's
5 testifying as to her experience in this field as it pertains
6 to biomechanic engineering.

7 Well, if I can -- if the objection here is lack of
8 foundation, we can address that. I mean, she has already
9 testified at the very start of her testimony that she
10 routinely, as a pathologist, routinely consults and examines
11 and reviews the materials, the literature in this field.
12 She's not going to testify -- she didn't do the study, she's
13 not going to testify as a biomechanic engineer and the use of
14 force on Lincoln Penland, but she can testify as to her
15 experience and expertise.

16 In fact, let me just read you two cases, and we'll
17 consider them here. "Simply because a qualified expert admits
18 that he or she consulted other experts or admits that other
19 specialists may be more qualified in some areas does not
20 render that expert unqualified to testify in the matter."
21 That's Patey -- or Patey v. Lainhart, cite 977 P.2d 1193. And
22 then State v. Kelley, 1 P.3d 546, "The courts have routinely
23 allowed persons to testify" --

24 **MS. TOOMBS:** Can I --

25 **MR. BUSHELL:** Can I finish my thought here?

1 "The courts have routinely allowed persons to testify
2 as experts based on the totality of their qualifications and
3 experience and not on licensing or formal standards alone."

4 **MS. TOOMBS:** Correct. But she's -- now she's going
5 into the math --

6 **THE COURT:** I'm okay with that, but the part I'm
7 struggling with is that she seemed to be going down to -- she
8 would talk about that "they" do all these calculations and
9 stuff and then based on that, "we" know, as if she knows about
10 the biomechanical side of it, and she doesn't.

11 **MR. BUSHELL:** I think she does. And I think she can
12 testify to that, that she does.

13 **THE COURT:** Then I think you'd need to put more on
14 than what I've got. Because I think what we've got, she could
15 tell about her experiences and -- and in those other cases
16 that she relied on a biomechanical engineer, but I don't know
17 that I've heard anything --

18 **MR. BUSHELL:** Okay.

19 **THE COURT:** -- that would qualify her here.

20 **MR. BUSHELL:** Well, that -- that's my point is we can
21 certainly try to -- if that's the objection, lack of
22 foundation, I'll ask her questions regarding foundation.

23 **THE COURT:** Okay.

24 **MS. TOOMBS:** And at this point, Your Honor, we would
25 ask to excuse the jury and do this outside the presence of the

1 jury. Again, the -- we -- counsel has requested an
2 opportunity to meet with an expert at a -- one of our
3 experts -- and that meeting is scheduled for noon.

4 **THE COURT:** Do we want to break for lunch now, then?

5 **MS. TOOMBS:** I'm wondering if we should break --

6 **THE COURT:** And leave her on for 15 minutes outside
7 the presence of the jury?

8 **MS. TOOMBS:** Yes.

9 **MR. BUSHELL:** That's fine.

10 **THE COURT:** That work?

11 **MS. TOOMBS:** Uh-huh.

12 **THE COURT:** Okay. Have the jury come back at what
13 time? 1:30?

14 **MR. MILES:** I'd say 1:45 by the time we take care of
15 this and --

16 **MS. TOOMBS:** Right.

17 **MR. MILES:** -- then have a bit longer.

18 **THE COURT:** That scared me.

19 **MR. MILES:** We always estimate that things are going
20 to take 15 minutes when they take 30. I'm just giving us a
21 little extra cushion.

22 **MS. TOOMBS:** We're learning attorney times.

23 **THE COURT:** You okay with that, 1:45?

24 **MR. BUSHELL:** Yeah.

25 **THE COURT:** Okay.

1 **MR. MILES:** So if I take my time and times it by two.

2 (Proceedings resume in open court at 11:44:52.)

3 **THE COURT:** Okay. Members of the jury, we've
4 finished our legal huddle and we've decided we're going to
5 take our lunch break now. It will be a little bit longer than
6 normal so that we can tie up all loose ends.

7 So we'll take our lunch break now and we'll resume --
8 if you could be back here at 1:45, we'll do our very best to
9 resume at that point.

10 Remember the instructions. And I should probably
11 remind you at least once a day and this will be that time. Do
12 not discuss this case with anyone, not even one another, until
13 the case is finally delivered to you for your deliberations.
14 Also, do not allow anyone to discuss this case in your
15 presence.

16 Do not show your notes to anyone. Do not attempt to
17 investigate or learn anything about the case outside of the
18 courtroom. Avoid any media coverage of the trial. And most
19 importantly, do not form an opinion until all of the evidence
20 is in.

21 Okay. With that recited yet again, we'll release you
22 for the lunch double hour. And if you'll follow Dave --

23 **THE BAILIFF:** Isaac.

24 **THE COURT:** -- Isaac -- and you'll get to know and
25 love him as well -- he'll show you out of the building.

1 (Pause in proceedings)

2 **THE COURT:** Okay. We're still on the record. We're
3 outside the presence of the jury.

4 Please, everybody, feel free to sit down, be
5 comfortable.

6 The State has made an objection based on foundation
7 to Dr. Ophoven going into areas of biomechanical engineering.
8 And the defense is going to ask some questions concerning that
9 so we can determine whether she's qualified to opine on that
10 or not.

11 **MR. BUSHELL:** Thank you, Your Honor.

12 **EXAMINATION**

13 **BY MR. BUSHELL:**

14 **Q.** Doctor, you mentioned earlier that oftentimes
15 forensic pathologists are referred to as doctors' doctors?

16 **A.** Yeah.

17 **Q.** And when we talked about this, you indicated that
18 routinely, over the course of your entire experience as a
19 pathologist -- let's back up -- remind -- what is pathology?

20 **A.** Pathology is simply the evaluation of body tissue,
21 fluids, and other materials for determination of presence of
22 injury or disease.

23 **Q.** And what is forensic pathology?

24 **A.** Forensic pathology is the interpretation of
25 medicolegal matters at law. So we're trained to take medical

1 information and interpret it for consideration in court.

2 **Q.** Okay. What is biomechanics?

3 **A.** Biomechanics is simply the interpretation of force on
4 tissue. Pathologists do that every day.

5 **Q.** They do?

6 **A.** Well, yeah. Every day -- every time I have a person
7 who is in a car wreck, I'm looking at the effects of force on
8 tissue, and I'm supposed to analyze whether this is a run over
9 or a hit and flown through the air.

10 The biomechanical engineers are people who run tests to
11 do math to calculate force, but ultimately it's the forensic
12 pathologist, whether you have a biomechanic or not, who is
13 supposed to render the opinion as to what that force did to
14 the tissue, how did that force end up there, and what -- what
15 you can and can't say about the abnormality. So we basically
16 are of all the -- outside of orthopedics, the people who do
17 the most biomechanics of anyone in medicine.

18 **Q.** And you stay apprised of literature and the recent --
19 the current science of biomechanics?

20 **A.** Sure, as it applies to head injury, as it applies to
21 fractures, as it applies to abdominal trauma. The science of
22 biomechanical engineering is calculating force. Biomechanics
23 is simply the effects of force on living tissue, and that's
24 kind of what forensic pathologists do all the time. So when
25 we're looking at what are the possible things that could have

1 caused the damage here and what kind of information do we rely
2 on -- do I rely on to answer the questions, I, of course, am
3 accessing and reading the biomechanical literature as it
4 relates to better and better models, better and better ways of
5 calculating force. But at the end of the day, biomechanical
6 engineers don't render opinions about how an injury occurred
7 as it relates to the deaths (unintelligible) the manner of
8 death, that still falls on the forensic pathologists. And
9 we're the ones that sign the death certificate. So they're
10 consultants, but they're not -- they don't answer the
11 question.

12 Q. How often do you consult with them?

13 A. In any case where there -- someone has said that --
14 that an accident has occurred and the -- someone doubts that
15 or someone has rendered an opinion that says I don't believe
16 it, when it's outside of common sense, then calculating --
17 calculating the actual force, I've had cases where I consulted
18 with a biomechanic where the question was could a child suffer
19 a fatal injury by running full force and bonking their head on
20 a toilet. I -- I couldn't -- I could not calculate the amount
21 of force that that would take.

22 Q. Because you're not a biomechanical engineer?

23 A. Well, I couldn't calculate it. I mean, I'm obviously
24 concerned that it is a high-risk scenario, but it's one of
25 those situations where I couldn't say -- I couldn't tell the

1 person who says I don't believe it, the math that says it.
2 There have been some cases, for instance, where -- and it's
3 almost always cases where an accident is presented and the
4 experts, the child abuse expert often will say I don't believe
5 it.

6 Many -- for many years there was a belief amongst
7 pediatricians that short falls couldn't generate enough injury
8 potential to cause a fatal injury or kill a child. Those of
9 us that do work on falls and see people who come to medical
10 attention all the time know that people get hurt all the time
11 from falls. But if it gets to a medicolegal scenario and
12 someone just says I don't believe it, then there's times where
13 you really want to have someone actually calculate the force.

14 In a commonsense scenario, like this one, I -- I didn't
15 recommend a biomechanical analysis.

16 **MS. TOOMBS:** Your Honor, at this point I would
17 object. Counsel has tried to interject a couple of times and
18 the witness has spoken over. I think that at this point --

19 **THE WITNESS:** Oh.

20 **MS. TOOMBS:** -- there needs to be some questions.

21 **Q. (BY MR. BUSHELL)** Would you consider this scenario one
22 in which your experience, your years of consulting with
23 biomechanical engineers, your familiarity with the current
24 state of the science of biomechanic engineering, one in which
25 you could not render an opinion of force on impact without

1 a biomechanical -- without being a biomechanical engineer?

2 **A.** No. No, I did not determine that -- the statements
3 provided, as I understood them, were clearly more than enough
4 to cause a potentially fatal blunt force trauma to the head.
5 I wasn't aware that a biomechanical person had been consulted
6 or that a report been submitted.

7 **Q.** Until recently?

8 **A.** Until recently. And in my opinion, that does not
9 serve -- that would not serve as a biomechanical report for
10 me. It has nothing in it that would allow me to get any
11 additional information.

12 **MS. TOOMBS:** Objection, Your Honor. At this point,
13 that's --

14 **MR. BUSHELL:** We'll leave it at that.

15 **THE WITNESS:** Sorry.

16 **MR. BUSHELL:** You're fine.

17 Your Honor, at this point, we would ask that
18 Dr. Ophoven be qualified not as a biomechanical engineer, but
19 as a forensic pediatric pathologist, qualified and educated
20 and capable of testifying about biomechanics and perhaps
21 biomechanical engineering, where the two disciplines overlap.
22 The doctor has clearly indicated a wealth of knowledge, a
23 wealth of experience sufficient to meet the standard.

24 **THE COURT:** Before I hear your argument, I wanted to
25 ask Ms. Toombs if she had any questions first.

1 Q. And they -- you are not a biomechanical engineer.

2 A. No, I'm not.

3 Q. You have not studied biomechanical engineering.

4 A. I have studied a lot of it.

5 Q. By reading.

6 A. But I have not -- well, and lectures, and I actually
7 worked hand-in-hand with Chris Van Ee and Ken Monson and
8 others, Kirk Thibault, around issues of biomechanical
9 engineering and what is known and not known as it relates to
10 the shaken baby syndrome, for the last 10 years. I worked
11 with them all the time.

12 Q. But you -- you personally have not conducted any of
13 those -- any biomechanical studies?

14 A. No, I don't do the testing in the laboratory.
15 That's -- they have the labs.

16 Q. And you don't -- you have not received education
17 specific to that.

18 A. Yes, I have. But I have not got a degree in it. But
19 I have lectures, I have textbooks, I have conversations, and I
20 work with biomechanical --

21 Q. Okay.

22 A. -- engineers all the time.

23 Q. So let me rephrase my question. You have not engaged
24 in a course of study at a university which would allow you to
25 speak as a mathematician or a scientist in the field of

1 biomechanical engineering?

2 **A.** No.

3 **Q.** And in fact, you do rely on -- you consult with
4 biomechanics to answer questions, and I believe you said, when
5 someone says I don't believe that?

6 **A.** Well, just like I do -- like I consult with
7 radiologists.

8 **Q.** Yes or no.

9 **A.** Yes, sometimes I do; sometimes I don't.

10 **Q.** Okay. So you -- you're in this -- today, you're in
11 the position of saying I don't believe that it couldn't have
12 happened, correct?

13 **A.** No. I'm saying the science says it could have
14 happened, yes, based on my training, experience, knowledge
15 of --

16 **Q.** But let's --

17 **A.** -- biomechanics.

18 **Q.** But let's unpack that. You have simply -- your
19 training and experience is in the field of pathology.

20 **A.** Yeah.

21 **Q.** Okay. So the mathematics of it that you were talking
22 about earlier, that's something that you get -- you're just
23 referring back to somebody else.

24 **A.** No.

25 **Q.** That's not your education.

1 **A.** No, that's not correct. I used -- I teach --
2 **Q.** You teach --
3 **A.** -- biomechanics to --
4 **Q.** -- physical -- you teach the physics and the math --
5 **A.** Sure, when I --
6 **Q.** -- without a -- a degree.
7 **A.** Well, of course. I mean, my job as a forensic
8 pathologist, and someone asked me to teach a class or a course
9 in the diagnosis and understanding of forces that produce
10 different injuries, different kinds of injuries and head
11 trauma, I get right into the physics of it. I teach force
12 equals mass times acceleration, I show graphics, I discuss the
13 details of it and educate others --
14 **Q.** But -- okay.
15 **A.** -- about -- I'm sorry.
16 **Q.** But you -- you agree that that is a specific field,
17 biomechanical engineering is a specific --
18 **A.** I agree, that's a field.
19 **Q.** -- field.
20 **A.** Yes, it is.
21 **Q.** And you would agree that it's a complicated
22 mathematical field.
23 **A.** The testing. The laboratory testing, where they take
24 the actual mechanical dummies and do all that stuff. But when
25 we're talking about playground safety, helmets, automobile

1 accidents, aeronautics, there are many, many disciplines that
2 participate in teaching and understanding the effective force
3 on tissue and what allows us to better understand the
4 mechanics of it. The biomechanical engineers run the
5 laboratories, they have the crash test dummies. So when they
6 say it can be 75 G's, then we rely on their laboratory testing
7 to do that. That doesn't mean I don't know what --

8 Q. Okay. No further questions.

9 THE COURT: Mr. Bushell? Any other questions of
10 Dr. Ophoven?

11 MR. BUSHELL: No.

12 THE COURT: Okay. Now, do you want to argue it?

13 MR. BUSHELL: I would. Just briefly. Just like
14 Doctor -- just like Mr. -- Mr. Ingebretsen, who was here last
15 week, he himself recognized that the field of medicine is a
16 recognized field and that he was not a doctor. He's -- but he
17 is familiar with physiology, he's familiar with medicine, et
18 cetera, he was qualified to testify about medical issues. He
19 recognized that medicine is a recognized field, but he is not
20 a doctor. But there is some overlap and he was allowed to
21 testify about that overlap.

22 Judge, once an expert is qualified by the Court, a
23 witness may base her opinion on reports, writings or
24 observations not in evidence, which were made or compiled by
25 others, so long as they are the type reasonably relied upon by

1 experts in that particular field. It couldn't be more clear.

2 Dr. Ophoven has indicated that relying upon experts
3 in that particular field is done routinely. She's familiar
4 with reports, writings, and observations that aren't in
5 evidence. This is a routine practice for a pathologist, for a
6 forensic pathologist. There is an overlap of disciplines,
7 that is clear. The fact that Dr. Ophoven is so familiar with
8 it doesn't -- shouldn't hurt her; in fact, it should help her.
9 It just exhibits truly how qualified she is. Nobody is saying
10 she is a biomechanical engineer. She's not. But the two
11 fields overlap.

12 We're talking about one field, biomechanics, that
13 studies of force -- studies force on tissue and pathology
14 which studies tissue. By its very definition, those two
15 fields overlap. And routinely, over the course of decades, as
16 Dr. Ophoven has testified, she has relied upon the opinions,
17 the current state of the science, publications, she's taught
18 on these very issues. And as I pointed out at the bench, two
19 cases are critical here. Simply because a qualified expert
20 consults other experts or other specialists may -- that may be
21 more qualified in some areas does not render that expert
22 unqualified to testify in the matter. That's Patey v.
23 Lainhart, 977 P.2d 1193.

24 The second case, the fact that -- well, courts have
25 routinely allowed persons to testify as experts based on the

1 totality of their qualifications and experience. I would say
2 three-plus decades in this field, and consulting and looking
3 at and analyzing and reading literature and teaching on the
4 subject certainly would go to the totality of the
5 qualifications and experience and not on licensing or formal
6 standards alone as is evidenced by our courts.

7 This is truly, the shoe's now on the other foot. We
8 made this argument the other day and, Doctor -- or I'm sorry,
9 not doctor -- Mr. Ingebretsen acknowledged that medicine is a
10 recognized field. Clearly, it's a recognized field.
11 Ms. Toombs keeps saying but you agree, you agree, biomechanic
12 engineering is a recognized field and you don't have a degree,
13 do you? Mr. Ingebretsen recognized that medicine is a
14 recognized field. He doesn't have a -- he's not a doctor.
15 And yet, he was allowed to testify about issues -- medical
16 issues, about physiology, about medicine, about bone
17 structure, these are all medical in nature, but there's an
18 overlap.

19 Dr. Ophoven is clearly, clearly qualified to testify
20 on this issue. We would ask you to allow her to do so.

21 **THE COURT:** Okay. Ms. Toombs?

22 **MS. TOOMBS:** Your Honor, with all due respect to
23 Dr. Ophoven, she has been a pathologist for 30 years and a
24 medical doctor. We've heard the testimony of doctors over the
25 last week who have all said we can talk about this, but we

1 can't talk about that.

2 Now we have a single doctor with no specific training
3 in biomechanical engineering, we have a doctor with no
4 training in math, we have a doctor with no -- no licensing.
5 And just to be clear, there is licensing that is involved,
6 Doctor -- or Mr. Ingebretsen did talk about that, in the
7 studies that he has to go through and the testing that he had
8 to go through, and she now wants to testify at -- in -- in the
9 place of Alpine Engineering essentially, is what we've got
10 going on.

11 There's nowhere -- she indicates in her testimony
12 that she taught, but there's nowhere in her CV that indicates
13 anything about biomechanics. She doesn't say anything about
14 biomechanics in the CV. She simply talks about the various
15 different decreased iron status, effects of short-term and
16 long-term prenatal steroids, influence of perinatal
17 asphyxiation, all of these things -- association of decreased
18 ferritin levels; none of these are biomechanical presentations
19 that she's provided in her CV. Yet, she wants us to -- today
20 to qualify her as an expert in that because she, along with
21 other people, lecture about something. Your Honor, that's no
22 different than if I go and lecture about a particular --
23 how -- to law enforcement about this area of the law and you
24 go and lecture from your perspective of it. That doesn't make
25 us the same person.

1 She hasn't got the training. She -- she has not had
2 specific experience in the field. She routinely relies on
3 biomechanical engineers. And just to be clear, the testimony
4 of Doctor -- of Mr. Ingebretsen was very clear. I don't get
5 into the medical part, I just talk about the effects of
6 forces. Yes, there is some overlap. Yes, he did receive
7 specific training. In fact, he took two years of the same
8 class, the same medical training that an under -- that a
9 premed student would take; she hasn't even done that.

10 There's not any evidence that she is qualified as a
11 biomechanical engineer. And to compare the fact that he
12 testified -- that Mr. Ingebretsen testified about the forces,
13 he didn't -- he didn't talk about the diagnoses. In fact, he
14 said, I take those as they come to me. And I say, okay, you
15 say this is what happened, I find out why. I have no problem
16 with her testifying as to what the diagnoses are, what the
17 medical fields are, what she saw in the pathology because that
18 is her field. However, it is not her field to go outside that
19 into the field of biomechanics.

20 Your Honor, I would again reiterate this is exactly
21 the issue that we raised before the Court prior to trial. We
22 were not allowed an opportunity to confront Dr. Ophoven about
23 this because counsel didn't send her Doctor --
24 Mr. Ingebretsen's report until -- we don't know when. But
25 apparently, at this point she has it, and our request is that

1 she not be allowed to go down that road and start attacking
2 these things where we have not been able to talk with her
3 about it, we have not been able to understand what
4 calculations she's done. There's been no testimony from her
5 that she did any calculations. She can't testify that he did
6 the calculations incorrectly because that's clearly not her
7 field.

8 So the State's request is that she be limited to the
9 effects as a pathologist, which does not include the
10 mathematics behind the study that biomechanical engineers do.
11 The fact that I have read more textbooks on retinal
12 hemorrhaging and radiology, et cetera, than I would ever want
13 to read, does not make me a pathologist. It does not make me
14 a pediatric child abuse specialist, and that is where she's
15 at.

16 I can talk with people all I want, I can be involved
17 in a field for 30 years, that does not meet the 702 threshold,
18 Your Honor. Therefore, we would just simply ask that you
19 limit the testimony of Dr. Ophoven to the same types of things
20 that Dr. Ulmer did.

21 If you recall, what day did she testify, I don't even
22 remember now.

23 **MR. BUSHELL:** Two days ago.

24 **MS. TOOMBS:** When Dr. Ulmer testified a couple of
25 days ago, counsel objected when she started to use the words

1 "force." And we went back and we said, okay, we're not
2 using -- we're not talking about specific forces. We're
3 talking about what do you see in your clinical experience, and
4 she talked about it from that perspective. Here, we've got
5 somebody who's trying to educate the jury as to math and she
6 is not the math person.

7 **THE COURT:** Okay. Okay. Based on what I've heard, I
8 didn't think she's going down that line. I don't think that
9 she could testify as to the mathematical calculations of an
10 engineer because she's clearly said she's not. I also don't
11 think she could talk about what biomechanical engineers do in
12 their labs in running these studies and that type of thing.

13 I think it's clear that she's, based on her training
14 and education and experience, this is something that
15 biomechanics -- not being a biomechanical engineer -- is
16 something that she routinely does and keeps up on, has
17 experience in, education in, and in fact, has taught on it. I
18 think she's qualified and meets the threshold to testify about
19 biomechanics.

20 I think it's very different from the motion that was
21 made earlier. That was a completely different scenario, and
22 it was -- frankly, as we discussed, after listening to the
23 audio, the motion -- the motion did not match what I heard in
24 the audio well at all. The audio said something very
25 different than what was in the motion, and that was denied for

1 different reasons than what we're here for now. It -- I think
2 she meets the threshold qualifications for biomechanics. If
3 she stays within what she's told us about so far. She clearly
4 couldn't talk about the math or the calculations, the studies
5 in the labs, but I think that's what she's admitted, she's not
6 qualified do that.

7 **MS. TOOMBS:** And just so that we can clarify, Your
8 Honor, she has been talking about 75 G's and the math portion
9 of it. And that's what the State is --

10 **THE COURT:** And that part, I think if she stays, just
11 like Mr. Ingebretsen did, saying I accept a diagnosis from
12 another field. If she's saying I accept a study from another
13 field as a fact, I don't see that as being any different. If
14 she tries to say I ran the math on, you know, a 50 -- or a
15 30-pound child falling on an object and I came up with this,
16 that's where I think it -- she would have to stop. She
17 couldn't do that. But I think she could say I accept
18 biomechanical engineers' work routinely in my field and --
19 just like Mr. Ingebretsen did. He said, I accept their
20 diagnosis from the medical side. He also went into quite a
21 bit of testimony about his ability to -- in the medical field,
22 and I think it's the same here. She's testified, and I
23 believe that is the overlap of her knowledge and experience in
24 biomechanics. So for those reasons, I think she does meet the
25 threshold qualifications and will allow her to testify.

1 Now, you all had something to do at noon, it sounds
2 like, and you're past that.

3 **MR. BUSHELL:** I think it was actually 12:15, which is
4 right now. So maybe we can break and come back at 1:45
5 (unintelligible) jury.

6 **THE COURT:** Okay. Any other business to take care
7 of, then, before we take a break? From the defense?

8 **MR. BUSHELL:** No, Your Honor.

9 **THE COURT:** From the State?

10 **MS. TOOMBS:** No, Your Honor.

11 **THE COURT:** Okay. We'll take our own recess then.
12 Everybody be back at 1:45 and we'll resume.

13 We can go off the record, Debbie.

14 (Recess taken from 12:14:43 to 1:45:32.)

15 **THE COURT:** Okay. We're back on the record. All
16 parties and counsel are present. And we're outside the
17 presence of the jury.

18 Mr. Bushell?

19 **MR. BUSHELL:** Your Honor, thank you. Right before
20 the -- well, when the jury was dismissed, we were in the
21 middle of discussing an objection the State has raised, we
22 excused the jury and resolved that issue. I would ask that
23 when they come back into the court, indicate to the jury that
24 the Court overruled the State's objection, perhaps cite the
25 reasons why, and we can go forward.

1 I just don't want to leave them hanging with this
2 idea, what was the resolution. Because they did hear the
3 objection and the basis for it, we would like them to be
4 instructed as to what the Court's decision was in overruling,
5 that the doctor is indeed qualified to discuss these issues
6 that she was in the middle of discussing.

7 **THE COURT:** Okay. Ms. Toombs?

8 **MS. TOOMBS:** Your Honor, I would object to that. I
9 don't know that -- first off, I think it would put an improper
10 stamp from the bench on Dr. Ophoven's expertise. I don't
11 think that's an appropriate position for the Court to be
12 stating, that she's got the expertise, especially where they
13 haven't heard the discussion prior.

14 In addition to that, Your Honor, I think that, to
15 some extent, you did overrule the objection, but you also did
16 sustain the objection which is the State's concern, was that
17 she can't go into the mathematics of it, is my recollection.

18 **MR. BUSHELL:** I'll leave it to the Court.

19 **THE COURT:** Okay. I'll tell them that we -- we
20 resolved it, we resolved the objection and that she meets the
21 threshold. That's what was -- that was the argument.

22 **MR. BUSHELL:** Thank you.

23 **THE COURT:** That she can't go into certain areas and
24 if she does, I expect the State will pop up. Does that work?

25 **MR. BUSHELL:** That works.

1 **THE COURT:** That's what we did.

2 Okay, Dave. Let's bring the jury in.

3 (Pause in proceedings)

4 **THE BAILIFF:** The jury is present, Your Honor.

5 **THE COURT:** Thank you, Dave. Members of the jury,
6 welcome back.

7 I'm getting dangerously close to being on time. So
8 here we go.

9 As we left, when we excused you for the longer lunch
10 hour, you heard an objection by the State to whether
11 Dr. Ophoven could testify further into the area that she was
12 going into. While you were gone, we resolved that with a few
13 limitations. I denied that objection and so now the State
14 (sic) will continue to proceed. But if she goes into those
15 limited areas, I expect the State will pop up again and I'll
16 have to rule on that.

17 Okay. Go ahead, Mr. Bushell.

18 **MR. BUSHELL:** Okay.

19 **DIRECT EXAMINATION, CONT'D**

20 **BY MR. BUSHELL:**

21 **Q.** I'm struggling to remember where we left off. I know
22 that we were having a conversation about your testimony, your
23 analysis of biomechanics, not biomechanic engineering but
24 biomechanics in general.

25 **A.** Correct.

1 **Q.** So can you explain to us how your field or your
2 discipline, forensic pathology, how does that relate to
3 biomechanics?

4 **A.** Well, the definition of biomechanics is the study of
5 force on living tissue. There are subsets of that obviously,
6 but for the forensic pathologist, our day-to-day work is
7 studying the effects of force on tissue. Whenever we are
8 analyzing the injuries that occur from a fall, from a boxing
9 event, from a traffic accident, from any number of scenarios
10 where tissue is damaged, we are evaluating and drawing
11 conclusions about how and from what direction the force came
12 and the scenarios and circumstances under which force causes
13 damage to skulls and brains and scalps and so forth.

14 Biomechanical engineering is a subspecialty of
15 engineering where the actual physics is calculated. It's --
16 you know, it's much more complex than that, but they have
17 laboratories where they have the ability to actually measure
18 force based on very sophisticated CRABI dummies. And I think
19 you've seen on television, the car crashes where the dummies
20 are in the car crash. And they're actually not just looking
21 at the car crash and saying, well, that would have caused
22 damage, they're measuring impact forces using fairly
23 sophisticated calculations.

24 As I was mentioning before the break --

25 **MS. TOOMBS:** Objection, Your Honor. I think that at

1 this point she's -- she's answered the question that was asked
2 and going on to something else.

3 **MR. BUSHELL:** Okay.

4 **THE COURT:** Okay.

5 **Q. (BY MR. BUSHELL)** Prior to the break, what were you
6 saying?

7 **A.** Well, I was speaking to the issue of force being an
8 entity that causes damage to tissue that we literally examine
9 on a day-to-day basis. You know, Newtonian physics has
10 existed for hundreds of years, and the basic principles of
11 Newtonian physics underlie our understanding of what happens
12 when gravity and acceleration and force, being mass times
13 acceleration, is causing damage to tissue.

14 The -- the times that I have consulted with biomechanical
15 engineering is if when I -- when I have a scenario where I
16 need an actual calculation to be made for someone to render,
17 develop an experimental model and develop a laboratory
18 examination, I've had them developed in burn cases, I've had
19 them developed in a variety of scenarios where we need to
20 actually have a numerical assessment done, I may consult with
21 a biomechanical engineer to do the calculation. But
22 biomechanics is separate from the engineering which is the
23 calculation. The effects of force on tissue is the day-to-day
24 work of a forensic pathologist.

25 **Q.** And in cases such as this, is it important to conduct

1 those lab tests, those model experiments as you said,
2 calculations, before coming to conclusions?

3 **A.** No. No, you don't have to do a laboratory analysis,
4 you don't have to -- you don't have to do math on those things
5 that are pretty much common knowledge or common sense.

6 **Q.** Okay.

7 **A.** And so for those of us, for instance, that deal with
8 falls, that deal with the kinds of injuries you get from
9 people in a fight, from a variety of scenarios, there's --
10 there's some basic common knowledge that everyone would, I
11 think, pretty much stipulate for those of us that are looking
12 at the effects of the abnormalities on tissue itself. Whether
13 or not there's a tear on the surface of the scalp, whether or
14 not there's a tear in the brain tissue underlying the
15 fracture, whether or not there's bleeding into the brain
16 tissue, all of these things form the model that we're dealing
17 with.

18 And as I mentioned on direct earlier, in this case, we
19 have a fracture of the bone, but the bone itself didn't deform
20 sufficiently to cause laceration of the underlying dura, it
21 didn't cause laceration of the underlying brain. When we're
22 dealing with really severe impacts, then we see that kind
23 of -- we see that kind of ancillary finding with tearing of
24 the soft tissue of the skin, the scalp, and the tissues inside
25 the skull.

1 So, combining that with what is well recognized about the
2 kinds of forces that can cause fractures, the kinds of forces
3 that can cause subdural, there are a lot of scenarios where
4 there is no need for an experimental model to be developed to
5 actually answer some simple yes/no questions, could, as in
6 this case, a three-year-old develop sufficient force to cause
7 a skull fracture and a brain injury.

8 **Q.** Okay. Well, Doctor, let me ask you this, in cases
9 where specific mechanisms are alleged.

10 **A.** Yes.

11 **Q.** Where there's a theory that this is what caused the
12 injury, and in your experience of 30-plus years, the use of a
13 biomechanical engineer, trying to determine whether that
14 mechanism is, in fact, the instrument that caused the injury,
15 is it important in those scenarios to conduct experiments and
16 testing on that material or on that so-called murder weapon?

17 **MS. TOOMBS:** Objection, Your Honor. At this point, I
18 think that she would be going into the biomechanical
19 engineering portion of it.

20 **THE COURT:** Mr. Bushell?

21 **MR. BUSHELL:** I disagree. The question was whether
22 in her experience of 30 years of being a forensic pathologist
23 and the competent -- in consulting with biomechanical
24 engineers, in reaching these determinations, what is it that
25 she's seeing, based on her experience. I think she can opine

1 whether -- based on her 30-plus years of experience, whether
2 she sees that or if it's common to just not do those tests.
3 That's a fair question.

4 **THE COURT:** I'm going to overrule the objection.

5 **A.** There are -- there are scenarios where -- where an
6 analysis is clearly not necessary in my opinion and others'
7 opinions. Where -- where a specific analysis would, I think,
8 be -- would be a good idea, if someone were to say I know
9 exactly how this happened and I'm basing that on a factual
10 analysis, then there -- that would be a time where one would
11 want to create a laboratory analysis.

12 So for instance, if we're saying I know for sure that
13 sufficient force could be generated in, say, a slam of a
14 person of X height onto that, and I know for sure that that's
15 what happened, then that would be a time where you might want
16 to order an actual laboratory test.

17 As opposed to a situation where you'd say it's feasible,
18 it's conceivable that that's it. But there are many, many
19 scenarios where sufficient force could be developed, including
20 the alternative evidence that's present in the case. And
21 so --

22 **Q. (BY MR. BUSHELL)** Would be what in this case?

23 **A.** In this case, the witness stating that a child
24 subjected the baby to multiple blunt force injuries, witnessed
25 blunt force injuries. So it really gets down to -- and I

1 don't mean this to be too simpleminded, but it comes down to
2 semantics. If I'm going to say I know what happened, then I
3 better show you the proof. I better show you exactly what I
4 know. But if I'm saying there are -- there are more than one
5 possible explanations for a situation and that is
6 scientifically legitimate, then I don't have to do all the
7 possible scenarios of what our -- what could or did happen.
8 It has to do with how the field is practiced.

9 So we -- if we're in a position where we say there are
10 multiple possible explanations and all of these explanations
11 could theoretically result in a skull fracture, and that's the
12 scientific answer, then you wouldn't -- you wouldn't ask a
13 biomechanical engineer to do thousands of scenarios, which is
14 really what we're talking about in some situations.

15 **Q.** Okay. Thank you, Doctor.

16 So shifting gears a bit. Okay, you've talked to us about
17 how you -- what information you obtained, what documentation,
18 what materials, the next step was identifying the key
19 findings.

20 **A.** Right.

21 **Q.** We then talked about what you do with those key
22 findings, looking at differential diagnoses. Then we moved on
23 to -- so remind me, what's the next step after identifying
24 differential diagnosis?

25 **A.** Well, we get to the end.

1 **Q.** Okay.

2 **A.** And that is that -- your conclusions. And forensic
3 pathologists are expected to give their conclusions to a
4 reasonable degree of medical certainty. That is not
5 universally defined and not every pathologist uses the same
6 criteria for reasonable medical certainty.

7 I have created criteria, because it's the same criteria I
8 use when the oncologist asks me -- when I say this is -- this
9 is acute myelogenous leukemia, the first thing they're going
10 to say is are you sure? And I have to answer that question.
11 If I'm sure, then I answer the question. And if I'm not, then
12 I am required to either find the answer to the question or
13 explain to the person asking the question why I can't answer
14 the question.

15 My criteria for reasonable medical certainly are the
16 following: Number one, I'm qualified to answer the question.
17 So based on my training and experience and knowledge, I am --
18 this is a kind of question that I am used to answering and
19 this is in my area of expertise.

20 Number two, that I have sufficient information available
21 to me to answer the question, that I have the science that I
22 can -- that I can produce or show or reproduce or qualify.

23 And number three, that other -- that other scientists in
24 my field of specialization and experience would look at my
25 evidence and say that is what reasonable people in our field

1 would -- would concur is sufficient evidence to answer the
2 question that you have answered.

3 And then ultimately, I take responsibility for my answer
4 so I can show that I'm qualified; number two, I can show what
5 I -- what I base my opinion on and that it's my understanding,
6 based on my science and experience, that others in my field
7 would agree with my conclusions.

8 **Q.** Okay. So you answered all three of those questions
9 in the affirmative?

10 **A.** I did that with this case, yes.

11 **Q.** So then let me ask you, did you render an opinion in
12 this matter?

13 **A.** Yes.

14 **Q.** What is it? What did you determine?

15 **A.** It's my opinion to a reasonable degree of medical
16 certainty that Lincoln Penland died from complications of
17 blunt force trauma to the head, and it is my opinion to a
18 reasonable degree of medical certainty that the manner of
19 death should be certified as undetermined.

20 **Q.** Let's talk about that. It should be -- how do you --
21 okay. Let's talk about the -- undetermined as opposed to
22 what?

23 **A.** There are -- there are five circumstances of death:
24 Natural causes, accident, suicide, homicide, and undetermined.
25 Each of those is a scientific term that has experiential

1 information and experience -- and science to stand behind it.
2 Natural causes meaning there is some condition of the body,
3 natural to the person, a disease that caused them to die.
4 Accident being an unforeseen event. Number three, the suicide
5 is that it is an event that takes place where the person takes
6 their life using an action that they would be likely to
7 recognize could be dangerous or end their lives. And homicide
8 being death from the act of another. And undetermined,
9 meaning two or more of the other options cannot be
10 distinguished.

11 So oftentimes we have accident suicide, or we may have
12 natural causes and suicide when someone takes their life and
13 they have an underlying illness. There's a lot of scenarios
14 where the distinctions become blurred.

15 In this case, because a three-year-old child does not
16 have the intellectual or psychological maturity to recognize
17 that the actions -- that is -- were described by Brylee, could
18 cause a potentially fatal impact, it can't be concluded that
19 this was an intentional act, a knowing act by another.

20 Now, if you're plain and simple definition of homicide is
21 that somebody died because somebody did something to them,
22 then homicide would apply here. But because the child is too
23 young to recognize what the potential consequences of the
24 actions were, I would have classified this -- that particular
25 scenario as a tragic accident.

1 So accident, homicide, either one of those is entirely
2 plausible in this case. So, my conclusions would be
3 undetermined. If you ask me to limit this to was it the
4 consequence of somebody doing something to Rylee (sic)
5 Regardless of their ability to comprehend it, then I would
6 certify the death as a homicide.

7 **Q.** Okay. Let me ask you, can you say with a
8 reasonable -- reasonable degree of medical certainty that
9 Lincoln Penland's head was not smashed through this table?

10 **A.** No.

11 **Q.** But can you say with a reasonable degree of certainty
12 that Boston Penland, the three-year-old little boy, didn't do
13 this?

14 **A.** No, I cannot.

15 **Q.** In fact, based on -- based on what you do know of
16 those two scenarios --

17 **MS. TOOMBS:** Objection, Your Honor. He is going down
18 the ultimate question, which is for the jury to decide.

19 **MR. BUSHELL:** I believe the ultimate question for the
20 jury to decide is guilt. The question I'm about to pose to
21 the doctor --

22 **THE COURT:** And, Doctor, before you answer, let me
23 rule on the objection. Let's hear the question.

24 **Q. (BY MR. BUSHELL)** Of those two scenarios, which is
25 more plausible? We've heard from experts all week about

1 plausibility and possibility. I think it's a fair question.

2 **THE COURT:** Is there an objection to that question?

3 **MR. MILES:** Foundation, I guess.

4 **MS. TOOMBS:** I'm not certain that there's enough
5 foundation that's been laid for her to testify as to her
6 conclusion. There's been a lot of information that's been
7 rendered over the last week that she's not indicated she knows
8 about or testified to.

9 **THE COURT:** Okay. I'll overrule the objection. I
10 think she can answer the question based on the information she
11 has.

12 **THE WITNESS:** Well, again, recognizing that injuries
13 -- serious and fatal injuries of children three years old and
14 younger are recognized and reported, and part of my experience
15 as a forensic pathologist, the -- in my opinion, the history
16 provided by the little girl is more plausible than the
17 information I recognize and understand from the abnormal
18 changing table.

19 **Q. (BY MR. BUSHELL)** Let me ask you this, Doctor, in your
20 experience, 30-plus years -- let me set the stage.

21 During your -- throughout your entire career, your
22 experience, you've done plenty of autopsies, did you also
23 examine and have -- were you privy to mechanisms or weapons?

24 **A.** Yes, sir.

25 **Q.** Okay. Doctor, I know you weren't here -- you haven't

1 been here until today, just inform -- the State's theory of
2 this case is that Tisha Morley grabbed Lincoln Penland by the
3 arms, shook him violently and slammed his head right here, his
4 head so forcefully to where it broke through right here.

5 **A.** Yes.

6 **Q.** Went through it and naturally had to come right back
7 up it. In your experience, Doctor, would you expect to find
8 DNA?

9 **A.** I would expect to find evidence that the child had
10 been on this -- this changing table and that there would be
11 material or residual DNA or trace evidence that indicated that
12 he had actually been on this piece of furniture.

13 **Q.** Okay. So more specifically, if Lincoln Penland's
14 head broke through this, went through it and came back up,
15 would you expect to find tissue or DNA or hair follicles where
16 the break is?

17 **MS. TOOMBS:** Objection, Your Honor. I think that the
18 evidence is clear that there was likely a blanket on it. Why
19 would -- why would -- we would -- well, let me put it this
20 way, Your Honor, I would object to foundation because I'm not
21 certain that she has laid any foundation for DNA analysis or
22 what -- where you would find DNA.

23 **THE COURT:** Mr. Bushell?

24 **MR. BUSHELL:** Well, Your Honor, a couple of things.
25 The Court, Your Honor has made it abundantly clear that

1 speaking objections are not appropriate. If you could
2 reiterate that, please. I would disagree. There has been --
3 it hasn't been clear whether there was a blanket, whether
4 there wasn't; we don't know. We don't know. What we do know,
5 there has been testimony provided that this was checked and
6 nothing, no hair follicles -- there's testimony from the
7 officers, no hair follicles, no tissue, nothing other than
8 wood fibers, that was the testimony.

9 **THE COURT:** Okay. I'll overrule the objection.

10 **A.** There are a couple of things to respond to. Number
11 one, part of our job at the time of autopsy is to collect
12 trace evidence along with law enforcement. So we collect
13 trace evidence from the child, and they collect trace evidence
14 from other objects. And if the -- if the -- if this was
15 brought to the morgue, then obviously there's an opportunity
16 for collecting a combination. Whether it had a blanket or
17 didn't have a blanket, there would be trace evidence
18 somewhere.

19 The second thing is, is I've heard you say that -- that
20 somehow grabbing and shaking the child would somehow --

21 **Q. (BY MR. BUSHELL)** We'll talk about that in a minute.

22 **A.** Okay. But the bottom line here is, is that had the
23 child's head been forced all the way through, one would expect
24 a different pattern of abnormality than one would see if the
25 child -- if the child was subjected to the points that were

1 made by the statements made by Brylee.

2 **Q.** So let's shift gears, then, and talk about that, the
3 grabbing and shaking.

4 **A.** Right.

5 **Q.** As I indicated, State's theory, Tisha Morley grabbed
6 Lincoln Penland by the arms and then shook him violently and
7 slammed him on this very changing table. There was a crib --
8 there is a crib attached to this, just so you have full
9 context here. You've seen the photos. Could grabbing --
10 let's talk about the fractures you talked about.

11 In the review -- in your review, you noticed that there
12 were fractures in the humerus in the child, in Lincoln
13 Penland?

14 **A.** These are metaphyseal fractures.

15 **Q.** Correct.

16 **A.** These are very unique abnormalities of the upper part
17 of the bone that typically results from a twist or a yank. So
18 the most -- based on the history that I've been provided of
19 the child being held onto by one hand by Boston, that -- that
20 is actually a classic way for that kind of injury to occur.
21 Typically, it's children being pulled up by an arm or by both
22 arms, not a shaking maneuver that has fallen by the wayside.

23 **Q.** So is it your --

24 **A.** So if you're talking about grabbing, then the
25 conclusion -- the obvious conclusion is, so if -- if you're

1 hypothesizing that the child was grabbed and slammed, then you
2 have to have evidence for a grab. You don't say I have -- I'm
3 postulating a mechanism and there's no evidence for it so --

4 **Q.** And in your review, did you see evidence of grabbing?

5 **A.** No.

6 **Q.** What would you -- what would evidence look like?

7 **A.** Well, they look like -- they look like fingerprint
8 marks, you sometimes see them on one side of the arm and
9 multiple ones on the other. You see fingerprint marks on the
10 chest where a child has been grabbed and roughly handled.
11 So -- so again, theorizing that something has happened, the
12 forensic pathologist says, well, okay, if you're saying that
13 there was a grab of the arms, then show me the grab marks.
14 Otherwise, then you've got the universe of potential theories
15 that you could put forward if you don't have to verify the
16 basis for the story you're putting forward.

17 So the forensic pathologist is required to take the
18 information. And what I have said simply is out of all of the
19 information I've received, the -- when you were asking me
20 about plausibility, the one -- the story of the two that I've
21 told you is part of my differential diagnosis, the one that
22 matches the findings is that the child suffered injuries at
23 the hands of his brother.

24 **Q.** Okay.

25 **A.** Otherwise, there's literally hundreds of alternative

1 scenarios you could come up with to say, well, it was a slam
2 on a bed, it was a slam on a changing table, it was a slam on
3 the floor, it was a grab and a winging. I mean, there's all
4 kinds of ways that you can put that together. But at the end
5 of the day, those are -- there's no evidence to support the
6 grab part.

7 Q. Would you have seen -- what would you see --
8 grabbing, you'd see, you said, marks.

9 A. Yeah, you'd just see --

10 Q. Bruising?

11 A. Yeah, you'd see little bruises that show that there's
12 fingerprints, and grab marks are common descriptions in child
13 abuse, I've seen them hundreds of times. So if you're going
14 to say I theorize that there was a grab, and I'm holding a
15 12-pound person and I'm doing something bad to them, and I'm
16 holding onto them in some kind of frustration or anger, then
17 you would expect to see -- you would expect to see that
18 there's some evidence of that actually taking place.

19 The metaphyseal fracture, however, is a twisting with
20 breaking of little tiny single cell columns of bone in the
21 growth plate. So the cartilage is -- should I -- I probably
22 don't need --

23 Q. You can use a diagram, Doctor.

24 A. It would be easier if I could diagram it.

25 **THE WITNESS:** If I can go to the board, Your Honor?

1 **THE COURT:** Any objection?

2 **A.** What this looks like under the microscope and -- oh,
3 my -- and Dr. Ulmer did a number of sections through the bone,
4 so I have a lot of slides that show this.

5 This is the cartilage cap. And I'm asking you to imagine
6 the chicken drummy or a chicken drumstick, where the cap of
7 cartilage can pop off, and then underneath that cap of
8 cartilage is the bone itself that sticks kind of up underneath
9 that cap of cartilage. In between that cap of cartilage and
10 the end of the bone are single cell wide columns of cartilage
11 that grows down in here. And then the body absorbs minerals
12 from the GI tract, and thanks to vitamin D, the minerals are
13 deposited onto these columns and they form ossified little
14 tendrils, single -- single cell wide.

15 And then if you look at the three-dimensional aspect of
16 the bone; it goes around like this. The long part of the bone
17 is the -- this is the cortex of the bone, this is the bone
18 marrow. These little tendrils here, of the growth plate, are
19 individually fragile. So this is probably the most delicate,
20 especially in the growing -- most delicate area. So if you
21 twist the arm, you can get a little bit of bleeding in here
22 and then you can get fibrosis and healing.

23 This doesn't cause permanent damage. We don't know how
24 often this happens to just everyday kids. No one has ever
25 studied how often there would be little abnormalities in the

1 growth plate of the bones. But it's a twist that causes these
2 to -- to be disrupted. You get a little bit bleeding, you get
3 a little bit of fibrosis. And then under the microscope, to
4 confirm that it really was a little bit of bleeding in there,
5 Dr. Ulmer actually took these really nice sections through the
6 bone and you can see, it doesn't go all the way across, but
7 there's little areas where there's -- where there's blood and
8 healing bone. So it's a twisting mechanism or a yanking
9 mechanism that causes these things.

10 **Q. (BY MR. BUSHELL)** What about --

11 **A.** And the theory of shaking -- of rattling the bones,
12 you know, that their arms are flapping around, that's been
13 gone for years.

14 **Q.** Thank you, Doctor.

15 Doctor, I want for revert back just quickly -- well, I
16 don't actually.

17 Let me ask you this question: Based on your experience,
18 your expertise, do you have a good feel for whether this
19 case -- or whether this was caused by shaken baby?

20 **A.** Oh, I have a real good opinion about that. I have a
21 solid opinion about that.

22 **Q.** And is that because of your experience and expertise?

23 **A.** Yeah.

24 **Q.** You gave us a rather thorough history of shaken baby
25 syndrome which then transitioned into a just a different name,

1 abusive head trauma. Last week when you weren't here,
2 Dr. Herman, a pediatrician, categorized those who are
3 skeptical of -- within the medical profession -- of the
4 current science or -- you know, of shaken baby syndrome or
5 abusive head trauma as a fringe group of medical experts. Can
6 you talk to us about that?

7 **A.** Sure. When -- when the evidence started coming out
8 that shaking was not only not a verified theory, but there
9 were serious problems with it, there were some individuals who
10 took the lead in saying this is a flawed theory and before we
11 start making decisions that have significant impacts on people
12 accused of shaking and so forth, we better do more and better
13 science.

14 About the time that the Boston nanny case occurred, the
15 Matty Eappen case, I, amongst others, were still in a -- in a
16 situation where we had no evidence one way or the other about
17 shaking. People had raised concerns about it, but no one had
18 ever come forward and said there's a problem -- there's
19 actually scientific problems with it. So I would be
20 considered a laggard. And around the turn of the century,
21 people who challenged the diagnosis of shaken baby were often
22 referred to as fringe people, that they were just arguing for
23 the sake of arguing and they were getting in the way of people
24 protecting babies.

25 And the forensic pathology world was still on the line.

1 There were forensic pathologists who clearly felt that the
2 shaking part of it was not a problem, and there were other
3 forensic pathologists who thought it was a problem. And
4 that's 1999, 2000.

5 2001, some landmark things happened. First of all,
6 biomechanical studies started -- better biomechanical studies
7 started being available instead of the old fashioned, single
8 shake Duhaime dummy in Pennsylvania, they had a recalibrating
9 dummy and they had the football players from Penn State shake
10 as many times, as hard as they could, and they weren't able to
11 demonstrate any level of significant trauma potential at all.
12 That was the biomechanical side.

13 And then secondly, there was the development of a special
14 stain for brain tissue that allowed us to look at the damage
15 in cases where we thought there was shaking. So they put that
16 special stain on in the brains of babies that they thought
17 were shaken and it was supposed to show this pattern of
18 diffuse axonal injury, we called it DAI, and we all assumed it
19 was going to be there even though we'd never seen it. And low
20 and behold, when we put that special stain on these brains of
21 babies that were supposed to have been shaken, there wasn't
22 diffuse axonal injury.

23 So our theory of shaking, scrambling the nerves and
24 destroying tissue and the forces that we imagined were
25 being -- these heads were being subjected to, absolutely were

1 not proven.

2 It look until about 2005 for a number of people to start
3 going whoa, this is a dangerous diagnosis. And by 2009, the
4 diagnosis had been so successfully, I think, attacked because
5 of lack of evidence, that the American Academy of Pediatrics
6 said, We have to change the name, we can't call it shaking
7 anymore, because people are attacking shaking using science.

8 So they changed the name to abusive head trauma, but
9 continued to testify that it was acceleration/deceleration
10 like you get with shaking. The forensic pathology world
11 discontinued the use of that language pretty much completely.
12 Neuropathologists quit. So the -- the argument continued,
13 because there was a lot of investment in the shaken baby
14 syndrome, the whole concept of it. But anymore, when you ask
15 a forensic pathologist, why is this person deceased, we show
16 you why they're dead, and we're supposed to answer the
17 question, how did that happen.

18 When there's an obvious big-time impact, the concept of
19 shaking doesn't make any sense. The only reason that shaking
20 was -- is continuing to be held onto so hard is, for many
21 years people believed that if you shook a child hard enough
22 for it to go on to die, they would be immediately symptomatic,
23 having a cardiac arrest, they'd be in a complete coma, and
24 anyone would know that they were in trouble. And they -- they
25 weren't taking into account intracranial equilibrium failure,

1 the development of increased intracranial pressure, the
2 development of symptomology with brain swelling.

3 So the arguments became, for some people, very harsh.
4 And for some people who still adhere to the shaking theory,
5 those of us who don't support that side of the argument are
6 fringe people.

7 **Q.** Well --

8 **A.** But I think it's pretty clear, after the Karolinska
9 Institutet publication, who the fringe people might be and I
10 don't think it's the people that are asking questions about
11 the validity of shaking, because the Karolinska Institutet
12 said there is no connection between brain swelling, subdural,
13 and retinal hemorrhage and the shaking event. It's over, for
14 some people.

15 **Q.** Thank you, Doctor.

16 I want to shift gears a bit and discuss -- have you
17 discuss with us a rather uncomfortable topic. Clearly, you're
18 aware of what's being alleged here. Earlier in your
19 testimony, before the lunch break, you mentioned that sibling
20 abuse, I believe, you said is -- well, I don't want to put
21 words in your mouth, but it sounded like you said the most
22 prevalent cause of injury in children?

23 **A.** I did say that.

24 **Q.** Okay. Talk to us about that.

25 **A.** Interestingly enough, over the years there have been

1 many, many studies of the epidemiology and the demographics of
2 physical abuse to children, but it has only included the
3 analysis of physical abuse perpetuated by adults. So we look
4 at physical abuse from boyfriends, we look at physical abuse
5 from husbands and dads, we look at physical abuse from daycare
6 workers, we look at physical abuse from moms. No one has ever
7 added to that mix the physical violence that children subject
8 each other to.

9 It turns out once you open that door and you look at who
10 causes the most injuries to children, it's other children.
11 Now, I'll be the first one to acknowledge that it isn't fatal
12 injuries very often at all. In my entire clinical career or
13 my practice, I've probably had four cases that were obviously
14 fatalities from children. But there are multiple cases
15 reported in the literature, and now it is part of the
16 conversation. And one of the -- one of the kind of
17 conventional wisdoms that -- that have -- has been perpetuated
18 over the years is that short falls can't kill children, that
19 shaking is a common form of child abuse and that children
20 don't hurt or kill children. These theories have all fallen
21 by the wayside with good science, and now they're starting to
22 study the prevalence. And I think those of us that work with
23 kids know that -- that kids are kids and kids can kill kids.

24 But I was looking through the literature the other day
25 and it was clear they're still not even counting injuries that

1 are inflicted in very -- by very young children because we
2 draw a line as a community between sentient injuries, someone
3 who knowingly hurts another one and someone who inadvertently
4 hurts someone. So people with limited mental health and
5 children who don't know their own strength and children who
6 put themselves in harm's way, they don't get counted in the
7 demographics.

8 So what I have to say is when confronted with these rare
9 cases where it appears, to me, very evident that a child has
10 suffered a serious or fatal injury at the hands of another
11 child, it requires that people overcome resistance to the idea
12 despite the fact.

13 **Q.** You mentioned that in your experience, you have been
14 involved in cases where toddlers or children cause the death
15 of a sibling?

16 **A.** Yes.

17 **Q.** Can you talk to us about that?

18 **A.** I have -- the ones that come to mind, there was a
19 case of a -- a six-month-old. This little girl did have the
20 ability to sit up, but she was -- she was a normally developed
21 six-month-old. The mother was home alone with her and this
22 girl's sibling. The boy was three-plus years old. And the
23 mom found the child outside of where she -- remembered having
24 put her. She remembered having put her in the bed, and she
25 found her on the floor. She thought the child appeared to be

1 sleepy. She didn't think anything of it and gave her a bath,
2 and then subsequently found her to be -- having suffered from
3 a very complex, worse skull fracture with a lot of bleeding
4 under the scalp. She went on to die. Because the mother was
5 the only person present, the assumption was, which it
6 typically is, is that the adult present was the one who
7 actually inflicted the injury.

8 Over time, however, investigation identified that this
9 child actually did not only have the capability of causing the
10 injury, but because of studies that took place subsequent to
11 this event, it became very clear that he not only had the
12 ability to do so, but the means and that it was likely that he
13 did so.

14 Another case I had was a three-year-old who took his
15 twin -- not his twin. His mother had had twins, so she had
16 twins plus this three-year-old. She was in bed with one twin
17 and the other twin was in a crib. When dad came home for
18 lunch, he woke the mother up and said where is the other twin?
19 She said, he's in the crib. He wasn't in the crib. It became
20 pretty clear that he had been removed from his crib, and he
21 was found stuffed behind the couch with a fatal head injury.
22 Again, the thinking was, because she was the only adult in the
23 house, that she had to have been the one to do that, but dad
24 was left, of course, with the surviving twin and the
25 three-year-old, and he called foster care some time within the

1 next couple of weeks and acknowledged that the three-year-old
2 was attacking -- attacking the twin. His little face was
3 covered with scratches and the -- behind the couch was the
4 place where the three-year-old would put his toys, his --
5 stuff his toys. So it took some -- it took some thinking and
6 some kind of breakthrough events to get the authorities to
7 actually reason that the likelihood was that the
8 three-year-old actually caused the death.

9 So, again, most of the cases that I have worked with and
10 a lot of the cases in the literature, it takes -- it takes
11 someone to say, but could it have been one of the other
12 children that caused the injury and sometimes -- sometimes
13 people are able to get past that resistance and other times
14 they're not. In the two cases that I just mentioned, these
15 two women were not -- one was not brought to trial and the
16 other one was not convicted of a crime.

17 Q. These were cases you were directly involved with?

18 A. Yes.

19 Q. You mentioned there's lots of -- is there literature
20 on --

21 A. Yes.

22 Q. -- scenarios like this?

23 A. There is.

24 Q. And --

25 A. That's just a -- that's just two of the ones that

1 I've had. I've had others, but those are -- those are two
2 where the -- that I think illustrate, I think, very clearly
3 the fact that there was resistance to recognizing the
4 possibilities.

5 **Q.** In cases -- other cases that you were directly
6 involved in or cases that have been documented throughout the
7 literature, do the children, the older kids, the toddlers who
8 inflict these injuries, sometimes they have violent tendencies
9 and that's documented?

10 **A.** Well, I think there's a spectrum of aggression as,
11 you know, the psychology literature looks at measuring or
12 assessing aggression and -- and what they're looking at is to
13 see whether or not some of these toddlers are more aggressive.
14 But it is -- it is well recognized that at that age group,
15 little boys are by definition more aggressive than they were
16 when they were younger and when -- than when they get to be
17 older. So there is, I think, peaks and valleys of that. So
18 the amount of aggression doesn't necessarily mean that we're
19 looking at someone who has -- who has violent tendencies or
20 who is going to go on to have ongoing violent tendencies.
21 They're more aggressive at that age -- I mean, I think those
22 of us that have had three-year-olds know that they're just
23 full of it. And the -- they go full speed and they do
24 everything at the max and when they're playing with other
25 children, you have to watch them like a hawk.

1 **Q.** Well, let's be clear, the literature doesn't indicate
2 that these children could do this tragic act. It's not as
3 though they're homicidal.

4 **A.** No, no, no, no, no.

5 **Q.** Okay. Documented cases, cases you've been involved
6 in, do they always exhibit violent aggressive behavior before
7 the actual act?

8 **A.** No.

9 **Q.** What about after the fact, later in life?

10 **A.** No.

11 **Q.** It could just be random?

12 **A.** Well, I think, again, we're getting into an area
13 where there -- the psychologists have whole textbooks on the
14 abusing child and the different categories of the abusing
15 child, but no one says that if a child inflicts an injury on
16 another child, that somehow that means that there is
17 psychopathology involved.

18 **Q.** You indicated that there's lots of literature, you
19 have experience in this. Is it becoming more and more
20 documented?

21 **A.** Yes.

22 **Q.** It is?

23 **A.** Yeah, it is. I think -- I think that 10 years ago if
24 you were to ask a room full of child protection people or
25 others, you know, who are the number one physical abusers of

1 children, they -- you know, based on the age, they'd say
2 mothers less than a year, boyfriends over a year, blah, blah,
3 blah. The last time I gave a lecture on -- and asked the
4 question, everybody yelled out other kids. So it's a
5 different -- it's just a different time, though.

6 **Q.** So based on what you know, based on what you've
7 reviewed, and you've -- you're familiar with Brylee Shepherd's
8 statement about what she saw?

9 **A.** Yes.

10 **Q.** And looking at the injuries that Lincoln Penland
11 unfortunately suffered, could a three-year-old have
12 inflicted -- that's my question, could a three-year-old have
13 inflicted these injuries?

14 **A.** Absolutely.

15 **Q.** Injuries as severe as this?

16 **A.** Well, again, it's a -- you have to talk about the
17 qualifiers here. It's a fatal injury, so it's as severe as it
18 can be from that standpoint. But as severe as this, as I've
19 mentioned, we don't have lacerated dura, we don't have
20 lacerated brain, we don't have a complex comminuted skull
21 fracture, we don't have the kinds of fractures that you can
22 see even in kids who have had a heck of a blow, and what you
23 have to take into account is the constellation of factors and
24 variables that come together as to why one child would go on
25 to a fatal event and another child would not, would be able to

1 recover. And those are individual issues, they aren't
2 necessarily the result of the event itself. This baby went
3 on -- I mean, he came to the hospital with stable vital signs.
4 So it looked from the record, to me, like people thought he
5 might do okay. And there wasn't the gloom and doom when
6 people talk about, you know, a horrible prognosis or when he
7 dies, you know, that kind of stuff is present quite early in
8 the record when you have the expectation that someone isn't
9 going to make it. Whereas, with this case, because his vital
10 signs were stable and because he -- he didn't have an
11 irreversible scan at the beginning, people didn't have the
12 gloom-and-doom conversation in the medical record.

13 Q. In other words, what it sounds like you're saying is
14 that these injuries, as heartbreaking as they are, that they
15 ultimately did take his life, they weren't as severe as you
16 would see, perhaps, in other cases?

17 A. No. I've seen lots of kids -- I -- I investigated,
18 participated in the investigation of lots of children who
19 survive head trauma from a variety of causes. Most of the
20 time it's in the context of possible abuse.

21 Q. Okay.

22 A. I see lots and lots of cases of children who survive.
23 And this case the child clearly came in as a potential
24 survivor, based on my experience.

25 Q. And so in your opinion, with a reasonable degree of

1 medical certainty, is that what Brylee Shepherd saw, a
2 three-year-old boy kick, stomp, jump, and a head being slammed
3 either in a door or by a door could reasonably account for
4 these injuries?

5 **A.** Yeah. One of them. I don't see evidence of multiple
6 impacts. One of them did it.

7 **Q.** Okay. In other words, the head wasn't hit multiple
8 times?

9 **A.** No. There's no evidence the head was hit multiple
10 times. It just -- one fatal impact set the course in motion.

11 **Q.** Well, that -- that reminds me, let me ask you this
12 question. Are these injuries possible from a short fall?

13 **A.** Sure.

14 **Q.** Would it require a fall of more than one story or
15 more?

16 **A.** Oh, no. That's old -- that's old -- that's old --
17 people used to say that in the '80s. The kind of
18 abnormalities that we see in shaking, which is, interestingly
19 enough, quite a lot less than a two-story fall or a
20 60-mile-an-hour car crash. It's like the -- it has to be so
21 terrible that it would be equivalent to a car crash or a
22 pedestrian accident or a two-story fall. Having autopsied
23 people who have been subjected to that kind of thing, this
24 isn't anything like that at all. And this is the kind of
25 pattern that you can get from a fall off of a changing table,

1 a fall off a couch. What is known is that if you have the
2 worst-case scenario on a particular fall, it could take -- it
3 doesn't take a lot to generate enough G forces to cause a
4 fatality.

5 **Q.** What about a 35-pound boy jumping and landing on
6 Lincoln Penland's head?

7 **MS. TOOMBS:** Objection, Your Honor. That's the
8 second time he's posited that scenario and that is not what
9 Brylee Shepherd ever said happened. None of that is in Brylee
10 Shepherd's statement. She says he kicked, threw, drew on,
11 stomped, and slammed his head in the door.

12 **THE COURT:** Mr. Bushell?

13 **MR. BUSHELL:** Again, speaking objection.

14 **THE COURT:** Well, let's have you approach the bench.

15 (Discussion at the bench at 2:46:40.)

16 **THE COURT:** Okay. It is a speaking objection.
17 Don't -- don't do that.

18 **MR. BUSHELL:** My response would be that it's a
19 hypothetical, it was posed as a hypothetical. I can
20 preface --

21 **THE COURT:** Are you referring to Brylee?

22 **MR. BUSHELL:** Pardon?

23 **THE COURT:** Are you referring to Brylee?

24 **MR. BUSHELL:** I'm referring to a 35-pound boy, if he
25 jumped and landed on Lincoln Penland's head.

1 **MS. TOOMBS:** And that's exactly the problem,
2 Your Honor. That's facts that are not in evidence. And if
3 she wants to posit that it could be from a changing table or
4 whatever, but don't -- the -- the way that he phrased it was
5 that Brylee Shepherd indicated that he jumped and that's --
6 that's at least twice that they have said that and that is not
7 the evidence in the case.

8 **THE COURT:** Well, I didn't think on this question he
9 referred to Brylee at all. That's why I asked.

10 **MR. BUSHELL:** I didn't. I'll rephrase the question.

11 **THE COURT:** Okay. How are you going to ask it, so
12 let's see if there's an objection.

13 **MR. BUSHELL:** Hypothetically speaking, if a
14 35-year-old (sic) boy did this, would that have caused these
15 injuries?

16 **MS. TOOMBS:** And then I would object to relevance,
17 Your Honor, because that's not the facts in this case. The
18 facts in this case are -- I mean, hypothetically speaking all
19 kinds of things could have happened. It could have been a car
20 crash, but that's not the facts in this case.

21 **THE COURT:** Well, but that's not the --

22 **MR. BUSHELL:** You didn't object to an 8-pound bowling
23 ball being dropped on his head.

24 **MS. TOOMBS:** I did object to it. I said I don't know
25 where this 8-pound bowling ball came from. But the fact that

1 he's now -- everybody agrees there was no bowling ball, but
2 he's trying to --

3 **THE COURT:** Well, but there are other toddlers here
4 besides what Brylee saw and Boston.

5 **MS. TOOMBS:** And the other toddlers -- none of the
6 other toddlers describe anything. None of the other toddlers
7 saw anything. Brylee doesn't say that he jumped on him or
8 anybody else jumped on him. That's a mischaracterization of
9 the evidence and -- and I would object to the relevance of it.

10 **THE COURT:** Well, I would agree it's a
11 mischaracterization of what Brylee said.

12 **MS. TOOMBS:** There's none -- none of them said that.
13 None of them have ever said jumped on.

14 **THE COURT:** Are you saying we have to have some
15 direct evidence before he can posit a hypothetical?

16 **MS. TOOMBS:** Your Honor, I would argue that, yes,
17 it -- otherwise, it's not relevant.

18 **THE COURT:** Well, there were other toddlers there.

19 **MS. TOOMBS:** What?

20 **THE COURT:** There were other toddlers there.

21 **MS. TOOMBS:** What's the -- what's your -- with all
22 due respect.

23 **THE COURT:** Why couldn't Brylee or another child be
24 the one that's landing on the child? That's why I'm asking,
25 are you referring to what Brylee said?

1 **MS. TOOMBS:** Well, the evidence in this case, counsel
2 has clearly said, are -- Boston is the one that did it, and
3 the only witness -- they have said repeatedly, the only
4 witness is Brylee. And now they're talking about that only
5 witness, Brylee, and -- and then positing a hypothetical
6 question about the -- this idea of jumping. None of the
7 witnesses talked about jumping. None of the witnesses talked
8 about -- about anybody else doing anything. The only person
9 who says anything is Brylee and she doesn't say jump.

10 **MR. BUSHELL:** Response would be a couple of things.
11 Not every child was actually interviewed. There isn't
12 evidence of every child who was there that actually took a
13 statement and has been entered into evidence. Number two,
14 there's never been any direct evidence entered about this
15 hypothetical of falling from a --

16 **MS. TOOMBS:** But they weren't talking in terms of
17 directly with Lincoln, that's -- there are studies.

18 **MR. BUSHELL:** And there are studies, I'm sure, of a
19 35-pound year-old -- 35 pounds landing on top of his head. I
20 can pose it as --

21 **MS. TOOMBS:** Much like a six-year-old --

22 **MR. BUSHELL:** -- a hypothetical, that's our position.

23 **MS. TOOMBS:** -- 35-pound.

24 **THE COURT:** Okay. I'm going to overrule the
25 objection. For the speaking objections, in the future, just

1 say, for instance, objection, Your Honor. Foundation. May I
2 approach?

3 **MS. TOOMBS:** Okay.

4 **THE COURT:** Okay.

5 (Proceedings resume in open court at 2:50:35.)

6 **Q. (BY MR. BUSHELL)** Dr. Ophoven, just for the record,
7 that objection was overruled. So let me ask you,
8 hypothetically, if a 35-pound year-old boy fell onto Lincoln
9 Penland, would that explain these injuries?

10 **A.** Absolutely. No question.

11 **Q.** Hypothetically, if a 35-pound year-old boy was on a
12 coffee table, jumped off, landed on Lincoln Penland, would
13 that explain these injuries?

14 **A.** Absolutely.

15 **Q.** Hypothetically speaking, if a 35-pound year-old boy,
16 jumping from couch to couch, Lincoln Penland is below that,
17 and lands on Lincoln Penland, would it explain these injuries?

18 **A.** Absolutely.

19 **Q.** Is there any element of these injuries that you don't
20 think would line up with that?

21 **A.** No.

22 **Q.** How about a door being shut on his head?

23 **A.** I'd have to see a reenactment of that before I would
24 be able to opine whether the door slamming on the head would
25 have left a linear mark or whether it would have -- whether it

1 would have impacted sideways. So just the door slamming is --
2 is a little bit ambiguous to me, but certainly slamming a door
3 against a child's head could cause -- could cause a fracture.

4 Q. I mean, you mentioned linear, you'd see markings?

5 A. Yeah, you know, there are some scenarios where you
6 would expect to see some kind of -- some kind of indicator
7 that -- that it -- that it was that or could be that. I'm not
8 suggesting that a door slamming couldn't -- isn't consistent
9 with that, but I'd have to understand a little bit better
10 where the child's head was.

11 Q. You'd need more information about the door?

12 A. Yeah. Yeah, about -- well, whether the head was
13 between the wall and the door, whether the head -- whether the
14 head was -- whether the child was positioned and the door just
15 swung and slammed into one side of the head, certainly that
16 could do it.

17 Q. So as opposed to being in the doorjamb as it shut --

18 A. Right.

19 Q. -- on the opposite way as it opens?

20 A. Yeah, the open door slamming into the child's head
21 certainly could cause a fracture.

22 Q. Okay. Let's shift gears just a bit, Doctor. I want
23 to talk to you a little bit about what we've, over the last
24 week or so, been talking about, this idea of what -- maybe --
25 this is probably a misnomer, but a lucid interval.

1 **A.** Okay.

2 **Q.** You mentioned at the start of your testimony here
3 today that you had a chance to review pretty much the entire
4 record that was provided with law enforcement.

5 **A.** Yeah.

6 **Q.** Did you ever have a chance to see Tisha Morley's time
7 line that she provided for that day?

8 **A.** Well, parts of it, sure. There were -- there -- in
9 the -- in the police statements, I don't know whether you have
10 a specific written record or -- but there was -- there was a
11 timeline in the statements and so forth that talked about --
12 about before Lincoln was left alone and after Lincoln was left
13 alone. And the timeline after he was left alone, certainly
14 there were multiple moments where the -- where the child was
15 showing symptomology of a traumatic brain injury.

16 **Q.** So that's what I want to talk about. As you recall,
17 then, it sounds like the statement provided by Ms. Morley was
18 that Lincoln Penland, that day, February 19th, 2014, she heard
19 him crying inconsolably. She had gone downstairs, she heard
20 him crying. He was inconsolable, fussy, vomiting, wouldn't
21 eat much, ate a little bit later, just irritable.

22 **A.** Yeah.

23 **Q.** Based on what you've reviewed, the evidence, the
24 science from the record, the medical records, would Lincoln
25 Penland have been symptomatic upon impact?

1 **A.** No. Again, that goes back to the old days, the old
2 things that people used to say, that if you were shaken and if
3 your brain got scrambled and you went on to die from a shaking
4 event, that you would probably not -- and again, this is pure
5 speculation, that you would probably not be interactive or
6 terribly conscious, and -- and people would refer to that as
7 the lucid interval. There wouldn't be a lucid interval after
8 shaking.

9 What I went into -- fairly --

10 **Q.** Doctor, can I just interrupt? You mentioned there
11 wouldn't be a lucid interval after shaking. But I -- let me
12 just make sure my question is clearly understood, the bigger
13 question is whether there could be or couldn't be a lucid
14 interval after the head impact, the broken --

15 **A.** Oh, of course. Absolutely. Again, when I was
16 referring, this morning, to the process of intracranial
17 equilibrium, maintaining and sustaining circulation and proper
18 flow of blood and maintaining the pressure within the normal
19 zone, as long as -- as long as the individual has continual
20 flow and oxygenation, then they may be building up to a
21 failure of intracranial equilibrium, but until it fails,
22 they'll be conscious and interactive. They may -- you know,
23 you stick a spoon in their mouth and they may swallow. If you
24 stick a nipple in their mouth, they may -- they may swallow.
25 But until the bottom falls out of equilibrium, they're not

1 going to be in a total coma.

2 The -- in the old days, in the '80s, people used to talk
3 about there not being any awake time after you shook a baby to
4 death. But that failed to take into account the complex
5 issues having to do with equilibrium and circulation and the
6 onset of brain swelling, an increase in intracranial pressure.

7 As it turns out, that -- that anybody with blunt force
8 trauma, if you fall off your bike or you fall down the stairs,
9 depending on how rapidly it takes the intracranial equilibrium
10 to deteriorate, you may be interacting with your environment
11 until the next day. So it depends on how fast the blood
12 builds up, how fast the swelling occurs, how long it takes for
13 the circulation to slow down and stop. And so, this whole
14 issue from the second this child was hurt, no one would have
15 seen any signs of brain activity, that's just -- that's not
16 correct at all.

17 **Q.** Okay. What -- what symptoms, if a lucid interval did
18 occur, would you expect to see with these injuries, the
19 fractured skull, the increased bleeding, the internal turmoil
20 that's going on? If there was a lucid interval going on, what
21 would -- how would that manifest itself externally?

22 **A.** Periods of inconsolable crying, lethargy,
23 irritability, diminished appetite, vomiting, kind of exactly
24 like he was described.

25 **Q.** And -- well, let's -- let's talk about inconsolable

1 crying. You said periods of inconsolable crying?

2 **A.** Yeah.

3 **Q.** That implies crying inconsolably, stopping, and then
4 maybe doing it again later?

5 **A.** Yeah.

6 **Q.** Is it your testimony that that would not be nonstop
7 just wailing and wailing and wailing?

8 **A.** No, no, no, no. They -- no. I mean, again, when a
9 person -- when a person -- I think we can all -- I think we
10 can all imagine this for ourselves, you know, you hit your
11 elbow and you get that nerve or you get a burn and it hurts
12 like the dickens for a period of time, depending on what you
13 did, it's like that's the only thing that's on your mind, and
14 it hurts and hurts and hurts and hurts, and then it doesn't so
15 bad and it calms down. Babies don't cry constantly after they
16 get a broken leg or after they suffer an injury. They'll cry
17 inconsolably for a while and then they'll -- they'll be quiet,
18 and then if you don't move their broken leg, they'll look like
19 they're perfectly fine. But if you mess with their leg and
20 it's broken, they'll have inconsolable crying for a while. So
21 it depends on the baby, it depends on the pain, it depends on
22 a lot of different factors, but inconsolable crying means that
23 they're suffering from some pain that usually occurs right
24 after the event.

25 **Q.** Let's be clear, you -- there's a difference between a

1 broken leg, broken arm, versus what Lincoln Penland suffered
2 which was a fractured skull?

3 **A.** Well, yeah, fractured skulls don't hurt as -- hurt as
4 bad and brain damage doesn't hurt at all. So you're right,
5 they're not the same. But depending on -- on the nature of
6 the abnormality, a fracture and concussion may not be as -- be
7 experienced as painfully as a broken leg in a child.

8 I'm not suggesting this wasn't painful. It was. But it
9 all has to do with -- with the extent of the pain fibers
10 themselves being fired and the child's maturity level to -- to
11 experience and understand pain, very young children don't
12 experience pain the same way as we do, because they don't
13 connect -- they don't connect with fear and apprehension and
14 anxiety the same way we do when we have -- when we get hurt.
15 So they're going to cry while the pain is still bright.

16 **Q.** So entirely scientifically possible or even plausible
17 that a lucid interval was occurring based on what you've seen
18 in the evidence?

19 **A.** Oh, yeah. Sure.

20 **Q.** Again, you discussed this briefly earlier in your
21 testimony, retinal hemorrhaging, retinal folds; what can that
22 tell us?

23 **A.** It's my opinion it doesn't tell us anything about the
24 question at hand here today, whether this was an accident or
25 whether or not this was an inflicted injury. We know that it

1 was an impact. In -- in years gone by they would say, well,
2 you couldn't get retinal hemorrhages from an impact. Well, we
3 know you can get retinal hemorrhages from an impact because
4 there's an impact.

5 Q. Doctor, there's been some photos admitted last week,
6 prior to you testifying today. I'll just ask it while we're
7 waiting for this to come up. How soon would you see -- so
8 from the moment impact happened to Lincoln Penland's head, how
9 quickly would you see bruising?

10 A. Oh, that depends. You may not see obvious bruising
11 at all. But you'd expect with a fracture for the skull to be
12 boggy, for there to be accumulation of blood under the scalp,
13 that it -- that it would be swollen.

14 Q. Okay. But bruising, there's no --

15 A. Bruising just means that there's a blood vessel close
16 enough to the surface that you can see it.

17 Q. And that's my question. So, how soon would you
18 notice something visibly, externally visible, that there was
19 something going on?

20 A. You may not -- you may not. I mean, if you look at
21 the pictures of the outside of his head at the time of the
22 autopsy, they don't look bad.

23 Q. Wrapping up, I promise.

24 Doctor, would it be important as a medical examiner -- as
25 a pathologist, to have taken a sample from the skull fracture

1 to determine the degree of healing?

2 **A.** Not in this case.

3 **Q.** Okay.

4 **A.** Because 10 days elapsed. If -- if the child had died
5 within 24 to 48 hours, then the skull fracture would have been
6 a critical piece of evidence, because if there had been
7 healing in it then you could say for certain that the injury
8 occurred before he necessarily even arrived at the -- at the
9 residence.

10 **Q.** Give me just one moment, Doctor.

11 Doctor, I know I asked you this, so after determining
12 differential diagnoses, using that in your interpretation in
13 reaching your -- with a reasonable degree of medical
14 certainty, you then reached a conclusion. Tell me again, what
15 is your opinion?

16 **A.** It's my opinion that Lincoln Penland died from
17 complications of blunt force trauma to the head as indicated
18 by a skull fracture and that the manner of death, as I would
19 certify it, would be undetermined because I would consider the
20 injuries as inflicted by a three-year-old to be an accident,
21 not in the same category as homicide. If I'm required to
22 include them the same, then it's a homicide, but it's -- the
23 subset of that opinion is that there is no scientific
24 mechanism in this case to distinguish between injuries that
25 occurred at the hands of his brother or, alternatively, the

1 hand -- the hands of an adult.

2 **MR. BUSHELL:** Thank you, Doctor. That's all the
3 questions I have.

4 **THE COURT:** Okay. From the State?

5 **MS. TOOMBS:** Perhaps we should take a -- our quick
6 afternoon break and then --

7 **THE COURT:** Resume after?

8 **MS. TOOMBS:** -- resume after.

9 **THE COURT:** Is that all right with the defense?

10 **MR. BUSHELL:** That's great.

11 **THE COURT:** Okay. Members of the jury, we'll take
12 our mid afternoon break. Let's plan on resuming at -- let's
13 start at 3:25.

14 Same instructions apply to you regarding your conduct
15 during the recess.

16 It looks like Dave will be leading you out.

17 (Pause in proceedings)

18 **THE WITNESS:** Can I be excused?

19 **THE COURT:** Yes.

20 **THE WITNESS:** I gotta run.

21 **THE COURT:** Okay. We're still on the record. We're
22 outside the presence of the jury.

23 Any other business to take care of before we take our
24 own break?

25 **MR. BUSHELL:** No, Your Honor. Thank you.

1 **THE COURT:** Okay. Thank you. We'll see you back at
2 3:25.

3 We can go off the record, Debbie.

4 (Recess taken from 3:07:36 to 3:23:51.)

5 **THE COURT:** Okay. We're back on the record. All
6 parties and counsel are present. And we're outside the
7 presence of the jury, but they're being summoned right now.

8 (Pause in proceedings)

9 **THE BAILIFF:** The jury is present, Your Honor.

10 **THE COURT:** Thank you, Dave.

11 Members of the jury, welcome back. We're on the home
12 stretch. I'm so sorry about the heat in here and how
13 uncomfortable, but is the jury room -- the air conditioning is
14 working in there? Do you want me to send you out more? Is
15 that where we're at?

16 **MS. TOOMBS:** More frequent breaks.

17 **THE COURT:** How are you doing, Ms. Toombs? Is it
18 pretty hot there in the well?

19 **MS. TOOMBS:** It is warm down here.

20 **THE COURT:** It looks warm, so -- again, if you want
21 to take off your coats and that, I appreciate the
22 professionalism, but this is unusual, so feel free to shed
23 your coat if you feel that you need to.

24 **MS. TOOMBS:** Thank you.

25 **THE COURT:** Okay. Go ahead, Ms. Toombs.

1 **MS. TOOMBS:** Thank you.

2 **CROSS-EXAMINATION**

3 **BY MS. TOOMBS:**

4 **Q.** Dr. Ophoven, I think that there are a number of
5 things that we can probably agree on, so let's cover those
6 first. We can agree that Lincoln Penland suffered several
7 pretty impactful injuries, pretty important injuries.

8 **A.** Well, he suffered one injury that had consequences to
9 lots of areas of his head.

10 **Q.** Okay.

11 **A.** And he had some fractures to his shoulders.

12 **Q.** Okay. He doesn't have, however, any lacerations,
13 cuts, or scratches?

14 **A.** Not of consequence, no.

15 **Q.** Nothing -- in fact, when you say "not of
16 consequence," there's nothing in the medical record that
17 indicates he had even a scratch on him.

18 **A.** Well, he had a little abrasion on the back of his
19 head --

20 **Q.** When he presented to the hospital, you're right.

21 **A.** Yeah. I mean, there were --

22 **Q.** So --

23 **A.** -- a little of this and a little of that, but nothing
24 that was of consequence --

25 **Q.** But the abrasion doesn't --

1 **A.** -- to the cause of death.

2 **Q.** The abrasion was caused by the C collar, correct?
3 The papoose?

4 **A.** It's likely to be.

5 **Q.** So that wasn't there when he presented at the
6 hospital.

7 **A.** I -- I know that it was thought to have been the
8 consequence of the -- of the -- securing his head.

9 **Q.** Okay. He did have the bruise behind his right ear
10 and bruising on the lower back part of his thighs, right?

11 **A.** Yes.

12 **Q.** Okay. And I think we also can agree that his
13 injuries are the result of forced impact?

14 **A.** Yes.

15 **Q.** And that those injuries are what ultimately led to
16 his death.

17 **A.** Absolutely.

18 **Q.** And looking at this retrospectively, would you agree
19 that once he sustained those injuries medically, that there
20 was nothing else that could be done for him?

21 **A.** It's unlikely.

22 **Q.** So no matter how soon you called for aid, Lincoln
23 Penland was going to die?

24 **A.** Well, I -- I can't say that for certain. All I can
25 say is that -- is that when he arrived to the hospital, the

1 results were inevitable.

2 Q. I think we can agree that Lincoln Penland did not
3 cause these injuries to himself, correct?

4 A. You bet.

5 Q. All right. Okay. Since he didn't cause the injuries
6 to himself, we can obviously agree somebody else caused them
7 to him?

8 A. You bet.

9 Q. Okay. And we also agree that these injuries occurred
10 on the 19th?

11 A. Yes.

12 Q. There's no evidence of preexisting head trauma to the
13 day he collapsed?

14 A. That's correct.

15 Q. And you're sitting here today just saying, I just
16 can't tell you whose hands caused those injuries?

17 A. That's correct.

18 Q. Okay. I'm going to shift gears a little bit here. I
19 think there's more that we'll agree on later on, but I want to
20 just cover a few things.

21 You're working full time as a consultant right now; is
22 that true?

23 A. Yes, ma'am.

24 Q. And you've been in full-time consulting practice
25 since 2010?

1 **A.** Yes.

2 **Q.** Possibly even 2009?

3 **A.** Yes.

4 **Q.** Okay. And you currently have no other sources of
5 income?

6 **A.** No, ma'am.

7 **Q.** You review primarily --

8 **A.** Social security for now.

9 **Q.** Fair. Not a lot of that, right?

10 **A.** No.

11 **Q.** All right. And you're not a certified pediatric
12 pathologist, are you?

13 **A.** No, I didn't take the boards, but I practiced as a
14 pediatric pathologist before there were boards.

15 **Q.** Okay. But there -- but there are boards, and it
16 requires specific training that you undergo and you've not
17 taken those boards, correct?

18 **A.** I undertook the training. I chose not to take the
19 boards because they -- they were made available 10 years after
20 I completed my training, and I was done with that.

21 **Q.** And you don't currently treat any children?

22 **A.** No, ma'am.

23 **Q.** In fact, you don't maintain a practice treating
24 children?

25 **A.** No, ma'am.

1 **Q.** You -- you last treated a child, I believe, in -- the
2 last time you had responsibility for treating a child in any
3 kind of a hospital setting, absent, perhaps, your own children
4 of course, would have been 1989?

5 **A.** Yeah. I was -- yeah, while I was at the -- at the
6 Children's Hospital, yes, ma'am.

7 **Q.** Okay. So it would be --

8 **A.** And I wasn't the treating doctor, but I was asked to
9 see patients and consult. But I wasn't -- I didn't have a
10 pediatric clinic where I saw patients with ear infections and
11 so forth.

12 **Q.** So no -- not clinical practice then?

13 **A.** No, the clinical practice was earlier. But I was
14 asked to consult on patients and see patients, living
15 patients, in the late '80s.

16 **Q.** Okay. Last time you actually performed an autopsy
17 was in 2009?

18 **A.** That's correct.

19 **Q.** And the last time you performed an autopsy on a child
20 that was determined to be a homicide by -- at least by you,
21 was in 2004, approximately?

22 **A.** Yeah.

23 **Q.** Okay. Last time you performed an autopsy involving a
24 traumatic brain injury would have been sometime between
25 2002-2004 area?

1 **A.** Yes, ma'am.

2 **Q.** Now, you indicated --

3 **A.** In a child.

4 **Q.** Fair. We are only talking about kids here.

5 **A.** Yeah, I just want to -- lots of --

6 **Q.** You take on about five cases a month --

7 **A.** That's about right.

8 **Q.** -- in your consulting practice; is that true?

9 **A.** That's correct.

10 **Q.** And you -- where are you from, again?

11 **A.** Minnesota.

12 **Q.** Minnesota. Okay.

13 **A.** Go Vikings.

14 **Q.** I thought I recognized the accent. Since 2007, in
15 criminal cases, you've testified almost exclusively for the
16 defense, correct?

17 **A.** That's correct.

18 **Q.** And you mostly testify in cases where the defendants
19 have been charged with child abuse?

20 **A.** Yes, ma'am.

21 **Q.** In this case, for your opinion, report, consultation,
22 you've been paid to date about 10,000 -- a little over
23 \$10,000?

24 **A.** That's correct.

25 **Q.** And you've not been paid yet for your testimony here

1 today?

2 **A.** That's correct.

3 **Q.** But you will be billing for that?

4 **A.** Yes, ma'am.

5 **Q.** So, again, you don't maintain any active patients or
6 practice and it's been about 30 years since you clinically
7 treated anybody?

8 **A.** Yep, that's fair.

9 **Q.** Now, earlier, I think you testified that you -- you
10 were doing hospital work in the late '80s and then in the
11 '90s, you -- you were doing autopsies with the ME's office?

12 **A.** Some, that's right.

13 **Q.** Okay.

14 **A.** I -- I transitioned. During the early '90s, I was
15 still at the Children's Hospital but not in the laboratory. I
16 had a different job description, and the hospital allowed me
17 to expand my consulting practice and work with law enforcement
18 and the state board and so forth. And then in the mid '90s, I
19 left the children's Hospital and practiced at the -- at Allina
20 Health Systems for some time.

21 **Q.** Okay. You're -- you're farther afield than -- but
22 not doing clinical practice. You're in the lab and you're out
23 in a medical, some kind of a health system --

24 **A.** That's correct.

25 **Q.** -- facility?

1 **A.** That's correct.

2 **Q.** And I want to make sure I understand, because in a
3 prior testimony you had indicated you did no -- you stopped
4 doing autopsies in 1989 until 2001, so about a 12-year hiatus?

5 **A.** That's correct. I -- I chose not to do second
6 autopsies, so I only did consulting. When people would ask me
7 to do autopsies, I referred them to the local agencies.

8 **Q.** Okay. Now, you would agree also, wouldn't you, that
9 actual hands-on treatment is important in reaching your
10 diagnoses?

11 **A.** Not -- not necessarily, no, ma'am. I think it
12 depends on experience, it depends on what the -- what the
13 evidence is. For the forensic pathologist, obviously --

14 **Q.** So let me -- let me just stop you right there because
15 I want to clarify. In prior testimony, you testified
16 specifically about forensic pathology, you can't just do it by
17 looking, you have to pick it up, you have to turn it upside
18 down, you have to smell it, and you have to get the texture.
19 That's what pathology is?

20 **A.** Sure.

21 **Q.** Since 2009, you've been doing, in large part, your
22 consulting by just looking?

23 **A.** Yes, ma'am.

24 **Q.** You weren't -- and you weren't present for the
25 treatment of Lincoln Penland while he was alive?

1 **A.** No, ma'am.

2 **Q.** You did not perform the autopsy in this case?

3 **A.** No, I did not.

4 **Q.** And you were not present during the autopsy?

5 **A.** No, I was not.

6 **Q.** In fact, you didn't personally participate in any
7 examination of Lincoln Penland's body?

8 **A.** Not his body, no, ma'am.

9 **Q.** You didn't participate in his care?

10 **A.** No.

11 **Q.** And you have no firsthand knowledge of this case?

12 **A.** No.

13 **Q.** Now, you indicated -- you provided a report, correct?

14 **A.** Yes, ma'am.

15 **Q.** You indicated in your report, and I think you -- you
16 testified somewhat to that this morning, "When they arrived
17 home, they saw that he had vomited. At this point, they could
18 not rouse him." That's not accurate, is it?

19 **A.** Well, I don't -- if that's what I put in my report,
20 that's what I -- that's what I thought when I wrote it.

21 **Q.** But that's not accurate, is it?

22 **A.** I don't know, ma'am. I obviously need --

23 **Q.** The facts of the -- so if the facts of the case were
24 that when the defendant brought him out to his mother, he had
25 already vomited, he was nonresponsive, then you would agree

1 that statement in your report is not accurate?

2 **A.** What statement is it that you're arguing with?

3 **Q.** "When they arrived home, they saw that he had
4 vomited. At this point, they could not rouse him."

5 **A.** Well, I think that's correct. They couldn't rouse
6 him and he had vomited. He was also --

7 **Q.** At Tisha's house, not when they -- when the Penlands
8 arrived home.

9 **A.** Okay.

10 **Q.** You also indicate that when he arrived at the
11 hospital, and I'll quote it, "The patient is somnolent but
12 responds to mildly aggressive painful stimuli." That's what's
13 in your report, correct?

14 **A.** Yes.

15 **Q.** But in fact, the hospital records indicate that he
16 responds mildly to aggressive painful stimuli, is that a
17 difference?

18 **A.** The way you're saying it is different.

19 **Q.** So the -- the version that's in your report is
20 different from mild -- responds mildly to aggressive painful
21 stimuli would not be the same as mildly -- responds to mildly
22 aggressive painful stimuli?

23 **A.** Well, those two statements are different. I don't
24 know whether there were different statements in different
25 locations or whether I miswrote the sentence.

1 **Q.** Okay. Your findings indicate traumatic injury to the
2 left humerus, but you don't mention in your findings at all
3 that there was any fracture to the right humerus. You
4 acknowledge today that there are fractures in both shoulders,
5 correct?

6 **A.** Yes, there are.

7 **Q.** Now, you've -- you and counsel have talked
8 extensively about retinal hemorrhaging and whether or not, in
9 your opinion, shaking can cause injury, fair?

10 **A.** Yes.

11 **Q.** Okay. And your opinion is that it can't?

12 **A.** It's my opinion that shaking as a cause of retinal
13 hemorrhage, brain swelling, and subdural hematoma has not been
14 verified. I am not suggesting that vigorous shaking can't
15 cause harm. I'm just saying it doesn't produce that
16 constellation of findings.

17 **Q.** But we can all agree that there was not -- there is
18 not just shaking in this case. We obviously have evidence of
19 impact?

20 **A.** It's my opinion there is no evidence of shaking in
21 this case and that there is evidence of impact.

22 **Q.** Okay. You would agree, though, that studies have
23 found that retinal hemorrhaging are strongly associated with
24 inflicted brain injury, correct?

25 **A.** They're seen in brain injury, yeah -- in inflicted

1 brain injury. They're also seen in many other circumstances.
2 That's the problem with interpreting them as indicative of
3 inflicted brain injury.

4 Q. But when you combine subdural hematomas, retinal
5 hemorrhaging, skull fractures, seizures, and bruising to the
6 head, you end up with 85 percent chance that the predictive
7 value that that is abusive head trauma?

8 A. No.

9 Q. You disagree with that?

10 A. I disagree with that.

11 Q. That's a finding -- are you familiar with Maguire?

12 A. I'm aware of Maguire's finding. The problem with his
13 finding is that there was no definition of inflicted head
14 trauma that was uniformly used. And oftentimes the definition
15 of inflicted head trauma is based on retinal hemorrhage,
16 subdural hematoma, and brain swelling. So if you make the
17 diagnosis of inflicted head trauma because those things are
18 there, then you're certainly going to see those in patients
19 that you called inflicted head trauma. What isn't the case is
20 that there is a uniform -- that there is uniform criteria for
21 the diagnosis of inflicted head trauma.

22 Q. But would you --

23 A. I will agree that in inflicted head trauma you can
24 see those findings. It's not predictive.

25 Q. Okay. We'll agree to disagree on that one.

1 You would agree that if you have a skull fracture,
2 metaphyseal fractures and other injuries, you would be, at
3 least in 2007 -- excuse me -- yeah, 2007, you would be
4 inclined to say abuse is --

5 **A.** I would say it was -- I would say it was suspicious
6 in 2007. It is not diagnostic. The problems with metaphyseal
7 fractures have evolved subsequent and the constellation of
8 findings of skull fracture, subdural hematoma, retinal
9 hemorrhage and metaphyseal fractures, as they appeared in this
10 case, do not allow for the diagnosis of inflicted trauma.

11 **Q.** Okay. In fact, you would also agree that abusive
12 head trauma itself isn't -- isn't controversial. It happens,
13 right?

14 **A.** Head trauma from child abuse certainly happens,
15 absolutely.

16 **Q.** Okay.

17 **A.** But substituting abusive head trauma for shaking is
18 not -- is not uniformly accepted.

19 **Q.** Okay.

20 **A.** But I believe that child -- child abuse --

21 **Q.** So it's just -- it's just the shaking without impact
22 that you --

23 **A.** That's correct.

24 **Q.** -- have a problem with.

25 But you're not a board-certified ophthalmologist?

1 **A.** No, ma'am.

2 **Q.** You're not an ophthalmology pathologist?

3 **A.** No.

4 **Q.** You would agree that it is important for a
5 pathologist to rely on -- or yeah, a forensic pathologist to
6 rely on specialists where they're available?

7 **A.** Only if they have the ability to add to the
8 knowledge. But the -- the responsibility is up to the
9 pathologist to decide if -- if, for instance, an
10 ophthalmologic pathologist would not be helpful in a situation
11 where all you're looking for is retinal hemorrhages and folds
12 because that doesn't allow you to distinguish between an
13 accident and an inflicted injury.

14 I do think it's important to have -- okay. I'll quit
15 going.

16 **Q.** Sorry.

17 **A.** When you start to laugh I realize I've --

18 **Q.** It's warm up here.

19 It is your opinion that -- and just so that we can
20 clarify, in 2014, Boston was -- well, at least two months
21 prior to February 19th, Boston wasn't even 30 pounds. So
22 35 pounds is not in the picture.

23 **A.** Okay.

24 **Q.** It's -- but your -- it's your opinion that a 30-pound
25 child can cause this skull fracture?

1 **A.** No question.

2 **Q.** But you're not a biomechanical engineer.

3 **A.** I'm not an engineer.

4 **Q.** And you have -- would you agree that it's important
5 to consider all of the injuries?

6 **A.** Sure.

7 **Q.** Okay.

8 **A.** In proper context.

9 **Q.** In fact, you would agree that in this case, if it
10 weren't for Brylee Shepherd's statement, you would have
11 classified this as a homicide?

12 **A.** Yes.

13 **Q.** So, as I recall it, your testimony was there's two
14 possibilities here, Ms. Morley or Boston Penland.

15 **A.** You're correct. Or some of the other children. I
16 mean, I -- I don't know for certain, but in this case it's
17 Boston --

18 **Q.** But that's -- there's no evidence of that, right?

19 **A.** You're right. So Boston versus Ms. Morley.

20 **Q.** And you would agree that you have to look at the
21 possibilities, we've talked about -- you've talked about that
22 on direct examination.

23 **A.** Yes, ma'am.

24 **Q.** One of the things that you need to make sure you look
25 at is what is reasonable, right?

1 **A.** Yes.

2 **Q.** Okay. And you look for specific verifiable
3 information, and you would use that information in your
4 analysis? Is that true?

5 **A.** Yes.

6 **Q.** Now, you've testified in the past that you wouldn't
7 consider the statement of a five-year-old child because
8 five-year-olds are not credible, correct?

9 **A.** I have -- it depends on the scenario. But most of
10 the time I'm not -- if I'm looking at the --

11 **Q.** You -- you can stop with "I have."

12 **A.** I've said that. I have said that.

13 **Q.** Okay.

14 **A.** Yes, I have testified to that.

15 **Q.** And in that particular case where you testified in
16 that fashion, that five-year-old's testimony said that -- the
17 person who retained you, the defendant in that case, had been
18 seen by the five-year-old hitting the victim?

19 **A.** Yes.

20 **Q.** And in that case, that five-year-old's testimony was
21 also corroborated by the mother, but you discounted the mother
22 because of domestic violence issues?

23 **A.** It wasn't that simple, ma'am. I -- I did discount --

24 **Q.** Five-year-olds are not credible?

25 **A.** I am leery of accepting statements from

1 five-year-olds at face value.

2 Q. Okay. All right. At face value, good point.

3 In this case, you are relying on the statement of a
4 four-year-old.

5 A. Yes, ma'am.

6 Q. At face value.

7 A. Yes, I am.

8 Q. Have you seen the recording?

9 A. No.

10 Q. But you acknowledge that Lincoln didn't have any
11 cuts, correct?

12 A. No.

13 Q. No, you don't acknowledge --

14 A. I'm acknowledging that he did not have any cuts.

15 Q. All right. So when Brylee Shepherd says Lincoln was
16 bleeding on the floor, she's not correct, correct? Not
17 correct?

18 A. I agree that there was no reported bleeding on the
19 floor.

20 Q. And there have been testimony in this trial, before
21 you came, so to be fair, I'll just inform you, that people who
22 saw Lincoln Penland that day say he did not have any drawing
23 on him. So -- and I would like to, at this point -- I
24 probably should have grabbed these out.

25 So I have here what's been marked State's Exhibit 146.

1 This is the shirt that Lincoln Penland was wearing. You'd
2 agree that there is marking on this, correct?

3 A. Yes.

4 Q. But that's by the crime lab. We've already had
5 testimony about that.

6 A. Okay.

7 Q. There's no other drawing on this shirt, is there?

8 A. Not that I can see, although I haven't examined it.

9 Q. I probably should put that back (unintelligible).
10 And here I have State's Exhibit 165, and these are the pants
11 that Lincoln Penland was wearing and there's no marking on
12 these.

13 A. I'll take your word for it.

14 Q. Okay. So when Brylee Shepherd said that Boston
15 drew on him, she's incorrect there as well.

16 A. I don't agree that -- that there's drawing on the
17 baby -- on the baby's clothes or on the baby's body.

18 Q. So there's no evidence of drawing.

19 A. Not that I'm aware of, no.

20 Q. Okay. Now, Brylee says that Boston stepped on
21 Lincoln's chest. You examined the photographs and you
22 examined the autopsy results.

23 A. Yes.

24 Q. You also examined chest X-rays.

25 A. Yes, ma'am.

1 **Q.** You would agree there is no injury, either external
2 or internal, to Lincoln Penland's chest.

3 **A.** That's correct.

4 **Q.** So Brylee's statement doesn't match the evidence
5 there either.

6 **A.** I agree.

7 **Q.** Now, Brylee also says that, when asked what happened
8 to the baby, she says, he died there at the house. We all
9 know that fatally injured or not, Lincoln Penland did not die
10 in the house that day, correct?

11 **A.** You're right.

12 **Q.** So she's also inaccurate there.

13 **A.** She's not correct; you're right.

14 **Q.** Now, you testified earlier that the demonstration --
15 that Brylee's statement that -- that Boston lifted Lincoln by
16 one arm sounded reasonable to you?

17 **A.** Well, to cause the metaphyseal fracture. If he
18 pulled on her (sic) arm.

19 **Q.** So --

20 **A.** Whether he lift -- pulled on his arm, if he lifted
21 him even a little bit, he could have caused the -- the
22 abnormality in the shoulder.

23 **Q.** Okay. Now -- even a little bit, you say?

24 **A.** Yeah. The weight of the child's body is --

25 **Q.** Okay. Well, let's -- you can --

1 **A.** Okay.

2 **Q.** Now, I'm going to ask you to speculate a little bit.
3 If I walk out of this courtroom and go into another room
4 somewhere in this court, you would have no idea what I'm doing
5 in that other room, would you?

6 **A.** You're right.

7 **Q.** You -- you said you've seen the video of the doll
8 reenactment?

9 **A.** Yes, ma'am.

10 **Q.** And you're aware that the doll was underweighted by
11 five pounds?

12 **A.** Yes, ma'am.

13 **Q.** And Boston did try to pick up the doll twice?

14 **A.** Well, yeah.

15 **Q.** Okay. And both times when he tried to pick up the
16 doll, he was only successful in lifting him a few inches?

17 **A.** That's what the video shows, yes, ma'am.

18 **Q.** Okay. Now, you've reviewed the autopsy report.

19 **A.** Yes.

20 **Q.** I would hope.

21 **A.** Yes.

22 **Q.** At death, Lincoln Penland weighed eight kilograms.
23 That's about 17.6 pounds, correct?

24 **A.** Yes, ma'am.

25 **Q.** All right. And sizewise, let's see, they measure

1 crown to heel, correct?

2 **A.** Yes.

3 **Q.** And that one is 70 centimeters so -- I did the math
4 last night -- that's about 27 -- just over 27-1/2 inches.

5 **A.** Yes, ma'am.

6 **Q.** Almost 28 inches.

7 **A.** Yes, ma'am.

8 **Q.** So he's -- from head to heel, he's 28 inches tall.

9 **A.** Yes, ma'am.

10 **Q.** Crown to rump, they also take that measurement,
11 correct?

12 **A.** Yes.

13 **Q.** And in that measurement, he's 47.9 centimeters which,
14 by my calculation, comes out to 18.8588 -- can we round to 19
15 inches?

16 **A.** You bet.

17 **Q.** All right. Now, as we talked about Lincoln -- or
18 excuse me -- Boston was weighed in December of 2014, about 10
19 months after Lincoln Penland was injured fatally and died, and
20 he only weighed 31 pounds.

21 **A.** Okay.

22 **Q.** So, by my math, that means that Boston outweighed
23 Lincoln by at best, 13 pounds.

24 **A.** Okay.

25 **Q.** Now, were you aware that Boston stood about 36 inches

1 tall at the time?

2 **A.** I assumed it was about that range.

3 **Q.** Pretty common for a three-year-old, right?

4 **A.** Yes.

5 **Q.** 36 inches tall would be only nine and a half inches
6 taller than Lincoln.

7 **A.** Okay.

8 **Q.** Would that be correct?

9 **A.** Yes. You're doing faster math than I am. I'm not --
10 I'm not able to do that, but I assume you wouldn't be doing
11 silly math to ask me the question, so I'm -- I'm agreeing with
12 you on principle.

13 **Q.** You'll agree with me that my math is correct.

14 And you indicated in direct examination that you have
15 reviewed Lincoln's medical history?

16 **A.** Yes.

17 **Q.** You know that he did not have any history of
18 coagulopathy diseases.

19 **A.** Not before he came to the hospital.

20 **Q.** And what -- and trauma is very -- coagulopathy
21 abnormalities are very common with trauma.

22 **A.** Absolutely. That's why he had the coagulopathy.

23 **Q.** And those issues, those coagulopathy issues were
24 quickly resolved, right?

25 **A.** They were treated.

1 **Q.** Well, he only had -- according to -- now, you
2 indicated his fibrinogen was low, correct?

3 **A.** His fibrinogen was low, his platelets were low, his
4 PT and PTT were prolonged. So he had a --

5 **Q.** So his --

6 **A.** -- period where he -- where --

7 **Q.** Let me go ahead and just give you the numbers. On
8 February 19th, his fibrinogen was at 23 11, so that's 11 11,
9 right? His fibrinogen was at 191, correct?

10 **A.** I -- I'd have to look at -- I assume you're reading
11 correctly.

12 **Q.** Okay.

13 **A.** Yes, ma'am.

14 **Q.** And by 2:20 on 5-23, he was back within the normal
15 range.

16 **A.** Oh, yeah.

17 **Q.** And normal was at 234.

18 **A.** Yes, ma'am.

19 **Q.** So it's not a large difference.

20 **A.** Well, his platelets were extremely low. I mean,
21 there were other tests that were -- that were clearly
22 indicative of a significant coagulopathy that would have
23 precipitated bleeding, but I agree that they treated him --

24 **Q.** It resolved quickly?

25 **A.** -- with fibrin split products and refurbished his

1 coagulation system.

2 Q. And it resolved fairly rapidly.

3 A. Fairly rapidly, but not before bleeding took place.

4 Q. You'd agree that he was not -- there was no evidence
5 that he was diabetic.

6 A. No, there -- no. There was --

7 Q. And he didn't --

8 A. I agree that he didn't have evidence of diabetes.

9 Q. Okay. He did not suffer from craniosynostosis.

10 A. I don't know that they were worried about it, but the
11 autopsy didn't show any abnormal fusion. I think he just had
12 an unusually shaped head. At least the autopsy didn't
13 identify abnormal fusion.

14 Q. So you don't know from your review of the medical
15 record?

16 A. Well, the medical records basically suggested that
17 there was concerns about it earlier, but I didn't see any
18 evidence at the autopsy.

19 Q. So if his -- if his doctor came in and said I never
20 had any issues with craniosynostosis --

21 A. Synostosis?

22 Q. Yes.

23 A. Yeah. Well, it was in the record, is all I'm
24 reflecting.

25 Q. Okay. You'd did -- you -- you would agree that he

1 wasn't anemic?

2 **A.** Not -- not in his day-to-day life, no.

3 **Q.** In his (unintelligible). And he didn't have Terson's
4 disease?

5 **A.** Not in his day-to-day life, but as soon as he had --

6 **Q.** And he --

7 **A.** -- as soon as he had bleeding in his head, he had
8 Terson's.

9 **Q.** Okay. But he didn't have any history of prior
10 fractures.

11 **A.** No.

12 **Q.** And in fact, there was no prior history of abuse
13 concerns at all.

14 **A.** I agree.

15 **Q.** Whether that abuse came from -- in fact, including
16 Boston. There was no --

17 **A.** There's no evidence of -- of injuries.

18 **Q.** -- evidence of prior abuse from Boston.

19 **A.** That's correct.

20 **Q.** In fact, the jury has heard testimony that Boston
21 loved his brother and was excited about being a big brother.
22 So that happens, doesn't it?

23 **A.** Pretty often.

24 **Q.** Yet, on his third day -- third day at Tisha Morley's
25 home, suddenly he has all of these problems, Lincoln has all

1 of these issues?

2 **A.** Lincoln has all these issues -- yeah.

3 **Q.** On --

4 **A.** On the third day, he --

5 **Q.** And suddenly --

6 **A.** -- had a head trauma.

7 **Q.** -- on the third day at Tisha Morley's home, Boston is
8 abusing his brother?

9 **A.** Well, whether you call it abusing or whether or not
10 the -- some bad things happened --

11 **Q.** With no evidence --

12 **A.** -- to Lincoln while the children were all playing
13 together, there's no way to exclude that that happened, no.

14 **Q.** Now, you would agree that the trauma patterns on
15 Lincoln are consistent with blunt force trauma, correct?

16 **A.** They are.

17 **MS. TOOMBS:** Just one moment, Your Honor.

18 **Q. (BY MS. TOOMBS)** And I'm going to read from your
19 report to make sure I get the words correct here.

20 Your findings in your report is that, "The pattern of
21 injury is consistent with a single blunt force impact to the
22 skull."

23 **A.** Yes.

24 **MS. TOOMBS:** No further questions, Your Honor.

25 **THE COURT:** Okay. From the defense?

1 **REDIRECT EXAMINATION**

2 **BY MR. BUSHELL:**

3 **Q.** Doctor, Ms. Toombs asked you -- well, I think her
4 comment was that since 2007, your experience in testifying and
5 consulting has been almost exclusively for defense counsel,
6 where a defendant is charged with child abuse?

7 **A.** That's correct.

8 **Q.** But throughout your history, do you have -- or
9 throughout your entire career, do you have a history of
10 assisting and working closely with and performing autopsies
11 and acting as a medical examiner with law enforcement?

12 **A.** Absolutely. It was -- yes. Absolutely. My --

13 **Q.** Tell us about that.

14 **A.** My career basically started in 1971. I presented,
15 actually, a grand round to the Department of Pediatric --

16 **MS. TOOMBS:** Objection, Your Honor. We spent over an
17 hour this morning getting this answer. It's been asked -- I
18 apologize. It's been asked and answered.

19 **THE COURT:** Mr. Bushell?

20 **MR. BUSHELL:** This was -- this is direct response to
21 a cross-examination question. The State tried to impeach the
22 doctor. I'm trying to tease out that detail. She's -- I
23 mean, we know that impeachment applies. She's certainly
24 eligible and able to tell us about the counterargument.

25 **THE COURT:** I'll overrule the objection.

1 **MR. BUSHELL:** Thank you.

2 **Q. (BY MR. BUSHELL)** Go ahead, Doctor.

3 **A.** My -- my first grand round -- my -- we were all asked
4 to present a grand rounds. And one of the reasons that I
5 started on this journey in child abuse as a -- as a pediatric
6 intern, was I had a little baby that presented with the
7 recently published criteria for classic shaken baby syndrome.

8 So I entered the fray in 1971, understanding the various
9 nature of head injuries to children and completely bought into
10 the theory of shaken baby. And over the years, taught,
11 lectured, and worked with law enforcement around the various
12 ways that children present with traumatic head injury.

13 And -- and this journey has taken me through the changes
14 in understanding and the improvements in scientific detection
15 to the point now where I am viewed as I think -- I think
16 State's counsel stated that -- that, I quote, "a member of a
17 fringe group," which I'm not anymore. But people who were
18 worried about the -- the theories and so forth were viewed as
19 somehow not with the crowd.

20 As of 2007, consultations from law enforcement and
21 prosecution changed in my practice because I was unwilling to
22 accept unsecured science any longer. And more and more cases
23 were coming forward that had unsecured accusations due to
24 flawed science. So the transition from 100 percent teaching
25 and educating law enforcement and prosecutors about head

1 injuries in children have, to this point, now, led me to the
2 place where the cases that I do end up performing sworn
3 testimony, which is not very common, are those cases where, in
4 my opinion, the science -- the science is not being properly
5 conveyed or has -- has -- is behind in its scientific
6 interpretation.

7 So the reason that I am pretty much exclusively
8 testifying in cases for defendants is because these are the
9 cases that are like this one, where there is significant
10 dispute or debate about the interpretation of the evidence. I
11 make a diagnosis of child abuse -- child abuse head trauma
12 literally on a monthly basis. So it's only the cases where I
13 am in disagreement with the interpretation of the original
14 findings that I end up providing testimony or consulting.

15 **Q.** Have you ever seen a prosecution of a person for
16 being -- for not abusing their child?

17 **A.** No.

18 **Q.** All right. But you do have -- just to reiterate, you
19 do have a history of -- well, let me just put this way, of
20 working for the other side.

21 **A.** Well, yeah. The world sees it as sides; I see it as
22 science. So if the prosecution had consulted me on this case,
23 they would have gotten exactly the same opinion. So it's an
24 unanswerable question. As I understand it, the -- it's -- the
25 plausibility of both -- of both --

1 **Q.** Scenarios?

2 **A.** -- both scenarios is very real and confirmed by many
3 of us involved in the case.

4 So it's a question of -- of how do you end up making the
5 decision, then, if you can't distinguish scientifically, then
6 we're not supposed to make a decision. We're not supposed to
7 convey that I'm picking one or the other of two legitimate
8 explanations. The forensic pathologist is supposed to be
9 scientifically neutral.

10 **Q.** Would it be scientifically dishonest to say one way,
11 definitively, it had to happen this way?

12 **A.** Well, it would be to me because there is no
13 scientific evidence to support that it could only have
14 happened the way, as I understand it, that there was a slam
15 against the changing table.

16 **Q.** Does the amount of money that you're being paid for
17 your services impact your opinion here?

18 **A.** Oh, of course not. I get the same salary and have
19 gotten the same salary for the last 10 years. I make \$180,000
20 a year, whether I testify or don't testify.

21 **Q.** So Ms. Toombs, in her cross-examination, looked
22 through your report, found a few things. Let me ask you this,
23 Doctor, in your report, you did indicate, quote, "When they
24 arrived home, they saw that he had vomited. At this point,
25 they couldn't arouse him."

1 Does this splitting hairs in any way impact or affect
2 your overall analysis or opinion?

3 **A.** No.

4 **Q.** Does it impact your testimony here today?

5 **A.** No.

6 **Q.** You also indicated -- well, let me -- I believe
7 Ms. Toombs indicated that you had written in your report that
8 Lincoln Penland was not responding to stimuli.

9 **A.** No, I said -- she read a statement that said he was
10 mildly responding to aggressive stimuli, and she read from my
11 report that he was responding to mild stimuli. What I was
12 trying to convey, obviously, clumsily, is that he was
13 responding to painful stimuli, whether it was a lot of stimuli
14 or a little. What we're looking for is does the brain
15 acknowledge, with movement of body parts, that pain has
16 occurred, which is a signal, when we're assessing the degree
17 of brain damage. If the body responds to pain, then neur --
18 brain function is still there, as opposed to a child who
19 has -- receives painful stimuli and does not respond. That is
20 a completely different scenario and it suggests that brain
21 function has diminished to the point of being -- almost being
22 lost.

23 **Q.** So that doesn't -- same question. Does that in any
24 way change your overall opinion, your analysis?

25 **A.** No. It -- it -- what I was trying to convey was he

1 responded to painful stimuli which is an important positive
2 vital sign.

3 Q. Regarding the right humerus, the fracture, as I'm
4 sure you recall now, maybe -- speaking of Ms. Toombs, you now
5 recall -- initially, nobody saw the left side of -- one of the
6 sides?

7 A. What I recall is that there were multiple X-rays with
8 different techniques that were looking at the right shoulder.
9 Nobody noticed anything about the left shoulder. And so there
10 were plus/minus, was there an abnormality or was it a normal
11 variation? And the radiologist even said you probably should
12 do a follow-up X-ray in a couple of weeks to see if this is
13 real or not. What I neglected to do was to add to my report,
14 after I received the slides, because I had submitted a report
15 prior to my having received the slides, I neglected to add to
16 my final report that in the autopsy, Dr. Ulmer sampled both
17 growth plates and identified abnormalities in both growth
18 plates, which means that there was abnormalities on both
19 sides. But I -- I did not add that to my original report.

20 Q. And those were very minute?

21 A. Well, it's there. There's no question it's there.
22 The question is, it's a metaphyseal fracture and it's -- it's
23 specific to twisting or yanking.

24 Q. Okay. And so that, failing to go in after you
25 received and indicated that in your report, does that change

1 any aspect of your testimony here today?

2 **A.** No.

3 **Q.** Does that change at all your overall analysis and
4 your opinion?

5 **A.** No.

6 **Q.** And again, regarding those broken bones. not caused
7 by grabbing and holding, more -- more caused by pulling and
8 twisting?

9 **A.** Pulling on an arm, even lifting by an inch or two is
10 putting strain on the growth plate of the upper humerus, which
11 is exactly how you get that pattern of microscopic hemorrhage
12 that Dr. Ulmer showed.

13 **Q.** Okay. Could a 30-pound boy do that to a baby?

14 **A.** Yes.

15 **Q.** Doctor, you're not a board-certified ophthalmologist?

16 **A.** No.

17 **Q.** As Ms. Toombs pointed out?

18 **A.** Right.

19 **Q.** As a pathologist with 30-plus years of experience, do
20 you routinely consult with and work closely with
21 ophthalmologists?

22 **A.** Well, I -- I am responsible for reviewing the
23 pathology of the eyes from autopsy routinely, removing eyes
24 routinely at autopsy, and comparing what was seen at autopsy
25 with what the ophthalmologists describe, either confirming or

1 not confirming. Every now and then, we have no retinal
2 hemorrhage of the eyes and people thought they saw them, we
3 have no retinal hemorrhages at the time the eyes were examined
4 and there were lots of retinal hemorrhages at the time of
5 postmortem, and lots of variations in between. I also work
6 with ophthalmologists as the science of understanding retinal
7 hemorrhages is becoming more and more clear and more and more
8 controversial.

9 Q. And do you stay apprised of the current literature
10 regarding ophthalmology in child abuse,
11 abusive-head-trauma-type scenarios?

12 A. Yes.

13 Q. Okay. Do you stay apprised of scientific
14 developments?

15 A. Yes.

16 Q. So, well, I'm -- Ms. Toombs asked you about your
17 testimony in a previous case, that five-year-olds are not
18 credible. Ms. Toombs did not allow you to expound on that.
19 So talk to us about that.

20 A. The --

21 Q. What was that case all about?

22 A. The -- the analysis of a case -- in that case, and in
23 cases where I am asked about the reliability of
24 five-year-olds, it has to do with the identification or the
25 timing of injury in cases where the -- where the information

1 that is provided by the five-year-old, from my -- from my
2 analysis, was not credible or reliable. And I routinely do
3 not take the evidence of a five-year-old and say this is --
4 this is carved in cement by definition because they're little
5 and they can be -- they can be incorrect in their findings. I
6 think in looking at statements and questioning youngsters,
7 there's -- there's a wide range of reliability in terms of
8 their statements.

9 My understanding is that this was a -- was volunteered
10 observations that were spontaneous. That's a different --
11 that's a different animal than a child that is -- that has
12 been interrogated for purposes of potentially identifying a
13 perpetrator or defining a crime. They're just different
14 scenarios. A spontaneously volunteered statement observed in
15 a scenario where the differential diagnosis includes the
16 possibility of toddler trauma, to me, is very different.

17 **MR. BUSHELL:** Give me one second, Your Honor --
18 Doctor.

19 Your Honor, may we approach, please?

20 **THE COURT:** Yeah.

21 (Discussion at the bench at 4:16:04.)

22 **MR. BUSHELL:** Your Honor, by virtue of impeaching
23 Dr. Ophoven with the previous testimony about the reliability
24 of five-year-olds, the State has opened the door now for
25 Dr. Ophoven to opine as to why this situation is different,

1 and specifically --

2 **MS. TOOMBS:** Well --

3 **MR. BUSHELL:** Hang on. Specifically explain why she
4 finds Brylee Shepherd's comment reliable here, which is in
5 Detective Vanderwarf's report, which she reviewed and included
6 in her report, the mother reported Brylee as a reliable
7 observer.

8 The State opened that door despite the fact that they
9 requested before she even testified. Our position is, my next
10 follow-up question is, why do you believe Brylee Shepherd in
11 this case? She ought to be allowed to testify about what she
12 read in Detective Vanderwarf's report that the mother said
13 Brylee is reliable.

14 **THE COURT:** Okay.

15 **MS. TOOMBS:** She --

16 **THE COURT:** Just -- sorry.

17 **MS. TOOMBS:** Your Honor, she opined in direct
18 examination that that was the more credible --

19 **THE COURT:** Can you speak a little louder?

20 **MS. TOOMBS:** Sorry.

21 **THE COURT:** I can't quite hear you.

22 **MS. TOOMBS:** She opined in the -- in direct
23 examination that that was the more credible scenario. I was
24 simply pointing out her -- her -- impeaching her by showing
25 that in one case she relies on a four-year-old, but in a case

1 that doesn't suit her client, she relies -- she won't rely on
2 a five-year-old. I did not talk about any of that.

3 Counsel is now trying to back door this, and if the
4 Court is inclined to allow that in, we would object again
5 because it is hearsay. We would also say if the -- if the
6 Court's inclined to allow her to opine on hearsay from the
7 stand, she can -- she can rely on it all she wants, she just
8 can't opine on it. And if she states that Brylee Shepherd's
9 parents said anything --

10 **THE COURT:** I -- I don't mean to interrupt --

11 **MS. TOOMBS:** -- then I think it's important --

12 **THE COURT:** -- but I'm not -- I'm not going to allow
13 it.

14 **MS. TOOMBS:** Okay.

15 **THE COURT:** Because I think she -- I think you
16 covered your portion. You pointed out that she said this
17 previously, and you asked her questions where she
18 distinguished between this case and the other case. But I
19 think going further into this would -- is it Vandergraf (sic)?

20 **MS. TOOMBS:** Warf.

21 **MR. BUSHELL:** Vanderwarf.

22 **THE COURT:** Vanderwarf, what he said the mother said,
23 I think that's -- that's too far, and I think it would be
24 unfair.

25 **MR. BUSHELL:** Fair enough.

1 **THE COURT:** I think you've countered what -- I think
2 the jury gets both sides, why she thinks this is different.
3 But I think going into the other is a whole nother area.

4 **MR. BUSHELL:** Fair enough.

5 **THE COURT:** I don't think we should
6 (unintelligible) -- I am curious what you are doing in other
7 rooms in our court.

8 **MS. TOOMBS:** Texting.

9 (Proceedings resume in open court at 4:18:59.)

10 **Q. (BY MR. BUSHELL)** Doctor, sorry about the delay.

11 **A.** Uh-huh.

12 **Q.** So to make sure we're clear, do you see a distinction
13 between whatever case that was where you opined on the opinion
14 of that particular five-year-old --

15 **A.** Right.

16 **Q.** -- and this?

17 **A.** Yeah, I do.

18 **Q.** Okay.

19 **A.** A significant distinction.

20 **Q.** Do you have any reason to believe that this
21 four-year-old, Brylee Shepherd, what she saw does not account
22 for these injuries?

23 **A.** There's -- there is no scientific way to conclude
24 that the statements provided that Boston caused injuries that
25 resulted in a fatal injury to Lincoln did not occur. There is

1 no scientific way for to -- to say that that isn't the cause
2 of his fatal injuries. That's, I think, the simple and
3 fundamental basis for my opinions here is that little kids
4 hurt kids.

5 Little kids can crack children's heads and can result --
6 can cause injuries by the weight of their bodies and the
7 weight of their momentum to result in a fatal injury. And
8 there's nothing about this case that allows me to say that
9 didn't happen.

10 **Q.** Do little kids always, to the most minute detail, in
11 chronological order, in recounting something, get it exactly
12 right?

13 **A.** They never --

14 **MS. TOOMBS:** Objection, Your Honor. There's no
15 foundation for that.

16 **THE COURT:** I'm going to sustain that objection.

17 **MS. TOOMBS:** And move to strike the answer.

18 **THE COURT:** And strike the answer.

19 **Q. (BY MR. BUSHHELL)** In your experience, with your
20 familiarity of cases you've been on, and in the literature
21 that you have observed and read and studied in case studies
22 throughout the world, have you ever come across cases where
23 children are a witness, recount what they saw?

24 **A.** I -- I've reviewed children's witness statements
25 literally by the hundreds over the years, almost -- if there

1 are children around that can speak, they are often interviewed
2 as part of, not only the criminal investigation, but as part
3 of the inquiry about children who have been the victim of --
4 of abuse, especially sexual misuse and so forth. So I have
5 read hundreds and hundreds and hundreds and made a correlation
6 between children's statements and the -- the medical evidence
7 on many occasions.

8 Q. And in all of those, do you see scenarios where the
9 child didn't tell it exactly right or there were some
10 discrepancies?

11 A. They -- they very rarely --

12 MS. TOOMBS: Objection, Your Honor. There's still no
13 foundation that's been laid for this opinion.

14 THE COURT: Okay. Counsel, why don't you approach.

15 (Discussion at the bench at 4:22:20.)

16 MS. TOOMBS: Happily.

17 THE COURT: Huh?

18 MS. TOOMBS: Happily. You've got a fan here.

19 THE COURT: Do you just want to stay?

20 MS. TOOMBS: Can I?

21 MR. BUSHELL: I thought I laid the foundation after
22 the objection. If not, I'm --

23 THE COURT: I'm worried about you getting into expert
24 opining about the truthfulness of children. I think that's
25 the function of the jury.

1 **MR. BUSHELL:** Sure. That's fine. I'll move on.

2 **THE COURT:** Okay.

3 (Proceedings resume in open court at 4:22:54.)

4 **MS. TOOMBS:** Your Honor, we could -- we would just --

5 **MR. BUSHELL:** That objection was sustained, for the
6 record.

7 **MS. TOOMBS:** Thank you. And we would move to strike
8 the question and the answer.

9 **THE COURT:** I don't know that she answered, did she?

10 **MR. BUSHELL:** She didn't.

11 **Q. (BY MR. BUSHELL)** Doctor, you testified,
12 cross-examination, that we all agree, Lincoln Penland did not
13 do this to himself.

14 **A.** I agree.

15 **Q.** Somebody else caused these injuries.

16 **A.** Yes.

17 **Q.** But the science can't tell you who did.

18 **A.** That's correct.

19 **Q.** The medicine, the -- the science can't tell us
20 whether it was an adult or whether it was a child.

21 **A.** Absolutely not.

22 **Q.** And given the facts, given the evidence, given the
23 science to be proved, your opinion of these two scenarios,
24 which is more likely, which is more reasonable, which is more
25 plausible, which is more explainable, based on the evidence?

1 **MR. BUSHELL:** Your Honor, I'm going to object at this
2 point. This is outside the scope. We're now -- outside the
3 scope of redirect, which was within the scope of cross.

4 **MS. TOOMBS:** I thought that he asked her about the --
5 the statements in the interview. So if he didn't, I will
6 withdraw that.

7 **MR. BUSHELL:** I didn't.

8 **MS. TOOMBS:** I thought that he had.

9 **THE COURT:** I thought that you had as well. You're
10 saying you didn't?

11 **MR. BUSHELL:** Not that I recall. We did not talk
12 about the video. No.

13 **MS. TOOMBS:** Okay. I'll withdraw it. I apologize.

14 **THE COURT:** Okay.

15 **Q. (BY MS. TOOMBS)** You are very adamant that you
16 can't -- that you have to consider the plausible evidence,
17 correct?

18 **A.** Yeah.

19 **Q.** That's what you just testified?

20 **A.** Yeah. You're supposed to -- you're supposed to do a
21 complete review, develop a differential diagnosis, and answer
22 the questions to the limits of the evidence.

23 **Q.** And in fact, you have, in the past, written that in
24 cases of children that have -- excuse me -- that have no
25 evidence of prior abuse, no evidence of acute fresh injuries

1 in a pattern diagnostic of assault, and the injury is
2 consistent with a single impact consistent with a fall,
3 accidental injury must be considered. You've written that in
4 the past, correct?

5 **A.** Yes, ma'am.

6 **Q.** And in fact, that was written in a report that you
7 prepared when you were retained by Cathy Henderson, correct?

8 **A.** Yes.

9 **MR. BUSHELL:** Your Honor.

10 **MS. TOOMBS:** And --

11 **MR. BUSHELL:** Again, scope.

12 **MS. TOOMBS:** This is plausibility. It goes to
13 plausibility and it clearly goes to her statements.

14 **MR. BUSHELL:** My -- my question was struck. It was
15 objected to regarding plausibility and possibility. She
16 wasn't allowed to answer.

17 **MS. TOOMBS:** Not that -- not that question.

18 **THE COURT:** Yeah, I agree. You can ask.

19 **MS. TOOMBS:** Thank you.

20 **Q. (BY MS. TOOMBS)** That case involved the death of a
21 two-month-old baby, and you said, accidental injury must be
22 considered. That child was found buried in a cardboard box --

23 **A.** That's not correct.

24 **Q.** -- correct?

25 **A.** That's not correct. That's not correct, ma'am.

1 Q. This is not your report?

2 A. That's -- that is -- that case has gone to -- that
3 case has gone to appellate court and a lot of the original
4 findings were not --

5 Q. At the time that you wrote your report --

6 MS. TOOMBS: May I approach, Your Honor?

7 THE COURT: Yes.

8 Q. (BY MS. TOOMBS) This is your report, correct?

9 A. Yes, ma'am.

10 Q. And at the time that you wrote your report, you
11 state, "Brandon was in the care of Cathy Henderson and
12 reportedly died on or around January 21st, 1994. Brandon's
13 body was found approximately 18 days later buried in a
14 cardboard box."

15 A. That's correct.

16 Q. That's not what you wrote.

17 A. That's what I wrote. Yes, ma'am.

18 MS. TOOMBS: No further questions.

19 THE WITNESS: Well --

20 THE COURT: Okay. From the defense?

21 FURTHER EXAMINATION

22 BY MR. BUSHELL:

23 Q. Dr. Ophoven, would you like to provide an explanation
24 for that?

25 A. Yes. My involvement in that case was that this woman

1 was charged and originally convicted of having caused the
2 death of this child, and she was actually sentenced to death.
3 Her conviction was ultimately reversed because the findings in
4 the case were entirely consistent with the fall that she
5 described.

6 So this is a -- this is a very high-visibility case. She
7 was -- her conviction was reversed on the basis of her having
8 been accused of having caused the injury and the original
9 testimony by the -- by the state's witnesses.

10 Ultimately, it was found that she indeed -- this was the
11 consequences of a -- of a drop-fall impact. So the -- the
12 baby actually did die from a fall. So this was not a good
13 case to pick.

14 **MR. BUSHELL:** Thank you, Doctor.

15 **THE COURT:** Okay. From the State?

16 **MS. TOOMBS:** If I may have just one moment,
17 Your Honor?

18 **THE COURT:** You may.

19 **FURTHER EXAMINATION**

20 **BY MS. TOOMBS:**

21 **Q.** Her conviction was overturned, that's correct.

22 **A.** And her death penalty --

23 **Q.** Sharply divided, but she did plead guilty before
24 new -- new trial, correct?

25 **A.** I don't know the details of that. She was -- her

1 conviction was overturned. Her death penalty was
2 overturned --

3 **Q.** She was --

4 **A.** -- and the testimony at -- at the proceedings was
5 that the case was entirely consistent with a fall. She
6 pled --

7 **Q.** She was --

8 **A.** I -- she -- she made a plea so that the -- so that
9 everything ended, but she was no longer on death row. And the
10 testimony from everyone from all over the country was that the
11 findings were entirely consistent with a fall.

12 **Q.** So they -- they gave her a new trial, and prior to
13 going to trial again, she pled guilty.

14 **A.** So -- I don't know to what.

15 **MS. TOOMBS:** No further questions.

16 **THE COURT:** Any further questions from the defense?

17 **MR. BUSHELL:** No, Your Honor. Thank you.

18 **THE COURT:** Okay. Does any member of the jury have a
19 question they'd like to ask Dr. Ophoven? It looks like
20 there's several.

21 Dr. Ophoven, you might not be used to this. We don't
22 always do this, but we are allowing the jurors to ask
23 questions. So the process is they write them down, hand them
24 to the bailiff, he brings them up here. I meet with counsel.
25 If they're legally appropriate, we ask you.

1 Okay. Counsel, if you'll join me at the bench.

2 (Discussion at the bench at 4:32:40.)

3 **THE COURT:** Thank you. Oh, wow. That's just the
4 first one I opened. (Unintelligible)

5 **MS. TOOMBS:** What -- what does that say? She can't
6 answer (unintelligible).

7 **MR. BUSHELL:** She can.

8 **MS. TOOMBS:** Yeah (unintelligible).

9 **MR. BUSHELL:** (Unintelligible)

10 **MS. TOOMBS:** I agree. I don't know that she can --
11 she can't opine on that because that's not her -- that's not
12 her (unintelligible). She can't do -- she can't answer from
13 here down.

14 **MR. BUSHELL:** Oh, boy.

15 **MS. TOOMBS:** Okay. I think she's already said
16 (unintelligible).

17 **MR. BUSHELL:** It's not (unintelligible).

18 Quantitative isn't a -- a term that's --

19 **MS. TOOMBS:** That's the science of it.

20 **MR. BUSHELL:** It's (unintelligible).

21 **MS. TOOMBS:** Yeah. He's asking for a scientific --

22 **MR. BUSHELL:** (Unintelligible) your question.

23 **THE COURT:** She generated a lot of interest.

24 **MS. TOOMBS:** So (unintelligible).

25 **MR. BUSHELL:** We're fine with all that.

1 **MS. TOOMBS:** Okay. So, yes.

2 **THE COURT:** Everybody is okay with this one?

3 **MS. TOOMBS:** Yes. Okay. And this one, don't you
4 think this might be speculation (unintelligible)? Oh, my God,
5 there's more on the back.

6 **MR. BUSHELL:** (Unintelligible) I think that one calls
7 for speculation.

8 **MS. TOOMBS:** Yeah, I think (unintelligible).

9 **MR. BUSHELL:** (Unintelligible)

10 **THE COURT:** Can you see this?

11 **MS. TOOMBS:** (Unintelligible)

12 **MR. BUSHELL:** (Unintelligible) Well, it's as
13 irrelevant as --

14 **THE COURT:** Huh?

15 **MR. BUSHELL:** This would be hearsay. If the
16 objection to --

17 **MS. TOOMBS:** It's not hearsay. This is now an
18 in-court statement. So the question is, are you aware that
19 Brylee knew about a possible reward for going to the CJC?
20 That's part of the evidence in the case and I think that that
21 can be -- I mean, it may factor into her --

22 **THE COURT:** So are all the other four okay?

23 **MS. TOOMBS:** I think we all agree that this one might
24 be speculation.

25 **THE COURT:** Number three?

1 **MS. TOOMBS:** I think it's a good question. I think
2 it shows they're thinking, but --

3 **THE COURT:** About the pants.

4 **MR. BUSHELL:** I think it calls for speculation
5 (unintelligible).

6 **THE COURT:** I -- I think three does. Do you both
7 agree on that one?

8 **MS. TOOMBS:** Yeah.

9 **THE COURT:** We can mark that --

10 **MR. BUSHELL:** We don't -- we don't agree that
11 (unintelligible).

12 **THE COURT:** What?

13 **MR. BUSHELL:** The last, number five. We don't think
14 the doctor can testify to that. The last one there.

15 **THE COURT:** You think she can?

16 **MR. BUSHELL:** She cannot.

17 **THE COURT:** Oh. Can I ask her then? I mean, are you
18 objecting to me asking it?

19 **MR. BUSHELL:** We are objecting to it.

20 **MS. TOOMBS:** And I would -- and my response to the
21 objection, I'm not sure what the legal -- I guess, maybe I
22 should ask, what's the legal basis for the objection to the
23 question?

24 **MR. BUSHELL:** The same legal basis that she can't
25 opine on the credibility of the daughter --

1 **MS. TOOMBS:** Well, the --

2 **MR. BUSHELL:** -- of the girl.

3 **MS. TOOMBS:** No. The difference is that in this,

4 Bry -- she has testified that she watched Brylee -- or that

5 she knows what Brylee said, and that's a statement. They're

6 just checking to make sure that she knows because none of us

7 asked about that. We've talked about --

8 **MR. MILES:** (Unintelligible)

9 **MS. TOOMBS:** Yeah. Yeah. We're not asking if she's

10 aware of it.

11 **MR. WIDDISON:** If it's just asking her whether she's

12 aware of it, I guess she can say yes or no to that.

13 **MR. BUSHELL:** That's fine.

14 **MR. MILES:** So she can say yes or no?

15 **THE COURT:** It -- it's fine to ask it?

16 **MR. BUSHELL:** We'll let --

17 **MS. TOOMBS:** Yeah.

18 **MR. BUSHELL:** No. We'll let the Court decide. Our

19 objection stands, but we'll let the Court decide.

20 **MS. TOOMBS:** (Unintelligible)

21 **MR. BUSHELL:** (Unintelligible)

22 **THE COURT:** I -- I think it's all right. I don't see

23 the problem.

24 **MR. BUSHELL:** Okay.

25 **MS. TOOMBS:** I think we're all --

1 **THE COURT:** So on -- before we move on --
2 **MS. TOOMBS:** Okay.
3 **THE COURT:** -- on these five, there was an objection
4 to five, which I overruled, and then both sides do not want me
5 to ask three, correct?
6 **MR. BUSHELL:** Correct.
7 **MS. TOOMBS:** I wouldn't go so far as to say I don't
8 want you to ask it. I just think that it's probably
9 speculation.
10 **THE COURT:** But that it would be speculating.
11 **MS. TOOMBS:** Correct.
12 **THE COURT:** Okay. Well, that's that. Okay. And
13 what's next?
14 **MS. TOOMBS:** Okay. This one is --
15 **MR. WIDDISON:** We'd have to object to the judge,
16 then, asking the question.
17 **THE COURT:** Bob Echard has, successfully, which hurt
18 my feelings.
19 **MS. TOOMBS:** Oh.
20 **THE COURT:** Yeah.
21 **MS. TOOMBS:** I agree with that question. I think
22 counsel does, too. That's the --
23 **MR. BUSHELL:** Yeah.
24 **THE COURT:** You're okay with this one? So I can ask
25 this one.

1 **MS. TOOMBS:** This is the vital signs question.

2 **MR. BUSHELL:** That's a good question.

3 **THE COURT:** No objection to this question?

4 **MS. TOOMBS:** (Unintelligible) look at both sides. I
5 think that one's okay; that one's okay; that one's okay.
6 Yeah, those are fine.

7 **THE COURT:** No problem with any of these?

8 **MS. TOOMBS:** Uh-uh.

9 **MR. BUSHELL:** No.

10 **THE COURT:** Okay.

11 **MR. BUSHELL:** And then this one, we have -- they're
12 asking for quantitative physics.

13 **MR. WIDDISON:** It -- it seems like to me. I -- we
14 don't know, but --

15 **MS. TOOMBS:** Yeah.

16 **MR. WIDDISON:** -- but just by using the word
17 quantitative (unintelligible).

18 **MR. BUSHELL:** It may be harkening back to Dr. Ulmer
19 said that it would be quantitatively tricky to say when the
20 fractures happened.

21 **MS. TOOMBS:** No, no. She -- I don't -- I don't
22 recall her ever using the word "quantitatively" anything. I
23 think this is -- this is more in response to the -- her
24 mathematical discussion earlier.

25 **MR. BUSHELL:** I agree that that's probably true, but

1 I asked Dr. Ulmer that because she had said it at the
2 preliminary hearing and I asked her, now, isn't it true
3 that -- you know, but I agree with the State. I think we all
4 agree that that's not what they're getting at here. These are
5 questions that are --

6 **MS. TOOMBS:** Outside her accuracy.

7 **THE COURT:** So do we agree I should or should not ask
8 these questions?

9 **MS. TOOMBS:** Do not ask those questions.

10 **THE COURT:** Which ones?

11 **MS. TOOMBS:** Well, can I -- can I put a sticky?

12 **THE COURT:** Don't mark on there? Mark on the sticky,
13 yeah.

14 **MR. WIDDISON:** So just put everything below the
15 sticky note and write --

16 **MS. TOOMBS:** Yeah. So impacted her
17 (unintelligible) --

18 **MR. BUSHELL:** Should we do the first two?

19 **MS. TOOMBS:** Yeah. I don't know about the size of --
20 this also asks for a biomechanical kind of a --

21 **MR. BUSHELL:** This asks -- this asks for what -- any
22 observer who has seen situations like this over 35 years can
23 answer it. The size of the impact is significant.

24 **MS. TOOMBS:** Okay.

25 **THE COURT:** So which one do I not ask?

1 **MR. WIDDISON:** Just the first two?

2 **MS. TOOMBS:** Uh-huh.

3 **MR. BUSHELL:** Just the first two questions.

4 **THE COURT:** Do not ask them?

5 **MS. TOOMBS:** No, ask them.

6 **THE COURT:** Ask them, but not the remainder? Okay.

7 **MS. TOOMBS:** Does that make sense?

8 **THE COURT:** Yep. You're okay with that as well?

9 **MR. BUSHELL:** We are, yes.

10 **THE COURT:** Okay.

11 **MR. WIDDISON:** Is that all of them?

12 **THE COURT:** Huh?

13 **MR. WIDDISON:** That's all of them?

14 **THE COURT:** We're -- yeah. Do you want me to go
15 through them all again or are you (unintelligible)?

16 **MR. BUSHELL:** No.

17 (Proceedings resume in open court at 4:43:20.)

18 **THE COURT:** Okay. Members of the jury, there's a few
19 questions we can't ask. I'm worried about some of the others
20 because you've used big words. Now, I -- I can read the
21 handwriting, but they're just large words so I'll probably
22 struggle with some of that.

23 Okay. Doctor, here we go. First question.

24 Would it be accurate to say that either an adult or a
25 very young person inflicted the skull fracture that ultimately

1 proved fatal?

2 **THE WITNESS:** Yes.

3 **THE COURT:** Okay. Would the size of the impact be
4 significant in this case?

5 **THE WITNESS:** The size of the impact. It could vary.
6 So it could be a -- it could be a -- the head being impacted
7 on one side and -- and being crushed against the floor or it
8 could be a smaller thing impacting the other side of the head,
9 so it could vary in -- in surface area.

10 **THE COURT:** Okay. Is it fair to say that much of
11 your testimony is in your review of the autopsy and the
12 conclusion drawn by the person performing the autopsy?

13 **THE WITNESS:** No, that's not correct.

14 **THE COURT:** Okay. Did Lincoln sustain the following
15 injuries: One, skull fracture and subsequent complications;
16 two, broken bone in the left arm; three, broken bone in the
17 right arm; four, trauma to the spine in the cervical region;
18 five, trauma to the spine in the lumbar region?

19 **THE WITNESS:** The -- there was blood in the cervical
20 and lumbar spine in the subdural area that is typically the
21 consequence of staying in the hospital for a period of time,
22 and blood from the subdural space drains by gravity down
23 into -- into the spinal canal.

24 There was no trauma to the spinal cord, to the
25 ligaments, or to the vertebral bodies. There was no evidence

1 of trauma to the spine or spinal cord. Simply blood draining
2 down which is -- which typically occurs from a -- from blood
3 in the -- in the subdural space upstairs.

4 So there was trauma to the -- to the right arm,
5 trauma to the left arm, and the injuries associated with the
6 fracture.

7 **THE COURT:** Okay. Would it be accurate to say that
8 Lincoln would likely have survived all the injuries except
9 skull fracture and subsequent complications?

10 **THE WITNESS:** The -- the -- yes. He would have -- he
11 would have not had significant complications from the -- from
12 the problems with the humerus. Those would have healed
13 without treatment or immobilization. Had they not taken the
14 X-rays, they probably would not have known they were there.

15 And the problems in the spinal canal would not have
16 left him -- because the spinal cord was normal, would not have
17 left him with deficits.

18 So the only thing that really was a permanent injury
19 was the -- the injury associated with the fracture.

20 **THE COURT:** Okay. In your opinion, can a reasonable
21 person conclude that the injuries listed above occurred on
22 February 19, 2014, at some time between 7:00 a.m. and
23 5:00 p.m.?

24 **THE WITNESS:** Yes.

25 **THE COURT:** Okay. Next question. You said that

1 Lincoln arrived at the hospital with vital signs. What does
2 vital signs mean?

3 **THE WITNESS:** When we're looking at a person who
4 arrives to an emergency room, we're looking first and foremost
5 whether they're breathing, whether they have a pulse, whether
6 they have blood pressure, and whether or not they're
7 circulating from -- when we -- when you push on your finger,
8 you'll see that it empties, it turns white and then pretty
9 rapidly fills again. That's called capillary refill.

10 Vital signs have to do with whether or not the person
11 is -- is showing evidence that their body is -- is
12 sufficiently oxygenating -- or that the body is breathing,
13 that the pulse is strong, and the blood pressure is adequate.
14 So stable vital signs means that there had not been cardiac
15 arrest or anything interfering with normal brainstem function.

16 **THE COURT:** And then a follow-up: Can it include
17 shallow breathing, nonresponsive?

18 **THE WITNESS:** Nonresponsive means that the -- that
19 the brain vital signs are not okay. So that's -- the neuro --
20 the neurologic vital signs are not okay. As measured by the
21 Glasgow coma score, if you're nonresponsive, that means you
22 don't respond to pain, which he was responding to pain, but
23 his level of consciousness was reduced.

24 **THE COURT:** Okay. Next questions: Will your
25 compensation or invoice amount differ based on a win or loss

1 of the trial for the defense?

2 **THE WITNESS:** Of course not.

3 **THE COURT:** Two -- or next question. If Lincoln was
4 dragged or lifted by the arm while twisting, would it not have
5 been likely to see additional damage to the cartilage or even
6 possibly pull the arm out of socket?

7 **THE WITNESS:** No, not necessarily, at all.

8 **THE COURT:** Okay. Next question. Is it possible
9 that if you had consulted with a biomechanical engineer and a
10 test conducted, it could have ruled out Boston's ability to
11 inflict the injuries seen in Lincoln given the seriousness --
12 or given the scenarios -- excuse me -- in Brylee's statement?
13 Do you need me to say that again?

14 **THE WITNESS:** No. No, I understand. It's, like, if
15 I had consulted with a biomechanical engineer, could I have
16 ruled out the Boston theory of -- of injury. And I already --
17 having done enough biomechanical consulting and understanding
18 the nature of the amount of force that can be generated from a
19 variety of scenarios, I am already aware that the -- a
20 biomechanical analysis would not have ruled out physical
21 trauma from the three-year-old.

22 **THE COURT:** Okay. Next question. Are you aware that
23 Brylee knew about a possible reward, parenthesis, animal,
24 closed parenthesis, for going to the CJC, which wasn't public
25 knowledge?

1 **THE WITNESS:** I don't understand that question.
2 Who's Rylee (sic)?

3 **THE COURT:** Did I say Rylee (sic)?

4 **THE WITNESS:** Oh, Brylee.

5 **THE COURT:** Brylee, uh-huh.

6 **THE WITNESS:** Would you read it again?

7 **THE COURT:** Okay. Are you aware that Brylee knew
8 about a possible reward, parenthesis, animal, closed
9 parenthesis, for going to the CJC, which wasn't public
10 knowledge?

11 **THE WITNESS:** What's the CJC?

12 **THE COURT:** That's the -- do you mind if I -- it's
13 the Children's Justice Center. That's where the interview was
14 taking place.

15 **THE WITNESS:** Oh, yes. I was.

16 **THE COURT:** Okay. Next question. You stated there
17 was, quote, absence of trauma to the brain, closed quote.
18 When Lincoln was inflicted with blunt force to his lower right
19 side of his skull and his brain would start to swell, isn't
20 that trauma to his brain because of ICP, intracranial
21 pressure?

22 **THE WITNESS:** There's a -- I'm making a distinction
23 between traumatic disruption of brain tissue. For instance,
24 if I fall and break my arm, the arm is broken versus
25 consequences of the impact to the head resulting in increased

1 pressure. So complications -- it certainly is complications
2 from the impact, but there was no disruption of brain tissue
3 from the fracture event. So there's no bruising to the brain,
4 there's no bleeding in the -- inside the brain. There's no
5 tearing of the -- of the dura. There's no traumatic
6 devastation of brain tissue like you would see in a more
7 serious impact where the bones can actually tear brain tissue
8 or, more commonly, where we see bruises on the brain following
9 a forceful impact. You can actually see bruises on the brain
10 in the area where the impact occurred if -- if it's a
11 higher-force impact. So there was not traumatic disruption of
12 brain tissue from the force of impact.

13 **THE COURT:** Next question. You said there's no
14 bruising from a shoulder grab. Wouldn't there be bruising
15 from another child grabbing the arms and then throwing the
16 infant?

17 **THE WITNESS:** Well, there's a lot of scenarios where
18 you would be seeing bruising, but if he -- if he took him by
19 the hand and just pulled him up or yanked on his -- on his
20 hand and pulled him upwards, you wouldn't expect to see
21 bruising from -- from that. And -- and we commonly see
22 abnormalities like this one when parents, for instance, pick
23 a -- a heavy baby up by -- by their hands. You can see little
24 abnormalities at the wrist or at the elbow or at the shoulder
25 without there being grab marks or bruising. So it has to do

1 with the delicate tissue at the -- at the -- at the growth
2 plate.

3 **THE COURT:** Okay. Were there any other questions
4 from the jury? It looks like we have at least one.

5 Counsel, if you'll join me at the bench.

6 (Discussion at the bench at 4:53:44.)

7 **THE COURT:** Thank you.

8 **MS. TOOMBS:** (Unintelligible) This is the same --
9 same question I asked Dr. Ulmer.

10 **MR. BUSHELL:** Yeah. (Unintelligible)

11 **THE COURT:** You're okay with those?

12 **MS. TOOMBS:** Uh-huh.

13 (Proceedings resume in open court at 4:54:25.)

14 **THE COURT:** Question: Does the nature of the skull
15 fracture -- fracture -- excuse me -- suggest impact with any
16 of the following: A, a flat surface similar to the top of the
17 table of the witness stand?

18 I'll stop there and then give you the next part --

19 **THE WITNESS:** Sure.

20 **THE COURT:** -- after you answer that.

21 **THE WITNESS:** Yes.

22 **THE COURT:** Okay. And B, an edge where two surfaces
23 meet like the top-front edge of the witness stand?

24 **THE WITNESS:** The fracture is, although I would have
25 expected there, perhaps, to be external evidence of a corner

1 impact on the scalp, but the impact itself could result in
2 that fracture.

3 **THE COURT:** Okay. And then C, a corner where three
4 edges meet like the top-front left corner of the witness
5 stand?

6 **THE WITNESS:** This is less consistent with that kind
7 of fracture. One would expect to see a depressed fracture
8 from a pointy impact.

9 **THE COURT:** Okay. Thank you.

10 Were there any other questions from any member of the
11 jury? Okay. Seeing none.

12 There were a few questions, you might have noticed,
13 that we didn't ask. If you are interested, after a verdict
14 comes in, we can tell you at that point why they were not
15 asked, but the great bulk of them were asked.

16 Any follow-up questions from either counsel?

17 **MR. BUSHELL:** No, Your Honor.

18 **THE COURT:** From the State?

19 **MS. TOOMBS:** No, Your Honor.

20 **THE COURT:** Okay. Thank you, Dr. Ophoven. You can
21 step down.

22 **THE WITNESS:** Thank you, Your Honor.

23 **THE COURT:** And is this a good place to break for the
24 day?

25 **MR. BUSHELL:** Well, can we have Dr. Ophoven be