IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, Plaintiff, vs. PATRICK DURAN, Defendant.	No. 1:14-CR-03762-WJ Pete V. Domenici U.S. Courthouse Bonito Courtroom Albuquerque, New Mexico Monday, August 26, 2019 10:00 A.M.

TRANSCRIPT OF PROCEEDINGS
DAUBERT HEARING RE: DEFENDANT'S PROPOSED EXPERT
VOLUME 3
BEFORE THE HONORABLE WILLIAM P. JOHNSON
CHIEF UNITED STATES DISTRICT JUDGE

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Proceedings reported by machine shorthand and transcript produced by Computer-Aided Transcription.

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(In Open Court at 10:15 A.M.)

THE COURT: This is United States vs. Patrick Duran, 14-CR-3762.

Would counsel enter their appearances for the record.

MR. MARSHALL: Good morning, Your Honor. Nicholas Marshall and Kyle Nayback for the United States.

MR. KOCHERSBERGER: Good morning, Your Honor. Don Kochersberger and John Samore on behalf of Mr. Duran, who is present. Dr. Joseph Scheller, the witness for today, is also in the gallery.

THE COURT: All right. Let me handle a couple of preliminary things before we continue with Dr. Scheller's testimony.

I took under advisement a previous objection to the scope of Dr. Hart's testimony. Dr. Hart was the treating physician of the child. He was not identified by the Government as an expert witness, and so there was an objection raised about Dr. Hart giving expert opinions because he wasn't identified as an expert witness.

I've decided to sustain the Defendant's objection. So Dr. Hart's testimony will be, in this case, will be limited to his role as the neuroradiologist in the case. However, in his area, in terms of a treating physician, he had to make decisions, and he made conclusions in the context of serving as a treating physician. So he will be allowed to give testimony

about his conclusions and what he did as a treating physician.

And some of that -- again, with medical doctors, it seems like there's always a little bit of overlap in terms of a fact witness giving some opinion testimony, but that's just the nature of the training that they undergo. In the course of treatment, they have to make and draw conclusions, and he's going to be allowed to explain why he did what he did as a treating physician. So I'll follow that up with a written order.

Now, there was also -- I mean, I understand the Government's motion to strike some of the, I think it was some of the exhibits that the defense submitted in advance of this hearing. I was trying to explain -- Document 166, which was the Memorandum, Opinion and Order Overruling Defendant's Objection to the Scope of the Daubert Motion and Granting Defendant's Request to Present Rebuttal Testimony, I went through it and I believe it's on Pages 3 and 4 that there was an issue about whether the defense was reading the Government's Daubert motion to only focus on two aspects of Dr. Scheller's opinions. That was that victims of child abuse are often found to have unexplained bruises, rib and limb fractures, scalp injuries, brain injuries and neck injuries, and that most subdural hygromas are not related to accidental or abusive trauma.

I ruled in favor of expanding -- in favor of the

Government on the overall objection that Dr. Scheller should not be allowed to testify based on Daubert and its progeny, in part because of methodology. And so in that regard, I'm allowing Dr. Scheller to do rebuttal testimony today in connection with allowing the record to be fully developed.

I'm overruling the Government's recent Motion to Strike the Notice of Foundational Material for testimony.

And then at the conclusion of the hearing, and I've got an order that's in the process of being finalized, but I'm going to require, because of the -- again, this Daubert, I think the initial hearing was back in November. So I'm going to require written closings, and I've set forth a schedule. I'm going to have the United States go first, since it's the United States' motion, and then defense, and then the Government may reply, and then I'm going to issue a written ruling on this.

I want to try to get this done as soon as possible, because I think this case needs to be prioritized. I mean, again, it's a difficult situation, and we're down -- we've got three judicial vacancies, and this isn't the only criminal case I've got by any stretch of one's imagination. But it's a 2014 case, and so I'm prioritizing this case in terms of bringing it to resolution one way or the other.

Anyway, that's how I intend to proceed. So with that, you may -- oh, yes, Mr. Marshall.

MR. MARSHALL: Your Honor, I have a question. In your order, Document 146, you had excluded a large number of defense's literature that they had attempted to supplement after the first hearing. I just want to make sure the Court's order today, I just want to make sure I'm not misreading. Does that overrule the previous order? Because much of what defense filed in the notice that didn't actually get filed is overlapping articles. So, many of those articles had previously already been excluded by the Court under Document 146, and it looked like a second attempt by defense to get those articles in before the Court.

And so I didn't know if the Court's new order is overruling 146, so that everything comes in, or if the articles and information that have previously been excluded are still excluded.

THE COURT: Well, again, I'm not interested in -- as a general rule, you know, once a trial Judge rules, I'm not interested in an end run around a ruling. But again, the problem is there was this issue over the scope of the overall Daubert motion.

So I'm going to give you a standing objection on it. I'm going to allow this testimony to go forward so there's a record developed, and then I think to the extent that the Government is claiming that the defense is doing an end run around an earlier ruling and that those matters should not be a

part of the record, or should not be considered, then that's why I'm having the order on the written closings handled that way.

MR. MARSHALL: Okay.

THE COURT: So I'm going to allow the record to be made so it's of record, and then when you all walk out of here today, there's going to be an order on how the written closings are going to be handled. And then at that point, I'm going to issue a ruling on the original Daubert motion.

So with that, you may call Dr. Scheller.

MR. KOCHERSBERGER: Two things briefly before I call Dr. Scheller, Your Honor. With respect to the articles, Document 146 excluded them because Dr. Scheller didn't mention them. So obviously our intent today is to have him mention the things that are important so that they don't have to be excluded.

THE COURT: Right, but I'm not going to prohibit them from raising an issue about --

MR. KOCHERSBERGER: I understand.

THE COURT: All right.

MR. KOCHERSBERGER: I just wanted to make clear why I don't think I'm circumventing your order. I'm trying to help comply with your order.

Secondarily, I think that the reason that this thing may have expanded beyond sort of out of controlness is that I

think Dr. Scheller, in other cases, has had opinions about the diagnosis of AHT, sort of in general, and whether or not that should be a good thing and all these sorts of things. He's not testifying about that in this case, and it's not part of the opinion that we filed. So I just want to make clear that that's not what we're trying to do here. And we'll have Dr. Scheller come up and testify, but within the scope of notice that we filed.

THE COURT: All right.

MR. KOCHERSBERGER: The defense will call Dr. Scheller.

(JOSEPH SCHELLER, DEFENSE WITNESS, SWORN)

MR. GARCIA: Please have a seat, sir, and state your full name for the record.

THE WITNESS: Joseph Scheller. S-c-h-e-l-l-e-r.

DIRECT REBUTTAL EXAMINATION

BY MR. KOCHERSBERGER:

Q. Good morning, Dr. Scheller.

A. Hello.

Q. As you recall, you testified in this same case back in, I think it was November; right?

A. Yes, sir. 2018.

Q. So I'll try not to go over the same material to the extent that we can avoid that, but some of it may be foundational, including what I want you to talk about a little bit right now,

which is just, what is your specialty within medicine?
A. I'm a pediatric neurologist. So that's a specialist pediatrician in diseases of the brain, spinal cord, nerves, muscles, and development.
Q. And as part of that professional specialization, what have you done in your medical career professionally? Like, what type of practice do you have?
A. For most of my 32 years, I've been working for children's hospitals, and that was in San Diego, California, in University of Maryland in Baltimore, and then at Children's Hospital in Washington, D.C.

And what I'm doing in those places is, I'm seeing inpatients with severe neurological problems, children who might have brain infections or strokes, or have been in bad car accidents. And then I also see outpatients, which are either follow-ups from the hospitalization or are more minor things like headaches, episodes of fainting, back pain, questions of development, that kind of thing.

Q. Do you -- is your practice specific to child abuse cases?
A. No, no, no, not at all. In fact, that's a small percentage of all the cases that I've seen in my practice over the 32 years.
Q. Did you have an opportunity to review Dr. Strickler's testimony from the last time we held a portion of this hearing?
A. Yes, sir.

Q. Are you familiar with Dr. Strickler's medical specialty?
A. Sure. That is child abuse pediatrics.
Q. How does your practice differ from that of a child abuse pediatrician?
A. Child abuse pediatricians get extra training. Every pediatrician is trained to recognize child abuse, or suspicious findings that suggest child abuse. Child abuse pediatricians get extra training in recognizing those, and that involves possibly maltreatment via sexual problems, via feeding problems, via physical force, emotional force. So child abuse is sort of a broad type of -- it presents with a broad range of possible findings or issues that suggest it.

Child neurology -- so, one small part of child abuse pediatrics is diagnosing abusive head trauma. Child neurology is involved with all aspects of head trauma. So that could be accidental falls, it could be children who stop breathing as part of a seizure, it could be children who did suffer physical abuse. So you get to see the whole spectrum of head injury and brain problems, and not just the ones that are suspicious for abusive head trauma.

Q. One of the things that we're here to talk about is the methodology that you employed to reach the various conclusions that you have in this case. I want you to talk, first, about in your regular practice of medicine, what is the methodology you use to come to medical conclusions?

A. So, you get the best history that you can as far as the medical problem, and that could be a story from the patient, if it's an older patient, or from the caregiver, a mom or dad if it's a younger patient. Then one performs a physical exam in order to try to narrow down where the problem might be based on what you learn from the history. One then does laboratory tests, which are usually blood and urine tests. They might also be, in the case of a neurologist, brain wave tests or other electrical tests that neurologists do.

So that's part number three. History, physical, laboratory tests. And then radiology, which is just imaging. Take pictures of body parts that you think might be affected, and then try to see if those pictures are relevant to a diagnosis.

Q. Is that widely accepted as the way all physicians do diagnosis?

A. Oh, yes, sir.

Q. Does your -- first of all, you said you reviewed Dr. Strickler's testimony, and I think she testified quite a bit about the methodology she used to reach her conclusions. Did your methodology that you used to reach your conclusions differ from hers in any way?

A. No, only from our experience. But we actually used the same methodology.

Q. One of the things that Dr. Strickler was able to do that

you weren't was to observe the patient in this case personally. First of all, how often does that happen in your practice?

A. It rarely happens. In other words, I do phone consults and I do consults by Skype, or those types of things. But it's rare. Ideally one would like to see the child who is having the problem and do a hands-on physical examination, and Dr. Strickler did have that advantage. She was able to do that and I was not.

Q. In some situations, do you still render diagnosis despite the fact that you haven't seen the patient personally?

A. Yes, both clinically based on descriptions of what I hear from treating physicians, let's say in an emergency or in another clinic, or based on reviewing the record weeks or months later.

For example, there are children who, let's say -- I'm in Maryland. Let's say a child was living in another state and had the whole neurological problem and hospitalization in that other state, and then moved and now they're coming to me for either a second opinion or continuing care. So I would need to review everything that they had undergone in the other state, and that would be the history, the physical exam, the laboratory tests, and the radiology, and then either agree with the previous diagnosis or say, perhaps they didn't consider something and you might consider this diagnosis.

So it does happen in my real practice. And then I do

medical-legal work like this one, and certainly it happens a lot in medical-legal.

Q. Is there anything that you lose in the process by not having personally observed the patient, and if so, what would those things be?

A. Well, it's almost like an interview, a job interview, or a date, you know. There's only so much that you can get from the information that you read online or that you're reading from data about a person. And then when you get to meet a caregiver or a child, then you just get a better sense, you can get a better sense of what's going on.

Q. Is there anything you gain by not having that personal contact?

A. Yes. And that is, very often while you're in a hospital setting and there's a lot of urgency and excitement about what's going on, people will say things that are not exactly accurate. They might try to give you their impression, which is not an unbiased impression. And so in that, I'll call thrill of the moment, one might struggle to see a bigger picture. And that's something that if you wait a week or a month or several months and then review the medical records, then you're out of that sense of urgency and you can really analyze all the findings.

Q. For your job in diagnosing pediatric neurology issues, is there a particular diagnostic sort of framework that you

utilize?
A. I didn't understand the question.
Q. I think that you had told me in earlier times, you called it a diagnostic puzzle, but it's a sort of framework that you use to diagnose neurological issues. I think you may have touched on it earlier in answering one of my other questions. But I wanted to be clear as to what that was, since your methodology is what we're largely talking about here.
A. Right. So I would call it a four-pronged puzzle or four-pieced puzzle, if we're imagining a child's puzzle, and piece number one is what you learn from the history, and sometimes that leads a person straight into a diagnosis. And sometimes it's what you learn from the physical exam, and that leads a person straight into a diagnosis. Laboratory studies, like blood tests, urine tests, electrical tests, that can lead somebody into a diagnosis. And then the fourth are the pictures, the images.

So sometimes it's one of those four, but in most cases it's a combination of the four. So you take the history, physical, laboratory tests and radiology, put them in combination, and then based on experience and training, you say, well, that leads to my diagnosis, or possibility of diagnosis of this and possibly other things.
Q. Is that something peculiar to you or is that just sort of how medicine works?

MR. MARSHALL: Objection, Your Honor. It seems like we're starting over from the very beginning of Daubert. We have not progressed to where we're rebutting the information that has come in with the other -- rebutting the information that we're supposed to be doing at this point. This seems like a brand new recitation of a rebuttal direct testimony -- or I'm sorry, a Daubert direct testimony.

THE COURT: What's your response?

MR. KOCHERSBERGER: I have three more questions about the background with respect to the methodology that he utilized, and then we are going to get into his specific opinions.

THE COURT: All right. As long as you're moving in that direction fairly quickly, then I'll overrule.

MR. KOCHERSBERGER: My concern was just that it's been almost a year since he was last here and it needs a little bit of a flow.

BY MR. KOCHERSBERGER:

Q. So, anyway, you were saying, is that peculiar to you or is that a typical thing, that diagnostic process that you use?

A. Definitely true for all the neurologists that I've ever worked with, and I've worked with a lot of other pediatric specialists and they do the same thing, whether they be cardiologists or endocrinologists, or whatever it is.

Q. One of the things that I think came up during

Dr. Strickler's testimony was whether or not you reviewed a complete set of records for the particular patient in this case. Is there anything that you're aware of that exists with respect to this patient that you did not have an opportunity to review to render your opinion?

A. No, sir.

Q. All right. Let's move into, as Mr. Marshall suggested, your actual opinions in this case, and we'll try to go through them in a systematic process here.

But before we do that, can you just sort of summarize, before we get into that detail, sort of the overall Reader's Digest version of what your opinion is in this case?

A. I always get confused. Is it "C.A." or "A.C.," and I think it's "C.A." He came to the hospital because of a seizure. That seizure was caused by a complication of a chronic condition. And then once that chronic condition -- I'm sorry; once the complication resolved, then "C" lived happily ever after. And I can elaborate on that as needed, but that's basically my opinion.

Q. Throughout the course of this case, did you review specific medical research literature to help inform your opinions in this case?

A. Well, as I was aware of medical research literature, because that's -- in order to stay current, I think almost every doctor will read the pediatric journals, and in my case

the neurology journals, sometimes the neurosurgery and some other journals.

MR. KOCHERSBERGER: All right. Your Honor, I think to make this go more smoothly, can I give the Government the binder full of the articles that we disclosed, put a binder up on the witness stand, and then if Dr. Scheller wants to refer to one of those, he can identify it and then we'll go through the process of whether or not it should be admitted?

THE COURT: Sure.

MR. KOCHERSBERGER: Just for the Court's information and for my colleague, these in this binder are numbered the way they were in the notice that we provided to the Government. As we move to admit them, I will mark them as actual exhibits in this case, and then Your Honor can rule on whether or not they should come in as exhibits. But at this point, it's just the binder full of materials.

As Dr. Scheller refers to them, and I don't expect he's going to refer to all of them, but the ones that he does say that were helpful for his opinion, then I'll go through and attempt to admit them as exhibits. Does that make sense and is that acceptable?

THE COURT: Do you object to that?

MR. MARSHALL: Yes, Your Honor, with the objections that we noted in our motion. But additionally, this is beyond the scope of rebuttal, again. This is -- they are now trying

to reintroduce Dr. Scheller in a sense almost like a brand new expert, because they're trying to lay the foundation that they couldn't and didn't lay the first time. They're not rebutting any single point that was mentioned by Dr. Hart or Dr. Strickler.

THE COURT: Yes, what is the -- he reviewed Dr. Strickler's testimony. This was noticed up for rebuttal. So, when are we going to get there? In other words, how does this have anything to do with rebutting --

MR. KOCHERSBERGER: I can explain that, Your Honor. The reason we had to bring Dr. Scheller back is because in his original testimony, he addressed just two limited areas of his opinion. Several other areas of his opinion were attacked by Dr. Strickler and the Government in the other phases of this case with Dr. Hart and Dr. Strickler, we're going to talk about those other opinions outside of the two that we've already talked about, and in order to do that, we need to have Dr. Scheller give the foundation for those other opinions, which are contained within these articles, some of them. Some of them he probably won't need to use. But since I don't know exactly what the Government is going to focus in on, these are all of the articles that he identified as being salient to his opinion.

THE COURT: Yes, but how is this rebutting Dr. Strickler's testimony?

MR. KOCHERSBERGER: Dr. Strickler challenged opinions outside of the two that we had presented testimony about at the first hearing. These are the foundational materials for those other opinions that are contained within his disclosure outside of the two that he actually already testified about.

MR. MARSHALL: And Your Honor, the defense was on notice of all of the information. In five of the subparagraphs in our notice, we talk about all of Dr. Scheller's opinions. That's also in our introduction, we're talking about all of Dr. Scheller's opinions. They were on notice of all of them. And it's disingenuous to state that they only talked about two. On direct examination of Dr. Scheller the first time, they went through all his points in his report. So they talked about all of them. So we should have had the foundation for all of them at that point. Trying to backdoor a foundation that wasn't provided in the first direct examination for the Daubert hearing is unfair. The Court excluded it once before, and we're asking you to exclude it again.

MR. KOCHERSBERGER: And we've already had this argument, Your Honor.

THE COURT: Well, I know, but part of it is, this whole thing seems to be so much more complicated than it needs to be.

You know what, I'm going to take a break, I'm going to go look at some of the transcript of the earlier hearing,

and then I'm going to make a ruling, and then we're going to try to get through this thing.

(Recess was held at 10:43 A.M)

(In Open Court at 11:23 A.M.)

THE COURT: All right. I'm going back to Document 92, which was the United States' original Motion in Limine regarding, and it's entitled, Regarding the Admissibility and Scope of Defendant's Proposed Expert Testimony, and the expert the Government said that this motion pertained to is Dr. Scheller. I'm reading from the very first paragraph.

It says: "The United States requests that as a matter of law, this Court preclude Dr. Scheller from testifying in this matter at any pretrial motion hearings or at trial because he lacks the qualifications to testify regarding the subject matter and because his opinions are not rooted in science and have not and cannot be tested."

So as far as -- and for example, in Paragraph 5, the Government then honed down on some of the examples in Dr. Scheller's report. But defense counsel was on notice as a matter of law that the United States was seeking to preclude Dr. Scheller from testifying at all. So that's a ruling I made earlier, and I'm sticking by it.

Now, after Dr. Scheller's testimony on direct, on November the 30th the Defendant filed, and it's captioned, "Mr. Duran's Amended Exhibit List for Daubert Hearing." And

it's Document 126. It was filed, I think it was November the 30th, 2018, after the first go-round of Dr. Scheller's testimony.

The Government then followed up with Document 14 -- I'm sorry. The Government then filed a motion to strike the amended Daubert list. That was Document 129 filed on December 7, 2018. And then I entered an order on that, it's Document 146, granting in part and denying in part the Government's motion to strike the amended exhibit list.

What I did allow was, there was a reference in the earlier November 19th hearing, and I ruled that the defense could provide the Massachusetts case, Commonwealth vs. Epps, which was referenced in the record, and submit it as Defendant's Exhibit 4. And then I said at the hearing, if there are other cases from other courts where Dr. Scheller's testimony is the subject of a court opinion, then I was going to allow the defense to submit supplemental case authority. And then I admitted, I think it was Exhibits 11, 13, 16, 26 and 27.

So we were talking about -- and then I said in that order that I agreed with the United States that there was no evidence presented during the evidentiary portion of that hearing to indicate that Dr. Scheller was aware of or considered the material in the amended exhibit list, Document 129, at Page 3. And I said because Dr. Scheller was

not questioned on direct or on cross-examination about these submissions, that I didn't consider it appropriate -- or I was ruling in favor of the Government on this because there was nothing in the record that at least the medical literature part of the Defendant's amended exhibit list for the Daubert hearing was relied upon by Dr. Scheller in his opinions.

Now, I'm going to read -- this is out of Black's Law Dictionary. "Rebuttal evidence: Evidence given to explain, repel, counteract, or disprove facts given in evidence by the opposing party." And so that was the purpose of today's hearing. I think at the time Dr. Strickler testified, Dr. Scheller was out of the country. So this was for rebuttal testimony. And, again, I've read the definition of what rebuttal evidence is.

Now, the Government has filed a Motion to Strike Notice of Foundational Material for today's hearing, but at this point, I have no way of going over this list of all of -- let's see. These are articles beginning with, let's see, 1 through 32. I have no way of comparing these 32 proposed articles, whether they're learned treatises or whatever they are, with what was on the original list. So I think the easiest way for this to proceed is I want to hear what the rebuttal opinion is, and then if some of this was relied upon in support of the rebuttal, then I'll let you make an offer at that point and I'll consider the objection and then rule on it.

But I'm not going to all of a sudden admit all of this stuff and then try to sort through and figure out whether it should have been given at the first hearing, because it wasn't offered then, and I'm not going to go back and redo that.

So, now, let's have Dr. Scheller resume the stand and let's hear what the rebuttal opinions are, and then if some of the material is relevant and in support of the opinion, then you can offer it. That's how we're going to proceed.

MR. KOCHERSBERGER: May it please the Court.

THE COURT: You may proceed.

BY MR. KOCHERSBERGER:

Q. Dr. Scheller, we're going to talk about some of the opinions that are reflected in your original letter that was Government's Exhibit 3 at the prior hearing, specific ones that Dr. Strickler took issue with in her testimony.

MR. KOCHERSBERGER: May I approach the witness with Exhibit 3, Your Honor?

THE COURT: Sure. Exhibit 3 is his original opinion; right?

MR. KOCHERSBERGER: That's correct, Your Honor. And I believe it was Government's Exhibit 3.

THE COURT: All right.

MR. KOCHERSBERGER: Would it be helpful if I cite to Dr. Strickler's testimony for Your Honor, as to how this is

rebuttal, or at least give you the page and line number?

THE COURT: Yes, that would be helpful, if you've got it handy.

MR. KOCHERSBERGER: I do. I won't read the quote from Dr. Strickler, but I'll at least point you to the record where she talked about the thing. That's probably the easiest way to handle that.

BY MR. KOCHERSBERGER:

Q. So, in Dr. Strickler's testimony, looking at your opinion here, you stated: "Infants who are victims of child abuse are often found to have unexplained bruises, rib and limb fractures, scalp injuries, brain injuries, and neck injuries," and then you said "C" had none of these.

At Page 84, Line 22, among other places, it appeared that Dr. Strickler challenged your testimony by claiming that there was a brain injury. So, let me ask you, how do you define a brain injury with respect to this portion of your opinion?

A. So in 2019, the best way to document a brain injury is to observe the presence of areas of brain compromise on the MRI test. The MRI test has a section of the test called the diffusion portion of the test. For example, if somebody has a stroke, somebody has a brain tumor, somebody has a brain infection, and somebody suffers a serious head injury that causes brain injury, then those areas of the brain that are compromised will show up on the MRI portion of the test. And

in "C's" case, there were none of these areas of brain compromise documented on his MRI test.

Q. And does that differ from the discussion that we've had and will be having with respect to hygromas and hematomas? And if so, how?

A. Sure. The brain is the brain, and then there's a space in between the brain and the inside of the skull. Something can go on in that space and cause a problem, but that doesn't mean that there's something that has injured or compromised the brain.

Q. All right. And how did you determine that there was no evidence of brain injury? I think you mentioned it, but just to be clear, what methodology did you employ to make that determination?

A. The methodology that neurologists use which is careful looking, observation, of the diffusion portion of the MRI test.

THE COURT: I didn't hear you. What portion of the MRI test?

THE WITNESS: It's called diffusion, and it represents a method that the MRI is able to look at areas of the brain that have been compromised.

BY MR. KOCHERSBERGER:

Q. Okay. Are those the same images that you talked about in your initial testimony that demonstrate the hygromas, or is it a different image all together?

A. Well, an MRI is hundreds of images, and the series that demonstrates the hygromas is a different series, but it's all part of the same. The child was in the scanner for an hour and they did all these techniques to document various problems that one might be able to notice.

Q. Did you have anything different that you relied upon to make this conclusion than Dr. Strickler or Dr. Hart had in their record?

A. No, it was the exact same images.

Q. Next, you indicated that "C's" head CT scan and MR scan were misinterpreted to demonstrate chronic or subacute subdural hematomas (blood clots) when, in fact, the scans revealed chronic subdural hygromas. Dr. Strickler testified that you were wrong. Page 94, Line 12 is where that starts.

But to try to have this make sense, what is your understanding of how the United States' witnesses interpreted the MR and CT scans with respect to the hematoma/hygroma issue?

A. Sure. So, again, we're talking about a collection of something that is sitting in between the brain and the inside of the skull, something that doesn't belong there. May I use an analogy?

Q. Sure.

A. If I see a person in uniform from a distance and I recognize that uniform as a military uniform, I can say, I think that person over there is in the military. If the person

next to me says, well, I know that person is in the Navy, if that person has no better vision than me, then that's taking a generality and making it into something specific.

So this is the difference of opinion I have with Drs. Strickler and Hart, is that a subdural hygroma is a general term for a fluid collection that's in a space where it doesn't belong, and that's all you can see when you look at "C's" MRI scan.

Drs. Strickler and Hart are saying, no, that's something specific. It's not just a fluid collection, it was a fluid collection that was once an acute blood clot and has now evolved or degenerated into a chronic blood clot. So they're giving it a specific label, and I'm giving it a general label because I don't believe you can make a specific call from what that looks like.

Q. All right. And what was the -- it's sort of baked into what you already said, but just to be very poignant about it, what methodology did you use to reach your conclusion about the identity of what you saw on those images?

A. So first and foremost, experience with looking at MRI scans, and then awareness of the literature that there is, indeed, something called a chronic subdural hematoma, and that there is, indeed, something called a chronic subdural hygroma, which is a less specific term and one that is widely used.

Q. Are there any specific articles that you recall reviewing

in relation to this particular subject matter?
A. Sure, there's a number of them. There's a number of articles by a Dr. Lee written in the '90s, early 2000s, and then the last one was around 2014. And his first initials are K.S. Lee.
There is an article by Dr. Cho, C-h-o, that I referred to, and there is --
Q. Let me stop you there. You said Dr. Cho; right?
A. Yes. I think that was in and around 2005.
MR. KOCHERSBERGER: All right. This is in the list that we provided at No. 22. I'm going to mark it for identification here as -- let me get my exhibit stickers.
THE COURT: Is 22 on the exhibit list?
MR. KOCHERSBERGER: It's No. 22 on the list of foundational materials. I'm going to give it an exhibit number now.
THE COURT: I meant to say foundational materials.
MR. KOCHERSBERGER: And my understanding is that the defense -- unfortunately, we both used numbers, but the defense is up to No. 29. So I'm going to mark it as that.
Can I give the witness one of these binders, and then we'll use the one that comes out of binder as the actual --
THE COURT: Yes, that makes sense.
THE WITNESS: There's one by my seat if you're running low.

MR. KOCHERSBERGER: No, I've got one, and you've got one.

BY MR. KOCHERSBERGER:

Q. I've handed you what's now been marked as Defense Exhibit 29, which corresponds with the article that was No. 22 on the Notice of Foundational Materials. Is that the Dr. Cho article that you were just referring to?

A. Yes, sir.

Q. And what type of a publication --

THE COURT: Just a second. So it's Exhibit 29?

MR. KOCHERSBERGER: It's Defense Exhibit 29. Unfortunately, the Government ended up on Government's Exhibit 29, so their next number is 30. We should have used letters, and I apologize. We didn't do that.

BY MR. KOCHERSBERGER:

Q. As I was saying, what type of a publication is this article from?

A. It's from a Korean neurosurgical journal that's written in English.

Q. Is that a peer-reviewed -- are you familiar with the journal, by the way?

A. Sure.

Q. Is that a peer-reviewed journal?

A. Yes, sir.

Q. Is it the type of thing that people in your profession

normally rely upon for medical literature of this sort?
A. Neurologists, yes.
MR. KOCHERSBERGER: And so at this time, Your Honor, I'd move to admit Defense Exhibit 29.
THE COURT: Which is the article out of the Korean -- I'm sorry, what was the name of it?
THE WITNESS: Journal of Korean Neurosurgery.
MR. KOCHERSBERGER: And to help Your Honor so that you have the full name, it's the one that was identified as No. 22 on that list that we provided earlier.
THE COURT: Okay. Now, does the Government wish to state an objection?
MR. MARSHALL: Yes, Your Honor. At this point, I don't think a foundation has been laid about how it supports his finding and how it refutes anything that was in rebuttal. He stated that this is a journal article. He hasn't mentioned in any way how he's relied on it and how it was useful in the formation of his beliefs.
THE COURT: Lay a little more foundation.
MR. KOCHERSBERGER: Sure, Your Honor.
BY MR. KOCHERSBERGER:
Q. So, what's the significance of this article with respect to your opinion?
A. This article, like the other ones I quoted, documents and demonstrates that there is such a thing called a chronic

subdural hematoma, which is, again, just an old blood clot, and there's something called a chronic subdural hygroma, which is an old collection of fluid, and that there is confusion between the two, and that they are two separate things.

Q. And is this article, or the subject of this article, something that you reviewed in order to help inform your opinions in this case?

A. Well, it's something that I was aware of. Again, because I deal with fluid collections in the brain as a part of my practice, I'm aware of the literature. But I supplied this article in order to support that awareness that I have.

MR. KOCHERSBERGER: Okay, now we move to admit the exhibit, Your Honor.

MR. MARSHALL: I don't see how that title has anything related to what the defense has even mentioned. Furthermore, I have been scanning the article, and he keeps referring to the term chronic subdural hygroma. I don't see the term chronic. And if we're dealing with definitions, these special medical definitions and trying to say that there's some sort of difference, I think the chronicity issue is important. And this article does not support his chronic subdural hygroma findings.

THE COURT: You're going to ask him that on cross-examination; right?

MR. MARSHALL: Yes, sir.

THE COURT: So doesn't the objection at this point go to weight? In other words, I'll admit it for purposes of this hearing. The Government's objection, in my view, goes to weight.

(Defense Exhibit No. 29 admitted.)

MR. KOCHERSBERGER: Thank you, Your Honor.

BY MR. KOCHERSBERGER:

Q. I believe you also mentioned -- did you say Dr. Lee was another one?

A. Yes. K.S. Lee. And there are several articles written by that gentleman. I could do the most relevant one, to save time. I'll leave that up to the Court. Or we can go through -- I think there are three or four articles in this binder from that author.

Q. Let me find them and show them to you here. So, if you look at the document that was identified in the Notice of Foundational Materials as Document 16, I'm going to mark that as Defendant's Exhibit 30 for the purposes of this hearing. If you could, just pull that out of the book so I can put the exhibit sticker on that, Dr. Scheller.

MR. KOCHERSBERGER: May I approach, Your Honor?

THE COURT: You may.

A. Yes, I'm looking at it.

BY MR. KOCHERSBERGER:

Q. Can you pull it out of the book?

A. Oh, sure.
Q. Is this one of the K.S. Lee articles that you were just discussing?
A. Yes, sir.
Q. All right.
MR. MARSHALL: I'm sorry; I got confused on the numbers. This is Exhibit 30, but what was the number --
MR. KOCHERSBERGER: 16.
THE COURT: 16 in the binder.
MR. MARSHALL: Thank you.
BY MR. KOCHERSBERGER:
Q. And with respect to your opinions in this case, what is the significance of this particular publication for your testimony?
A. This specific one, or the series? Because they really are a series that describes Dr. Lee's experience and research into understanding the difference between a chronic subdural hematoma and a chronic subdural hygroma. So that includes this article, which is Exhibit 30, Defense Exhibit 30, published in a journal called Brain Injury in 1998. But it also includes --
Q. We'll get to the other, but we have to do this sort of systematically for the record. You said there's a series of articles, of which this is one. It's contained in the Brain Injury journal; is that correct?
A. Yes, sir.

Q. Is that a peer-reviewed journal?
A. Yes, sir.
Q. Is it a journal of the type that you review in your profession as a pediatric neurologist?
A. Yes, sir.
Q. Is it considered a learned treatise for those purposes?
A. Yes, sir.
MR. KOCHERSBERGER: I move to admit Exhibit 30.
MR. MARSHALL: No additional objections other than what's already been made. And just for the record, we're not going to be objecting to the quality of the journals, so I don't know if that will save some time. The objection is how it relates foundationally to Dr. Scheller.
THE COURT: Okay. I'll note the objection, and I'll admit it for purposes of this hearing, Exhibit 30.
(Defense Exhibit No. 30 admitted.)
BY MR. KOCHERSBERGER:
Q. I'm going to ask you to pull out what's No. 18 in the book in front of you, so that I can identify it as Defense Exhibit 31.
THE COURT: Are these the Lee articles?
MR. KOCHERSBERGER: Yes, Your Honor.
THE COURT: Do you want to do them as a group, the rest of them?
MR. KOCHERSBERGER: I can, if that's easier, sure.

THE COURT: I mean, separate exhibits, but offer them at the same time.

MR. KOCHERSBERGER: Okay. So that one is No. 18, and then I believe the next one is No. 19.

BY MR. KOCHERSBERGER:

Q. Is that correct, Dr. Scheller?

A. Yes, sir.

Q. Those are both Lee articles in the series you were just describing?

A. Yes. And then there's a fourth one, as well.

Q. So we will mark what was originally 18 in the Notice of Foundational Materials, as Defense Exhibit 31.

MR. KOCHERSBERGER: May I approach?

THE COURT: Yes. Feel free to go back and forth as necessary.

BY MR. KOCHERSBERGER:

Q. And if you could remove No. 19 from the book in front of you, we'll mark that as Defense Exhibit 32.

All right. So with respect to Defense Exhibits 30, 31 and 32, does that include all of the documents in the series of Lee articles that you just described?

A. One more, sir. And that's in the notebook labeled 20.

Q. 20? Okay. Can you pull that out? We'll mark that one as Defense Exhibit 33.

MR. KOCHERSBERGER: And to be clear, now that we have

all of these, we'll move to admit all of the series that we just discussed, which are Defense Exhibits 30 through 33.

THE COURT: Same objection?

MR. MARSHALL: Yes, Your Honor.

THE COURT: I'll note the Government's objection for the record, but they'll be admitted for purposes of this hearing, for the same reason as I admitted Exhibit 30. And for the record, then, Exhibits 30, 31, 32, 33, and was it 34? What's the last one?

MR. KOCHERSBERGER: Just through 33, Your Honor.

THE COURT: 33. Those four exhibits are the series of articles authored by Dr. K.S. Lee?

MR. KOCHERSBERGER: Correct, Your Honor.

(Defense Exhibits No. 31, 32 and 33 admitted.)

BY MR. KOCHERSBERGER:

Q. Dr. Scheller, the purpose of the series of articles, now that we have them, and how that influenced your opinion in this case, is what?

A. Dr. Lee documents very clearly in that series how subdural hygromas develop, how they become chronic, how they sometimes turn into acute subdural hematomas, and if they do, then over time they will also turn into chronic subdural hematomas. And so all three are valid possibilities, and sometimes they exist without one another and sometimes they all exist together.

Q. All right. The next portion of your opinion -- again, you

can follow along with Government's Exhibit 3 -- indicates: "Pediatric neurologists and neurosurgeons encounter these often in practice when infants are referred for larger than expected head circumferences. Some develop as a result of birth, others for no known reason." Dr. Strickler had some concerns about that opinion, and that's located at Page 95, Line 19, of her transcript.

First, when you say that pediatric neurologists and neurosurgeons encounter these, what is the "these" that you're talking about in your opinion here?

A. Fluid collections between the brain and the inside of the skull, and specifically subdural hygromas.

Q. And what is the basis for your understanding of these experiences that pediatric neurologists and neurosurgeons have?

A. Well, my own experience, and then I'd refer you to an article which is No. 28 in the packet, and it's written also by a Dr. Lee, published in 2018.

Q. All right, let me mark that as Defense Exhibit 34. How does Defense Exhibit 34 pertain to your opinion with regard to hygromas encountered in the practice of neurosurgeons and neurologists?

A. Well, this is a practice of neurosurgeons, and they describe their experience at their hospital of diagnosing and treating patients with this exact condition.

Q. Was there another that you were indicating that relates to

this part of your opinion?
A. Yes, sir. A similar experience was had by a Dr. Hellbusch, H-e-l-l-b-u-s-c-h, and that is File No. 30 in the packet. And again, Dr. Hellbusch is a neurosurgeon, so he describes his practice.
Q. We'll mark what was previously noticed as Article 30 as Defense Exhibit 35.
It looks like you took this Hellbusch article from Tab 31, right, not 30, just to be clear?
A. Could be. That's right.
Q. Nonetheless, it's Defense Exhibit 35, and the import of Dr. Hellbusch's article, with respect to your opinions related to the experience of neurosurgeons and neurologists, is what?
A. Identical to what I learned from the Dr. Lee article of 2018, which was the previous exhibit. Not K.S. Lee, but the other Lee.
Q. As I under- -- were there any others?
A. There's just one other, and that is, I believe -- and I was going to say No. 30, but now I'm not sure. It's an article Dr. Wiig, W-i-i-g, and that is an epidemiologic or population-based study of children with large heads in Norway.
Q. All right. Then we'll mark that article by Dr. Wiig that was identified in the Notice as No. 30 as Defense Exhibit 36.
MR. KOCHERSBERGER: We move to admit those three articles, 34, 35 and 36, at this time, subject to their

objections.

MR. MARSHALL: And again, Your Honor, the objection to this one is foundation. These are all related to hydrocephalus or BESS. Dr. Scheller says that "C.A." does not have this condition, so their relevance on this proceeding seems moot.

Dr. Plunkett had initially proposed the possibility of the child having BESS, but the doctors from the prosecution side, as well as Dr. Scheller, seem to be in concurrence that this is not a condition that "C" had. So the relevance of these articles it seems is meaningless in this case.

THE COURT: I'm sorry, what's the condition?

MR. MARSHALL: Hydrocephalus, or BESS. In Dr. Scheller's first testimony -- and that stands I think for benign extra either subdural or subaxial space. In Dr. Scheller's first time here, about a year ago, he said that "C" did not have that condition.

THE COURT: How is it relevant, then, if everyone is in agreement?

MR. KOCHERSBERGER: I don't know if everyone is in agreement, so I guess we'll ask Dr. Scheller.

BY MR. KOCHERSBERGER:

Q. Is that an accurate representation of your opinion with respect to this case?

A. The other attorney did quote me correctly, that I did not

believe that "C" -- I don't believe that "C" had the excess fluid condition between the brain and the first membrane. May I explain just to make it clear?

Q. Yes.

A. Fluid can accumulate in all kinds of wrong places and cause a child's head to get too big. One of the places it can accumulate is immediately outside the brain underneath the first layer of covering, the first layer I call the ceiling of the brain. So in between the brain and the ceiling, a fluid accumulation would be called BESS, as the other attorney suggested, and "C" did not have that.

Another type of fluid accumulation is in between the ceiling and the roof, which I would use as an analogy to the place under the dura, subdural, which I'm talking about the subdural hygroma, and when that happens, fluid accumulates as well. It's just in a different compartment. And that's what I've been suggesting that "C" has.

The term that the other attorney used, I'd say very reminiscent of Dr. Strickler and Dr. Hart, is that he used a general term and then a specific term. Just like I gave the analogy with the uniform, hydrocephalus just means too much fluid. Too much fluid could be between the roof and the ceiling, or too much fluid could be between the brain and the ceiling.

So I don't want there to be any confusion. Hydrocephalus

is just a general term. BESS, as the other attorney said, is a very specific term, and I will say, and did say, that "C" did not have BESS according to what I saw in the records.

Q. And these particular articles that were identified as Defense Exhibits 34, 35 and 36, I believe, are those restricted to BESS or the more general term that you were just talking about, the hydrocephalous?

A. Some talk about hydrocephalous in a general term, and some talk about both hydrocephalus from too much fluid between the roof and the ceiling, or too much fluid under the ceiling.

MR. KOCHERSBERGER: With that explanation, then, we renew the motion to admit.

THE COURT: Well, the relevance is very limited, because I guess everyone is in agreement that that condition that's referred to as BESS is not applicable in this case. It's got a limited relevance, but all admit it for purposes of this hearing.

(Defense Exhibits No. 34, 35 and 36 admitted.)

MR. KOCHERSBERGER: I'll just ask one follow-up question for Dr. Scheller. Hopefully I'm understanding correctly.

BY MR. KOCHERSBERGER:

Q. Dr. Scheller, you're saying that "C" did not have BESS, but that he did have a different type of hydrocephalus that's reflected in these articles; is that correct?

A. Yes, sir.
Q. Okay. Next in your opinion you say that most are not related to accidental or abusive trauma. Dr. Strickler disputed this. It starts at Page 99, Line 20 of the transcript.
First, when you say most, most what are you talking about in your opinion?
A. Most chronic subdural hygromas.
Q. So most chronic subdural hygromas are not related to accidental or abusive trauma; is that correct?
A. Yes. And I am talking about young children. It would be a whole other story if we were talking about senior citizens or another group.
Q. All right. Are there any research articles related to this that you relied upon, or that you're familiar with, about the cause of most chronic subdural hygromas?
A. Yes, sir.
Q. All right. And are those articles we've already talked about? If so, which exhibit? And if not, which ones?
A. Yes. That would be included in the Hellbusch article. It would be included in the Cho and the Park -- I'm sorry, I didn't say Park -- in the Cho and the Lee, not K.S., articles. And it would be within the K.S. Lee articles, as well.
Q. And those are all articles that have already been admitted?

A. Yes, sir.
Q. Then your opinion goes on to talk about: "Subdural hygromas of infancy are usually benign, but they can occasionally cause small brain surface hemorrhages. These occur for two reasons. Small vessels that course from the inner skull to the brain surface are stretched by the fluid accumulation and can tear and leak blood. The body attempts to wall off the fluid collection and builds a membrane. This membrane is vascular and can leak blood. A small surface hemorrhage is apparent on C's head CT and MR scans."
I believe you testified about all of this at your earlier portion of the testimony, but just to be clear, with respect to this part of your opinion, how did you arrive at that conclusion?
A. Again, experience, but also in the articles by Park, by both Lees, and in the articles by somebody that I haven't quoted before, and this is a hard name to pronounce, Wittschieber. And I'm going to tell you which one that is. It's 29, I believe, or at least I had it as 29.
Dr. Wittschieber describes that mechanism, and then finally, there is --
Q. Hang on one second. With respect to Dr. Wittschieber, that was identified as Article No. 29 on the list. I don't believe we have admitted that as an exhibit yet; right?
Dr. Scheller, it's not in your --

A. We have not.
Q. It's still in your book?
A. Yes, sir.
Q. Okay. So let's call that Defense Exhibit 37, the Wittschieber article.
MR. MARSHALL: Which number was that?
MR. KOCHERSBERGER: It was No. 29 in the list of foundational materials.
BY MR. KOCHERSBERGER:
Q. And did you say there was another?
A. I thought there was, but I might be wrong. One moment. I'll quote the Park article, which is from 2008, and that is Section No. 24 in the notebook.
Q. So the Park article, which was identified in the Notice as No. 24, will be marked as Defense Exhibit 38.
MR. MARSHALL: Your Honor, I have a question for defense counsel. I don't understand how this Wittschieber article is different than the Government's Exhibit 26, also being a Wittschieber article.
THE COURT: Is it the same article?
MR. MARSHALL: It appears to be the same article. The typeface -- it could be a copy. They seem similar. Some of the formatting looks a little bit different, but overall, they look -- they're both from the American Journal of Neuroradiology.

MR. KOCHERSBERGER: They're likely the same article, Your Honor, and we just have a more inclusive list here. I just don't have the -- I think I do. Hang on.

I am mistaken, I don't. So I'm going to keep it marked as Defense Exhibit 37. Is that what I said? You have it right there in front of you.

THE WITNESS: 37.

MR. KOCHERSBERGER: And apparently that's identical to Government's Exhibit 26.

THE COURT: Well, let's do this. I'll note for the record that it appears that Government's Exhibit 26 and Defendant's Exhibit 37 appear to be the same article written by the same doctor. Is it Wittschieber?

MR. KOCHERSBERGER: Wittschieber. W-i-t-t-s-c-h-i-e-b-e-r, I believe.

BY MR. KOCHERSBERGER:

Q. All right. And then you mentioned the Park article, which was at Tab 24; is that correct?

A. Yes.

Q. We'll mark that as Defense Exhibit 38.

All right, with respect to those three articles, what is the importance of those with respect to your opinion on the mechanism of subdural hygroma that we just discussed from your opinion?

A. They all describe this two-pronged mechanism in which

subdural hygromas can cause some minor hemorrhage and trigger seizures.

THE COURT: What's he rebutting?

MR. KOCHERSBERGER: I'm sorry?

THE COURT: What's it rebutting regarding Dr. Strickler's testimony?

MR. KOCHERSBERGER: I believe that followed from Page 99, Line 20, on through.

THE COURT: All right.

MR. MARSHALL: And Your Honor, I would disagree with that assessment. I think these are all -- all these documents are trauma-related documents. Dr. Scheller's claiming that these are all benign conditions, but the articles, themselves, are talking about the hygroma formation post trauma. They don't support what the doctor is saying, and so I think it does not go to the foundation.

These are supposed to be a foundational support, and it just doesn't exist. And he hasn't done anything to say it supports it other than make a bold two-sentence claim that it supports his claim for seizures, but he hasn't pointed to anywhere in the documents about how it would do so.

MR. KOCHERSBERGER: He was talking about the mechanism of causing small surface bleeds, not seizures yet. We haven't gotten to that, I don't think.

THE WITNESS: I did mention seizures, but I can wait.

MR. KOCHERSBERGER: Nonetheless, that sounds like good fodder for Mr. Marshall on cross-examination to ask Dr. Scheller how it is that -- or I could just do it.

MR. MARSHALL: Your Honor, the objection is just that it's foundational to his opinion. If he's just giving us articles that aren't truly foundational, if they don't actually support his opinion, if he just makes that claim, we're here in rebuttal and we don't have a chance to have another doctor come in and --

THE COURT: I know, and that's why at this point, it's not clear to me what the basis for rebuttal is. You asked him about his opinions in Exhibit 3, but you didn't link it up with what Dr. Strickler testified to. So at this point, I'm going to sustain the objection unless you can lay a foundation as to how the exhibits -- I mean, I'll note that we've already -- it appears that the one exhibit has already been admitted as a Government's exhibit, but it's not clear to me what, in terms of Dr. Strickler's opinion, it's rebutting. So go back and link that up for me.

MR. KOCHERSBERGER: So in Dr. Strickler's testimony, and I believe it starts at Page 99, Line 20, and going forward through the next several pages, her opinion was that these subdural hygromas do not cause those bleeds in the way that Dr. Scheller had suggested. Rather, that those bleeds are caused by the trauma, itself. And that's what he is making the

distinction about.

THE COURT: All right. Let me get to Page 99.

MR. KOCHERSBERGER: Let me get the transcript as well, Your Honor. And I'm sorry, Your Honor, that was for the previous section that we were talking about. This particular section is contained starting at Page 25. Actually, before that, where Dr. Strickler is talking about there being no other cause of these injuries other than traumatic, and she discusses that throughout that section. I can read some of it, if you prefer.

THE COURT: Yes, that would help.

MR. KOCHERSBERGER: So she says --

THE COURT: Again, are you at Page 25?

MR. KOCHERSBERGER: This is -- I apologize, no. Hang on. The page numbers don't show up here at the same time. Page 11 is what I'm reading from here.

THE COURT: All right.

MR. KOCHERSBERGER: Dr. Strickler says: "Ideally, I would love to find another cause" for the finding. And so she examines those other causes, and then she ultimately concludes that there was not another cause.

Then she says at Page 24, Line 24, through Page 25, Line 2, she talks about whether she was able to locate any of the nontraumatic issues. She's talking about metabolic issues at this particular point. And then she rules out any medical

conditions that could cause the findings. That is located at Page 28, I believe.

On 28, she's talking about the medical history, and she says she tries to examine whether or not there is some medical condition that may cause the findings. And then I know she ultimately concludes that there was no other finding, I just have to find that part for Your Honor.

THE COURT: Would it be on Page 31, Line 12? Or maybe the top of Page 31.

MR. KOCHERSBERGER: Right. I mean, she discusses this throughout this section, all of the various other things that it could be other than trauma, and she rules out anything.

THE COURT: Right. And then she says: "My diagnosis" -- I'm at Line 12, Page 31. "My diagnosis was that "C" experienced physical abuse, which included his skin injuries and also abusive head trauma." So that's her. So what is he rebutting at this point with these articles?

MR. KOCHERSBERGER: Right. Dr. Scheller is saying that a preexisting hygroma can cause a hematoma by a couple of different mechanisms which are reflected in his opinion, and also in these articles.

BY MR. KOCHERSBERGER:

Q. Is that accurate, Dr. Scheller?

A. Yes, sir.

MR. KOCHERSBERGER: So it's rebutting Dr. Strickler's

testimony that there was no other possible cause, because she said it didn't work that way, essentially.

THE COURT: Okay. Now, Mr. Marshall, the objection.

MR. MARSHALL: These articles, I don't believe, support what he's saying. He makes the claim that this article supports what he's finding, but there's been no identification of where in this article it supports his claim. And if you look at some of these titles, most of them appear to deal with adults, and some of these are adults in old age. And as Dr. Scheller has previously testified, that is not the population we are to be considering, because in old age you have brain degeneration that takes place and that can cause some of these hygromas and other things.

So these articles aren't supporting the claim he's making when we should be talking about someone that is a child, at least under the age of five, under the age of three. These don't support the claim that he is making.

THE COURT: And we're talking about exhibits -- what are the numbers, again?

MR. MARSHALL: The Park article was, I believe -- I've lost my numbering, Your Honor. I'm sorry.

THE WITNESS: They're in order.

MR. MARSHALL: Park, I believe, talked about it, and the Wittschieber -- no, not that one. Some of the Lee articles are dealing with the elderly, as well, and not minors.

MR. KOCHERSBERGER: I believe, and I'm going to hand these back to Dr. Scheller to be sure, but I believe we're talking right now about Defense Exhibits 37 and 38, which are the Wittschieber article and the Park article.

THE COURT: Well, I won't definitively -- I'm having trouble seeing this. If the articles, as Mr. Marshall indicated, are talking about population groups other than children, I'm not sure they would be relevant. So I'll reserve on that.

MR. KOCHERSBERGER: And I can ask, just to save the time, which I know seems like a disingenuous thing to say after I'm taking up so much of your time.

BY MR. KOCHERSBERGER:

Q. Dr. Scheller, can you describe what those two articles are about and how they actually have something to do with what we're talking about here in regards to the mechanism for causing small brain surface hemorrhages?

A. Sure. The Wittschieber article obviously just deals with infants, because that's the whole topic of the article, and that article does point out these two mechanisms for chronic subdural hygromas to trigger small amounts of acute hemorrhage.

And number two, the Park article, which is the only article that discusses adults only that I provided, that article talks about the same idea. In other words, when the brain is removed from the inside of the skull, there's a space

there, and two things are going on. Small blood vessels crossing that space are stretched, number one, and number two, membranes are being made to block off an accumulation of more space. Those two things can leak blood.

So the Park article says the exact same idea as it applies to adults and older people. The Wittschieber article is, of course, just about infants.

MR. MARSHALL: Your Honor, I would beg to disagree with Dr. Scheller. The Wittschieber article explicitly states: "The term chronic hygromas should be principally avoided as it is a very imprecise and pathogenetically insufficient description." It is not a term that he uses in the article. He never refers to the term chronic subdural hygroma. That is the defense argument, and he says it's not a term you should ever use.

That is not something that it's talking about, like the way that a hygroma would develop and cause potentially a subdural hematoma. He never refers to the term in the article because it's an imprecise term that shouldn't be used, and that's the term that Dr. Scheller is using. It doesn't go to support him in any way.

MR. KOCHERSBERGER: I think we're talking about two different things here. We're talking about the mechanism by which the small brain surface bleedings can occur. That's one part of Dr. Scheller's opinion. We discussed his opinion with

respect to the term hygroma and how he's using it, and he identified the articles that were relevant to that. The fact that this particular doctor doesn't like that term, who wrote the article, doesn't take away from the fact that he describes the mechanism using other terms.

BY MR. KOCHERSBERGER:

Q. I guess, why don't you pinpoint in the article -- can you pinpoint in the Wittschieber article --

THE COURT: Let me ask you this: The Wittschieber article, is that the same article that's -- is this a different Wittschieber article, or is this the same one that's Government's Exhibit 26?

MR. KOCHERSBERGER: It should be the same one, Your Honor.

THE COURT: In other words, it's already admitted. Now, he may not have a valid basis for relying on it, but in other words, if the Government has already admitted that exhibit, then why are we -- what you're saying is, he shouldn't be relying on it, but the exhibit has already been admitted; right?

MR. MARSHALL: That is correct, it has already been admitted. But it doesn't go to the foundation for his argument.

THE COURT: Right. So at this point, the article is already in, so then it's an issue about whether or not his

reliance on the article is justified, as I see it.

(Defense Exhibit No. 37 admitted.)

THE COURT: And the Park article, I don't see the relevance. So I'll sustain the objection as to Exhibit 38. Let's keep moving.

MR. KOCHERSBERGER: The Park article, Your Honor?

THE COURT: Yes. You said it's for seniors, it's for adults. It pertains to adult brains.

MR. MARSHALL: Yes, Your Honor. I may have said seniors, but the age range that it actually lists is 37 to 83. Clearly adults to senior citizens.

THE COURT: Right. So on that basis, I'm sustaining the objection.

MR. KOCHERSBERGER: Okay, I understand, Your Honor. What I would expect would happen is in the closing arguments, we can make these arguments about whether these articles actually support these things and to what extent, and we can point you to language in a way that's much more efficient.

THE COURT: Well, it's of record, and I suppose if I, in reviewing the closing arguments, if I feel like I made an error, then I'll just note that I'm changing as to that article.

MR. KOCHERSBERGER: Okay.

BY MR. KOCHERSBERGER:

Q. All right. Now let's talk about what your opinion

proceeds into. "When the brain surface is irritated with blood, it can trigger a seizure." And I don't think there was really much in the way of dispute about whether that's true. But following that, you say: "This is why "C" had an episode of altered mental status and irregular breathing on the morning of 9/28."

So first, what is why he had that episode of altered mental status and irregular breathing?

A. He had a seizure at that time.

Q. And I believe the Court actually, at Page 120, Line 18, and continuing onto Page 121, Page 4, expressed concern about whether you can make that diagnosis based on the record here. So, what methodology did you use to determine that it was a seizure that caused the altered mental status and irregular breathing on the morning of 9/28?

A. The specialty of neurology is the one that is called around the world, and particularly in the U.S., when anybody is having a seizure, whether they be an infant or old person or anybody in between. One of the major topics that all neurologists are tested on when we take our board exam is the diagnosis and treatment of seizures, and so that's something that's key in a neurologist's training and experience. Certainly I've diagnosed and treated thousands of infants, children and teenagers who have had seizures in my 30 years of practice.

So the best explanation for an infant who has an altered mental status and alterations in the automatic control of what we do usually without thinking, like breathing, the best explanation is a seizure, absent any other seizure triggers. He didn't ingest any medicine he shouldn't have, he didn't have any signs of a brain infection, so on and so forth. So clearly to a neurologist what "C" experienced that day was a seizure.

THE COURT: Are you going off of something that I said, or are you going off of something that Dr. Strickler said?

MR. KOCHERSBERGER: It was something that you asked Dr. Strickler about and she commented on as a result of your question at those two lines I suggested. Dr. Strickler said that it was outrageous for Dr. Scheller to be rendering such an opinion having essentially not seen the child, I guess, is what her concern was.

THE COURT: In other words, Dr. Strickler, and again, I haven't -- I'm trying to find it here on this transcript.

MR. KOCHERSBERGER: I hope I wrote it down correctly. 120, Line 18, and 121, Line 4.

THE COURT: Right, that's what I said. But was I asking the witness a question?

MR. KOCHERSBERGER: You were, I believe. I believe her response is there, as well.

THE COURT: All right. "So in order to ascribe a

seizure to blood being on the surface of the brain, you first have to figure out why is the blood there in the first place, and how could that factor into the child having a seizure."

MR. KOCHERSBERGER: And --

THE COURT: Okay, these are questions that I think I asked, and this was Dr. Strickler's testimony. So, what's he rebutting?

MR. KOCHERSBERGER: I think they were questions you asked to Dr. Strickler while she was on the stand.

THE COURT: Right. I was just trying to figure out what's -- just because I asked the question, that doesn't mean it's proper for rebuttal. It would be the answer that Dr. Strickler gave to my question; right? That's what we're talking about.

MR. KOCHERSBERGER: That's correct, Your Honor.

THE COURT: Okay.

MR. KOCHERSBERGER: And you said: "This is why "C" had an episode of altered mental status and irregular breathing on the morning of 9/28. Do you agree with that statement?" Dr. Strickler said she did not, and then you asked her why and she gave a long reason as to why.

THE COURT: Right.

BY MR. KOCHERSBERGER:

Q. So given that, Dr. Scheller, is it your understanding with respect to the specific -- let me back up.

Are you saying the specific cause of the seizure that "C" had was the blood that was on the brain's surface?
A. Yes, sir.
Q. And how did you reach that conclusion?
A. Knowing what the causes of seizures are, and knowing that seizures do represent the brain being irritated by something. There are a lot of potential irritants. Drug irritants, chemical imbalance irritants, infection irritants, and so on and so forth. And the only thing, based on my review of the medical file, history, physical, labs and radiology, was that "C's" brain was being irritated by something. And you could see that the blood was sitting there, irritating it.
Q. Let me ask you this, and maybe it's me who's making this into something that it's not. Is it your understanding that you disagree with Dr. Strickler and/or Dr. Hart that the blood on the surface caused the seizure, or you just disagree as to how the blood got there?
A. I don't specifically remember their testimony. I can't say. I can just say my impression.
Q. Was there anything else that you observed in the medical records, including the imaging of "C," that would have identified the cause of the seizure that he had on the 28th?
A. Well, the reason you do the imaging is to look for other causes, tumor, infection, stroke, brain compromise, and none of that was found on the MRI scan.

Q. Got it. Okay, now let's talk a little bit about retinal hemorrhages, which is the next part of your opinion that was at issue. You said: "Retinal hemorrhages typically are not an indication of eye trauma and are certainly not specific to abusive head trauma." I believe at Page 24, Line 3, Dr. Strickler disagreed with that to an extent.

But first, please just describe what it is that you're saying here.

A. So, I gave you a demonstrative, and I'm happy to use it. But if the Court doesn't want me to use it, I won't use it.

Q. I think you could probably just explain it at this point. I don't know that the Judge wants a lot more exhibits. But let's see how the explanation goes.

A. I always explain things better with pictures, but I'll do my best.

If we can imagine the eye as a ball, and if we slice the eye in half, we'll see all the little blood vessels, that line, the inside of the ball. Half of those blood vessels are arteries, and those blood vessels are bringing blood to the eye, and then half of them are veins and they're going to drain that blood and bring it back to the heart.

So what a retinal hemorrhage represents is one or many little drips of blood that come out of an eye vein. Eye veins are very fragile, just like all veins are fragile. But these are tiny little veins, so they're more fragile than most, and

it doesn't take a lot to make them bleed. And the number one cause in the world of retinal hemorrhages has nothing at all to do with eye trauma or any kind of shaking or violence, or anything like that.

Q. I stopped at a portion of your opinion, and you seem to have gone on. All I'm asking you about is that first sentence, that "retinal hemorrhages typically are not an indication of eye trauma." That part of it, what is it that you're saying here?

A. I'm saying that the eye is often a bystander to what's going on in and around the brain, and so the most typical scenario for retinal hemorrhages is when something is happening in or around the brain indirectly affecting the eye.

An analogy would be if I go to a bar and two people near me are having a fight, I might be indirectly struck or thrown or something, but I'm not a part of the fight. So the eye is not part of the trauma yet. Because the circulation is so intimately connected, the eye will develop findings related to what's going in the brain.

THE COURT: What's being rebutted here?

MR. KOCHERSBERGER: That was the indication at Page 24, Line 3.

THE COURT: I see, where Dr. Strickler is talking about retinal hemorrhages?

MR. KOCHERSBERGER: Right. And Dr. Scheller is

saying that it's caused by the circulation issues, and we're going to get to that opinion in a moment, not by actual physical trauma to the eyeball, itself, which is where there seems to be a disagreement.

BY MR. KOCHERSBERGER:

Q. And so, how is it that the retinal hemorrhages actually form if it's not trauma to the eye?

A. If we can imagine a river, and the river is flowing, and then there are these little tributaries flowing into the river, if there's a blockage anywhere in that river, the tributaries flowing into the river will back up, and sometimes they'll overflow. Well, that's what a retinal hemorrhage is, is a backup of the flow of blood in these very small veins. The overflowing is this leakage of blood.

So, on the vein's trip from the eyeball to the heart, there is a stop in the brain. If there's something going on in the brain that will affect circulation, that will back up the retinal veins and cause them to leak, sometimes a little, sometimes a lot.

Q. Did you have any medical literature to describe this mechanism of causing the retinal hemorrhages?

A. Yes, I did, and I put them in the notebook. The most potent one is 25.

Q. All right. Tell us about the article that is identified on the Notice as 25, and I'm about to mark as Defense

Exhibit 39. What exactly does that tell us about this mechanism that you were just describing?

A. Doctors in California examined -- let me take it out before I forget.

A group of doctors in California examined the eyes of perfectly normal newborns and discovered that 20 percent of them, one out of five, had retinal hemorrhages, and not only did they have retinal hemorrhages, those hemorrhages involved multiple layers within the retina and also were found throughout the eyeball. In other words, in the periphery or in the middle of the eye.

So that tells me that -- clearly nobody has traumatized these children. They're born normally. But we do know that there are very dramatic changes in circulation and pressure within the skull as a baby's born, so that's the most logical explanation as to what causes retinal hemorrhages. The number one cause, being born.

Q. Are you suggesting that "C" had retinal hemorrhages that were there from the time that he was born?

A. No, sir, not at all. They almost always go away within a few weeks.

Q. So what does this have to do with "C's" situation?

A. It helps us understand the mechanism. We know that "C" did have a pressure build-up, because he had fluid that didn't belong there. We know that "C" did have a problem with

circulation, because he developed a small acute hemorrhage. Those two factors can combine to effect the brain circulation and then have that secondary effect on the veins in the eye.

MR. KOCHERSBERGER: Move to admit Defense Exhibit 39.

MR. MARSHALL: Your Honor, I'm objecting. It's a birth trauma related injury, or it's trauma from birth. It has nothing to do -- in this case, he said that he wouldn't expect this to have been the cause of the retinal hemorrhages in "C." He's trying to do some sort of either -- like a transitional property for how he gets to the injuries in "C." But the document that he's offering doesn't support his claim. He even admits it doesn't support his claim, because it should have resolved within a few weeks. "C" was eight months old, he wasn't an infant, there's no support here.

MR. KOCHERSBERGER: And Dr. Scheller is suggesting that the way a retinal hemorrhage is formed in a newborn is as a result of squeezing through the birth canal, causing increased pressure in the veins of the brain circulation, which then causes retinal hemorrhages in much the same way that the increased pressure in "C's" head that was documented from a different cause, but the same circumstance, increased intracranial pressure, caused his retinal hemorrhages.

As he described in his opinion, it's the circulation dynamics and the increased pressure that causes retinal hemorrhage. The retinal hemorrhage is not a direct result of

trauma, itself. So I think it's just describing the mechanism the same way, and in a pretty commonly observed way.

THE COURT: Anything else, Mr. Marshall?

MR. MARSHALL: I don't understand the -- well, and maybe it's better for cross. But it doesn't seem to -- to make an accurate comparison, you would have to then say that "C" had gone through something traumatic, which justifies the prosecution's perspective, because what the article is saying is that the birth trauma is part of the reason for the retinal hemorrhaging.

And what Dr. Scheller is saying is that there's some other kind of condition that he might have had. The linkage from that condition to this article seems remote, unless he's saying that there's someone who put "C's" head in a vice and squeezed his head like he was trying to come out of his mother's vagina again, to cause those same kinds of injuries. The comparison is not an apt comparison.

THE COURT: Yes, I'm failing to see how it's an apt comparison, so I'm ruling in favor of the Government on that. The objection to Exhibit 39 is sustained.

BY MR. KOCHERSBERGER:

Q. Is the situation of a newborn having increased intracranial pressure different than the situation of a child "C's" age having increased intracranial pressure?

A. No. The mechanism is the same. One is caused by a birth

canal squeezing the skull, and one is caused by something inside the skull that doesn't belong there. And in this case, it was fluid and a little bit of blood.

Q. What methodology did you use to reach the conclusion that it was this increased pressure that caused the retinal hemorrhages?

A. All neurologists know that problems of brain circulation can cause retinal hemorrhages in any age. And, again, when there's a problem with brain circulation -- and let's just give an example. An aneurysm. An aneurysm is when a blood vessel bursts and starts to squirt blood inside the brain. Clearly the brain circulation is very, very dramatically affected. All neurologists, including myself, are taught that brain aneurysms are a very well-known cause of retinal hemorrhage. Nothing happens to the eye when somebody has a brain aneurysm, what does happen to the eye is that its circulation is indirectly affected by the circulation of the brain.

So that same idea, that anything that can affect the brain circulation can affect the eye, that could be true for a newborn, that could be true for an old person with an aneurysm, and it could be true with a child who has too much pressure from too much fluid.

Q. Is this at all a controversial thing within neurology?

A. When you say this, what's "this"?

Q. The fact that increased pressure causes retinal

hemorrhages.
A. No, sir.
Q. All right. And then in your opinion, you say: "To summarize, "C" had a chronic intracranial fluid circulation condition of infancy that is usually benign. In his case, it caused a small amount of bleeding and a seizure."
Dr. Strickler testified at some length about your use of the term chronic intracranial fluid circulation condition. That's at Page 40, Line 25 of her testimony. What are you describing here?
A. Chronic subdural hygroma, which is a very well-known medical term. It's in just about all of these articles. And then the complications that arise from that which, again, are in the medical literature that I provided.
Q. So a chronic intracranial fluid circulation condition of infancy, is that a diagnosis or a description, or what is that?
A. That's -- it was an attempt to have lay people understand what I had previously described in my letter medically.
Q. Which was what?
A. Chronic subdural hygroma of infancy.
Q. All right. Finally, you say: "There's no evidence that "C" was a victim of abusive head trauma." What do you mean by that?
A. No conclusive evidence. I had listed a bunch of findings that might happen to a child who's been a victim of abusive

head trauma, and "C" didn't have any of those findings. And I can list them again. They're in the letter.

Q. Just tell us what you're referring to.

A. Broken ribs, broken limbs, neck injuries, unexplained external injuries, scalp swelling, skull fracture, and brain injury.

Q. Are you familiar with the diagnosis of abusive head trauma?

A. Sure. Every pediatrician is trained in it. I am a board certified pediatrician, and certainly I do my best to keep up with the literature.

Q. And did you consider that as a possible diagnosis for "C"?

A. Well, it's a rule-out diagnosis. So if there is no medical diagnosis, then you would consider it. So I didn't get to that point, because I discovered that "C" did have a medical diagnosis.

Q. And that medical diagnosis was what?

A. Complications from a chronic condition that triggered his seizure.

Q. I think you described it, but was there any different methodology that you used to reach that conclusion that you haven't already described?

A. No, sir.

MR. KOCHERSBERGER: May I have just a moment, Your Honor? I think I'm done.

THE COURT: Sure.

BY MR. KOCHERSBERGER:

Q. Before we finish here, Dr. Scheller, we talked a little bit about the retinal hemorrhage in newborns. I think I forgot to ask you, were there other articles that you considered that bore on that same subject of the cause of a retinal hemorrhage?

A. Sure. Recently a Swedish panel of scientists tried to evaluate the medical literature that assessed the importance or relevance of retinal hemorrhages to the diagnosis of abusive head trauma, and found that there was no science behind it at this point. It was all anecdotal.

Q. Is that any of the things that we have in the materials?

A. Yes, sir. There's two, actually, references to it. No. 17, and then a corresponding one is No. 4. No. 4 is really a response to those who criticized No. 17.

Q. So what is the importance of No. 17 with respect to retinal hemorrhage?

A. The idea that all the medical literature, of which there's a lot that documents retinal hemorrhage as a portion or as a criteria for diagnosing child abuse, is all tainted with circular reasoning. In other words, we suspect the child is abused, we know that retinal hemorrhage is a sign of abuse, let's find the retinal hemorrhage and then that proves that retinal hemorrhage is a sign of abuse.

Q. And I apologize, I didn't ask my question very well. I

was talking about other articles that describe the pressure-caused retinal hemorrhages as the mechanism for a retinal hemorrhage that are contained in the materials that you provided, other than the one that the Judge ruled was inadmissible because it involved newborns.

A. Sure. One of them is No. 27.

Q. All right. Tell us about that one.

A. So, that looked at infants who are victims of abusive head trauma and who weren't, and looked for retinal hemorrhages in both, found retinal hemorrhages in both groups, and there seemed to be, they couldn't conclude for sure, but there seemed to be a connection between increased intracranial pressure and retinal hemorrhage in both groups.

Q. That was the document that was identified in the Notice as No. 27, and I'm going to mark it here as Defendant's Exhibit 40. And that relates to the mechanism causing retinal hemorrhages; is that what you said?

A. Yes, the increased intracranial pressure that I suggested.

Q. Were there any other articles?

A. There's an article that I've written. It was published I think around 2017 or 2018, and it's not in this binder. It's about infants who are found to have retinal hemorrhage like "C" who didn't have any brain injury.

Q. How about any others in the materials, is there any? Take a look at No. 26, just to be sure.

A. I don't want to get into that one.

Q. Okay.

MR. KOCHERSBERGER: All right. So I would ask to admit Defense Exhibit 40. Again, it describes the pressure-caused retinal hemorrhage mechanism that Dr. Scheller has described both with respect to birth, with respect to the patient in this case, and now with respect to a whole bunch of others that were studied.

MR. MARSHALL: No objection.

THE COURT: It will be admitted for purposes of this hearing.

(Defense Exhibit No. 40 admitted.)

MR. KOCHERSBERGER: I have no additional questions, Your Honor. Thank you.

THE COURT: All right. Let's take a -- how much of a break do you need? Can we be back at 1:45, or is that pushing it?

MR. MARSHALL: That's fine, Your Honor. I was going to say 15 minutes. But if the Court would prefer an extended break, that's fine as well. I wasn't sure how much time the Court had available.

THE COURT: Well, I had them, this morning, vacate the stuff later on this afternoon. In other words, we've got to get this finished.

MR. MARSHALL: Yes, sir.

THE COURT: So does that work for you, coming back at 1:45?

MR. KOCHERSBERGER: Whatever you like, Your Honor. We had planned to be with you all day.

THE COURT: In other words, if you're going to try to grab a quick bite to eat, maybe we ought to do 2:00, then. Does that work?

MR. KOCHERSBERGER: Sure, that would be fine. Thank you.

THE COURT: All right. We'll be in recess until 2:00.

(Recess was held at 12:55 P.M.)

(In Open Court at 2:06 P.M.)

THE COURT: You may be seated, Dr. Scheller. Counsel may cross-examine.

MR. MARSHALL: Thank you, Your Honor.

CROSS REBUTTAL EXAMINATION

BY MR. MARSHALL:

Q. On direct examination in rebuttal, you talked about your methodology when you treat a patient.

A. Diagnose and treat, yes, sir.

Q. And that there were four different things that you look at. Is that the same methodology that you use when you're forensically consulting?

A. Yes, sir.

Q. All right. In this case, you wrote a report?
A. Yes, sir.
Q. And that's Document 3 in the Government's exhibit list?
A. Yes, sir.
Q. You stated that there were four parts to your methodology. Can you point in your report to where you talk about the physical exam of the patient?
A. Sure. It's the second line. Shall I read it, or not?
Q. Second line of what page, sir?
A. Right at the top.
Q. Okay.
A. Should I read it?
Q. Sure.
A. "I reviewed medical records in this case including records of birth, pediatric visits, ER visits, hospitalization, and follow-up." Every single one of those contained physical exam findings.
Q. All right. And where do you use -- in your findings, where do you make mention of any of the physical findings that "C" actually had?
A. On the top of Page 2 in my version -- well, I'm sorry. Let's start with the bottom of Page 1. "Altered mental status and irregular breathing," that's a physical finding. And then on the top of Page 2, "Right upper arm bruise." That's another physical finding. And then just underneath there, "A head

circumference of 46 centimeters." That's a physical finding.
Q. What about medical history? How did medical history -- you talk about medical history as one of the things that you use in the formation of your diagnosis; is that correct?
A. Yes, sir.
Q. But you never took a medical history in this case?
A. No, sir, I did not.
Q. You stated you never read any of the police reports that talked about the Defendant, about what happened in the case?
A. I don't specifically recall.
Q. Do you recall telling the attorney that you don't consider the actions of the Defendant in making your diagnosis?
A. Yeah, if I said that in my previous testimony, I may have. I don't recall saying that.
Q. You never spoke to the Defendant prior to the Daubert hearing, the first Daubert hearing?
A. That's correct.
Q. You never spoke to any of the treating physicians in this case?
A. That's right.
Q. You never spoke to the consulting physicians in this case?
A. That's right.
Q. You have a Certificate of Neuroimaging, but you never spoke to Dr. Hart or any of the other radiologists in this case?

A. That's right.
Q. Now, I want to start kind of with more of a general question. You constantly refer to this as a chronic subdural hygroma.
A. Yes, sir.
Q. What caused it? You never mentioned what was the cause of his chronic subdural hygroma.
A. I'm not sure. I can only hypothesize.
Q. What is your hypothesis?
A. The most common cause is birth, and what happens at birth to a number of children, not everybody, is that the brain, due to the squeezing of the birth canal, the brain moves away a little bit from the inside of the skull and creates a space. And that space could just disappear, or that space could accumulate fluid and turn into a chronic subdural hygroma. That's the number one cause in infants.
Q. And you've diagnosed "C" as having this condition. So you're saying now that you think he obtained it from birth?
A. Possibly.
Q. What would have been another cause?
A. A minor trauma in the first few months of life that perhaps would have gone unrecognized because maybe he cried for a minute and stop crying, but it was enough to, again, to move the brain just a little bit away from the inside of the skull and cause fluid to accumulate there.

Q. You've never referred to that statement before, have you?
A. I don't understand the question.
Q. You've never -- you stated before that chronic subdural hygromas are not the result of trauma.
A. I mean, significant trauma. But I have said that. I have said those exact words. But what I mean is a significant trauma, a trauma that people would recognize. Falling down the stairs.
Q. Dr. Scheller, do you agree that it's important to be precise when we're talking about a diagnosis?
A. For sure.
Q. And when we're talking about a brain injury?
A. For sure.
Q. Now you're saying that it could be the cause of trauma when you previously said it was not the cause of trauma. Do you understand how that could be contradictory and confusing?
A. I never said anything was the cause of trauma. It may have been caused by trauma. I'm trying to be precise, so if we can be precise with the questions, I'd appreciate it.
Q. So is your supposition in this case that it's birth trauma? Is that what you believe happened?
A. It may be. I'm not sure.
Q. And you were here for the first Daubert hearing in November when Dr. Hart testified, were you not?
A. Yes, sir.

Q. Do you recall as part of his testimony the discussion of the Rooks article?
A. Sure.
Q. Have you read the Rooks article?
A. I'm very familiar with it, yes, sir. In 2007, I believe, it was published.
Q. What was one of the important findings in the Rooks article, if you're so familiar with it?
A. It really only had one important finding, and that was that 45 percent of perfectly normal children did have MRI evidence in the first few days of life of acute subdural hematoma, although they were mostly very small.
Q. And what happened to those subdural hemorrhages?
A. We don't know, because only a small percentage of the children were followed over time.
Q. So you disagree with their conclusion that a subdural hemorrhage after one month of age is unlikely to be birth related?
A. That's actually not their conclusion, if one reads a little bit further into the article. That's a misrepresentation.
Q. All right. Can you read me the last line of the conclusion statement?
A. Sure.
Q. And if you need to, confirm it with the Rooks article.

A. "Subdural hematoma after one month of age is unlikely to be birth related."
Q. Okay. So you're saying that's not their conclusion?
A. Well, they wrote it.
Q. Did you just not tell me to read further?
A. I did.
Q. But that's the last line of the article. So it's impossible to read further; correct, Dr. Scheller?
A. Except for the Acknowledgments, you're right.
Q. So you can't read any further. Their conclusion is what?
A. Well, I'll read it again. "Subdural hematoma after one month of age is unlikely to be birth related."
Q. And you're saying that's not what their finding was?
A. That is not an appropriate conclusion from what they studied.
Q. And you've done how many studies?
A. I'm sorry?
Q. How many studies have you done?
A. A number of them. I've worked on a lot of projects and I've written some articles.
Q. How many studies related to birth trauma?
A. I have one that I can think of offhand.
Q. And you didn't cite it for your conclusions today, though, did you?
A. I did not.

Q. The Rooks article also says that all subdural hematomas have resolved at the age of three months.
A. No, it did not say that.
Q. Let me continue on.
THE COURT: I'm sorry, who is the author of the article you've got right now?
MR. MARSHALL: It's the Rooks article.
THE COURT: Is it R-o-o-k-s?
MR. MARSHALL: R-o-o-k-s. Actually, the title of the article, which I did not mention, is, "Prevalence and Evolution of Intracranial Hemorrhage in Asymptomatic Term Infants."
THE COURT: Thank you.
BY MR. MARSHALL:
Q. Now, as part of this article and this study -- and there was over 100 different patients; is that correct?
A. They did MRIs on 100 infants, neonates.
Q. And as you mentioned, it was approximately 46 that had findings?
A. Forty-six out of 100 had an acute subdural hematoma immediately after birth.
Q. And one of the things it notes is that all of them were asymptomatic; correct?
A. Yes.
Q. "C" was symptomatic?
A. Yes, sir.

Q. "C" was also eight months old?
A. Yes, sir.
Q. He had an altered mental state, his eyes were glazed, his eyes were deviated to the side and not focused, he had a seizure, he had breathing problems, he was vomiting, and he was limp?
A. That's a correct description of his findings on the day in question.
Q. Well, it was beyond the day in question; correct?
A. His symptoms did continue, yes, sir.
Q. They lasted several days, because he was hospitalized for several days due to the ongoing altered mental state and condition?
A. Yes, sir.
Q. Now, you were talking at one point about the different types of brain injuries, and that you would expect them to show up on the MRI; is that correct?
A. Yes, sir.
Q. Does a concussion show up on an MRI?
A. No, sir.
Q. Is a concussion considered a brain injury?
A. Possibly.
Q. You're the neurologist. Is a concussion considered a brain injury?
A. And I'm saying possibly.

Q. What else would it be if it's not a brain injury?
A. A brain irritation. A brain malfunction.
Q. Okay. Now, it was part of your testimony today that "C" did not have any brain injury?
A. That's right.
Q. It's a part of your testimony today that there was no brain injury on any of his scans?
A. That's right.
Q. That even in the, and I may misuse the term, but like even in the scan that had the diffusion of the MRI, you're saying that there was no sign of injury?
A. That's right. That's how the radiologist interpreted it, and that's how I interpreted it.
Q. Okay. Now, an acute subdural hematoma would be considered a brain injury?
A. No, sir.
Q. What would an acute subdural hematoma be considered? Is that a normal finding?
A. Absolutely not.
Q. If it's not a brain injury, what do you consider it?
A. It's a collection of blood in between the brain and the inside of the skull. There is sometimes an accompanying brain injury, but not always.
Q. What causes subdural hematomas?
A. The number one cause in the whole world is an impact

injury to the outside of the skull.
Q. All right. And what about a subarachnoid injury?
A. We don't use that term subarachnoid injury. We might say subarachnoid hemorrhage. I don't use the term subarachnoid injury.
Q. Okay, subarachnoid hemorrhage.
A. What's the question?
Q. Would that be considered a brain injury?
A. No, but that's much more likely to produce one than a subdural hematoma.
Q. So when you're saying that there were no signs of brain injury on the scans, you would disagree with the findings of Dr. Hart when he listed the different brain injuries?
A. I don't believe Dr. Hart found any brain injuries, either. He did document a subdural hematoma, fluid collections, but I don't believe he documented any brain injury.
Q. Well, he documented acute subdural bilateral hematomas.
A. That's correct. That's outside the brain.
Q. Including a tearing of the dura.
A. I don't remember him saying anything about a tearing of the dura. I don't remember that.
Q. We'll let the record speak on that. He talked about an intraventricular hemorrhage, and that's within the brain; is that right?
A. That's correct. That's subarachnoid.

Q. So that's within the brain?
A. Not really. It's not in the brain substance, it's in the fluid that is circulating within and around the brain. But it's not in the brain, per se.
Q. And this was a hemorrhage?
A. I'm sorry? I don't understand.
Q. It was diagnosed as a hemorrhage?
A. There was a small hemorrhage that was subarachnoid that was in the ventricular system, the lakes of fluid that are inside the brain.
Q. And he said that it was not likely from the subarachnoid injury?
A. Well, that's an opinion, but he's entitled to his opinion.
Q. Do you disagree with his opinion?
A. Well, yeah. In order for blood to get into the lakes, it has to get into the space underneath the arachnoid membrane, what I referred to before as underneath the ceiling. And so there had to be blood subarachnoid.
Q. And the cause for this kind of an injury would be a trauma?
A. One of the causes, absolutely.
Q. Okay. What are the other causes? Aneurysm?
A. Aneurysm is a cause.
Q. Metabolic issues?
A. I wouldn't -- it would be -- I wouldn't consider metabolic

disease as a cause of subarachnoid hemorrhage.
Q. But according to Dr. Hart, all the other causes have been ruled out leaving trauma as the most likely cause.
A. That was his opinion, yes.
Q. He also found likely acute hemorrhage over the cerebellar hemispheres with blood over and under the tentorium?
A. Yes, sir.
Q. And previously you said this could have been from flowing blood.
A. I don't remember.
Q. The multiple focal points of injury or hemorrhage on the brain, or in the head, could have flowed from one area to the other?
A. I probably said that at the trial in November. I don't remember saying it today. I may have said it.
Q. Would you agree or disagree that it would be unlikely from blood to flow from the other spaces into the tentorium?
A. It's a question that doesn't make sense neurologically, so I can't answer it.
Q. So if there is a hemorrhage in the tentorium, a subdural hemorrhage, are you saying it is likely or unlikely that these would have been caused by the same injury?
A. So, I'm assuming there's an injury?
Q. Yes.
A. So there's still a problem with the question, and I'm

happy to help you clarify, because the question doesn't make sense neurologically.

Q. Go for it.

A. The tentorium is a piece of skin, and that piece of skin is the same piece of skin as the dura. So when there is a subdural hematoma or a subdural hemorrhage, then there's blood in between that piece of skin and the brain.

Now, that piece of skin covers that back lobe of the brain called the cerebellum, and I think what you're referring to is Dr. Hart's, I guess, pointing out and finding it very important that not only is there blood above that piece of skin -- in other words, a subdural hematoma in between the main part of the brain and the piece of skin -- but there's also a blood collection between the back lobe of the brain, the cerebellum, and the piece of skin. So that's over the tentorium, or supratentorial, and infratentorial.

So the way I'm understanding your question is, do I agree with Dr. Hart that isn't that an important finding, that not only is there blood above the tentorium, above the piece of skin, but there's also blood underneath it. And I don't. I think it's the same blood and it just tracks from above to below.

Q. Now, all those different, for lack of a better term, either injuries or hemorrhages within the head, you're saying none of those are brain injuries. But would you call them

injuries?
A. I'd say they're medical problems. In other words, if somebody with hemophilia bleeds, would I call that an injury? No, it's a medical problem. That person is bleeding. It might cause an injury, but it's a medical problem. It's a very significant one. An injury to me implies that there's been some kind of impact or trauma or something, and I don't want to concede that.
Q. I know. Your argument seems to be a little bit circular, because you're saying that there is some sort of blood caused here. You've already said that we've ruled out the other causes, so that the most likely other cause here is trauma. But now you're saying that you're not willing to say that this is an injury, even though it's the only remaining cause that it could be.
I mean, in your practice, you do a differential diagnosis; is that right?
A. I do, yes, sir.
Q. So you go through, you look at the different potential problems and you rule them out. If everything has been ruled out except for trauma, what else are you left with?
A. That's right, and that's how Dr. Strickler came to her conclusion. And I disagree with that. I don't believe that there was trauma.
Q. So then what was the other cause?

A. There was a chronic medical condition that allowed subdural hematomas to develop either spontaneously or from a minimal injury, one that we would never pay attention to otherwise, and that chronic medical condition is called a subdural hygroma, and that's what caused the acute subdural hematomas that you are referring to that are usually caused by an impact injury or some kind of trauma. But in this case, I don't believe they were.

Q. Okay. What was their causation, if it was not from trauma?

A. A complication of chronic subdural hygroma --

Q. What --

A. -- as I stated in my report.

Q. I'm sorry to interrupt you. But a hygroma is a condition? It's where there is fluid on the brain; correct?

A. Fluid in between the brain and the inside of the skull, that's right.

Q. And on an MRI scan, it's indistinguishable -- or it's hard to tell exactly what it is. It does not look like CSF, like you described, and it doesn't look like blood?

A. That's right. Fresh blood. It doesn't look like fresh blood.

Q. So it looks like some sort of other fluid, possibly a mixture of CSF and blood?

A. Yes.

Q. All right. They don't spontaneously occur, do they?
A. Hygromas?
Q. Yes.
A. To our knowledge, they don't.
Q. In infants.
A. I'll say in many cases, we don't know what the reason is. And we blame it on birth, but we're not positive.
Q. Now, you go back to saying you blame it on birth. You have the Rooks article; is that correct?
A. Yes, sir.
Q. All right. Will you look at the Rooks article again, in the second to the last sentence in the Results section?
A. Second to last sentence? Okay.
Q. "Most SDHs" -- subdural hemorrhages, in this case -- "present at birth were" -- is that greater than? -- "three millimeters and had resolved by one month, and all resolved by three months on MR imaging." Is that right?
A. I'm not on the right page. I'm on Page 1085.
Q. I'm reading from the top in the Results section, in the Introduction.
A. Oh, in the abstract?
Q. Yes.
A. Oh, sorry. Hold on. Okay, try me again.
Q. "Most subdural hemorrhages present at birth were greater than three millimeters" -- is that right, or is that less than?

A. Less than. Less than three millimeters.
Q. -- "less than three millimeters and had resolved by one month, and all resolved by three months on MR imaging." Is that right?
A. You quoted it right. It's very misleading.
Q. Oh, okay. So, you're claiming that this is some sort of birth injury. Dr. Hart presented you with evidence in the Rooks article that there were no studies that have shown that there's been injury from birth past three months. Where are you -- other than what you said was experience, on cross-examination, what other studies are you relying on?
A. Well, they are in front of me here in this pile, and I can name several of them offhand. The Cho article that I referred to, which is Exhibit 29. The four K.S. Lee articles basically --
Q. Let's go back. Let's talk. The Cho article, which you said is Exhibit -- I'm sorry; I don't have the right numbers, unfortunately.
A. I have it as Exhibit 29.
Q. I have the book in front of me, I'm sorry. What was it in the book, do you recall?
A. I could tell you. One moment. 22.
Q. All right. Where does it -- show me in the article where it talks about birth injuries lasting longer than three months.
A. If you take a look at Page 2 of the article, which is

actually Page 274 --
Q. Sure.
A. -- on the top, it's the fourth column, "Cause of SDFC." So the term they're using is subdural fluid collection. So, what was the cause? If we look, one, two, three, four, five, six, at least, that I can count, are what they call idiopathic. Idiopathic means they had no clue what caused it. When there is no clue what might have affected a young infant to cause a subdural hygroma, the only trauma every young infant has been through is birth.
Q. Okay, so it doesn't attribute it to birth, you're attributing it to birth.
A. In this case.
Q. You're the only person that has made that leap. The article doesn't make that leap.
A. I don't know. I'll have to check the discussion.
Q. You said that you used this to form the foundation of your belief, so I'm assuming it supports you.
A. It does support me.
Q. Okay.
A. I'm sorry; are you waiting for me? I'm waiting for you.
Q. You said you were going to find it in the discussion. I was waiting for you.
A. All I see is that they can't explain why these children had subdural hygromas, but they did present themselves within a

few months after birth.
Q. All right. So it's unknown?
A. They called it unknown.
Q. All right. And so, when you say it's unknown, it's possible that it could still be some sort of trauma that was not seen?
A. Sure.
Q. It's possible that it was trauma that was inflicted and nobody is reporting?
A. Sure.
Q. It's possible that it was trauma that the caretaker that's there just didn't see?
A. That's right.
Q. So unknown doesn't necessarily have to -- you made it sound like unknown automatically was birth trauma.
A. Yes, sir.
Q. Unknown is unknown?
A. Unknown is unknown. But they did make allowances for other types of traumas that they did identify in this article.
Q. All right. So which other ones talk about birth trauma being a cause?
A. I'll take a moment.
Q. Because it's my understanding, Dr. Scheller, this book you provided to defense counsel; is that correct? The articles in this book, not necessarily the book, itself.

A. Yes, sir.
Q. And you provided that book to them saying that these articles supported your foundational beliefs that you wrote in September of 2017; is that right?
A. That's right.
Q. All right. So I'll give you a second.
A. I'm looking at the K.S. Lee article in 1994.
Q. In the book, which one was that?
A. I'll find it in a moment. 18 in my version of the book.
Q. Okay.
A. And I'm reading from Page 553, where it says, Discussion. "TSH" -- which stands for traumatic subdural hygroma -- "occurs most often at the extremes of life." That's the first sentence. Skip a sentence, and then the third sentence says: "In the infant the brain is quite compressible, and in the elderly, brain atrophy creates a potential space where fluid can easily collect." So it's the same idea.
Q. Where does it say birth?
A. Well, that's the only thing I know that happens to every child, that happens in the first few months of life.
Q. All right. This, like many of the other K.S. Lee articles, all refer to trauma; right?
A. Yes, sir.
Q. You're saying that your hygroma is a nontraumatic injury. So how do all these articles that refer to trauma support your

finding that you claim is a nontraumatic injury?
A. Every one of these articles, in addition to mentioning that subdural hygroma comes from trauma, also mentioned that trauma can be trivial or minimal, and to me, that's no trauma.
Q. Okay. So you're playing a semantics game where minimal trauma, it just equals no trauma?
A. Yes, sir.
Q. So now you are the one that gets to determine what level of trauma is actual trauma versus no trauma?
A. All these articles did.
Q. What is minimal trauma?
A. That's minimal trauma. I just hit myself on the head with this.
Q. Did it cause you a seizure?
A. No, sir.
Q. Did it cause you vomiting?
A. I don't have a preexisting condition.
Q. Going back, you said you provided this book, and so far you've only been able to provide one article, after several minutes you found one article that you believe supports you, but it doesn't actually mention birth trauma in the discussion.
A. That's right.
Q. And you said you provided this book to defense counsel, or the articles in the book to defense counsel?
A. Yes, sir.

Q. You stated that these are the articles that helped form your opinion?
A. That and my experience, yes, sir.
Q. And that your opinion was written in September 2017, is when it was dated?
A. Yes, sir.
Q. So how did you rely on two articles that were dated in 2018? Articles that were written after, how did they help provide the foundational beliefs in your report written a year earlier?
A. You're right. If they were written in 2018, then they did not help me write my report in 2017.
Q. So this was a mistake?
A. Oh, I don't know that it was a mistake. The attorney called and said, what articles did you rely on, and these are the articles in my knowledge base.
Q. Okay. So when he asked for the articles that you relied on, you provided articles from after your thing was written, and you claimed that that's what you relied on?
A. The principles and the ideas in the articles are ideas that I'm very familiar with from my experience and from older articles. But you're right, I wrote my report in 2017, and there's at least one article from, I believe it's from Lee, in 2018. Unless -- it is possible that I did get an early release. Sometimes they do have early releases of articles and

I do get them. So I'm not sure. But it is possible that I didn't see it until after.

Q. Now, you also referred to these as chronic subdural hygromas?

A. Yes, sir.

Q. Now, that is a term that is in disfavor; is that correct?

A. By Dr. Wittschieber, sure.

Q. All right. So which of these other articles talk about chronic subdural hygromas? They refer to subdural hygromas, they refer to chronic subdural hemorrhages, but they don't refer to chronic subdural hygromas, do they?

A. They absolutely do, and I'm happy to find them.

Q. Sure, find one for me.

Are you still on the first article, or are you on other articles now?

A. I'm going through all of them.

Q. Just the articles that were admitted.

A. Sure.

Q. There were a handful I know that were not admitted, and that would not benefit anyone at this point.

A. I'm reading a sentence from K.S. Lee's article of 1998.

Q. Was that what was provided as 16? "The Pathogenesis and Clinical Significance of Traumatic Subdural Hygroma"?

A. Yes, sir.

Q. Okay. Where does it mention chronic subdural hygroma?

A. It says the following words, which are: "Subdural hygromas" -- which is SDGs, which is Dr. Lee's shortening of it -- "develop as delayed lesions." I'm in the section Natural History and Evolution. "Then they change over time. The fate of subdural hygromas depends on the dynamics of absorption and expansion. They continue to grow for a time, and then reduce in size." So that's what chronic means. In other words, they're there for a time. The word is not mentioned, but I'll find it. He says it elsewhere.

Q. Okay. He does refer to subdural hygromas and he does refer to chronic subdural hematomas or hemorrhages.

A. It's in the illustration on Page 29 in K.S. Lee's article of 2015. "History of Chronic Subdural Hematoma."

Q. Which one is that, just so we're clear?

A. It's No. 19, and it's the illustration on Page 29.

Q. For the record, I think that was submitted as 32.

On that one, the image that you're saying, he puts a question mark after "chronic," though; right?

A. He does.

Q. That's odd. He doesn't put a question mark by hemorrhage --

A. That's true.

Q. -- or hematoma.

MR. KOCHERSBERGER: I object to the relevance of all of this, Your Honor.

MR. MARSHALL: If he thinks that his diagnosis of chronic subdural hygroma isn't relevant, then I don't know why we're here.

THE COURT: I'll overrule. You may continue.

BY MR. MARSHALL:

Q. Now, you had it in the graph, but did you see it in that article when you were flipping through, other than the picture?

A. I'm happy to look through it.

Q. I thought you were, sir. Let me remind you, these are the articles that are foundational to your opinion.

A. I'm sorry; what was the question?

Q. You said these are the articles that are foundational to your opinion that it's a chronic subdural hygroma, and now ten minutes later we still don't have one article that mentions the term chronic subdural hygroma from your foundational medical literature that you provided; is that correct?

A. That's correct, except for the one that I mentioned.

Q. All right. You said that -- there was one in the graph, but it's not in the body of the article. You haven't found it, have you?

A. I can't say it's not in the body of the article. I'm happy to take the time to read it, if you'd like.

Q. Well, I'm going to move on. It's been ten minutes, and you haven't found anything.

I'm going to jump back to the article you just mentioned,

the K.S. Lee article from 1998. That was 16 in the book. It actually illustrates some problems using the subdural hygromas. In the middle of the second paragraph in the Diagnosis on Page 599, it talks about: "However, an absolute distinction between a subdural hygroma and a chronic subdural hematoma is not only difficult, but actually impossible in a significant number of cases." Is that correct?

A. Yes, sir.

Q. And you -- jumping back to the term chronic subdural hygroma, Wittschieber, in the article that you said was foundational and put in your book, mentions that the term chronic hygromas should be "principally avoided as it is a very imprecise and pathogenetically insufficient description."

A. That's his opinion, yes.

Q. So his opinion is your description of the diagnosis is very imprecise and pathogenetically insufficient?

A. That's right.

Q. Also in that Wittschieber article, it talks about -- again, it's in the abstract. "But if other infrequent reasons can be excluded, the presence of subdural hygromas strongly suggests a post-traumatic state and should prompt the physician to search for other signs of abuse."

A. I'm sorry; what was the question?

Q. That's what it says; right? It talks about subdural hygromas --

A. Well, that's actually what Dr. Wittschieber says.
Q. -- being in a post-traumatic state?
A. That's right.
Q. Trauma being inflicted? In fact, in the article by Wittschieber, he basically says there are two primary causes for the subdural hygromas. One is the remains of a previous subdural hemorrhage, and the other is, "Subdural hygromas have been verified by traumatically induced tears in the arachnoid membrane"?
A. That's what he writes.
Q. You found another cause somewhere?
A. The cause I explained to you earlier, about the brain moving away from the inside of the skull.
Q. Okay. And that is in elderly patients; right?
A. Elderly and infants.
Q. And despite that, you said that "C" did not have extra space, extra axial space?
A. I don't understand the question.
Q. Are you now saying that you think that he had extra axial space and that a hygroma magically appeared in his head?
A. That's how hygromas do appear.
Q. By magic?
A. From space that opens up between two pieces of tissue that should be squeezed together.
Q. Except the article says it's from trauma.

A. Dr. Wittschieber believes that, sure.
Q. So you think that it's not just fluid, like CSF, that would normally fill a space like that, you are saying that it is hygroma, which is some sort of mixed density fluid that contains another fluid, most likely blood and CSF, that is nontraumatic filling a space that happens to appear?
A. That's right.
Q. Okay. Can you show any article that shows chronic subdural hygromas of a minor that were nontraumatic that caused either chronic subdural hematomas or the injury like you were describing? Were there any articles that supported your opinion?
Wittschieber said it was trauma. The Lee article said it was trauma. The Cho article I think said it was trauma, I don't remember. But which article supports your idea that it was a nontrauma formation of a hygroma in an infant?
A. Well, at least two. You were the one that was pushing the idea that idiopathic is not trauma, and so in the Cho article --
Q. Ultimately you agreed, unknown is unknown; right?
A. I do agree, unknown is unknown. But to me, unknown means that this child suffered a birth injury, because that's the only trauma we've all been through.
So the Lee -- I'm sorry. The Cho article has a number of cases of subdural hygroma without any known trauma, and then

the Park article -- no, it's not Park. It's Lee. The Lee article from 2018 also has a number of cases of subdural hygroma that are not trauma related.

Q. Okay. Jumping back, you said that the only trauma you think is a birth trauma. In this case, "C" had other signs of trauma, did he not?

A. No, sir.

Q. Okay. He had a bite on his shoulder. That was not a trauma?

A. If you can explain to me how a bite on the shoulder can cause something wrong with the brain, then I'm very happy to listen.

Q. Your definition said any unexplained trauma. I'm asking for any trauma on the body.

A. That's explained trauma.

Q. Okay, that's explained trauma. You said there was no other trauma. A bite mark is trauma?

A. A bite mark is trauma, and it's trauma to the skin.

Q. Okay. He had a circular abrasion in the middle of his back. That's a sign of trauma?

A. Might be.

Q. Okay, what else could it be?

A. Sleeping on something, being pushed against some kind of toy. It could be anything.

Q. What about the tear in his lip?

A. In his?
Q. Lip.
A. Might be a sign of trauma, might not be.
Q. Okay. So you're ignoring findings from the physical examination that you said was very important?
A. I'm ignoring findings that are not conclusive in any way.
Q. Okay.
A. A skull fracture in conclusive.
Q. Instead, you're relying on something that you think from your personal experience exists when there's no data to support it, and you're saying that you're going to ignore the actual factual findings of medical doctors that saw the patient?
A. That's not at all what I said, but you're welcome to interpret it however you'd like.
Q. Okay. How is a subdural hygroma a circulation condition?
A. All fluids in the body circulate, including spinal fluid and including dural fluid. The dura is a piece of skin, but fluid does circulate in it. And so that's a circulation condition.
Q. Does it have a membrane?
A. I'm sorry?
Q. Well, never mind.
How did the blood on "C's" brain -- you said he had a seizure basically because there was blood on his brain. How did he get blood on his brain?

A. Well, from either a leaky membrane or from a very small blood vessel crossing the surface of the brain to the inside of the skull that leaked, that was stretched and leaked some blood onto the brain.
Q. A common way for those to be stretched and leak is shaking or trauma, a whiplash injury?
A. It might happen.
Q. But you still say it is a nontrauma finding?
A. Yes, sure.
Q. Traditionally the arachnoid layer is an impermeable membrane. But you're saying it could be leaky?
A. The idea that's put forth in all these articles -- there's a problem. The problem is -- when you do an MRI scan and look at the spinal fluid and you look at the dural fluid, they're a different color. And so there is fluid there. A lot of people think there's spinal fluid that seeps through the membrane and then combines with dural fluid and makes it thicker. Nobody is really sure. But it does seem to be a mix of spinal fluid and thicker dural fluid.
Q. You also talked about retinal hemorrhages.
A. Yes.
Q. Can trauma cause retinal hemorrhages?
A. Sure.
Q. You mentioned that, I think it was the veins, that blood backed up in the veins. Are you saying that there was a clot

in "C" that caused these injuries?
A. No, sir. Just a backup.
Q. And correct me if I'm wrong, but you're saying it's your understanding that he had increased cranial pressure that caused his retinal hemorrhages?
A. Yes, sir.
Q. All right. Where in the medical records did you see that?
A. The fact that there was fluid in a place where it doesn't belong is evidence that he had increased intracranial pressure.
Q. But you said it was minor because it wasn't from a trauma.
A. It's minor in most people, but it still causes pressure. There's something where it doesn't belong.
Q. What in the workup indicates that there was increased intracranial pressure?
A. Fluid in a place where it doesn't belong, and blood in a place where it doesn't belong.
Q. But it wasn't any -- is it the Cushing's Triad? Were there any signs of a Cushing's Triad in "C's" case?
A. I didn't see any.
Q. Is the Cushing's Triad generally something you'd look for in intracranial pressure?
A. If there's a very dramatic increase, yes, sir.
Q. So you're now saying that a very minor increase in intracranial pressure will lead to retinal hemorrhages of a minor?

A. I never said the word minor. I think you're going from dramatic to minor, and I'm happy to either try to answer the question or you could ask it a different way.
Q. I've asked you repeatedly, what in the medical records indicates there was an increase in intracranial pressure?
A. Fluid in a space where it doesn't belong.
Q. And that's your only answer?
A. Yes, sir.
Q. Just so we're clear, there were acute findings in the neuroradiology exams; is that right?
A. Yes. We went over those.
Q. What's the threshold for causing retinal hemorrhages?
A. I don't think anybody knows. I don't know.
Q. How long is the -- is there a duration of pressure to cause the hemorrhages?
A. Current thinking is that it's a sudden increase in pressure. So when there is a rapid rise in pressure, that's what's going to cause the backup in the veins in the retina.
Q. Now you're the one using dramatic terms. You just said a rapid rise. What is any indication that there was a rapid rise if there is no indication in any form from the Cushing's Triad in this case?
A. Again, you've got fluid in a place it doesn't belong, and then out of the blue, you then have bleeding into that fluid. That's going to increase the pressure.

Q. Okay.
A. But there was no indication of Cushing's Triad.
Q. But you also agree that retinal hemorrhages could be from trauma?
A. Sure. Accidental or abusive.
Q. That subdural hematomas could be trauma?
A. Accidental or abusive, yes, sir.
Q. The acute subdural hematoma in this case could have created an increased intracranial pressure?
A. It might have.
Q. You stated in your first interview that subdural hematoma is the body's reaction to impact trauma?
A. That's the number one most common cause for subdural hematoma. And again, the trauma to the head, of course.
Q. Is your opinion that subdural hygromas are more or less often caused from trauma?
A. Are we including birth trauma or not?
Q. Trauma.
A. And are we talking about infants?
Q. Infants.
A. I think it really depends. If we can follow the progression of the head size from birth, then the most likely cause is birth trauma. And if we cannot, if we don't see a head size acceleration until a few months after birth, then there probably was a minor trauma that caused it.

Q. Is it your opinion that "C" had an accelerated head growth?
A. Yes, sir.
Q. So 75th percentile to the 90th percentile you would consider accelerated head growth?
A. Yes, sir.
Q. And it's all a matter of what data point you pick, because when he was born, he had a 98th percentile head; is that correct?
A. Yes, sir.
Q. You never listed in your report, though, an acute subdural hematoma, did you?
A. I didn't use those words.
Q. Or subarachnoid hemorrhage?
A. I didn't use those words.
Q. And I know you haven't used this term, but I just want to understand. Are you saying that your subdural hygroma would have caused an acute subdural hematoma through a re-bleed?
A. I didn't use the term re-bleed, but some people might use that term. A re-bleed just means a leaky membrane. I didn't use that term.
Q. But is that essentially what you're saying, that the subdural hygroma caused the bleed that led to the acute subdural hematoma?
A. I'm sorry; could you ask the question again?

Q. I mean, you didn't use the term re-bleed, but is that essentially what you're saying, that the subdural hygroma bled causing the acute subdural hematoma?
A. So, re-bleed implies that there was an original bleed. So let's pretend we have a completely different case, not "C." A child falls off the porch --
Q. Go ahead.
A. I'm just trying to explain. I don't have to.
Q. Go for it.
A. If a child falls off the porch and gets an acute subdural hematoma, and then six months later in that spot has a new acute subdural hematoma without any new trauma, that's a re-bleed. There was an old bleed and now there's a new bleed.
I don't know that "C" ever had an original acute subdural hematoma before the events at eight months old.
Q. So now I feel like we've started back at square one with you, Dr. Scheller. You have not provided any evidence that this hygroma came from anything other than a traumatic event; is that correct? And your evidence says that you were saying that this is a birth trauma?
A. I can't agree with either one of those, but I'm happy to elaborate.
Q. What is your diagnosis for "C.A."? What is it? What caused his injury?
A. He had a chronic subdural hygroma either caused by birth

or caused by some unknown event in the first few months of life that then had a complication when he was eight months old, bled, caused a seizure, and that was the end of the story.

Q. What evidence was there of anything other than trauma for "C.A."?

A. The fact that there was no evidence of trauma anywhere near the head.

Q. So then you disagree with the consensus statement, this is Government's Exhibit 8, that subdural -- under the Birth Trauma section, it indicates that no evidence at birth subdural hemorrhages cause re-bleeds?

A. I didn't use the term re-bleed, but I definitely disagree with the consensus statement. So that's fine.

MR. MARSHALL: Okay. No further questions, Your Honor.

THE COURT: Is there redirect?

MR. KOCHERSBERGER: Nothing further, Your Honor.

THE COURT: All right. Dr. Scheller, thank you. I know you traveled in from somewhere on the East Coast.

THE WITNESS: I've got a whole bunch of exhibits here. I don't want them to get lost.

THE COURT: Why don't you just put them on the bench right there, and I'll let counsel sort through them.

MR. MARSHALL: Your Honor, I'm not sure which numbers they were, but I would ask to move in the articles we mentioned

today, the Rooks article and -- Wittschieber is already in. So Rooks is the only new article. I'd ask to move that in as evidence, or at least to be a part of the record.

MR. KOCHERSBERGER: I have no objection, Your Honor, but I will note that the original Notice, the documents that are in the binder, attached to the one that was No. 20, the Rooks article is there. So if we admitted 20, the Rooks article may be appended to the exhibit that originated from 20.

THE COURT: Is it Defendant's Exhibit 20?

MR. KOCHERSBERGER: No, it would have been the Notice No. 20. It was one of the K.S. Lee articles, and I believe -- I think it's No. 33. It actually has the Rooks article in it. I just discovered that earlier. Let me make sure.

Yes, Defense Exhibit No. 33 is actually the K.S. Lee article and the Rooks article. So it's in there that way. It just got there by mistake.

THE COURT: Should it be a separate exhibit?

MR. KOCHERSBERGER: I can pull it out of this and make it -- do you want me to call it a Defendant's exhibit?

MR. MARSHALL: It was used in cross, so I'd prefer that it was a Government's exhibit. I'm not sure what number we're on. 30 or 31.

MR. KOCHERSBERGER: I think you should be on 30.

THE COURT: You don't object; right?

MR. KOCHERSBERGER: I do not object.

THE COURT: Okay. Then it will be -- what's the last number? All right, Government's Exhibit 31 is admitted.

(Government Exhibit No. 31 admitted.)

THE COURT: All right, I entered an order. Did you all see that order yet?

MR. KOCHERSBERGER: Yes, sir.

MR. MARSHALL: No, Your Honor.

THE COURT: I'll wait until Mr. Marshall finishes.

Now, I'm assuming you're going to order a transcript from this hearing.

MR. MARSHALL: Yes, Your Honor.

THE COURT: So what I thought is, in terms of the written closings, two weeks from when the transcript is completed for the Government, and then defense will have two weeks to respond, and then if the Government wishes, a week to do a reply. Now, is that realistic?

I'm just trying to -- again, this case, we've got to move this case forward, and so that's the schedule. Because then I've got to have some time to sort through all of this. And then, as you see in that order, I'm requiring you to cite to places in the record.

Now, if you all confer and if you need an additional week, I have no issue with doing a stipulation where the Government gets three weeks, and then the defense gets three weeks, if you all feel like you need that.

All right, anything else for today?

MR. MARSHALL: No, Your Honor.

MR. KOCHERSBERGER: No, Your Honor.

THE COURT: Then we will be in recess. Thank you.

(Proceedings adjourned at 3:13 P.M.)

* * * * *

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, Plaintiff, vs. PATRICK DURAN, Defendant.	No. NO. 1:14-CR-03762-WJ Daubert Hearing - Vol. 3

CERTIFICATE OF OFFICIAL COURT REPORTER

I, Mary K. Loughran, CRR, RPR, New Mexico CCR #65, Federal Realtime official Court Reporter, in and for the United States District Court for the District of New Mexico, do hereby certify that pursuant to Section 753, Title 28, United States Code, that the foregoing is a true and correct transcript of the stenographically reported proceedings held in the above-entitled matter on Monday, August 26, 2019, and that the transcript page format is in conformance with the regulations of the Judicial Conference of the United States.

Dated this 6th day of September, 2019.

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, Plaintiff, vs. PATRICK DURAN, Defendant.	No. 1:14-CR-03762-WJ Pete V. Domenici U.S. Courthouse Bonito Courtroom Albuquerque, New Mexico Monday, November 19, 2018 8:30 A.M.

TRANSCRIPT OF PROCEEDINGS
DAUBERT HEARING RE: DEFENDANT'S PROPOSED EXPERT
VOLUME 1
BEFORE THE HONORABLE WILLIAM P. JOHNSON
CHIEF UNITED STATES DISTRICT JUDGE

APPEARANCES:

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Reported by: MARY K. LOUGHRAN, CRR, RPR, NM CCR #65
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Proceedings recorded by mechanical stenography; transcript produced by computer.

I N D E X

W I T N E S S E S

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1 through 24 - Government Binder	108
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26 - Review Article: Subdural Hygromas in Abusive Head Trauma	159

* * * * *

(In Open Court at 8:34 A.M.)

THE COURT: This is the case of the United States vs. Patrick Duran, 14-cr-3762.

Would counsel enter their appearances for the record, please.

MR. NAYBACK: Good morning, Your Honor. Kyle Nayback on behalf of the United States. At counsel table is Nicholas Marshall. Seated in the gallery is Dr. Carole Jenny, Dr. Leslie Strickler, who is walking into the room, and we have got a third doctor who is participating, Dr. Hart, who is a radiologist from UNM. Thank you.

MR. SAMORE: John Moon Samore for Mr. Duran, who is present in the courtroom, Judge, and in the gallery is Dr. Joseph Scheller, who will be testifying today. And we can discuss a little bit before we begin how we're going to move through this thing.

THE COURT: Sure, go ahead. What did you want to discuss before the witness testifies?

MR. SAMORE: What I understood, before we begin, is that the anticipation is that we can go to 2:30 today.

THE COURT: Yes.

MR. SAMORE: Both sides are hopeful of getting our primary out-of-town witnesses on the stand and testifying, so we are going to put Dr. Scheller on first. Dr. Jenny, I think, will also be testifying. I think Dr. Strickler and Dr. Hart

live near here, so they may be testifying, but probably not today.

We did want to note, before we begin with Dr. Scheller, that it appears from the Government's motion that there are only two opinions that it's questioning, and those are found in Paragraph 5. And the only two opinions that they have questioned in the motion are regarding whether the "victims of child abuse are often found to have unexplained bruises, rib and limb fractures, scalp injuries, brain injuries, and neck injuries;" and then the second portion of this challenge is whether subdural hygromas "are not related to accidental or abusive trauma."

Dr. Scheller is prepared and we are prepared to answer questions and present evidence regarding the opinions that he has offered and his background, but those are the only two opinions that were challenged in the motion, and we feel that we should certainly make a record, but that's all that the Government can raise in its challenges today.

MR. NAYBACK: I disagree, Your Honor. This is a Daubert challenge. Those are two examples of the problems that we had with Dr. Scheller's opinions. Under the Daubert standard, all of Dr. Scheller's opinions need to be rooted in science. We don't believe they are, and we intend to challenge his credentials and everything about the report he's tendered.

Secondly, with regard to housekeeping, I think

Mr. Samore and I came to an agreement, but in order to expedite things today, we have an exhibit binder that I'd like to tender to the Court. We were hoping to give this to the Court and go quickly back and forth with the exhibits, instead of laying foundation and tendering them.

THE COURT: Is that acceptable?

MR. SAMORE: Judge, it is pretty close to acceptable. I want to clarify that we have clarified a portion of those records as far as the reports and CV foundations. That's fine.

The Government has put into evidence portions of some rulings on several cases that Dr. Scheller testified in, and those are hardly complete. We are not going to question that he can be asked questions about those cases. The relevance is something we would dispute, particularly when each case is decided on an individual basis. So as far as whether they can ask him questions about those for purposes of this hearing, we think that's appropriate.

We also note that we have included in our exhibits and have offered additional references to legal articles. Those are not -- were added as supplemental authorities. Those are only authorities in support of the position we have that we think the Government is going to share, that there is dispute and controversy about shaken baby, abusive head trauma, and those issues. They are not going to be the primary grounds by which we are asking the Court to rule in this hearing. We are

going to deal with those medical issues, but that is the purpose for which they are offered. And I don't think the Government is going to question that they can be presented. Their relevance, again, would be subject to the Government's argument. Thank you.

THE COURT: All right. Well, let's go ahead and get going with the testimony. Let's go ahead and start with Dr. Scheller.

MR. NAYBACK: Thank you.

MR. SAMORE: We call Dr. Scheller, please.

MR. GARCIA: Please raise right your right hand, sir.

(JOSEPH SCHELLER, M.D., DEFENSE WITNESS, SWORN)

MR. GARCIA: Please have a seat and state your full name for the record.

THE WITNESS: Joseph Scheller. S-c-h-e-l-l-e-r.

DIRECT EXAMINATION

BY MR. SAMORE:

Q. Dr. Scheller, you brought to the witness stand your computer. Will you be referencing that at portions of your testimony today?

A. I intend to show some of what I call demonstrative type exhibits to explain concepts of anatomy that are sometimes difficult to comprehend without the pictures.

Q. All right. Prior to referring to any exhibits or discussing your opinion in this case, in particular, let's

review with this Court and make a record on your qualifications.

Have you previously testified in New Mexico Federal Court, to your recollection?

A. I did testify in the state of New Mexico recently, but I don't remember if it was federal court or another kind of court.

Q. All right. Do you recall if you testified, within your memory, before Judge Johnson?

A. This Judge?

Q. This Judge.

A. I don't believe I ever have testified in Albuquerque before.

THE COURT: That's all right. I don't have a recollection of Dr. Scheller.

BY MR. SAMORE:

Q. Tell us where you practice and what the area of your medical practice is today.

A. Currently I'm seeing patients two days a week in my private office in Baltimore, Maryland, and then three days a week I work on medical-legal, or forensic cases. That means an attorney will contact me to give an opinion about a head injury case, or a toxic exposure case, or a malpractice case, or a birth complication case. There are several types of cases that I get calls about, and that's what I do the three days of the

week. So, part-time private practice of pediatric neurology and part-time medical-legal work.

Q. And prior to your present position as a child neurologist, what were your recent positions that you have held?

A. I guess I'll go backwards in time. From 2012 to 2014, I was a fellow, which means a trainee, in brain and spine neuroimaging at the Winchester Medical Center in Winchester, Virginia. Neuroimaging is a specialty of neurology. It is not neuroradiology, which is a specialty of radiology.

Before 2012, for 15 years, I was an attending physician at Children's National Medical Center in Washington, D.C. So that means I was a staff pediatric neurologist. I had hospital and clinic obligations. I also had teaching obligations and obligations in the laboratory. Pediatric neurology is the diagnosis and treatment of children from the day of birth until teenage years, usually late teenage years, with any type of brain, spine, spinal cord, nerve, muscle, or developmental condition. So we see anything from as simple as headaches to as complicated as children in coma. There is an outpatient half of it, and an inpatient half of it. So that takes us back to 1997.

So, again, private practice. Before that, fellowship. Before that, practice at Children's Hospital. Before that I was a staff child neurologist at the University of Maryland in Baltimore for five years, 1992 to 1997.

Prior to that, I was a fellow, a trainee, in epidemiology, the study of risk factors for diseases in populations, and that was back in 1991 to 1992. And then prior to that, for four years, I was at Children's Hospital of San Diego as a staff pediatric neurologist from 1987 to 1991.

So, basically, since 1987, except for two fellowship blocks of time, I've been a practicing pediatric neurologist, both inpatient and outpatient.

Q. When were you certified as a pediatrician with the American Board of Pediatrics?

A. 1988.

Q. And are you certified as a child neurologist?

A. Yes. That was 1989.

Q. Tell us a little bit more about the neuroimaging and your certification of what neuroimaging involves.

A. So, neuroimaging is a branch of neurology. Just like a neurologist can be a specialist in strokes or Alzheimer's disease or epilepsy, there is also fellowship or specialty training in brain imaging. So even though every neurologist gets basic training and is tested in the neurology board exams on CAT scans, MRI scans, ultrasounds, and other imaging that one can perform on the brain or spine or spinal cord, neurology does offer this extra training and certification.

So, I did the extra training, took the exam, and now I have that certification in the umbrella organization that

certifies a neurologist to have this specialty. It's called UCNS. United Council of Neurologic Subspecialties. So neuroimaging is one of those neurologic subspecialties. It is not neurology and it is not neuroradiology.

Q. Now, in your practice as a pediatrician, do you see children in that practice where there is concern for abuse?

A. Oh, sure.

Q. And could you --

A. Now, you said in my practice as a pediatrician. So even though I unofficially practice pediatrics every day because I live in a community where everybody knows who I am -- already this morning I got a pediatric phone call from one of my neighbors back in Baltimore -- I have not practiced official pediatrics since 1991. In other words, in a clinic setting.

But in all the hospitals where I've been at, child abuse is a real consideration, a real possibility, and it is something that we see and I get involved in.

Q. Could you tell the Court and the Government some of the ways that you are referred, if you are referred cases from doctors in other areas that consult with you on cases where abuse may be of concern?

A. The two main areas are where a child has a skull fracture for no apparent reason -- and when we are talking about a child, we are almost always talking about an infant or a toddler. The reason for that is because once a child is two or

three or four, they have multiple ways of getting into trouble and falling and hitting their head and getting skull fractures. But when you have an infant or a toddler, who usually doesn't fall from a height, if that child has a skull fracture, then I'll be consulted to opine if -- to tell whether it's accidental or inflicted or abusive.

And the second way I get involved is when an infant or toddler has a subdural hemorrhage. A subdural hemorrhage refers to a collection of blood clots that are in between the brain and the inside of the skull. That's the most classic or most common finding when somebody suffers a significant head injury. Somebody will suffer an impact to the head, the brain will be pushed up against the skull and then be pulled away from the skull, and in that force a blood clot will be created in between the brain and the inside of the skull.

So if an infant or child has a subdural hematoma, then I will often be called if there is no good explanation for it, and the question is, is that related to an abusive act, is it related to an accidental injury, or is it possibly related to another disease or condition.

Q. And that leads to my next question. Are you also consulted regularly on cases that don't involve abuse, but involve other possible neurologic problems?

A. Sure. As a neurologist, we are consulted for all types of head injury. In other words, bicycle injuries, car accident

injuries, falls from height injuries, those kind of things.

We are also consulted about seizures on a regular basis. Seizures are electrical storms in the brain that cause the brain to stop functioning for a period of time, and a person might pass out or shake all over or have a color change, stop breathing, have a dramatic change in heart rate. So because almost all seizures originate in the brain, that's one of the primary things that neurologists are consulted for. So it's a common reason for a consultation.

So, seizures, head injuries, and then all kinds of other things like strokes, brain infections, so on and so forth.

Q. When you are consulted to help diagnose neurological problems, are you involved with the individual child, or with personal contact, or do you review records? How does that work?

A. So, in medical-legal cases, I sometimes meet the youngster and sometimes I don't. It really depends on the attorney, depends on location, depends on a lot of things. When I'm consulted in the hospital or as an outpatient, I'm always meeting the patient and I'm always meeting, if it's a person under 18, I'm always meeting a guardian or parent, whoever is in charge of that person.

Q. Do you have regular child patients, as some folks that are pediatricians do, or do you only consult in special cases in those two days a week when you're serving in the pediatric

practice?
A. So for the two days a week, I'm seeing new patients, which could be patients that are referred from family doctors or pediatricians, or I'm seeing follow-up patients. For example, yesterday I saw a youngster who was struggling with his medication, and I had to see him urgently to fix that problem. So people with epilepsy, people with migraines, people with back pain, people with chronic complications from head injuries, those are the kind of people I'm seeing on a regular basis.
Q. Focusing on that portion of your practice, how many patients are you seeing a year, approximately, just so that the Court has an idea how many you're seeing? And this is in 2017-18, that period. Can you give an estimate?
A. I'd say between 500 and 1000.
Q. And over the course of your professional practice, what's your experience in working with children that may have neurological problems?
A. I've seen more than 25,000 children and teenagers and young adults with possible or definite neurological problems.
Q. Now, during the time that you have served in your professional career, has the quality of x-rays and images improved?
A. Incredibly. Incredibly. I'm old enough to remember when CAT scans were just coming out, and the images from the CAT

scans were very blurry and very, very rudimentary. And now we've gotten much better. The CAT scan imagery is much, much better. And the CAT scan has, in a lot of ways, been superseded by the MRI scan, which the detail is something we couldn't even imagine back in the 1970s. So it's a constant process, and the radiology keeps getting better each year.

Q. And are you qualified to read CAT scans and x-rays and neuroradiological images?

A. As a imaging specialist, I'm qualified to read CAT scans and MRI scans and x-rays of the brain and spine. As a pediatrician, I was trained to read routine things like chest x-rays and routine abdominal films and routine limb studies that look for fractures or other abnormalities.

Q. Are you familiar with the literature, the professional literature, medical literature, regarding the issues in your professional career which would include treating children that may have abusive neurological injuries?

A. Yes. I've kept up with the routine things that I see, which are epilepsy, migraine, head injury, and then head injury that is suspected of being abusive head injury. So I have kept up with that.

Q. And are you -- the opinions that you're going to be offering today from your report, what is their basis?

A. Basically my training and experience and knowledge of neurology and neuroimaging.

Q. Now, one question that I have, on which you touched, and I'm just going to return to it briefly, is neuroimaging considered a specialty?
A. Yes, it is a specialty of neurology. And again, certified by an organization called the UCNS.
Q. Now, you've also told the Court that you do cases where you're involved as a -- where you're consulted also by private attorneys in possible criminal cases. Isn't that true?
A. Yes, sir.
Q. Do you take all those cases that you are referred, or do you wind up testifying in each of those cases?
A. No, sir. I get calls from a lot of defense attorneys who are defending people who have been accused of suspected abusive head trauma, and I take some cases and some cases I tell the attorney, I don't think I can help you.
Q. Now, have you diagnosed retinal hemorrhages in children with neurological problems?
A. Yes. The retina exam, though not as sophisticated as an ophthalmologist's retinal exam, is something that we are taught is very important in our neurology training. The eye is connected to the brain.
Q. But is that a standard part of your neurological examination, to check the eyes?
A. Absolutely. 25,000 patients and 25,000 retinal exams.
Q. Can there be causes other than -- one of the constant

issues that may come up in our testimony today and with other witnesses is, are there other causes than trauma to create a retinal hemorrhage.

A. Absolutely.

Q. Could you tell us some of those causes, possible causes.

A. Oh, sure. Well, the number one cause, and it might be considered traumatic, I don't believe it is, and that is being born. In other words, three out of every ten children -- if there are more than ten people in this courtroom, then three or more of them at birth had retinal hemorrhages. So what that means is, and there is usually no reason to do it, but if for some reason an ophthalmologist went into a local hospital's nursery and said, I'd like to check every normal baby's eyes, that ophthalmologist would find that three out of every ten babies did have retinal hemorrhages. So that tells us, although birth can be considered mildly traumatic, there is some squeezing of the skull and clearly a whole bunch of things that are going on in the birth canal.

So somebody is being accused of having abused a newborn baby, and yet babies are often found to have retinal hemorrhages. So that tells us we need to consider other mechanisms for retinal hemorrhages, including things that change the pressure inside the skull and thus inside the eye, which is connected to the brain.

Q. How do you measure whether there is those kind of changes?

What are the diagnostic tools that you use?
A. Now, I said the word pressure. Are you asking me specifically about pressure or the diagnostic tools to look at the eyeball?
Q. To look at the eyeball.
A. Okay. So, regular doctors like myself will use an opthalmoscope, and that's just a scope that shines a light through the pupil and allows the person on the other side of the scope to see the back part of the eye and the retina and all the nerves that can be seen there. The ophthalmologists use a much fancier tool. They dilate the eye and use a retro-opthalmoscope, and that allows them to view the periphery of an eyeball. We're looking at the back of an eyeball, and as neurologists we can only see a small part of the back of the eyeball. The ophthalmologists can see a good part of the back of the eyeball.
Q. Now, would you define, at least for the Court at this point, what is a subdural hematoma?
A. I mentioned it before. A subdural hematoma is a blood clot between the brain and the inside of the skull. The word dura is talking about the piece of skin that covers the brain, and so subdural tells us that it's underneath that piece of skin. So there is a blood clot underneath the piece of skin that is sitting between the brain and the inside of the skull.
Q. And another term that will come up in our testimony this

morning is a hygroma. What is a hygroma?

A. A hygroma is a fluid collection. So just fluid that is sitting usually in a place where it doesn't belong.

Q. Can it be blood? Is it conceivable that it could be blood, or can it be blood, do we know?

A. Well, can I sort of go back to explain what you need to know to understand the answer?

Q. Please.

A. So a blood clot is a blood clot. I think we all know what that looks like, and we are very, very familiar with it. But, what happens when there is a blood clot in between the brain and the inside of the skull?

So, what happens is, it sits there for a while, and then the body starts to break it down and decompose it. So in that first few days, maybe a week or ten days, it will look like a blood clot, but then after that it will begin to break down and look more like fluid and less like a blood clot. And so if we're seeing a hygroma, it's just a collection of fluid. If somebody sees a collection of fluid in between the brain and the inside of the skull, a person can say, oh, well, that was once a blood clot. Well, that might be true, but how would you know?

So let me give a scenario. My son, the skateboarder, doesn't wear his helmet and falls off his skateboard and hits his head really hard. He goes in for a CAT scan and I say,

son, you have a subdural hematoma. It's not so big, so we're not going to do surgery. Just lay low, stay off the skateboard, and come back in a month and we're going to do another CAT scan and make sure that that subdural hematoma is going away.

He comes back in a month and the blood clot is gone, and in its place is this collection of fluid. So in that case, the doctor can say, well, I'm sure that you had an acute subdural hematoma, I saw it on the scan, and now I'm sure it is going away, but it's not completely gone because now I'm seeing fluid there.

But let's say my son never had that first CAT scan, and let's say all he had was -- he fell, he hit his head, didn't want to go to the doctor, laid low for a couple of weeks, and about a month later gets a CAT scan and all they see is fluid. They can guess maybe he had a blood clot there maybe a month ago, but nobody can tell him, I'm absolutely sure you had a blood clot there a month ago. All we see is fluid.

Q. Do you have a demonstrative exhibit with you so that you could illustrate the distinctions between how a subdural hematoma might look as opposed to a subdural hygroma?

A. I do.

Q. And in this case, we are not asking to refer specifically to this case, but just something that's illustrative.

A. Sure. So, I'm just -- can everybody see the window? The

window has -- the top of it says, "Documents DB," which is the database. These are just some CAT scans and MRI scans that I have in my files.

So, one of them is labeled "Acute Subdural Hematoma, Ten Months." This is a child who fell off a kitchen counter and landed on his head. It is not part of this case at all. It is just purely demonstrative. I just want to get everybody oriented, and then I'll show the -- I'm sorry, let me do it this way. Yes, I'll do it this way. I'll get everybody oriented and then show the abnormality.

So, on this --

THE COURT: Would counsel approach for one brief second?

(At the Bench as follows:)

THE COURT: Are these in the exhibits?

MR. NAYBACK: They are in the exhibits.

THE COURT: So the experts can go to the jury box if they need to, as long as they can see.

MR. SAMORE: Judge, I think what I'll do is have him give a case number or something for purposes of the record, if we ever have to mark it. It may have a code, and that way at least we know what we are looking at. That may help us.

THE COURT: Okay.

(End of discussion at Bench.)

(In Open Court)

THE COURT: If it would be easier for the other experts to sit in the jury box where there are monitors, you are welcome to do so. Are the monitors on?

MR. SAMORE: Thank you, Judge.

THE COURT: If you would, restate the last question, and then Dr. Scheller can answer.

MR. SAMORE: Certainly.

BY MR. SAMORE:

Q. Dr. Scheller, as you describe this image to the Court, is there a way you can identify it without giving the name of this child? Is there a code that you have that we can at least put in the record?

A. Well, it is labeled "Acute Subdural Hematoma, Ten Months." I gave it a generic name.

Q. That's what I wanted, was a file name. Okay, please continue.

A. I'm going to ask the Court to imagine that we can take a virtual slicer, like a guillotine, and put it on top of a person's head so that it's sitting from ear to ear, directly on top of the head, and in theory we can do that and then slice right down. We would remove the whole face and we would be able to look face to brain at that person who got virtually sliced and then see the left side of the brain, the right side of the brain, and so on and so forth. And if we had that slicer, which basically is what CAT scans and MRIs can do, then

we can take that slicer and move it closer to the forehead or closer to the back of the head.

So, just to get everybody oriented, the slicer is just over the soft spot. We can see the soft spot at 12:00. I'll point to it. And then we slice directly down, and we have gone through the eyeballs. So you can see the left eyeball, which is this one, and then the right eyeball. And then you can see the skull, which is completely white, and then the gray matter inside the skull is the brain.

So as we go from front to back -- I'll just go to the middle here. This is the back of the eyeball. So this is just at the back of the soft spot. And again, we are seeing the brain, which is the gray stuff, the bright white stuff, which is the skull, and then there's something here that doesn't belong here, and that is this. I'm going to call this a cottony or cloudy-looking material.

Actually, this is a little better, because it sort of looks more like cotton and like clouds. That's exactly what a blood clot looks like. This child suffered a blow to the right side of his head, and that blow caused some trauma to the skull, caused some trauma to what was underneath the skull, and it resulted in bleeding and then clotting right in between the brain and the inside of the skull.

So if we call this top of the picture 12:00 o'clock, imagining that this is a clock, and then if we call this part

of the picture 8:30, we can see that there is a blood clot that extends from 8:30 to 12:00, and it is in between the brain -- it is not in the brain. It is in between the brain and the inside of the skull. And if we look all the way to the right side of this picture, it tells us that this is the right half of the brain. So this is what we would call a right-sided somewhat large acute, which means that it is new, subdural hematoma blood clot that is underneath that piece of skin called the dura.

Let's pretend this person did not need surgery. And I don't recall if they did or not. But let's pretend that they didn't, and we start to see it go away over the next several days or week. What is it going to look like in a month? And the answer is that this cloudiness or this cottony-ness will turn into darkness as the blood turns into more of a fluid type of base and not blood, as the body is breaking it down. So we might get a very, very similar picture, but instead of any of this cloudiness or cottony-ness, there's just a collection of fluid there, or a collection of dark stuff. We have a hint of it over here, but most of this will turn dark after a month or so.

So one would be an acute subdural hematoma, and one is a chronic subdural hematoma. We knew it was blood, and now that it has turned into fluid, we can say it was a chronic thing. But we knew it was blood prior to that.

Q. How does spinal fluid show on one of these images?
A. On the CAT scan, the spinal fluid is black, and we know that. For example, if we take a look at this image, this image shows the brain, which we know is gray, and right in the middle of the brain we see a butterfly that's black. That butterfly is a pair of lakes of spinal fluid that everybody has in his brain. So we know that spinal fluid is going to show up as black. And we can see spinal fluid in some other lakes deeper or further down in the brain at 3:30, and then down around 6:00 and so on.

So spinal fluid on a CAT scan, and some of the MRI images, is black, or almost black. Fresh blood is cottony or white, cloudy white. And then the brain is sort of like the middle, a charcoal kind of gray.

Q. So when you are attempting to offer a diagnosis for a neurological injury, do you assess the color of the fluid as it shows? And is that an important factor?
A. That's very, very important. And when you say color, I mean, it's just going to be white, gray, or as they say nowadays, shades of gray.
Q. The shades, tell us why.
A. Because as this blood clot, for example, begins to dissolve or evolve or get digested, it's going to go from cottony white on a path to black. But until it gets to that black, and it's going to take weeks, it's going to be cottony

white, less cottony white, a little more gray, a little more gray, and so on and so forth.

Q. Are you qualified to give opinions on neurological images such as this?

A. Oh, yes. Well, I have been qualified in many other courts.

Q. Now, turning your attention to -- in this young man's case, did he need -- is there an apparent need for surgery on this, or is this one of those things where you wait and watch?

A. In Calvin A.'s case?

Q. Pardon me; I'm talking about this case.

A. Oh, the case we're looking at?

Q. If you know.

A. I don't recall. I made this image last year, and I just don't remember.

Q. Now, in your experience, and also with reference to your training and what you have read, have you found that children -- is there evidence that children's brains are more vulnerable than adult brains? And by vulnerable, I mean vulnerable to trauma.

A. Yes, but not for the reasons we think.

Q. Okay.

A. So, in other words --

Q. I'm going to narrow that question. How about infants. Infants as opposed to adult brains, what is the evidence, if

any, that an infant brain -- it would seem to many of us that growing up, they may be more vulnerable. Could you try to address that question?

A. Sure. You say that they are more -- we know that they are obviously more vulnerable in this way, and in other ways it would be more a theory or a hypothesis.

In other words, if I look at you, you are 6'2" or something like that, and you've got long legs, a big trunk, and then your head is maybe one-sixth, one-seventh of the whole picture. It's a very, very relatively small part of your whole body.

With infants, their head is like one-third of their body. And so if they are going to fall, they're going to fall with their head first, because that's where the weight is, and that's the problem. That's actually half the problem. So if an infant falls, there's a very good chance he's going to fall on his head, and that's because he has a higher center of gravity.

The second problem is that if you, for some reason, fall off a ladder, then you're going to have all of these protective reflexes that are going to catch you. Maybe you'll break your arm or break a leg trying to stop the fall. Young infants don't really have very good protective reflexes until they get to nine months or twelve months, so they're not going to be able to catch or stop their fall by using a limb.

Q. Are there any definitive studies that have been created using models as far as to establish -- and this is not even getting to AHT -- to show that children's brains or heads may be more vulnerable to injury? I should have said brains. I'll limit it to that. That children's brains are more vulnerable than adult brains.

A. The models confirm what I was saying about how the head is a bigger part and weighs more and is sort of the first thing that's going to hit the ground in a lot of falls. And then they're using transducers to measure how much force is generated on an infant's head when they hit the ground. But I don't know that they have actually compared the amount with a transducer of a fall, let's say an infant who falls three feet head first onto his head versus an adult who falls three feet head first onto his head. I don't know if that's been compared.

Q. Have you studied neuro anatomy?

A. Yes, sir.

Q. Tell us what that is.

A. That tells us the names of everything and where they belong in the brain, spinal cord, head, and the eyes, as well.

Q. Returning to the images, are you able to show us an image of a hygroma --

A. Well, maybe.

Q. -- to illustrate what we were looking at with a subdural

hematoma and a subdural hygroma?
A. I thought I would have access to the internet. Am I allowed to connect to the internet? I was looking for a free Wi-Fi, and I didn't see it. But I don't know if the Court has one to connect it to or not.
THE COURT: There is one in the building, but I don't know the password.
(A discussion was held off the record.)
A. I just want to make sure I can connect. There is an encyclopedia for radiologists called Radiopaedia, and there is a nice picture of a subdural hygroma there that I want to share.
BY MR. SAMORE:
Q. For purposes of today, I don't think there is an objection. I think that will help us. So if you're able to show that, can you show us that?
A. I'm going to try.
Q. And then we will turn to the specifics.
A. Now, before I show it, I want to show what the normal looks like so everybody can appreciate what the difference is.
Q. Please.
A. So this, again, is a generic child who does not have a subdural hygroma. We once again have a slicer, and that is from ear to ear. In this particular image, the slicer is over the child's forehead. So we can see the eyeballs, we can see

the brain, which on an MRI scan looks very much like the brain, and then we can see the skull. That is the outer arc on top of the brain.

As we go closer, as we go into it, we'll be in the back of the eyeballs here. So we can see on this image the back of the eyeballs. That's what I'm pointing to now. And we can see the brain very, very clearly above the eyeballs with all its hills and valleys. And then we can see that the brain is up against the inside of the skull, which is where it's supposed to be. There is a little bit of fluid there. That's the black stuff. That's just outside the brain. But the brain is up against the inside of the skull, which is how most people are. So this is a child who does not have a subdural hygroma.

I'm going to go back to that Radiopaedia image. Here it is. We can compare this image -- let me get the almost exact duplicate. This is close. I think this will work. Sorry; it's taking me a minute.

Okay, so the image on everybody's left is an image without a hygroma. This is a child who has a little bit of fluid in between the brain and the inside of the skull, but just enough so that you can see the outline of the ridges or the bumps on the surface of the brain. The image on my right is a child whose brain looks okay, yet there's something in between the brain and the inside of the skull. It goes all the way from about 9:00 to 12:00, and then again from 12:00 past 3:00.

Now, when we want to determine the nature of this -- and let me just mention, incidentally, that this child was given a dye for contrast and that's why we're seeing flecks of white. This child does not have bleeding in the brain at all. So let's try to analyze, what is the nature of this fluid -- I'm sorry, what is the nature of this material that we are seeing in between the brain and the inside of the skull.

Well, is it spinal fluid? It definitely is not spinal fluid -- and I'll enlarge the picture -- because we know the spinal fluid sits in the lakes on the inside of the brain and spinal fluid is black. And if we look really, really carefully, we know that the brain sits in a bath of spinal fluid and we can actually see spinal fluid just on the surface of the brain, and that's the right amount of spinal fluid. Just a little thin bath of spinal fluid that the brain is sitting in.

So how can we describe the nature of this? Well, we can say it's lighter. It's a lighter shade than the blackness of spinal fluid, but it's not nearly as light gray as the brain. So all we can say about this fluid -- there's only one thing we can say. This is fluid that is thicker than spinal fluid, but certainly is not a solid like the brain. The brain is a solid matter and that's why it's gray. Spinal fluid is very watery, and that's why it's black. This is something in between. That's all we can say.

Now, if we knew that a month prior this child had blood where this fluid is, then we can say, I know for sure this is chronic subdural hematoma. This is blood that has now evolved and then digested and has turned into fluid. But if we don't know, then we can just say, it's just fluid that is sitting in between the brain and the inside of the skull, and we have to try to imagine what put that fluid there.

Q. Can the bleeding such as that found in a subdural hematoma occur without trauma?

A. The answer is, yes, but it really depends on the case. As a general rule, no. A subdural hematoma is the body's reaction to an impact trauma. But there are exceptions.

Q. And in this instance, you're showing us a subdural hygroma -- this is the hygroma you're showing us?

A. Again, it is not spinal fluid, it is fluid of a thicker nature.

Q. Is there protein in subdural spinal fluid?

A. There is. Just a very little.

Q. There is much more protein in blood?

A. Much more in blood. So here we are sort of halfway.

Q. Now, you have stated that, in your opinion, that one -- that most subdural hygromas are not accidental or abusive trauma.

A. That's correct.

Q. Can you describe that more fully and some of the reasons

you render that opinion?

A. Sure. So, I first want to say I'm limiting my remarks to infants, because old people get subdural hygromas. As people get older, the brain begins, sadly, to atrophy a little bit. It gets smaller and pulls away from the inside of the skull. So old people can get fluid in between the brain and the inside of the skull. So I'm not at all talking to what happens to old people and their subdural hygromas or hematomas.

One of the things that we see in pediatric neurology and neurosurgery is we see infants who are two or four or six or eight months old, and their heads are way too big, and the reason we know that is one of the pediatrician's jobs, in addition to checking on so many other things, is also checking growth. So they check weight as an indication of growth, they check length, and they check the head size to make sure that the head is growing appropriately.

Now, what is making every baby's head grow is the brain grows and pushes the bone out. It pushes the skull out. So the reason why my head is not the same size it was when I was six months old is because, thank goodness, my brain continued to grow and push the skull out with it. So we expect a normal rate of growth in those first several months for babies, and there are growth charts that document that.

So now the question is, what if there is brain plus something else that's growing inside the skull? Then the skull

is going to grow too fast. So you'll get what we call accelerated or rapid head growth. Pediatricians are checking for that, and if they find it, right away they call either myself or the child neurologist or the neurosurgeon and say, I think this child needs a CAT scan. You have to explain what's going on, and then describe it to the family and decide if it needs treatment. So as a routine matter in the world of pediatric neurology and neurosurgery, we are getting kids, who are infants, and their heads are bigger than they should be.

If we put them through CAT scans or MRI scans, sometimes we'll see this fluid collection and sometimes we'll see a subdural hygroma. In other words, we have answered, why does this child have a big head. Oh, the brain is growing, that's good, but there's also fluid that is pushing the skull out and making the skull grow even faster. And then we have to ask the question, why did this child have a subdural hygroma?

So it's 100 percent true that a subdural hygroma can be a complication of a head trauma. Did this child fall out of the crib? Was this child in a car accident? Was this child a victim of abuse? So that is a possibility. But in many of the patients that I have seen, I have talked to the parents in great detail, I have examined the child fully, and there is no indication. The child is three months, six months, nine months, the head is big, we see the subdural hygroma on the CAT scan, and there's no indication of trauma whatsoever.

So then we have to ask the question, why did this subdural hygroma occur? There is the sort of like obvious answer, which is, we don't understand why. A lot of people say, we don't know why it happened. But the other idea that I believe very much is that it is a complication of birth, and what that means is that fluid -- in the squeezing of the head at the time of birth, fluid was allowed to accumulate in between the brain and the inside of the skull, and that fluid simply hasn't gone away. The body hasn't figured out a way to manage it.

So, many of the children that I've seen with subdural hygromas that have caused them to have large head sizes in the first year of life are children who have not been victims of abuse, have not suffered trauma whatsoever. The only trauma they have ever been through is birth. And you can actually track their head size and say, oh, at birth they were 50th percentile, at one month they were 75th percentile, at two months they were 90th percentile, and now at eight months, they're 98th percentile. Clearly this is a complication of birth.

Q. Did you see in Dr. Jenny's opinion that she noted that between four and six months, Calvin's head grew at a more than normal rate? Have you seen that in her report, or letter?

A. Yes, sir.

Q. Did that play a role in your assessment of this case?

A. I believe I explained that in my own report, but I agree

with her about that.
Q. And can those kind of excessive growth rates resolve in a benign way on their own with no complications?
A. Yes. In fact, this condition used to be called -- the name of too much fluid inside the head is hydrocephalus. When you have the fluid outside the brain, that's called external hydrocephalus. And this kind of condition used to be called benign, no big deal, external, outside the brain, too much fluid, hydrocephalus. In the vast majority of cases, as the brain continues to grow, it squeezes the fluid out and the fluid finds a place to go, and the children, by the time they are one-and-a-half or two or two-and-a-half, the fluid is gone. Where did it go? We don't know. But they resolve it on their own. In rare cases, a surgeon has to go in and drain the fluid, and in even more rare cases, there are complications from this fluid.
Q. Now, you also tell us in your opinion that victims of child abuse are often found to have unexplained bruises and rib and limb fractures, scalp injuries, brain injuries and neck injuries.
MR. NAYBACK: Your Honor, I'm going to object real quick. Excuse me, Mr. Samore. I was waiting for a tender of the expert, and then I was going to request to voir dire. It seems like we have glided right into the doctor's opinions. I don't know if that was going to be left out.

MR. SAMORE: For purposes of a Daubert motion, the last time I did one of these we just moved right through it, getting the testimony in, and then because it was only to the Judge, then the Government made its questions. But I can certainly do that now and then let -- whatever order, I think it comes out to the same place.

THE COURT: I'm going to reserve ruling, so I'll let the parties make the record. But do you want to challenge his qualifications?

MR. NAYBACK: If you're going to hold it under advisement, Your Honor, then I will wait until Mr. Samore has completed and I will simply voir dire the witness at that time.

THE COURT: Okay.

MR. SAMORE: That's what we did the last time. It wasn't with this Court, but it got the opinions out, and then the voir dire happened at one time.

THE COURT: Okay.

MR. SAMORE: I am going to be offering the doctor as a child neurologist, pediatric neurologist, at least in that regard.

BY MR. SAMORE:

Q. Now, I think my question was, back to the finding that victims of child abuse are often found with unexplained bruises, rib fractures, scalp injuries, brain injuries and neck injuries, tell us what the basis is, largely, for your opinion

that that is often the case.
A. Well, I've been in children's hospitals for 25 years, and that is just simply the circumstance. In other words, yes, it is true that a single bruise might be an indication of child abuse, it might not. But certainly the more findings that a child has, that brings the child to our attention quicker. And I can list 10 to 15 findings, and if a child has 10 to 15 of them, that's certainly going to be extremely, extremely suspicious for child abuse. And if a child has only one or two findings, that's going to be a lot less suspicious. It's just been my experience that way, that children who are victims of child abuse tend to have a lot of findings.
Q. And is it possible that children who have been the victim of abuse will not have any external injuries, but they may have internal injuries that are not visible to the naked eye?
A. Absolutely.
Q. And you have found those kind of cases, too?
A. Yes, sir.
Q. And you're also, as well as from your training and experience, you also are current and keep yourself informed with the literature about abusive head trauma, shaken baby syndrome, and other child abuse issues?
A. Yes, sir, I do, as a pediatrician and particularly as a pediatric neurologist.
Q. Now, in this case -- I'm going to try to move us toward

Calvin's case right now so Mr. Nayback can ask his questions. What records did you review in preparation, prior to rendering your opinion on this case?

A. I don't remember all the records that I reviewed, but I did review the medical records, including the hospitalization -- oh, I did have all the pediatrician records. I'm sorry. I did have the birth records, I did have the medical records from the hospitalization when the child was, I believe, eight or nine months old -- it was I think September of the year in question -- and then I did get to see follow-up records.

I reviewed the images, which included CAT scans and MRI scans, and then I reviewed reports. There's a report from Dr. Plunkett, a report from Dr. Jenny. I'm not sure if I recall other -- there was a report from a child abuse doctor. I can't remember her name. And there were a lot of interviews of the client and that kind of thing. I paid most attention to the medical record.

Q. And then last night, did you have the opportunity to at least give a read or some review of the Government's exhibits that I provided to you when you arrived in Albuquerque last night?

A. Yes, sir. Thanks for giving them to me.

Q. Do you -- I know Mr. Nayback will be asking you questions about that, but are you familiar, or did you at least recognize some of the literature that went back as far as 1972 about

hygromas that was included?

A. Sure.

Q. Dr. Jenny's only reports that you have seen are the one in April of 2017, and then also -- that was regarding Dr. Plunkett's opinion, and then there was also an August 23, 2018, letter that was sent to the defense on September 12th. Have you seen that?

A. Yes, sir.

Q. All right. Now, to assist the Court in addressing these issues, Dr. Plunkett referred to what he described as BESS. What is that condition?

A. Can I show a demonstrative?

Q. Please.

A. I'm at the website as everybody can see called Radiopaedia, and in this particular set of images, this child actually has both too much spinal fluid around the brain on one side and then too much subdural fluid, the subdural hygroma, on the other side. What BESS stands for is -- the "B" is for benign. It usually goes away. The "E" is for expansion. There's too much. So it's Benign Expansion of the Subarachnoid Space.

Let me show one other demonstrative so this becomes more logical, and that is a diagram of the coverings of the brain. I'm sorry I didn't show that before. I think this is a good one.

So, this is sort of a cutaway kind of view where you can see what is between the brain and the hair. On the outside, we've got the scalp. Underneath the scalp, we have a thicker layer called the periosteum; peri meaning around the bone. And then we have actually got the skull. Then these two layers, one I'll call sort of gray and one sort of skin-colored -- and this is just a diagram -- that is the dura. They describe it on this graphic as periosteal. In other words, the dura next to the bone. And then the meningeal, the dura closer to the brain. So it's sort of a double layer.

Then we've got the final layer, which is the arachnoid, which in this diagram happens to be purple. The arachnoid is the Saran wrap that surrounds the brain. This is the brain below, in this diagram, and the arachnoid is the Saran wrap that wraps the brain and keeps all the spinal fluid in. As I said before, the brain sits in a bath. That bath is the spinal fluid, and it is held in by this arachnoid membrane. So there is fluid in between this space on the inside and the arachnoid. That's the thin layer I described before, and that's supposed to be there. It is supposed to be a thin bath.

What happens if there is too much fluid? If it accumulates, then there's a problem of circulation and you get this picture. So that's what we're looking at, where I have the curser.

So, again, this happens to be the right side of the brain,

where I'm pointing, and in between the brain and the inside of the skull, as we saw before, there really shouldn't be much fluid at all, and yet here there's simply a larger amount of fluid than you would expect. And we know that this is spinal fluid, because this fluid that I'm pointing to at, let's say, 10:00, 11:00, 9:00, is the exact same black color as the spinal fluid that sits in the lakes. So this child, on the right side, has BESS. Too much spinal fluid. Benign Expansion of the Subarachnoid Space.

Let me explain why it's subarachnoid. So, this is fluid -- where did I put that graphic? This is fluid that is sitting underneath this purple. So that's what's going on on the right side. On the left side, on the left side, it's very, very clear that this fluid is a different color. This fluid in between the brain and the inside of the skull is lighter gray. Not as light gray as the solid of the brain, but certainly not nearly as black as spinal fluid. So on this side -- and if you look very, very closely, you can actually see there is a very, very thin layer of spinal fluid the way it should be right on the surface of the brain.

But this child has too much fluid on the other side of his head in the subdural space, which, again, is here. So this child has a combination of both. Two completely different conditions. Sometimes they run together, as you can see. But the BESS that Dr. Plunkett referred to is an expansion in the

amount of spinal fluid outside the brain.
Q. And Dr. Jenny addressed that in her letter of April 2017. You saw that?
A. Yes, sir.
Q. Was BESS a relevant factor at all in your assessment of this child's condition?
A. This child, Calvin, actually did not have any sign of excessive spinal fluid.
Q. Did you conclude that Calvin probably had a seizure?
A. Absolutely.
Q. Let's turn our attention to what you did find in your review and in your report of Calvin. What were the most relevant records that assisted in your analysis?
A. The imaging is very, very important, always, and also the clinical material, what actually happened to him, what was the outcome, how much did he suffer in the hospital, that kind of stuff.
Q. Did he appear, from your review of the records, and, of course, in your report, did he have a skull fracture?
A. No, sir.
Q. Was there reference in Dr. Strickler's report and in a radiological report that one of the x-rays showed a linear skull fracture?
A. There was a question of a skull fracture. There was not one confirmed.

Q. Were there any other tests done that were more definitive?
A. Yes, sir.
Q. What were those?
A. The CT scan of the head.
Q. Did anything confirm any fracture?
A. No, sir.
Q. What about -- what did you find in the CT scan? How did it appear to you?
A. I can show it, but he had a --
Q. Please.
A. He had a very, very small subdural hematoma. The Court hopefully will remember the previous subdural hematoma which I showed, which was large. Calvin's was much smaller, and I believe this is it. Let's make sure this is the right person. First and foremost, if we look at the top of the image, it's got the name, Calvin A. If we look at the bottom right, we have got the date, September 28, 2014.

This is different than the view that I showed you before. This is what I would call the flipped bird's eye view. So instead of the guillotine being on top, the virtual guillotine being on top of the child's head, we can put that across the top of the nose, front to back, and lift off the top of the head and find out what's below. In a radiological case, that's what they do, and then they flip the image so that the "R" -- this would be the right eye, and we know that because the

technician put the letter "R" there, and this is the left eye. And again, we know that for the same reason.

This is the virtual slice through the eyeballs, and then we can go up to the top of the eyeballs, that's the top of the eyeballs, and then continue with the slicer and go up into the forehead. So here we are in the forehead, and here we get the first inkling of Calvin's acute subdural hematoma.

At 12:00, where I'm pointing, would be Calvin's forehead. The oval is, of course, Calvin's skull. We already know that spinal fluid is dark, blackish, or almost black, and we know that a blood clot is going to look like wisps of cotton or little clouds. So we get an inkling that between here, 11:00 and 11:30, this line is suspicious for a very thin, small blood clot.

As we go higher, we can see that that blood clot is present also in sort of like a thin line form at about 9:00, 9:00 to 9:30. And as we go higher to that, we're going to see there's a little bit of blood clot that is between, I'll say, 10:00 and 10:30. And then we also see this little blood clot that is in between the two hemispheres. It is this thin sort of cottony little line in between the two hemispheres. As we continue to go up, we still see that thin line, and that's about it.

So, there is the presence of what we would call an acute subdural hematoma. It is very, very thin. It is very, very

small. But he did have one on September 28, 2014.
Q. Could that have caused a seizure?
A. No, it could not have.
Q. Do you have an opinion as to what may have caused the seizure?
A. Yes. And I need to give a little bit of background to explain.
Q. Please.
A. Nobody on earth should ever get a subdural hematoma, but if somebody does get one, because the blood clot is one layer removed from the brain, it typically will not cause brain compromise and will typically not irritate the brain. Brain compromise is the idea that there is a part of the brain that is acutely malfunctioning in a very important way so that the brain cells are not working right.

Brain compromise is a very, very important feature, because let's say somebody has a stroke. We're not at all talking about Calvin, we're talking about a theoretical old person. Say that theoretical old person suddenly can't move his arm. You rush him to the hospital and they say, what's wrong? He goes into the MRI machine, and an MRI -- a CAT scan is not very good at this, but an MRI is so good. An MRI can actually pinpoint an area of compromise in this patient's brain that is controlling the arm. That part of the brain is not working right now. Maybe it will get better, maybe not. Maybe

it needs treatment, maybe not.

So if there is brain compromise, we can understand that that brain compromise would be enough to trigger a seizure. The brain is a very, very sensitive organ and works with these small electrical signals. If the electrical signals are disrupted, that can cause a seizure. It is basically a short-circuit in the electrical signals.

Calvin had an MRI scan that didn't show any brain compromise, so we have sort of ruled that out. So, what might cause a seizure --

Q. Let me interrupt you for just a moment. What would the evidence be in an MRI that there is not a brain compromise? Is it something we can see on the screen?

A. Not on my screen, but it is something that's visible on a Microsoft screen, because there's a program for that that my McIntosh can't read.

Q. Did you look for that before you entered your opinion on the MRI?

A. Yes, sir. The name is called diffusion, the diffusion technique of the MRI scan, and on the diffusion technique, there was no image of brain compromise.

Q. I interrupted you. I'm sorry.

A. Again, let me make this as clear as I possibly can. A traumatic acute brain compromise can trigger a seizure, because something is happening in the brain. The brain is irritated,

and that disruption of normal brain electrical signals can trigger a seizure.

However, Calvin did not demonstrate any evidence of brain compromise on his MRI scan, which I think was the next day. I'd have to look at my notes to be sure of that. I believe it was the next day. So the question then comes up, what did irritate his brain that caused a seizure? We know for sure that he had a seizure once he came to the hospital. I very strongly suspect that it was a seizure that caused him to have this traumatic alteration in consciousness.

What can cause a seizure? The other thing that can cause a seizure in this type of scenario is a little bit of blood on the surface of the brain. In other words, subarachnoid blood. So, again, let's look at that diagram to see if I'm making myself clear to everybody.

Q. Is this going to be Calvin?

A. No, sir. This is just going to be the diagram.

So, again, if we look at this diagram, we can see that the only way for something to actually get on the surface of the brain to irritate it is to be under that purple layer, under the arachnoid layer. All neurologists know that if somebody has subarachnoid blood, a little bit of blood on the surface of the brain underneath the arachnoid, that can trigger a seizure. And we also know that if there is a little bit of blood in the subdural layer -- in other words, one layer removed from the

brain -- that would not trigger a seizure unless it's so big that it's squeezing the brain.

In that earlier CAT scan I showed you as a demonstrative, that blood clot was so big it was actually squeezing the brain, and the child did have seizures because the brain was being compressed and irritated that way. What we see on Calvin's CAT scan is a very thin, small amount of blood not on the surface of the brain, one layer removed. So we then have to assume and look for evidence on the MRI scan that Calvin, indeed, did have subarachnoid blood on the surface of the brain, and that evidence is, indeed, there on his MRI scan.

So let me then backtrack and say, I am sure that Calvin had a seizure because he had a small subarachnoid hemorrhage, and I have evidence of that. I didn't see it on the CAT scan. It wasn't very visible. But I did see evidence of that on the MRI scan.

Q. Now, Dr. Jenny in her letter that was critical of your opinions described -- well, she identified that Calvin's brain was concussed, and as evidence, it appears she described post-concussive symptoms including prolonged high-pitch crying and extreme irritability, and identified those as symptoms of brain injury. Are those symptoms of brain injury?

A. Can be. In other words, if a baby does get concussed -- in other words, if somebody drops a baby from a height and the baby hits his head, that baby could get the high-pitched cry

and lethargy. But it's also very much symptomatic of a seizure. So, I mean, one can choose that concussion diagnosis, but if the child then goes on to have a seizure in the hospital and everybody admits to it, it was just a few hours later, then why assume, oh, the child first had a concussion and then had a seizure. Just say the child had a seizure.

Q. She also noted that -- I think I'm going to quote it. "The acute bleeds on Calvin's studies are in some places where there was no pre-existing subacute fluid, such as in the posterior fossa and in the ventricle." Do you agree with that?

A. No, not at all.

Q. Could you describe why you do not agree with that?

A. Yeah. We have to start from the beginning of the sentence, which is -- we, you and I, have talked extensively about what a hygroma is and what a chronic or a subacute subdural hematoma is, and that they might be the same thing, but there is no proof that they are the same thing, particularly in this case. Again, unless you have prior evidence where you've actually seen an acute subdural hematoma, you don't know if something is a chronic subdural hematoma or even a subacute subdural hematoma, which just means something that is maybe a week after the original event, or maybe two weeks, something like that.

So the first thing that she says -- I need you to read it to me, and then I'll stop you so I can explain that part and

then go on to the second. Can you read that quote again from Dr. Jenny?

MR. SAMORE: May I approach the witness, Judge? I have a copy, and it will probably be quicker.

THE COURT: Sure.

BY MR. SAMORE:

Q. It's Paragraph 4.

A. Can I continue?

Q. Please.

A. Okay. I'm sorry. Actually, she did write it correctly. I apologize. So here is the first sentence. "The acute bleeds on Calvin's studies are in some places where there was no pre-existing subacute fluid" -- I agree with that 100 percent -- "such as in the posterior fossa and in the ventricle." Okay, that sentence is 100 percent accurate, and let me just demonstrate. I don't have the -- I don't have the MRI that I can show, but I can at least demonstrate on Calvin's study where the posterior fossa is. Unfortunately, we don't see it well enough to say if this is blood or not.

So, here are the eyeballs. Once again, this is Calvin. This is September 28, 2014. If we go up to the forehead -- there's the forehead; I'm sorry. Just above the eyeballs, just at the bottom of the forehead, so towards the back of the picture -- actually, if we look really closely, we can see Calvin's left ear and Calvin's right ear, and then if we look

from about 4:00 to 8:00, then we can see there is this big sort of triangular part of the brain, and that is what we call the posterior fossa. That's the back part of the brain. If we put our hand at the back of our skull, that's the brain underneath there.

So, Dr. Jenny writes that there was evidence of bleeding there in the posterior fossa. In other words, if we look at the MRI, which I can show you, you can see in between the brain and the back of the skull, there is a little bit of blood there. She is 100 percent correct about that.

What she is incorrect about is that subdural hematomas move. Blood, before it clots, will flow, and it will flow to the back particularly if a child is laying on his back. So it is very, very common that we will see a child with a subacute subdural hematoma on day one and all the blood is right at the front of the head, and on days two, three or four, as we do more CAT scans, we will see the blood is more towards the back, because the child is laying on his back and the blood will move or flow.

So to say the fact that there is blood in between the back of the brain and the inside of the skull means something new is going on, absolutely not. This is blood that has, I would say, trickled down to that area. So that, to me, is not an argument.

And then the second argument is actually my argument, but

she is making it in the reverse; ventricular blood. And let me say exactly what that means. We don't see it on this picture, but I had earlier pointed to these butterflies that are in the middle of everybody's brain, and these butterflies are lakes of spinal fluid. You see this pair here. We had seen on the other view the same pair. The name of these lakes of spinal fluid is ventricles. How does blood get into a ventricle? The answer is that the bath that the brain sits in circulates. So that same bath that we see on the surface of the brain is the same bath that's going into the brain and sits in the lakes. So this, to me, is proof positive that, indeed, Calvin had a subarachnoid hematoma. There was blood underneath that layer that got into the bath. And on the MRI scan, you can see some blood in the bath. A very, very tiny amount, but there it is.

So her argument that, oh, you wouldn't expect that from BESS, this condition that Calvin didn't have, I'd say you would expect it in a child with seizures who simply just has a very small subdural hematoma and we need to explain the seizures for another reason.

Q. In the past, you and Dr. Jenny have testified for either the prosecution or the defense on a number of occasions, but you've been on the same cases together, haven't you?

A. Same cases on opposite sides of the fence?

Q. Yes.

A. Yes, at least twice that I know, but maybe more.

Q. All right. Just a couple of final questions. There's a term, it's in some of the literature that both sides have presented, and it's called the triad. Can you just describe what the triad is and how it relates to shaken baby syndrome, or abusive head trauma, and the issues that are generally before the Court today?

A. Sure. So I have to sort of give like a preface to it and just say that the number one cause in the entire world -- if you're walking through any hospital emergency room and you see a doctor say, there's a patient in the room with a subdural hematoma, the number one cause you can assume, and there are exceptions, is that that person suffered an impact injury, and whether it was falling off a horse, whether it was getting into a barroom brawl, whether it was a baby with an inflicted injury, the number one cause of subdural hematoma in the whole world is an inflicted injury -- I'm sorry; is an impact injury. An impact injury means something struck the skull and that force was then transmitted to the surface of the brain, and that caused the bleeding in between the brain and the inside of the skull. Number one cause, impact injury, for subdural hematoma.

So, now we have a problem. We've got infants who are three or six or nine months old, and they're coming into the emergency room and they have a subdural hematoma and there's no visible evidence of impact and no caregiver description of an

impact. And so everybody is asking themselves and the caregivers, how did this child get a subdural hematoma if we know the number one cause is an impact injury and nobody is telling us the child had any impact and we're not seeing any evidence?

The answer that somebody came up with back in the 1970s was, perhaps violent shaking can also cause a subdural hematoma. That idea is still out there. It has sort of morphed into abusive head trauma, which is a vague term, but in 2009, people were saying violent shaking of an infant can cause subdural hematoma, and it might.

Q. You're not denying that it is possible and it could happen?

A. Certainly. I'm not denying that it is bad for anybody, and nobody should ever shake anybody, violently shake anybody, and certainly not a one-month-old, two-month-old, something-month-old infant. But I'm also saying, there really is no good scientific evidence that violent shaking of an infant causes a subdural hematoma, like an impact injury causes an acute subdural hematoma.

So part one of the triad is if an infant has an acute subdural hematoma. Then you're one-third of the way there. Part two of the triad is if a child has retinal hemorrhages. That is a very important finding. Part three of the triad is if a child had a dramatic change in consciousness, like Calvin

had. Child was fine, and then suddenly the child is unresponsive or has a seizure or passes out.

Q. Has that last factor sometimes been described as encephalopathy?

A. Yes. That's a fancy term that just means the brain is malfunctioning.

Q. And in 2009, how did that --

A. Let me just finish my sentence. I apologize.

So the idea was, and it was in the 1980s, 1990s, first decade of the 2000s, that if a person shakes an infant violently, that person can produce the triad, and the triad is subdural hematoma, retinal hemorrhages, and a dramatic change in mental abilities, what we call encephalopathy. So, then, there you have it. Without any evidence of impact, they would conclude that a child had been violently shaken, and that is shaken baby syndrome.

In 2009, the American Academy of Pediatrics changed the terminology to something more generic and more vague, and they have explained the reasons why in their consensus statement, whatever their reasons were. So now the term has morphed into abusive head trauma, which is telling you that not only has that person violently shook an infant, it might mean something more. But that's the preferred term nowadays.

Q. And are there some differences among professionals, not just you and Dr. Jenny, but many professionals in the field

regarding the proof issues and whether the triad is associated at a high degree with such injuries?

A. There is no --

Q. I misspoke. Is that triad of those physical observations, the retinal hemorrhaging, the subdural hematoma, the encephalopathy, highly associated with abusive head trauma?

A. Yes. There is a public disagreement about how important and how scientific that type of diagnosis is.

Q. And I think the final question before I pass for cross is, in your review of the evidence that you used to render your opinions, did you find compelling evidence that pulling a child, or yanking a child, taking a child, whatever the term is, out of a bouncy seat and lifting them up in the air is alone going to cause the kind of -- is going to cause the seizure that was found in Calvin? Are you able to even address that specifically?

A. I have no reason to think that that would be particularly traumatic for a child, and certainly not for Calvin.

MR. SAMORE: No further questions. Pass the witness.

THE COURT: Let's take about a five or ten-minute break, and then we'll come back and counsel may cross.

(Recess was held at 10:05 A.M.)

(In Open Court at 10:15 A.M.)

THE COURT: We are back on the record. Counsel may cross.

MR. NAYBACK: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. NAYBACK:

Q. Dr. Scheller, prior to today, have your reports or opinions ever been subject to a federal Daubert hearing?

A. I remember being a part of at least two other, maybe three other Daubert hearings.

Q. Could I request those, and could you provide those to Mr. Samore?

A. I don't have them.

Q. Let me ask you this: Were there rulings made, Doctor?

A. I don't even know.

Q. And you don't know the names of the cases?

A. No, sir.

Q. Okay. And when you go around the country and you fly into state court, you're not usually challenged, are you?

A. I'm always challenged by a guy like you.

Q. Thanks, Doctor. If you come across those Daubert hearings where there's been rulings, will you provide those to Mr. Samore? Can I ask you to look?

A. Oh, sure. I don't do Nexis and Lexis kind of research, though.

Q. Now, it sounds like that you have a private practice in Baltimore; right?

A. Yes, sir.

Q. You're not affiliated with any hospital?
A. No, sir.
Q. And you don't sit on a child abuse response team?
A. No, sir. I've never been on a child abuse team.
Q. Okay. And you've never achieved academic tenure in any position you've ever held, have you?
A. That's correct.
Q. You've never formally taught in a classroom setting about child abuse?
A. Not to doctors.
Q. Okay. Well, if not to doctors, who, Dr. Scheller?
A. Social workers and attorneys.
Q. We'll get to the attorneys.
Can you explain how a child abuse examination is done forensically?
A. Well, I'm not a child abuse doctor, but I've read hundreds of them, so I can describe what I've read, and I've worked with child abuse doctors.
Q. I'll pass.
Would it surprise you to learn that it's a very comprehensive exam that seeks to exclude other medical reasons for brain injury?
A. One of the things. I mean, obviously they deal with other injuries, but possibly brain injury, that's right.
Q. You've never spoken on behalf of the American Academy of

Pediatrics to issue proclamations about child abuse, have you, Dr. Scheller?

A. Never.

Q. You've never been the director of a child abuse clinic?

A. No, sir.

Q. It sounds like in your current practice, you have a small private practice, you treat kids maybe with epilepsy and headaches.

A. Well, it could be anything, but a lot of it is epilepsy and headaches.

Q. Okay. So you spend two days a week there, but the majority of your time is spent traveling around the country testifying on behalf of criminal defendants; isn't that right?

A. So, the travel is definitely big, but in the real world, I probably travel like two days a month or three days a month, and then the rest of the time I'm reviewing files, talking to attorneys, that kind of thing.

Q. Have you participated in any studies about child abuse?

A. I've just written some case reports, that's it.

Q. Okay. And aside from, let's say, a public defender's office, no government agency has ever sought your advice on child abuse, have they, Dr. Scheller?

A. No, sir.

Q. Have you received any awards in your career regarding your service as a neurologist?

A. No, sir. Pats on the back.
Q. But you have presented at a conference for defense attorneys about defending child abuse cases; isn't that right?
A. Well, I'm not a lawyer, so I really can't tell them how to defend it. I really more teach them how to understand suspected abusive head injury.
Q. Well, you've spoken at more than one conference, Dr. Scheller, and you know there's plenty of paper out there on you; right? I mean, you know there's cases, there's fliers where you speak. You understand that; right?
A. Sure.
Q. Okay. So, you spoke at a national parent attorney conference, and you talked about medical conditions that mimic medical findings presumed to be child abuse, haven't you?
A. Oh, for sure.
Q. Why would you do that?
A. Well, that's an interest of mine.
Q. An interest of yours is defending parents and criminal defendants who have been accused of child abuse; isn't that right?
A. I'll put it a different way, if that's okay.
Q. Well, you don't have to agree. I'm just asking you, Doctor.
A. Well, that's not right.
Q. That's what you're doing in this case, you're providing an

alternative explanation for what is plain to other doctors abusive head trauma.

A. I'm not doing that at all.

Q. How often have you testified as a defense doctor in cases of suspected child abuse, how many times? Do you have a sense of that?

A. Definitely more than 100. Probably more than 150.

Q. And when did that start? In recent years?

A. More than ten years ago.

Q. Okay. And you knew Dr. Plunkett before he passed away; right?

A. Yes, sir.

Q. And you guys shared the same belief that there's no real such thing as abusive head trauma; right?

A. That never came up, and we never spoke about that.

Q. That's hard to believe, Doctor. Is that real?

A. That's real.

Q. Okay. And you've never testified for the Department of Justice or state prosecutors in any case where there's suspected abusive head trauma, have you?

A. That's correct.

Q. You've always testified for the defense; correct?

A. That's right.

Q. And that's because you don't believe that abusive head trauma is real?

A. That's not true.
Q. Okay. Let me ask it another way. Mr. Samore said there's a legitimate legal controversy over whether abusive head trauma exists. Do you remember him talking to you about that?
A. I don't know if he said the words legal controversy, so I can't -- I'm not a lawyer, so I don't know where there's legal controversy and where there isn't.
Q. Do you suspect there's a medical controversy?
A. There's definitely a medical controversy.
Q. And you put yourself in the five percent of doctors who don't believe that abusive head trauma is a real phenomenon, a medical phenomenon; is that right?
A. No, not at all. And you're putting me into a category that's simply not true.
Q. Well, Doctor, there are several cases where you've admitted that you are in the five percent versus the ninety-five percent on the topic of abusive head trauma. You're free to explain yourself, but I'm asking you, what puts you in that five percent, Doctor, that you've admitted to in many cases?
A. So I need to explain myself, and then I'm happy to tell you how I ended up there.
Q. Okay. Go ahead, Doctor.
A. I was very much like your average pediatrician in the 1990s, and when somebody like Dr. Jenny said, I reviewed the

case and this is child abuse, I said, okay, great, thanks. Let's do what we need to do. And then I got more interested in it, and I realized that the scientific basis, the foundation of diagnosing abusive child trauma -- back then it was called shaken baby syndrome -- and diagnosing retinal hemorrhages the very, very shaky. And the more I learned, the more I was convinced that it was a diagnosis that was -- that didn't stand on shaky scientific ground.

So the reason I come to court today and the reason I testify in other cases is really just to educate the courts about what we know and what we don't know about suspected abusive head trauma.

MR. NAYBACK: Approach the witness, Your Honor?

THE COURT: You may.

BY MR. NAYBACK:

Q. Dr. Scheller, I'm presenting you with an exhibit binder. I think Mr. Samore explained to me, anyway, that you had seen this on another occasion. Would you please turn to Government's Exhibit 8?

A. Did you say No. 8?

Q. Yes.

A. Yes, sir.

Q. Are you familiar with that paper?

A. Very.

Q. You've read it?

A. Yes, sir.
Q. Okay. Were you part author of that paper?
A. No, sir.
Q. Do you know any of the esteemed experts who were a part of that paper?
A. Oh, I've been on the other side of the fence of almost all of them. Not Dr. Slovis. Actually, Dr. Slovis was my teacher, so I apologize. I do know he has passed away, but he was my radiology teacher when I was a resident.
Q. This is a "Consensus statement on abusive head trauma in infants and young children." Is that correct?
A. That's right.
Q. Would you venture to guess how many medical associations support this consensus statement?
A. I've been asked by people like yourself in other trials, and there's probably like 15 or 20 of them. Maybe more, even.
Q. Okay. Now, are there any medical associations or other groups who sit on the other side of this issue, Doctor, besides yourself?
A. Oh, yes sir.
Q. And who are they?
A. Right now, the only group that is on the other side is a group in Sweden, and they are the people who are connected with the journal called the Acta Paediatrica Scandinavica.
Q. Now, I hope I'm not mischaracterizing your own statement

that you're in the five percent of doctors who are on the other side of this issue.

A. Well, I mean, that's a very vague statement, but I have said I'm in the five percent. And, again, if you want me to, I'm very happy to clarify what that means exactly.

Q. If you could, briefly.

A. Sure. The average pediatrician has trained in a pediatric hospital and has seen child abuse with his own eyes, so believes that it for sure happens, and I'm one of those people. The average pediatrician believes that a child abuse doctor who does not have specialized training in neurology has the facilities to rule out neurological causes of mimics of abusive head trauma. And so if a child abuse pediatrician says to an average pediatrician, well, I've ruled out all the neurologic causes, and so this is child abuse, the average pediatrician will say, okay, good job, thanks.

Once one becomes a neurologist, like I became, one becomes very, very critical of the ability to rule out other factors that cause mimics of abusive head trauma. And so I'm in that five percent that doesn't -- that is very skeptical when a child abuse doctor says, I've ruled out all the neurological causes and I've concluded that this is abusive head trauma.

Q. Have you ever held yourself out as a child abuse expert?

A. No, sir.

Q. Do you remember testifying in People v. Goins on

October 23rd of 2013?
A. I don't remember that specific case.
Q. Okay. Will you turn to Government's Exhibit 14?
A. I think, was it a Chicago case?
Q. Would you turn to Exhibit 14, Doctor?
A. Yep.
Q. Sorry; I get to ask the questions.
When you're there, please turn to Page 6 of 15, and let me know when you're there.
A. I'm here.
Q. Top right column, if you'll read along with me, it says: "Joseph Scheller, a pediatric neurologist and child abuse expert." Is that how you held yourself out in that case, Dr. Scheller?
A. It's a misrepresentation.
Q. Would the transcript, if I got it, reflect that?
A. I'm sure I didn't read the transcript. But I would never say it, because it's not true.
Q. But you would listen to an attorney's tender of you as an expert and clarify if they tried to qualify you as a child abuse expert, you would correct them, wouldn't you, in open court?
A. Yes, but it is possible that I had a momentary lapse. And if they said pediatrician, pediatric neurologist, child abuse expert, then I might have missed that one thing. But I have

never, and won't ever say that I'm a child abuse expert, until I do the training.

Q. Are you planning on doing the training, Doctor?

A. I think about it.

Q. Well, let's talk a little bit about your time down at the clinic -- was it in Virginia or North Carolina, this most recent training that you did?

A. Winchester, Virginia.

Q. Winchester, Virginia?

A. Yes, sir.

Q. Can you tell us a little bit more about how long you spent there?

A. Two years.

Q. And was that every day of the week?

A. No, sir.

Q. Did you live down there?

A. I lived there for the week.

Q. Okay.

A. I came on Monday morning, and left on Friday afternoon.

Q. And how much coursework did that involve?

A. It wasn't any coursework. It was reviewing CAT scans and MRI scans under the mentorship of people running the imaging department there.

Q. Okay. And that is not a subspecialty that is endorsed by the American Board of Medical Specialties; correct?

A. Not yet.
Q. Okay. And you're familiar with the American Board of Medical Specialties, aren't you, Doctor?
A. Yes, sir.
Q. Okay. And, in fact, neuroimaging isn't even a subspecialty in the American Board of Medical Specialties, is it?
A. I didn't understand the "even" part. What do you mean?
Q. The American Board of Medical Specialties does not recognize neuroimaging as a subspecialty, does it, Doctor?
A. Not yet.
Q. Okay. Are you advocating for that?
A. Other people are.
Q. Okay. So for two years, you spent some time down in Virginia, and what did you walk away with? What type of certification, and who was it by?
A. I mentioned it earlier. It's called the UCNS, United Council of Neurologic Subspecialties. They give an exam in a lot of different neurologic subspecialties, like stroke, like Alzheimer's, like epilepsy. So I got a certificate from them. I'm certified as a neurologic subspecialist which a specialty in neuroimaging.
Q. Okay. You're not a radiologist; correct?
A. That's right.
Q. What does it take to be a radiologist?

A. The ability to stay awake in dark rooms for four years in a row.
Q. Spare us the humor, Doctor. I just want to get through this today. Isn't it five years of training?
A. I actually don't know.
Q. Okay. You don't know what it takes to become a radiologist, nor are you one; correct?
A. Correct.
Q. Yet you are testifying and offering opinions with certainty about what Calvin A.'s MRI and CT scans say, aren't you?
A. Yes, sir.
Q. Okay. You're not board certified in child abuse by the American Board of Pediatrics; correct?
A. That's right.
Q. And when you claim to be a forensic expert, I think that's one of the things you testified earlier, that just means you testify in court a lot; right?
A. I never said I was a forensic expert, and I don't even know what that means.
Q. Okay. And you haven't held yourself out to be as such?
A. Again, I've never said that in court. Maybe somebody said it about me and it slipped past me.
Q. Now, you're getting paid for your work in this case?
A. Hope so.

Q. Part of that fee includes your testimony today; right?
A. Yes, sir.
Q. You're paid by the hour?
A. Yes, sir.
Q. How much?
A. $250 an hour.
Q. Okay. And how much do you anticipate being paid for your work in this case?
A. For the day today, for example, I charge $2,500. I had a lot of meetings with Mr. Samore, and that's $250 per hour. So probably around $5,000, maybe a little bit more.
Q. And how long did it take you to write your two-page report in this case?
A. I don't recall.
Q. Okay. I note that you didn't have any medical literature cited in your report, did you?
A. No, I did not.
Q. Now, when the United States asked for medical literature to support your opinions, Mr. Samore filed something and wrote about four articles that you submitted. Did you see that submission to the Court?
A. I don't recall.
Q. Okay. Did you provide him with the four articles that he tendered to the United States? Did you provide him with medical literature?

A. Yes, sir.
Q. Okay, we're going to go over those in a minute.
You make more testifying around the country than you do in your clinical practice; correct?
A. Not around the country. I make more from my forensic practice, for my medical-legal practice, than I do from seeing patients.
Q. What's your forensic practice?
A. Like I said, I'm basically traveling about two or three days a month, and then the other times I'm reviewing forensic cases and discussing them with attorneys, or writing reports.
Q. And that's why you call yourself a forensic expert?
A. But I don't.
Q. Okay. Your payment isn't contingent upon the outcome of the case, is it, Doctor?
A. No, sir.
Q. In fact, many of the defendants in cases where you testify get convicted, don't they?
A. Sure.
Q. How many hours have you spent on this case --
A. I don't know.
Q. -- do you know?
A. I don't know exactly. Like I said, today my charge for the day is $2,500. But I'd have to look in my files.
Q. Will you turn to Government's Exhibit 3, Dr. Scheller,

please?
A. Yes, sir.
Q. Now, this is your report that you submitted in this case; correct?
A. Yes, sir.
Q. Was there anything that we didn't hear about or see today that you wanted to add to your report in this case, including the medical literature that you provided later?
A. There was something I mentioned today that I didn't mention in my report, but it basically just confirms what I put in the report.
Q. Okay. Now will you turn to Government's Exhibit 1, and let me know when you're there.
A. I'm here.
Q. Dr. Scheller, this document, does it contain the medical literature that you submitted only when the United States requested it?
A. I'm looking at -- hold on. I'm sorry, I'm looking at the thing before Page 1? Before Section 1, or in Section 1?
MR. NAYBACK: May I approach, Your Honor?
THE COURT: Yes. Just show him.
BY MR. NAYBACK:
Q. Dr. Scheller, you should be looking at Government's Exhibit 1. That's an exhibit list. If you turn the tab, see Government's Exhibit 1 there? Is there a tab on

the bottom that says Government's Exhibit 1?

The title of the document, and I apologize if it's not in the correct order, Dr. Scheller, is "Mr. Duran's Response to Motion in Limine."

A. Okay, got it.

Q. Is it past Tab 1, just so I'm clear?

A. Yes, sir.

Q. Okay. Have you ever seen this document before?

A. Yes, sir. Last night.

Q. You hadn't seen it before last night?

A. I may have. I don't recall.

Q. Will you turn to Page 2?

A. Sure.

Q. There's some medical literature cited there, Doctor. Is this a document that you drafted for Mr. Samore to tender, or is this something that Mr. Samore wrote, or do you know?

A. I definitely did not write it. So, he wrote it.

Q. When you read it last night, did it appear to be accurate?

A. I wasn't checking it for accuracy.

Q. Okay. This is the medical literature that you -- do you recognize the titles of the four pieces of medical literature there? If you'll take your time and look through it, I think there's just four cites.

A. Yes, I only recognize the one from Dr. Lee mentioned in Paragraph 5, and then the reference to Radiopaedia. If I gave

Mr. Samore the other ones, then I'm sure I have them.

Q. Now, medical literature is generally peer-reviewed, isn't it?

A. Yes, sir.

Q. Tell us a little bit about Radiopaedia. Is that something that you would consider a reliable scientific source, other than for the reason that you contribute to it?

A. Radiopaedia is a reference for radiologists around the world.

Q. It's not peer-reviewed, is it?

A. It's actually -- no, it's not peer-reviewed, but it is edited.

Q. Is it safe to say that the Court can probably not consider that as a peer-reviewed scientific journal?

A. I can't answer that.

Q. Will you turn to Government's Exhibit 4, and let me know when you're there.

A. I'm here.

Q. Is this one of the pieces of literature that you submitted to Mr. Samore to support your opinions in this case?

A. I don't recall.

Q. You don't -- so, did you -- Doctor, I'm just trying to be clear. Did you get a request from the United States through John Samore for medical literature that supports your opinions in this case?

A. I think so.
Q. Okay. What's your understanding of a Daubert hearing? I'm just going to back up a minute.
A. Well, to understand -- well, in this case, or in general?
Q. In this case, or in general, Doctor. What do you know?
A. Well, first I'll answer in this case. Do I have the sufficient knowledge and background to present my findings in Calvin A.'s case when the trial comes.
Q. Is it your understanding that it's just knowledge and background, experience, that type of thing, or is it your understanding that you need to have medical literature to support your opinions?
A. Well, medical literature helps, but basically it's knowledge and scientific background, that kind of thing.
Q. Okay. So in Government's Exhibit 4, I know you don't recall, Doctor, but if this is one of the pieces of literature that you submitted to support your opinion, do you see a date on it?
A. 1972.
Q. That's before the advent of even MRIs, isn't it?
A. Yes, sir.
Q. What value would it have here today?
A. I don't recall why I sent this to him, so I'd have to take the time to read it.
Q. That's all right, of course. And then

Government's Exhibit 5, tell me when you're there.
A. Yep, I'm here.
Q. This is an article you seem to recognize. Do you think you sent this to Mr. Samore?
A. I mean, I refer to this article a lot, so it's very possible.
Q. And isn't the term hygroma -- that's an antiquated term that medical doctors don't really use anymore, is it?
A. Not my peers.
Q. Okay. Your peers in your private clinic?
A. My peers in neurology.
Q. And how often do you talk to your peers in neurology, Doctor? You're not affiliated with a hospital, are you?
A. I'm not.
Q. Are you a solo practitioner?
A. Yes, sir.
Q. Okay. Turning to Government's Exhibit 6, this was also cited by Mr. Samore. You don't recall sending this to him, do you, Doctor?
A. I may have, I'm just not sure.
Q. And this is your Radiopaedia page that you're a contributor to; right?
A. Yes, I probably did send it, because I don't know how else he would find it.
Q. Okay. And then finally, Government's Exhibit 7, is this

something you sent to Mr. Samore?
A. I don't recall.
Q. All right, Dr. Scheller, I'm going to continue on, then.
The crux of your theory in this case is that John Doe had an enlarged head; is that correct?
A. That's part of it, yeah. And I'm happy to refer to him as John Doe, if that's what the Court prefers.
THE COURT: Let me ask counsel, how do you all want to refer to the victim?
MR. NAYBACK: I don't mind Calvin. We can go through and we can redact, Your Honor.
THE COURT: What if we just say the first name, Calvin, is that --
MR. NAYBACK: Say that one more time; I'm sorry.
THE COURT: He's been referred to by his first name, Calvin.
MR. NAYBACK: I think that's fine.
MR. SAMORE: That's okay.
THE COURT: Okay, we'll just refer to him as Calvin, then.
BY MR. NAYBACK:
Q. Dr. Scheller, Exhibit 23. I'm sorry, you're going to have to lift some paper there.
A. Yes, sir.
Q. Do you recognize that?

A. Yes, sir.
Q. Go ahead and tell me, and point out to the Court where you see abnormal growth in Calvin's head size.
A. Well, I put it in my note, but --
Q. I'm sorry? I didn't hear the first part of what you just said.
A. I put it in my note, where I put the percentiles. And very often it's very difficult to get the percentile exactly just right, so I would not be using this as my reference.
Q. Okay. Well, isn't it true that if a pediatrician were to measure a child's head three times, it might come up with three different measurements?
A. Inexperienced, yes, sir.
Q. But on this chart, then, Doctor, you don't see anything that represents abnormal head growth? I mean, do you have any reason to question Government's Exhibit 23 as Calvin A.'s head growth chart?
A. I have no questions about it, no, sir.
Q. All right. Now, as a pediatrician, you've read head growth charts before?
A. Yes, sir.
Q. And can you just show us, then, where you see abnormal growth in Calvin A.'s head size?
A. Well, again, I didn't do this growth chart, but I see, between four months of age and six months of age, there is a

jump from the approximate 50th percentile to the 75th percentile.

Q. And at least part of your theory is that that jump could be attributable to the bleeding on the brain that you talked about in Calvin's head; correct?

A. Not at all. So I did not do a good job of explanation, if that's how you understood it.

Q. Go ahead, Doctor. Do you want to explain?

A. Yes. So, I'm not referring to this particular chart, because I didn't use this particular chart, the one that's in the exhibit binder. I'm referring to the head growth chart the way I measured it and put it in my report.

Q. I didn't see it in your report.

A. Okay. There's a percentile after each head growth measurement.

Q. Well, what chart did you use, Doctor, to get to --

A. My report is in here; right?

Q. It is?

A. Do you know what binder number?

Q. Doctor, I do, and it's also in the Table of Contents, but Dr. Scheller, I'm asking you, what chart? You said you reviewed the medical records in this case; right?

A. Yes, sir.

Q. So it's Calvin's head growth chart, the chart that we're looking at, where you must have gained your percentage from;

correct?
A. No, sir.
Q. Okay. Can you tell us what you reviewed prior to writing your two-page report?
A. I put it in the note, and I wrote that I reviewed records of birth, pediatric visits, ER visits, hospitalization and follow-up, and the x-rays and brain imaging. And then as I said before, I reviewed Dr. Plunkett's report, Dr. Jenny's two reports, and there may be other things, as well.
Q. Did you interview your client over here?
A. He's not my client, so I can't answer that question.
Q. You can't talk to him?
A. He's not my client, so I can't answer the question. You asked if I interviewed my client, and I didn't interview my client because I don't have a client.
Q. Okay. And you didn't look at the FBI law enforcement reports of your client's statements; right?
A. I don't recall.
Q. And you don't consider those as part of your analysis, do you?
A. I'm not a police officer or an investigator, I'm a physician, so I'm very comfortable reviewing medical reports and less comfortable reviewing police reports. So I probably did look at it, but what I considered most was the medical records.

Q. Do you recall writing a chapter in a book about getting the whole story as a physician?
A. It was actually a story for a magazine.
Q. Okay. Not quite peer-reviewed; right?
A. No, it wasn't a peer-reviewed magazine.
Q. So, Dr. Scheller, it appears that when you testify in the past in other state court cases that you disregard what a defendant said happened to the child before it had the medical episode that brought them into the hospital; is that true?
A. I wouldn't use the term disregard. I'll say I regard more the medical reports.
Q. Okay. So if Patrick Duran admitted to law enforcement that he shook the baby or jerked the baby, that's not something you would consider when you look at the medical reports and come up with the opinion that this is definitely not abusive head trauma, which is what you say in your report; correct?
A. Well, I don't think I used the word "definitely," but let me make sure. I'm looking at Part 3 of the binder, and I wrote -- I said: "There is no evidence that Calvin was a victim of abusive head trauma." And so I did not consider that evidence.
Q. You didn't consider the Defendant's statements to law enforcement; correct?
A. As evidence that he was a victim of abusive head trauma.
Q. So other than head size, were you aware if the child,

Calvin, had any family history of abnormal brain bleeds or anything like that? Did you see that in the history?
A. I'm sure it was referenced to, but it's not something I put in the report, so I don't specifically remember.
Q. Would it surprise you to learn that two other doctors who reviewed the charts in this case found John Doe's head size was on par with the rest of his body growth?
A. There can be differences of opinion. I'm fine with that.
Q. But that's the crux of your theory, isn't it, Doctor? I mean, you're here testifying, and the starting point of your medical opinion is that he had abnormal head growth, isn't it?
A. That's half of it.
Q. What's the other half, Doctor?
A. The other half is that you could actually see the fluid collection.
Q. We'll get to that.
A. So if you can see it and you know that fluid collections don't develop overnight, then you have to say, well, where did that come from? You look at the head growth and you go, okay, that explains why the head grew.
Q. Would it surprise you to learn that the two doctors and the radiologist in the courtroom today disagree with you about how you're reading the MRI and the CT scans?
A. Oh, not at all.
Q. You're fine with that; right?

A. Sure.
Q. You're providing an alternative explanation to what the evidence points to otherwise; correct?
A. Or maybe they're providing the alternative explanation. I mean, I guess that's for the Court to decide.
Q. You don't have any scientific studies to support, at least that you brought here today or that you recall, Dr. Scheller, that that percentage jump in head growth will lead to the medical diagnosis that you just made?
A. Well, just my clinical experience.
Q. Okay, let's talk about retinal hemorrhages. You published a short little article on that, didn't you, Dr. Scheller?
A. Yes, sir. More than one.
Q. Can I approach you with one?
MR. NAYBACK: May I approach, Your Honor?
THE COURT: You may.
MR. NAYBACK: This is Government's 25. I'm sorry, it's not in the binder. Can I approach the Court?
THE COURT: Yes.
BY MR. NAYBACK:
Q. Can you tell me how you came to prepare this short note, Doctor?
A. These are people I know and I spent some time with them.
Q. And you stand behind the article?
A. I didn't write every word of it, and there were some

wording issues, but it is what it is.
Q. Okay. On Page 465, which is the back side of Government's Exhibit 25, Doctor, in the right-hand column, the statement is made: "Rarely, retinal hemorrhages may occur in accidental trauma and, when present, are predominantly unilateral." Is that a statement you stand behind?
A. I guess in a generalized kind of way, yes.
Q. And would you agree -- I know you don't agree with the idea of abusive head trauma, but that retinal hemorrhaging can present in children who have either been shaken or have had blunt impact?
A. I got stuck in the first part of the question, because you misrepresented what I had said earlier. So can you say the question again without any misrepresentations? I'd appreciate that.
Q. Well, Doctor, listen, I'm just asking you questions. Feel free to rephrase my question and then answer it. I don't want to mischaracterize any of the stuff you've said in the last few hours. Okay?
A. Okay.
Q. Well, let me ask you this: Do you have a medical opinion about whether children who are shaken can present with retinal hemorrhaging?
A. So, children means five and ten year olds, or are we talking about a specific subgroup, or what?

Q. Eight month olds. Under a year.
A. I have no idea.
Q. Okay. How about the age groups that you gave, Dr. Scheller, ages one to five?
A. Similarly, I have no idea.
Q. Have you seen children in your private clinic that you suspected of abusive head trauma, that have suffered from abusive head trauma?
A. No, not in my private office.
Q. Okay. Is there another location where you had exposure to children who were suspected of having abusive head trauma?
A. Sure. All the children's hospitals where I worked.
Q. But I think you testified earlier, you never sat on a child abuse response team?
A. Right. But if it's a head injury, then a neurologist is called for consultation.
Q. So you're the consulting doctor? You're not the primary; correct?
A. Like the child abuse doctor, I'm not the primary.
Q. Now I want to turn to a few of the cases that you've testified about in the past, with the Court's indulgence. Can you turn to Government's Exhibit 10, Dr. Scheller?
A. Sure.
Q. I might bounce around a little bit.
A. Yes, sir.

Q. Do you recall testifying in Massachusetts on April 22nd -- well, about 2015. This is the date of the entry of the Court's order. But do you recall Epps?

A. I do.

Q. Okay. And if you'll turn to Page --

THE COURT: What exhibit are you on?

MR. NAYBACK: I'm sorry. Thank you, Your Honor. Exhibit 10.

BY MR. NAYBACK:

Q. And Dr. Scheller, if you'll turn to Page 2 of 3.

A. Page 2 of 3, yes, sir.

Q. I'm going to read that top right paragraph and ask you to follow along. It says: "The judge, who found Dr. Scheller's position 'absurd' on the basis of, among other things, his testimony that he (1) believed 'child abuse pediatricians are such good marketers'; (2) believed 'abusive head trauma [is] a great PR term [which] doesn't mean anything'; (3) disregards confessions in which individuals admit to having shaken a baby or child; and (4) believed regular people do not violently shake a child out of frustration, could properly assess credibility."

Did I read that correctly?

A. Yes, sir.

Q. Do you consider these credibility findings made against you?

A. I don't know understand the question.
Q. Do you understand what a credibility finding is?
A. Well, I'm not a lawyer, but I guess the issue is, am I credible or not.
Q. Do you take exception to what the Court wrote here, Dr. Scheller?
A. The Court, itself, took exception and reversed the findings of the lower Court.
Q. And then let's turn to Government's 14 -- well, let's pass. Government's 11 --
MR. SAMORE: Excuse me for just voicing an objection, Mr. Nayback, if I may.
Judge, that decision that the Government cited did not include the higher court decision which admitted all of Dr. Scheller's opinions. I'm having that printed up this morning, and I'll bring it for the Court and the Government.
THE COURT: You can supplement the record.
MR. SAMORE: Very good. Thank you.
BY MR. NAYBACK:
Q. Government's 11, Dr. Scheller, do you recall testifying in -- and I don't know if I'm saying the name right -- Sissoko v. State? That's in your home state, isn't it?
A. It is, and I think this was a Daubert hearing.
Q. I'll leave that to you, Doctor. Page 10 of 25, is this another case where it's been somehow overturned, or do you

know, Dr. Scheller?

THE COURT: I'm sorry, I'm at People v. Goins.

MR. NAYBACK: I'm sorry, I think I passed that one, Your Honor. Government's Exhibit 11. We covered Goins earlier.

THE COURT: I'm there.

BY MR. NAYBACK:

Q. And then, Dr. Scheller, Page 10 of 25.

A. Yes, sir.

Q. I'm on the third paragraph down, if you'll read along with me. "The Court stated that it was not persuaded by the testimony of the defense medical experts. It found that they displayed significant bias in that they were advocates for a change in the prevailing view in the medical community that abusive head trauma is an accepted diagnosis. In addition, the opinions of the defense experts were 'not well founded in the medical literature.'"

Did I read that right, Dr. Scheller?

A. You did.

Q. And you didn't have any medical literature that you cited to today in support of your opinions, did you?

A. Just that -- well, you mentioned four articles, which might have been, but then I had specifically remembered sending Mr. Samore the Dr. Lee article.

Q. Doctor, do you think that's enough to get past Daubert?

You didn't seem to remember the articles that I was showing you.

A. I'm not an attorney or a judge.

Q. Government's 15. And let me know when you're there, Dr. Scheller.

A. Yep.

Q. Do you recall acknowledging in that case that your rejection of rapid acceleration/deceleration as causation for such injuries is a view that is shared by only five percent of the relevant medical professionals, "and that puts him at odds with the views of organizations"?

A. It sounds right.

Q. Okay, thank you. And then I'm going to Government's Exhibit 13. Do you recall admitting that you're not board certified in child abuse and do not consider yourself a child abuse expert? I think you said that earlier, Doctor; correct?

A. Yes. And if it's in here, I'm so happy I'm consistent.

Q. And then this is the final case, and then I'll leave it, Doctor, as far as the cases go. One minute.

Government's Exhibit 9 -- let me see if I can get there. Do you remember the opposing doctor, Dr. Scheller? His name was Dr. DiLuna.

A. I don't.

Q. Page 13 of 32, if you'll turn there, and let me know when

you're there.
A. Yep.
Q. I'm reading that first full paragraph. "Dr. DiLuna completely disagreed with this finding and further claimed that it did not make any sense. First of all, there was no medical record or testing that demonstrated Avah had subdural hygroma. He stated that Dr. Scheller was clumping together medical terms that don't exist."
Did I read that right?
A. Yes, sir.
Q. Now, you never examined Calvin in this case, did you, Doctor?
A. No, sir.
Q. Never interviewed his mother?
A. No, sir.
Q. You never reached out to Dr. Leslie Strickler to talk to her about her report or findings?
A. That's right.
Q. Dr. Jenny, equally?
A. That's right.
Q. And the radiologist in this case that -- you've talked a lot about medical imaging this morning. You didn't talk to the radiologist about his findings in the case; correct?
A. I did not.
MR. NAYBACK: Court's indulgence.

THE COURT: Sure.

BY MR. NAYBACK:

Q. Dr. Scheller, you shared a bunch of images this morning so the Court could understand, presumedly, your knowledge of neuroimaging, did you not?

A. Well, I did it to educate the Court about the findings in Calvin's case. If it made another impression, I'm happy about that.

Q. It appeared to me that there were a host of HIPAA violations on the computer screen in a public setting. There were the names, patient ID numbers, patient records of the patients who were associated with those images. Did you have the permission of those patients or their parents prior to using their images?

A. I don't understand the question. These were anonymous. These were anonymous images. There were no names on them.

Q. Would it surprise you to learn that the doctors looking at the images saw names, medical records, birthdates?

A. I get hallucinations sometimes, myself.

Q. Now, tell me again what you think caused Calvin's brain bleed.

A. Is it all right if I refer to my letter, my report?

Q. Of course, Doctor, whatever you need to refer to.

A. I know sometimes in courts they don't like it when I read from something, and then other times they don't seem to mind

it. But I'm looking at the report which is in Part 3 of the exhibit binder. What I stated there was that I believe that Calvin had seizures from --

Q. Let me stop you, Doctor. There's no real dispute about the seizures; right?

A. Actually, I'm not sure about that.

Q. Do you know how many he had?

A. No, sir.

Q. Okay. Go ahead.

A. Anyway, I wrote that Calvin had seizures. I believe the seizures were due to a small amount of blood that were on the surface of his brain that came as a complication of Calvin having a chronic condition called a subdural hygroma. While these are often benign, usually benign, they can cause complications. Simply put, Calvin had a complication from that subdural hygroma that then caused a small subdural hemorrhage and a very small subarachnoid hemorrhage.

Finally, his retinal hemorrhages were not at all due to any kind of trauma or violent shaking, but rather were due to the complications that were going on on the surface of the brain.

Q. And there is no medical literature or scientific studies to support your opinions; correct?

A. Well, as far as the retinal hemorrhages, I'll use my own paper, which you didn't quote, but is on my CV that I published

in 2017 about how retinal hemorrhages can develop without any evidence of brain trauma at all, and also my experience and background in diagnosing retinal hemorrhages in children who have not suffered any brain trauma.

MR. NAYBACK: Court's indulgence.

BY MR. NAYBACK:

Q. Doctor, you kind of brought up that people were seeing things. Do you want to bring up those images, again, that you were using to educate us?

A. Sure. So which ones, specifically?

Q. Let's do five of the ten.

A. I didn't understand that.

Q. Go ahead with the first image, Doctor. We're not going to ask you about the medicine behind it, I just want to make sure I wasn't seeing things.

A. So, I showed these images. Everybody can see them, I assume. These are the ones that they --

Q. Yes. Can you go backwards?

A. Sure.

Q. This is Calvin A.'s; correct, Doctor?

A. Correct. And it's highlighted.

Q. I'm looking at the exemplars of other images that you brought up.

A. I didn't show any of those. I showed the ones that have generic titles like Acute Subdural Hematoma and Three Month

Coronal T1. I showed this set, which is highlighted in blue, and I showed this set, which is highlighted in blue.

Q. If you'll look in that left column where your cursor is, Martinez Nava Dante Jesus, that's someone anonymous?

A. Oh, no, that's a real person.

Q. Okay. Patient ID numbers; correct, Doctor?

A. Yes, sir.

Q. Is the age up there?

A. Not really.

Q. There's a column that says, Age, Doctor. Do you see it?

A. Yes, but it's between five years and six months, so that's not really an age.

Q. But it would help cross-reference the name of the person with their age; correct?

A. If that's what you choose to do, yes, sir.

Q. Can we go back one more image, Doctor?

A. I'm not sure what you mean.

Q. You were showing us images in order, and I was wondering, were you just picking and choosing around your medical computer there?

A. I'm sorry, I don't understand. I showed images on Calvin, and then I showed generic images of subdural hematoma and what a brain looks like without a subdural hygroma, and then I showed Radiopaedia images.

MR. NAYBACK: Thank you, Your Honor.

THE COURT: Is there redirect?

MR. SAMORE: Yes, Your Honor.

REDIRECT EXAMINATION

BY MR. SAMORE:

Q. Doctor, the first question I'm going to ask you is to turn to Exhibit 22 in the folder before you. Does that include Dr. Jenny's report from prior to your being contacted to review these records?

A. Yes, sir. I'm looking at Exhibit 22, and it's a 13-page report from Dr. Jenny.

Q. And you did review that prior to developing your report, didn't you?

A. Yes, sir.

Q. Turning your attention to Page 6, does that include three full paragraphs describing what the statements -- or at least representing to describe Mr. Duran's interview and reasons that the Government may believe that he is responsible for this child's injuries?

A. Yes, sir.

Q. Did you also read in the medical records that included Dr. Strickler's findings back in September and October of 2014, did she also reference her understanding of what Mr. Duran had represented and why he was being investigated for abuse?

A. Yes, sir.

Q. And turning your attention to Page 10 and Paragraph 8 of

Exhibit 22 --

MR. NAYBACK: Did you say 8 and 10?

MR. SAMORE: Page 10, Paragraph 8.

BY MR. SAMORE:

Q. Does that appear to be a conclusion from Dr. Jenny?

A. Yes, it does. It regards the rapid head growth between four months and six months.

Q. And does she appear to find that there was rapid head growth during that time period?

A. Yes, sir.

Q. Did she also attach a diagram -- I think that was from Dr. Jenny -- that's marked Exhibit 23? I'm not sure if that's from Dr. Jenny. I just know that there was a diagram that was disclosed. Do you see that Exhibit 23?

A. Yes. This is what the other, Mr. Kyle -- I forgot his last name -- referred to earlier.

Q. All right. Now, another question that the Government asked in cross-examination was regarding -- and I'm going to paraphrase slightly, so don't let me put words into Mr. Nayback's mouth or yours. But it was regarding the medical literature, peer-reviewed documents, methodology, etc., that is behind your and underlies your opinions. Do you recall that sequence of questions?

A. Yes, sir.

Q. Now, correct me if I'm wrong. I think on direct

examination, you referred to your primary basis being training and experience.

A. Yes, sir.

Q. Are you current, and are you aware of medical literature that fully describes and identifies in peer-reviewed documents the substantive basis for diagnosing hygromas, subdural hematomas, subacute and acute hematomas, and retinal hemorrhaging?

MR. NAYBACK: Objection, Your Honor. The United States has asked for this information well in advance of this hearing. You just heard Dr. Scheller testify that he was unaware of two of the four articles that Mr. Samore provided to the United States. I don't think Dr. Scheller ought to now, on the day of the Daubert hearing, reference literature unknown to the United States that allegedly supports his position. That's my objection.

THE COURT: What's your response, Mr. Samore?

MR. SAMORE: My response, Judge, is that it appears that the Government's position is that unless you're a CART doctor and you have a CART reviewed document, that's about all that counts.

Dr. Scheller has an active and has maintained an active private practice, as well as his forensic practice, and these opinions are so foundational that I don't think I had any understanding, certainly, in the request that we had to go back

to what you do when you're in medical school or doing standard peer-reviewed documents. I mean, it's beyond the most basic. I was trying not to burden this Court either now or apparently with what we're hearing the Government argue with this abundant primary substantive medical literature.

Doctors -- and this may be a good point for us to kind of address this briefly. The issue that we are having from the defense standpoint and the Government is that, in our understanding, Dr. Scheller never says AHT doesn't occur, it's not possible, or SBS doesn't occur. He is not diagnosing it as a child abuse specialist, like Dr. Strickler or Dr. Jenny. He is diagnosing it from his professional position as a qualified child neurologist.

So the Government wants, as their questioning clearly shows, they want to hear nothing but CART people and CART references, and there is a wealth of information about that that I hardly thought was necessary here, and certainly we can supplement the record with that. But they're asking the most basic --

THE COURT: Well, the point is, though -- I mean, we've gone to great lengths to schedule this hearing today, and again, just assume for purposes of argument that you get the doctor qualified to render an opinion, a major part of the Daubert focuses on reliability. That's what the Government is focusing on, and part of that is peer review.

I mean, I remember Judge Hartz's -- I can't remember whether it was a majority or a dissent, but it was on a Daubert case where he talks about the courtroom does not lead science. You don't make up novel or new theories in a courtroom in a Daubert case.

So if they had asked for this literature, to the extent it's there -- you provided the four articles, we've gone over that, but I think at this point the objection is sustained. We need to move on.

BY MR. SAMORE:

Q. I think one of your answers to Mr. Nayback's question was -- I think the phrase that you used was, or I think the question was whether shaking can produce, and I think it was a head injury, and I think your answer -- and again, I'm paraphrasing. I'm trying to get back to that point. Your answer was, no idea. Could you elaborate on that answer as it applies to evidence?

A. Yes. The way I remember the question was that he was asking, can shaking, violent shaking of an infant, produce retinal hemorrhages, and my answer was, I have no idea. And I have no idea for several reasons, and I'm happy to elaborate. Is that what you want me to do?

Q. Just, if you can, describe what the issue is as you see it regarding the diagnosis and proof of cause.

A. Sure. So in the laboratory, they've shaken laboratory

animals without producing retinal hemorrhages. So that doesn't prove that violent shaking can produce retinal hemorrhages.

There are witnessed violent shakings using Nanny cams, and none of them have ever been documented to show retinal hemorrhages, violent shakings that have been observed on Nanny cams. In other words, surreptitious video of a baby-sitter that turned out to be a violent person. So those have never produced it. So that's not a line of evidence.

The only evidentiary support that is produced in the child abuse world and in the ophthalmology world is confessions. So, they find retinal hemorrhages and they have a confession, and then they say, well, that's proof. To me, that's not scientific proof. That might be another kind of proof, but it's not scientific proof. There is no scientific literature that shows that violent shaking of a young infant can produce retinal hemorrhaging.

Q. Have there been efforts to try to develop physical models and to use those to measure or to establish whether shaking can cause all the triad of injuries, that shaking alone can cause the triad of injuries without impact?

A. Yes, sir.

Q. Have there been problems developing those models?

A. Yes, and the problems were noted back in 1987 in a publication by Dr. Duhaime where she concluded that her laboratory could not find evidence that the forces needed to

create subdural hemorrhage were generated in a violent shaking of a model.

Q. And did Dr. Jenny, herself, write recently in a paper that was associated with some folks in Japan where they took an infant model at the 5th percentile and a 50th percentile Japanese person and tried to create a testing model for shaken baby injuries?

A. Yes, sir.

Q. Did they have problems, and did they acknowledged that in that article?

A. They had problems creating the forces that are needed to -- that are thought to be needed to produce the symptoms in that model.

Q. And does Dr. Jenny in her reports that are a part of this record, and also in her writing, acknowledge that further study is needed to determine what forces are necessary?

A. Yes, sir.

Q. Did the Cory study have problems because there was no controls on whether the model's head was hitting the chest as it bounced back and you could not measure the forces easily?

MR. NAYBACK: Your Honor, I'm going to object to leading. This expert should be able to handle explanations on his own. Secondly, they're referencing a study in a vacuum. Mr. Samore doesn't have it. Dr. Scheller doesn't have it. The United States doesn't have it.

THE COURT: The objection is sustained.

MR. SAMORE: Judge, these are not surprise questions to the Government. These are articles and commentaries that we --

THE COURT: Yes, but I've got to make a ruling on this, Mr. Samore, and you're talking about articles or studies that are not in the record. Now, if we have to supplement, I mean, that's something we can talk about, but just to sit here and throw this out at a Daubert hearing at this point, I think the Government's got a good point. That's their objection.

MR. SAMORE: That's more efficient, Judge. That's what we'll discuss, then, because there's another study I wanted to address. But I'm not going to do that based on the Court's suggestion there.

BY MR. SAMORE:

Q. In your experience, are only CART doctors permitted to diagnose, or qualified to diagnose whether or not child abuse has occurred with a given constellation of injuries?

A. No, sir.

Q. And at risk of possibly repeating that question, do you diagnose these, as best possible from the source of the measurable injuries, whether or not child abuse may have occurred in your daily practice?

A. Well, because I'm a pediatrician, all pediatricians are trained in recognizing and diagnosing child abuse. I finished

my pediatric training in -- I got my board certification in 1987, and child abuse became a specialty maybe about ten years ago or so. So until that time, it was just regular pediatricians diagnosing child abuse. So in my background as a pediatrician, I'm comfortable recognizing the findings of child abuse and sometimes making that diagnosis.

Q. Are you saying in your testimony that Dr. Jenny or Dr. Strickler are not qualified to render a diagnosis in their judgment of what may be child abuse?

A. No. That's their specialty.

MR. SAMORE: There's just one other question, Judge, that was raised, and I think the best way to handle that would be by moving to supplement the record, Judge. I'm not going to ask that question now. Thank you very much.

THE COURT: All right. Thank you, Doctor. You may step down.

MR. SAMORE: Judge, I may ask at a later point to re-call, but I'm just going to say I think based on the Court's ruling, that's all we can really ask at this time.

THE COURT: I don't think we're going to be re-calling today.

MR. SAMORE: That is true, Judge.

THE COURT: Let's do this. Because we're on a tight time schedule today, let's try to resume -- let's take a short abbreviated break for lunch, and then let's try to resume

around 10 after 12:00.

MR. NAYBACK: Can I ask a quick question, Your Honor, logistically?

THE COURT: Sure.

MR. NAYBACK: I don't want to put anyone in a position where we're halfway through a witness at the end of the day. We have Dr. Hart, who is a radiologist, that we think may take ninety minutes to two hours. I think Mr. Garcia or yourself told me that we're ending at 2:30. If we start a witness and end up at about quarter to 2:00 or 2:00, is that going to be sufficient, or are you going to require the Government to start a witness and --

THE COURT: No, I'd say if we're close to 2:00 and it's a matter of starting another witness -- but Dr. Jenny traveled in from Seattle; right?

MR. NAYBACK: Yes. But she's a long witness, and Dr. Hart can't make it on the 13th and Dr. Jenny can. So we're all about saving Government resources.

THE COURT: Okay, I'll let you decide, just with that understanding. And I explained to you the situation, but I do have to adjourn at 2:30.

MR. NAYBACK: Yes, sir.

THE COURT: All right, thank you. We're in recess for lunch.

(Recess was held at 11:23 A.M.)

(In Open Court at 12:14 P.M.).

THE COURT: Mr. Nayback, you may call the next witness.

MR. NAYBACK: Thank you, Your Honor. I'm going to turn that over to Mr. Marshall. But before we do so, there seemed to be some lack of clarity this morning on my part.

At this point, we're going to move the United States Government's exhibit list and binder of exhibits into evidence. And secondly, we want to request Dr. Scheller's demonstrative exhibits be made a part of the record with copies provided to the Government. And if they cannot be, we would submit that the Court should either exclude them -- that the Court should exclude them and disregard them. Thank you.

THE COURT: First, is there an objection, for purposes of this hearing, to the exhibits in this binder coming in?

MR. SAMORE: Judge, I don't think the cases can come into evidence. I mean, that's something you use for --

THE COURT: Well, I'll take judicial notice.

MR. SAMORE: Yes. I mean, due to the nature of the proceeding, we kind of had a little more relaxed approach to that. I think with that understanding, sure, we're using it, they're marked for identification. But each case is individual, and we don't believe they have a great deal of relevance except as to this case. But we'll defer to the Court

as far as that final ruling on how it considers those exhibits.

MR. NAYBACK: If I could briefly respond, the United States would submit that cases where Dr. Scheller has testified and Court findings have been made against him are appropriately before the Court today. His credibility and what he has said in the past is on the line. If we were to bring court transcripts, we would also ask that those -- and we probably will at trial -- that those be made a part of the record.

THE COURT: I'm going to admit -- I mean, I could take judicial notice of them since they're court, but I think for purposes of this record and making it clear, I'm going to admit, and then I'm going to allow you to supplement the one case out of Massachusetts.

MR. SAMORE: I have, Judge. It's Exhibit D. And I didn't until Friday of last week, even, receive these documents. If the Court is going to admit those, then we're going to be having to spend some time digging out all the cases where his testimony was admitted, just as in Exhibit D.

THE COURT: Well, that's fine. If there's other cases, you can supplement the record.

MR. SAMORE: Very good.

MR. NAYBACK: And then, Dr. Scheller's exhibits.

THE COURT: What's your position on that?

MR. NAYBACK: We're asking Dr. Scheller's exhibits to be made a part of the record and for us to have copies of them,

what he showed this morning off his computer.

MR. SAMORE: You mean, the other case files for demonstrative?

MR. NAYBACK: That's what I mean.

MR. SAMORE: May I just take a moment and go back and speak to Dr. Scheller and see if we can provide them?

THE COURT: Sure.

MR. SAMORE: So, we will provide those, Judge, and we will redact them so there's no names.

THE COURT: All right, that's fine.

DR. SCHELLER: You don't need Radiopaedia, do you?

MR. NAYBACK: No. We actually -- you know, there was an issue, Your Honor, and I don't mean to be trivial about this, but the way Dr. Scheller posted them on the screen is the way we want them, and the way he posted them was with the identifiers of the individuals. He made an issue of it, Mr. Samore made an issue of it, and we think that's important.

THE COURT: Well, they can be sealed. They can be in a sealed exhibit. But as far as the -- if some of the photos or some of the images came from what I understood to be a website that would be accessible by anybody -- is that right?

MR. SAMORE: Judge, some of those were. I think -- apparently some of the images that went up accidently had the identifiers. So what I think -- and I do have no objection to providing them under seal for the parties and for the other

doctors.

What I think is happening here is that the Government and its doctors are hopeful that they can make some big presentation to challenge the ethics of Dr. Scheller and maybe get him in trouble with his state medical board.

THE COURT: You know, that's not my concern. My concern is to make sure this record is fully developed in the event it goes up to the Court of Appeals, because as a trial judge, I don't like cases coming back. So, this matter was presented during the hearing, I saw it, counsel saw it, so it needs to be part of the record, if you want me to consider it. And those parts we talked about can be sealed so they're not available for public view.

MR. SAMORE: We'll provide them.

THE COURT: And then if you would, make sure that the record indicates that website where some of the images can be accessed, because I took it or I understood the testimony to be that it was a general website.

(Government Exhibits Nos. 1 through 24 admitted.)

THE COURT: So with that, let's go ahead and hear the next witness.

MR. MARSHALL: Your Honor, the United States calls Dr. Blaine Hart.

MR. GARCIA: Please raise your right hand, sir.

(BLAINE HART, M.D., GOVERNMENT WITNESS, SWORN)

MR. GARCIA: Please have a seat and state your full name for the record.

THE WITNESS: Blaine Lawrence Hart.

DIRECT EXAMINATION

BY MR. MARSHALL:

Q. What is your profession, sir?

A. I'm a physician. I'm a neuroradiologist at the University of New Mexico.

Q. Let's kind of unpack that a little bit. Where did you go to medical school?

A. Vanderbilt University.

Q. When did you graduate?

A. 1981.

Q. And then after that, did you do a fellowship?

A. I did an internship, a one-year internship at the Naval Medical Hospital in Portsmouth, Virginia, and then I spent four years serving in the Navy as a physician, a medical officer. I did some training, and then worked at Bethesda at the Naval Medical Research Institute for three-and-a-half years. After that, I did a residency at the University of New Mexico in diagnostic radiology for four years.

Q. Are you board certified?

A. Yes.

Q. In what fields?

A. In diagnostic radiology, and then additionally

subspecialty certification in neuroradiology.
Q. And through which organization?
A. Through the American Board of Radiology, which is recognized by the American Board of Medical Specialties to examine in those fields.
Q. When someone traditionally says they're board certified, is that the organization that people think of that does those board certifications?
A. Yes.
Q. Where are you licensed to practice?
A. In New Mexico and Utah.
Q. And so what would you consider your specialty to be?
A. At this point, neuroradiology. That's all I've done for many years.
Q. How long have you been a neuroradiologist?
A. Twenty-eight years.
Q. At some point, did you take on leadership positions at the University of New Mexico?
A. I was the Section Chief for the Neuroradiology Section for quite a few years, and also served as the Fellowship Program Director for an accredited neuroradiology fellowship.
Q. What about with regard to pediatric neuroimaging?
A. It's been an interest of mine for many years, and I for quite a while took the lead in that at the University. It's something that I've attended meetings on, kept up with. So

it's an area of special expertise.

I have not done a dedicated pediatric neuroradiology fellowship. There are few of those around the country. But my pediatric -- sorry. My neuroradiology fellowship -- all accredited neuroradiology fellowships are required to have a substantial amount of pediatric training, as well.

Q. What is your current relationship with the University of New Mexico?

A. I'm now professor emeritus. In 2015, I retired officially. Since that time, I've continued to go to work on a 25 percent basis. So I'm still a faculty member, an emeritus faculty member working.

Q. Have you published in the field of neuroradiology?

A. Yes.

Q. Can you give an approximate number of publications?

A. I think the last time I looked at my CV, I had 95 publications, peer-reviewed publications.

Q. Have you been a part of any major research projects during your tenure at the University of New Mexico?

A. I've been involved with a number of research projects. I did a number of projects looking at cervical spine trauma in the 1990s. I did some projects dealing with child abuse. I had a project dealing with child abuse along with the Office of the Medical Investigator in the '90s. For the last ten years, I've been involved in an NIH sponsored study looking at

cerebral cavernous malformations, which is a type of vascular malformation of the brain that's particularly common in New Mexico.

Q. For both publications and research, have you done any that have focused on pediatric or child abuse, either publications or research?

A. I did a project with the Office of the Medical Investigator where we looked at postmortem -- that is, after death -- MRIs of children where child abuse was suspected. We did postmortem imaging. That is, after death, but before autopsy. And then the findings were correlated with the autopsy findings. We published that. It was actually one of only two articles I think I've had where they simply accepted it without asking for revisions, and it was in a forensic journal. American Journal of Forensic Medicine. I may not have the title exactly right. It was presented at a meeting where it was very well received, and I also wrote a chapter on things relating to that in a book on forensic radiology.

Q. Your CV is a part of what's already been admitted as Exhibit 21, but in it there's also a list of many different lectures that you've given.

A. Yes.

Q. Do any of those deal with child abuse?

A. I have done some, yes.

Q. Have you testified before in court?

A. A number of times.
Q. Do you know -- sorry. Were you qualified as an expert those times that you testified?
A. Yes.
Q. And in what areas were you qualified as an expert?
A. In neuroradiology. A number of those -- well, I testified in a number of child abuse cases in state district court, several district courts around the state, and I have served sometimes, not a lot of times, but a number of times over the years as a medical-legal consultant in malpractice cases. So, I was admitted as an expert relating to neuroradiology.

MR. MARSHALL: Your Honor, at this time I would tender Dr. Hart as an expert in neuroradiology.

MR. SAMORE: Judge, I object. He has not been designated as an expert to give any opinions. We have received no opinions from the doctor. He can testify as an expert solely to what he did in this case, but not as an expert either to comment on anything outside this specific record or on anything Dr. Scheller did.

THE COURT: Well, I'll reserve ruling, but I'm going to go ahead -- I'll give you a standing objection, if you want, but I'm going to go ahead and let all the testimony come in.

BY MR. MARSHALL:
Q. Now, Dr. Hart, did you have an opportunity to review the scans for Calvin A.?

A. Yes, I have.
Q. And if I'm not mistaken, that was approximately back on September 30th of 2014; is that correct? Or was it September 29th? I'm not certain.
A. The study was performed on September 30, 2014, and I don't have the report here, so I don't know if it was read -- probably the same day. But I don't have the date of the report in front of me.
MR. SAMORE: Judge, may I have a moment to ask if Dr. Scheller wants to sit at counsel table instead of in the gallery, so he can review the screen?
THE COURT: Sure, he can do that, or he can sit in the jury box, whatever. It doesn't matter to me.
BY MR. MARSHALL:
Q. And I'm sorry I didn't provide this to you earlier. Would looking at your report, would that help you during the course of your testimony today?
A. Yes.
MR. MARSHALL: Permission to approach?
THE COURT: Yes. Feel free to go back and forth as necessary.
BY MR. MARSHALL:
Q. Now, other than kind of like some red boxes that I think were used for redacting some information, does it look like your report that you authored?

A. Yes. So, I made the report on September 30, 2014.
Q. Now, in the course of reviewing the images, did you come to some findings?
A. Yes. There are bilateral subdural fluid collections, and then there was additional evidence of small areas of different signal intensity that are most consistent with recent hemorrhage. There was a small amount of blood in the left lateral ventricle fluid-containing space within the brain on the left side. There was blood, subdural blood, overlying the cerebellum on both sides, and a small amount of blood over the tentorium, subdural blood.

The MRV, the magnetic resonance venogram, showed no evidence of dural sinus thrombosis. And there was a very small focus of probable blood in the front between the two frontal lobes.

Q. Now, if you --
A. My final -- pardon me.
Q. Go ahead.
A. One of my final notes under the Impression was: "Given the findings of supratentorial and infratentorial" -- that is both above and below the tentorium that separates the cerebral hemispheres from the cerebellum and brain stem below -- "subdural hemorrhage and small amount of intraventricular hemorrhage, correlation is necessary regarding mechanism of injury including the possibility of nonaccidental trauma."

Q. All right. I'd like to go through some of those findings and kind of have you help explain them. Could you pull up on the imaging that first finding of a bilateral subdural fluid collection and try to help kind of describe them for us?

A. Sure. The image that we're looking at, the set of images that we're looking at on the left, is from a T2-weighted sequence, a sequence that emphasized -- kind of a bread-and-butter sequence that we always obtain. Cerebral spinal fluid, the fluid around the brain and in the ventricles, is quite white, and in general fluid, most fluid, is bright on that sequence.

These crescent-shaped areas of white fluid outside the brain are subdural. That is, they're beneath the dura and outside the brain, outside the arachnoid space. Right here, you can see the subarachnoid space, and there's a very thin membrane or layer of blood. So these are bilateral subdural fluid collections.

Q. I believe you made a comment about their signal intensity.

A. Yes.

Q. Could you explain that for us?

A. That's the technical term for what we see manifest on the images as gray, shades of gray from white through black. So that means -- what that's reflecting with MRI, which is created by using radio waves in a very strong magnetic field and then getting a very weak signal back from the body of radio waves,

this is reflecting how much radio signal we get back. So the more we get, the whiter it is.

An MRI is very complicated, and we can emphasize different qualities of tissue. The one I showed emphasizes mostly fluid. This is called a flair sequence, and free fluid like the cerebral spinal fluid in the ventricles here is very dark, and the subdural fluid is not quite exactly the same. So there's probably some increased protein content in there. However, I'd also point out that this very thin white crescent here is some additional subdural blood of a different signal, probably more recent; new. And if we look down lower, the similar white crescent here -- now we're below the tentorium -- that is subdural blood in the posterior fossa.

In addition, this looks similar to the T2-weighted sequence, because the fluid is very bright. And in one sense, it is a T2-weighted sequence, but it's a type of acquisition that makes some types of blood very dark, especially acute blood. So this dark area here over the tentorium, and back here between the hemispheres, represents blood. And this is blood in the left lateral ventricle, that fluid-containing space. Intraventricular blood.

Q. All right. So let's go back through. I have a few questions about it.

The first one you were talking about was kind of the -- for your first Impression, it talks about the findings most

likely represent bilateral subdural hematomas. Why do you say that they most likely represent subdural hematomas?

A. I should probably start with a brief discussion of terminology. Subdural hygroma has come up a lot, and it's a problematic term, because it may be that to a pathologist looking at the brain under a microscope, they can identify readily a hygroma and separate it from a hematoma. But the problem is, hygroma is used usually to refer to a fluid collection that looks mostly simple and mostly close to cerebral spinal fluid on CT or MRI.

The problem with it is that there are several conditions that may give a similar appearance. A chronic subdural hematoma may look like that after the blood, much of the blood has broken down, part of it been resorbed, and you have some remaining fluid with protein left. It may look like that. You can get an appearance like that after some infections. Now, that's not a consideration here. He had no evidence, that I know of, of meningitis. But sometimes children with meningitis can get a subdural fluid collection that looks like this. And then sometimes you can get a tearing of the arachnoid, which is a thin layer over the brain, and that can result in an accumulation of cerebral spinal fluid in the subdural space.

So because there's confusion, I and a lot of my colleagues, probably, tend to be cautious in how we use the term subdural hygroma, because it's difficult looking at the

imaging alone to always know what's what.

Because there was blood and we've got subdural fluid, and at least some of it was blood, I think that's the reason I referred to it as hematoma, although other people may use the term hygroma for at least part of this, and that would be, I think, acceptable.

Q. Now, you mentioned that it's a possible hematoma. Is there a way to age hematomas when you view them on the MRI?

A. It is very difficult.

Q. Why is that?

A. Blood is very complicated on the MRI. There is protein in the blood and there's also iron, and the iron goes through different stages as it goes through a transition. There's oxyhemoglobin, which is the form of hemoglobin that carries oxygen. When it's lost the oxygen, that's deoxyhemoglobin, and then that changes to methemoglobin. The body sometimes -- cells, white cells, can take it up. Macrophages can take up some of these breakdown products and you get hemosiderin formed. All of these have different appearances on MRI depending on which sequence you're looking at, so it becomes very complicated.

And it's also become apparent that we're not terribly good at looking at that and knowing for sure what's new and what's old, so we tend to be somewhat cautious about putting a date. If I see on CT scan a very dense appearance, then that's almost

certainly acute blood. But sometimes if you have a tear of the arachnoid, or for various other reasons, you may have a darker appearance on CT and still have acute blood. So one takeaway is that sometimes we can identify, oh, this is very likely to be acute blood, but other appearances could represent either new or older blood.

Q. You may have already just done this, but can you highlight, for that first Impression, where that was on the MRI, again?

A. This sequence is probably -- the flair sequence is probably the easiest to see. This crescent shape or sickle shape outside the head, this is the bulk of the subdural fluid that I was talking about.

Q. Now, what are things that could cause there to be subdural bleeding there in this part of the head?

A. Well, most of the time it's trauma. The vast majority of the time it's trauma. There are some very rare diseases that predispose to subdural hematomas.

Q. Was there any evidence of those in Calvin's case?

A. No. And I have to say, we always count on the pediatricians, also, to look in their history and examination for some of these rare things. Glutaric aciduria type 1 can be associated with subdural hematomas, but spontaneous. On the other hand, there's a pattern of atrophy in the brain that's not present in this case. So that was not a consideration.

But most of the time, it's trauma.

The subdural hematoma results from tearing at the innermost layer of the dura, which is a thick connective tissue membrane. Not skin, but just thick connective tissue deep to the skull. And that doesn't tear apart with trivial injuries, unless you have some of these very rare metabolic conditions.

Q. Can you highlight on the screen for us your second Impression, which I believe you said was a small amount of intraventricular hemorrhage in the left occipital orb?

A. Yes. This is on the gradient recall sequence, right here. That's Image No. 11, Series 5, for the record, I guess.

Q. If you can -- I think you can even circle it on the screen with your finger, if you'd like. Like that. If you touch the screen --

A. Oh, this one?

Q. Yes.

A. Thank you. Can you clear it?

THE COURT: I think if you touch the bottom right, it will clear your screen.

THE WITNESS: Okay.

BY MR. MARSHALL:

Q. Now, before the other -- you said it was kind of hard to age this. Does this injury appear more acute, or can you tell?

A. This blood appears acute.

Q. And how can you make that determination?

A. That dark signal is what you see with acute blood.
Q. And is there a way to characterize the nature of this injury? Is it like a small or large injury in this part of the intraventricular hemorrhage that you're referring to?
A. It's a small amount.
Q. How quickly is this kind of blood in this part of the brain absorbed?
A. A small amount is usually absorbed pretty quickly. That is, within a day or so.
Q. Now, again, what are the most likely causes of an injury to this part of the brain?
A. There are two possibilities. One is that a subarachnoid hemorrhage may reflux backwards into the ventricle. There's not a very large amount of subarachnoid hemorrhage here, though. It appears to be a small amount. And so I'm skeptical about that.

The other is that there's been a tearing of veins along the inner surface, the lining of the ventricles, which I think is more likely.
Q. What would cause that tearing of those veins?
A. Probably a shearing mechanism. That is, a back and forth tearing.
Q. So would this be more likely to come from -- that injury that you're describing, would that come from some sort of trauma?

A. Yes. This is not something we ever see spontaneously. This is a result of either trauma or -- you can have a spontaneous subarachnoid hemorrhage from a ruptured aneurysm. That's not the issue here, at all. But, you'd either have a lot of blood in the subarachnoid space, or it's from trauma.

Q. Let's move on and discuss your third Impression where you were discussing fluid that appeared to be likely hemorrhaged over the cerebellar hemispheres, as well as I think you noted some blood over the tentorium.

A. This is on the flair sequence, which is Series No. 8, Images No. 5 and 6. I show this thin crescent-shaped white signal, white-white appearance. That's subdural blood, and probably not old, probably recent.

Q. And how do you make that determination?

A. Again, the signal here. On the flair sequence, the chronic blood is something that could look like this. That is, over the broader, larger areas overlying the frontal lobes, this white appearance on the flair sequence is more likely to be recent hemorrhage.

The other question you asked was regarding the tentorium.

Q. Yes.

A. This is the T2 gradient recall sequence, which is Series No. 5. The very dark areas that I'm pointing to, Image No. 9 is one of the good examples of that, it appears to be blood over the tentorium.

Q. Now, is it possible for the different hemorrhages that you've pointed out, is it possible to have bleeding in one spot that then flows to these other different parts of the brain that you've identified, from the ventricles, the tentorium, the frontal lobe?

A. Yes. Blood in the subdural space can flow -- it does not typically flow, though, from above the tentorium to below the tentorium. Seeing blood move above the tentorium -- let me find an example.

Sometimes when we see patients with subdural hematomas, the blood moves. So we may see more back here, and then I'll follow up several days later and I may see more over in a different area. And some of that depends on how someone is in bed, if they're lying flat in bed for a significant amount of time. So there can be some movement.

Q. But you were saying that it's less likely to transfer down to the tentorium. Can you describe that, or why is that?

A. Yes. So, the tentorium is actually a reflection of the dura that I mentioned. It's very tough connective tissue. It wraps around the surface. Actually, part of it is the lining of the bone that is the skull. And then an inner layer of it folds in to provide partial separation in two places.

One is in the midline. It's very thin, and it gets a little bigger as you get towards the back. It's called the falx. And then the other is the tentorium. That is a

separation sort of top to bottom. Let me find the -- this is a set of images looking, you can see, from the side, and this very big space here is the cerebral hemisphere and some deeper gray matter structures. This is the cerebellum, and the brain stem here. These are separated by this very tough connective tissue membrane that's actually a part of the dura that comes off and folds in. So that comes clear up to here. There's less tendency for blood to run down from above to below.

Q. And so in your experience, would you think it would be more likely that these are independent injuries?

MR. SAMORE: Judge, excuse me. Before the answer is entered, may I just confirm with the Court that we have a standing objection to opinions?

THE COURT: Right.

MR. SAMORE: Thank you.

THE COURT: Well, let me ask, he was a treating physician.

MR. SAMORE: Yes, but he has been giving a number of opinions beyond that of a treating physician in the file. We only received his CV Friday night late, and looked at it Saturday. He has had no designation as an expert to render opinions, as the doctor has been. That's what we want to make sure the Court understands.

THE COURT: Well, I'll note the objection for the record. Anything you want to state, Mr. Marshall?

MR. MARSHALL: Your Honor, I think at this point we're still talking about findings from the child. We're not doing anything that could controvert any of Dr. Scheller's claims. At this point, we're still discussing his Impressions and his findings that are in the medical records that were turned over in discovery.

MR. SAMORE: And I have at least six opinions that I've been writing down. I haven't been writing them all. This gentleman is obviously very learned.

THE COURT: Yes, I know, but for a treating physician to interpret, for example, a CT scan, you necessarily have to draw some conclusions and come to some opinions, because you're interpreting the scan in connection with treating the child.

MR. SAMORE: He's the radiologist. I don't think he qualifies as the treating physician. But I think the Court --

THE COURT: Right, but he's interpreting the scan for the benefit of the treating physicians, so he necessarily has to come to some conclusions.

MR. SAMORE: That portion, yes, we agree on. But I just think he's gone beyond that.

THE COURT: Well, I'll note that for the record.

A. I forgot your question.

BY MR. MARSHALL:

Q. I think my question was, would it be your opinion that the injuries below the tentorium are more likely to be independent

from the ones that were in the other places that you've mentioned? I think either the ventricle or the other subdural space. The frontal lobe, I think you mentioned.

A. Yes. Because, again, in reference to my interpretation of the scan, the fluid space is above. The dura is physically separated quite a bit. So peeling off part of that dural layer above is not likely to peel all the way down to below. It's more likely they may have occurred either at the same time, but in separate locations, or at different times. And I've already explained that it's hard to know the exact timing.

Q. We kind of discussed the one that was subdural. Similarly with the intraventricular hemorrhage, is that likely -- or is that possible, that it's an independent injury, as well, from the other injuries?

A. Yes. I considered that all three of these are potentially independent signs of trauma, which is why my fifth item in the Impression portion of the report was, considering all of these factors together, we need to consider -- or ask the question, what caused the trauma.

Q. All right. Just briefly, you made a fourth Impression, which was that there was no dural venous sinus thrombosis. Why was it important for you to note that?

A. There's a very small minority of those who are defending in child abuse cases who have suggested that venous sinus thrombosis -- that is, blood clots in the veins that drain the

head, the brain -- may actually cause subdural hematomas. There's almost no scientific evidence for that, and I think it has very little support, but because that's out there, we usually include -- we would comment specifically on that possibility.

We did not find any evidence of clot in the veins in this case. But we do a sequence, which I haven't shown, a magnetic resonance venogram.

Q. Does that image show the venous structure of the brain?

A. Yes. So, this is part of what's called a magnetic resonance venogram. It's actually a specific sequence that is performed by highlighting moving blood -- in this case, slow moving blood -- in the veins, and then the computer reconstructs it into images. The images of the brain, the fluid and so on are deliberately chosen to be very dark so they don't show up, so what we're seeing is the veins.

And although there's some asymmetry here, most of the drainage in this case is to the left. Very little to the right. That's a normal variant. And there's no evidence of blood clot.

Q. Now, you also, as a part of your report, you had an addendum. Can you describe for us if there was any sort of a finding, or why it was important to note that you made this addendum in your medical record?

MR. SAMORE: Could I ask the page be identified?

MR. MARSHALL: It is 47 on the Bates. It's the addendum.

A. This is a sequence called diffusion weighted imaging. We have not looked at this yet. One of the primary purposes is to identify areas of infarction -- that is, dead tissue -- in the brain. For example, after a stroke. You can see it sometimes with brain trauma.

We have a small focus that's bright, right here, and that's what I was referring to, an acute clot. And it would have to be acute. Let me see, I'm looking at Series No. 12, Image No. 22. I keep forgetting, but I know for the record you need that. This probably represents another focus of hemorrhage.

And then I also mentioned bilateral thin posterior subdural fluid, likely hemorrhage, overlying the occipital lobes. I'm looking on the flair sequence, Series No. 8 and Image No. 8. You can see it on several images. So this represents another location. I would say this could be an area where you might have some movement of blood from above the tentorium.

BY MR. MARSHALL:

Q. Okay. Now, as part of your review -- well, have you had a chance to review Dr. Scheller's report?

A. Yes.

Q. One of his opinions, and I think it's Opinion -- I don't

know if it's numbered, but I think it's his second opinion, discusses whether or not there was a skull fracture versus comparing it to the CT image. It seems like Dr. Scheller ruled out the possibility of a skull fracture. Would you agree with that assessment, to completely rule out the possibility of a skull fracture?

A. No, I would not.

Q. And why is that?

A. Depends very much on the quality of the CT scan. The patient actually had two skeletal surveys done, and a skeletal survey is a set of x-rays, plain x-ray studies, that's absolutely standard in child abuse cases, because often that's better at identifying fractures than anything else. We always assume that CT and MRI are the best for everything, but that's not always the case. So a skeletal survey can be very important.

On both of them -- on one view of the head, looking from the front, we have a black line, straight line, right here. I'm sorry, let me see if can -- all right. So within my circle there.

Now, I don't know for sure if that's a fracture. It's suspicious. I would not agree that we can exclude a fracture because the CT does not show it. The CT scan, unfortunately, was suboptimal. It's done with five millimeter slice thickness. That is pretty standard for looking at adults.

It's not something I would consider acceptable for looking at children. At the University of New Mexico, we always -- well, actually, nowadays adults and children are done with thinner slices. But even in the past, we always insisted that children should be done with three millimeter thickness of the slice, and sometimes less, to enable us to do reconstruction images.

If you have thin enough slices, they can use the computer to look at reconstructed images in another plane. For example, I believe the images Dr. Scheller showed with CT as examples that were done through a coronal set of images, as if we were looking from the front, those are not directly acquired that way. Those are done from a regular CT slicing through the body as if we're going through the long axis of the body across. And then if you get thin enough pictures, you can use the computer to create an image that looks as if you're looking in a different plane, either from the front or from the side.

That's simply not possible with these five millimeter slices. I tried. I went back recently and tried using the multiplanar reconstruction software that we have available, and five millimeter slices are just too thick. If a fracture is in the same plane, more or less close to the plane of acquiring the CT scan, you can easily miss a fracture. I've seen very long fractures going most of the way across the head that were almost impossible to see on a CT scan if they're in the same plane, if they're lined up. And this is not a long one. If

it's real, and I'm not sure, but if it's real, it's small or short.

And the CT scan, which was not performed at UNM, it was performed at a community hospital -- and I'm not saying this to say bad things about them. It's not a trauma hospital. But just to make it clear that they're coming from a place where they're not used to seeing this, it was done with an adult type protocol, and it's not adequate to exclude a fracture.

Q. Now, Dr. Scheller had kind of a third note or third opinion that said that the "CT scan and MR scan were misinterpreted to demonstrate chronic or subacute subdural hematomas. In fact, the scans revealed chronic subdural hygromas. Subdural describes the location and hygroma describes the thick fluid nature of the collection."

Would you agree -- he goes on a little bit there, but would you agree with that assessment that he makes at that point?

A. Well, I think we're talking about mostly differences in terminology. I gave an explanation early on about how difficult it can be to know for sure, and I think I heard Dr. Scheller call this a subdural hematoma at some point, as well.

I think this may be what some people would term a hygroma, and I don't really have an issue with it. The important thing is that most subdural hygromas, the vast majority of them, are

the result of trauma. They don't just happen.
Q. All right. He goes on in that same section to say that many of these result from birth or unknown reasons. Now, would you agree with that part of the statement?
A. No.
Q. I think you just eluded to it a little bit in your previous statement, but would you care to elaborate?
A. Well, maybe it's not immediately known, but the weight of the scientific consensus right now is that most of these are the result of trauma. The subdural hygroma is a post-traumatic condition.

Now, can they occur from birth? Subdural hematomas can occur with birth. Actually, there's maybe some amount of bleeding inside the head in almost half of newborn infants. But there have been several studies looking at this in a prospective way. That is, looking at children at birth to see what's -- typically with MRI, not CT, so you don't use radiation. But to use MRI, and then look again on follow up. One of the larger of these studies by Dr. Rooks and colleagues looked at over 100 children, and almost half had some blood. Almost all of it had gone away by one month of age, and all of it had resolved by three months.

So in the sense that these may result from birth trauma, yes. But to last until eight months of age, no. I think that's extremely unlikely.

Q. And you also mentioned that the majority of these come from -- for a child of this age, at eight months, that the majority, I believe you stated, would come from some sort of trauma.
A. Yes.
Q. You mentioned that that was in the literature. Do you, offhand, do you have some of the literature that you would be referring to when it comes to that?
A. There's an excellent review article that was in the American Journal of Neuroradiology in 2015 on subdural hygromas in infants by Wittschieber.
Q. I'm going to present you with what's been marked as Government's Exhibit 26. Is this the article that you're referring to?
A. Yes.
Q. And what does this article discuss regarding hygromas and trauma?
A. One of the important points is that they can represent a chronic stage, or they may be seen acutely. So it's difficult to -- again, unfortunately, it's difficult to put a precise age. I have seen examples where you see subdural hygromas where there's a clearly known accidental cause of trauma, and we see it within a couple of days. So we know that hygromas can occur acutely.
Actually, just last week when I was reading out a few days

ago, I saw a case that had an acute injury, and after only two or three days had something that looked very much like this type of hygroma. So these can be either acute or chronic.

One of the other important take-home messages to me was the statement here at the end of the summary on the first page. "If other infrequent reasons can be excluded, the presence of subdural hygromas strongly suggests a post-traumatic state and should prompt the physician to search for other signs of abuse."

Now, you can get it from accidents, but it's most of the time the result of trauma, and it's the responsibility, then, having seen this, of physicians to search for possible causes.

Q. Now, regarding his fourth opinion -- and you have the book that's already been admitted as an exhibit next to you, I think. It's Exhibit 3 if you want to look at it for reference. But his kind of Point No. 4 were that: "Subdural hygromas of infancy are usually benign, but they can occasionally cause small brain surface hemorrhages." And then he gives several reasons for that. I was just wondering if you would agree with that assessment or not.

They're not numbered, but he does little bullet marks. So it's the fourth one down on Page 2 of Exhibit 3.

A. So this is -- "First, small vessels that course from the inner skull to the brain's surface are stretched by the fluid accumulation and can tear and leak blood." That's probably

correct.

"Second, the body attempts to wall off the fluid collection and builds a membrane. This membrane is vascular and can leak blood as well." Basically, this is describing the mechanism for formation of a chronic subdural hematoma, and my understanding, for example, from this 2015 article is that that's actually now considered -- the process of formation often of a chronic subdural hematoma is that you have a hygroma, then formation of membrane, and some additional bleeding or leaking.

"A small surface hemorrhage is apparent on Calvin's head CT and MR scans," to quote again from the report. Probably. It's so small that it may be subarachnoid. It may be within the subdural space.

Q. What about his opinion that they are usually benign? I think that's in the first sentence of that point.

A. Oh, "usually benign." Well, I'm not sure that I can answer. Benign sounds like it's really asking more of a clinical question, and as a radiologist, I'm not as much part of the clinical assessment. But I would not agree that they are something that we just happen to see and blow off. They're a sign of trauma.

Q. In his report and when he was testifying, Dr. Scheller referenced that bleeding on the brain can sometimes cause seizures. However, on the stand, he said that subdural

hematomas do not cause seizures. Do you agree with that statement that he made on the stand?

A. Yes. Sometimes you may have a seizure, though, from the same incident or trauma that caused the subdural hematoma. That is, it's thought to be most often due not to impact, but to shearing or tearing either of that membrane or of the veins going right to the surface of the dura. And then that same shearing or tearing mechanism may damage the brain, as well, and that may cause seizures. Most of the time when we look at -- let me back up.

If we see definite brain abnormalities on MRI, that's certainly a sign that there's been major damage. However, most patients with a concussion have no abnormalities to the brain visible on MRI. I'm sure everybody here knows that concussions are a huge topic now in sports and lots of other areas, and I wish it were as easy as saying that you could get an MRI to find out if a patient has a concussion.

There are some very sophisticated research type examinations that may suggest abnormalities with a concussion, but they're not routine imaging studies. A normal MRI usually does not show abnormalities of the brain with a concussion, and certainly a patient might have a seizure without having visible brain damage on MRI.

Q. So there could be some sort of brain damage that we're not seeing from the MRI that could have caused the seizure, or

could have caused the other effects that he was having? The lethargy, the emesis, the list of other kind of symptoms that he was having.

A. Yes.

Q. The inability to focus, those kinds of things?

A. Yes, sir.

Q. So it's possible to have brain trauma that's not visible on the MRI?

A. Absolutely.

Q. There's also been some discussion that this child had an enlarged space on his head. On the MRI, does it appear that he has an enlarged subarachnoid space or subdural space?

A. No. The short answer is, no. I think the browser program seems to have stopped here. Oh, good, it's going to open quickly.

This is subdural space, this white crescent out here. The very thin area of blood immediately next to the surface of the brain is subarachnoid space. So this is not Benign Enlargement of the Subarachnoid Spaces, or BESS, as some people refer to it.

Q. I think there was also another term. I don't know, was it hydrocephalus?

A. So, yeah, an old term for Benign Enlargement of the Subarachnoid Spaces was external hydrocephalus. Although I'm not sure anyone knows for sure, the general thought has been

that this is not just because the fluid magically accumulates, but because there's a delay in maturation of the mechanism that resorbs fluid.

Your body makes a lot of cerebral spinal fluid every day. An adult has maybe 120 to 150 cc's of cerebral spinal fluid around your brain and spine, spinal cord, and you make 500 to 600 cc's a day. So obviously a lot of it is absorbed constantly. You're always making it and resorbing it. And if that gets out of balance, then you can have some accumulation.

In infants, sometimes in the first -- it's thought that in the first, oh, 18 months of life, you simply don't yet have a mature mechanism for resorbing that fluid, and in those cases you can get this Benign Enlargement of Subarachnoid Spaces. That almost always gets better on its own. It doesn't require any intervention. But he doesn't have it.

Q. Okay. Now, in Dr. Scheller's final opinion, he kind of characterized this as a "chronic intracranial fluid circulation condition of infancy." Is that a specific finding?

A. I'm not sure I know what that means. But the fluid that we're seeing, we have no proof that this is chronic. This may have all been -- even what looks like may have been subdural hygromas, to use some terminology, can be seen with acute trauma.

So, some of it may be old, there's certainly some new. The blood in the ventricle. Some scattered areas that looked

different on CT, that were bright on CT. Some areas that looked very dark on the gradient recalled sequence. So there's some small areas that clearly look new. The areas that look more like fluid, we just don't know for sure. They could be old, but they could be relatively recent.

Q. And I think you may have mentioned it already, but was there a study that talks about the findings can be, even of this kind of mixed density, can be hyperacute, acute, subacute, or chronic, that you've already referred to?

A. That's been reported in a number of studies. The article that I mentioned talks about different densities. There are others. There was a very nice review from -- I'm blanking on the name. Bruno Soares, but I'm forgetting the first author's name. But it revealed imaging findings. It talks about the fact that you can see mixed density even in acute subdural hematomas.

Q. Now --

A. And acute hemorrhage. And I'm going to, again, indicate that I've got to be careful about hygroma versus hematoma. These are slippery terms.

Q. You were present in the courtroom when Dr. Scheller was showing some of his images earlier?

A. Yes.

Q. Do you recall one of the images that he said had unilateral BESS and then subdural hematoma, I believe, on the

other side?
A. Yes.
Q. Do you agree with that assessment of calling it kind of a unilateral BESS, as well as a subdural hematoma, based on just that one shot? I don't think you had access to the whole series.
A. All I could see was the one shot. Well, it looked like enlarged subarachnoid spaces on the right side, I would agree with that. I would have to say, though, that it's important to note that almost always when we see benign extra-axial spaces of enlarged subarachnoid spaces of infancy, or BESS, it's the same on both sides. It's bilateral. It's on both sides.
So the fact that we saw it only on one side makes me think that the subdural hematoma on the other side was probably from trauma and may have sort of pushed out the fluid on the other side.
Q. Part of Dr. Scheller's discussion made it seem like these hygromas, that he was calling it, are a normal finding as part of practice. Would you consider finding hygromas on a child's brain, is that like a normal finding or a benign finding as part of your practice?
A. It's uncommon, first of all, and then secondly, when it occurs, it simply has to raise the question of trauma. If that's the only finding, it would be difficult for me to say, oh, this is definite evidence of trauma. But I don't consider

it a normal or incidental finding on a scan. It's something that we would almost always talk to the referring pediatrician or surgeon or emergency room doctor about and say, you need to look into this.

MR. MARSHALL: May I have just a moment, Your Honor?

THE COURT: Sure.

BY MR. MARSHALL:

Q. The last brief line of questioning, you kind of mentioned this earlier when it came to kind of just generally the idea of subdural hematomas and some of their causes. As part of the research, does it appear that they can come from both impact as well as kind of shearing or whiplash injuries?

A. Yes.

Q. Is one more common than the other, in either the literature or your experience? And if you can, identify from which.

A. I think that it's generally considered that shearing is the more important mechanism in the formation of subdural hematomas, but obviously it may also have impact. So I'm not sure I can answer your question any more precisely than that.

Q. And does the literature support, though, that that kind of shearing mechanism can cause those subdural hematomas?

A. Yes.

MR. MARSHALL: Pass the witness, Your Honor.

MR. SAMORE: Judge, before I begin my questions for

the doctor, I just wish to confirm with the Court that by asking some cross-examination questions of him today, counsel does not want to be waiving his standing objection that he made previously regarding not having this doctor listed to offer opinions. May I do so?

THE COURT: Yes. I don't consider that -- I mean, again, I didn't rule on the objection, but I was letting the record be made complete in light of the fact that -- so the doctor will only have to testify once.

MR. SAMORE: Yes.

CROSS-EXAMINATION

BY MR. SAMORE:

Q. Trying to use the time wisely, but I'm certainly going to caution, Doctor, that I may ask the Court's permission to complete my cross-examination at a later time. But let's get as much done as we can today. Okay?

A. All right.

Q. One of the last questions that my colleague, Mr. Marshall, asked you about is, you were talking about shearing mechanism. Do you find evidence that a shearing mechanism occurred in Calvin's case?

A. I'm not sure what you would mean by how I would prove that, other than by the fact that there's subdural fluid collections, which often result from shearing.

Q. That could be an explanation, but we just don't know, do

we?
A. Well, we don't know the reason, but it's probably from trauma.
Q. All right. Are you able to date -- and I think this is part of your testimony. There was some difficulty in dating when subdural hematomas occur; is that correct?
A. Yes.
Q. Did I understand that?
A. If you see acute blood, sometimes we're able to say that that's acute. But if it's mixed, it's very difficult to know if it's all new, or old, or a mixture of new and old.
Q. And sometimes the subdural hematoma can exist for months and be asymptomatic; isn't that true?
A. Months? I don't know about that. I'm skeptical about that.
Q. You tell me. I'm trying to understand this.
A. Well, first of all, months would imply that we're worried about birth trauma, and the studies that have been done have not found that to be the case at all. It does not persist beyond three months. And eight months would be, I think, very unrealistic.
Q. Are you --
A. Even -- if I could just finish my thought.
Even in adults with chronic subdural hematomas, sometimes they last months, but often they have some symptoms, the

patients have some symptoms.
Q. And are you familiar with -- there's been some testimony, but Dr. Jenny in her report in 2017 specifically found that between four and six months, Calvin's head expanded rapidly, and the unusual growth occurred, she stated, because of subdural hemorrhages. Are you familiar with that passage?
A. I have not read her report.
Q. Okay.
A. And I --
MR. SAMORE: I'm going to ask the Court's permission --
THE COURT: Let him finish answering the question.
BY MR. SAMORE:
Q. I'm sorry.
A. I have not -- I mean, the head circumference issues are not really within my area of expertise as a neuroradiologist, and I have not read Dr. Jenny's report.
Q. Okay.
MR. SAMORE: Well, just for purposes of this question, and I'm not going to ask him to diagnose, but may I approach the witness? I'm just going to take Government's Exhibit 22 and refer the doctor to Page 10, Paragraph 8. May I approach the witness?
THE COURT: Do you want him to look in that exhibit book?

MR. SAMORE: Oh, that's even better.

A. Could you repeat that, where it's located?

BY MR. SAMORE:

Q. Sure. Page 10 of Exhibit 22, near the top of the page, Paragraph 8. Tell me when you've had the opportunity to read that paragraph.

A. Okay, I've read it.

Q. Now, Dr. Jenny in that paragraph, correct me if I'm wrong, appears to conclude that the "unusual growth occurred because of subdural hemorrhages resulting from one or more head injuries he experienced during that period of time."

Did I read that correctly?

A. Yes.

Q. Is there anything in your work that would confirm or be against what she found there?

A. No. The only thing I remember is from Dr. Scheller's report listing head circumference. 75 percent, 75 percent, 75 percent, 90 percent. It's not that large a change.

Q. But we can agree that Dr. Jenny found this in Paragraph 8 of her report, didn't she?

A. That's in the report.

Q. All right. Now, do you measure head circumference in any of your patients?

A. No.

Q. So all we have to refer to is Dr. Jenny's finding here?

A. Well, all we have to refer to is what's in the chart.
Q. All right. Did any of the images that you saw demonstrate that there was any brain compromise?
A. No.
Q. I know there was an article that I think I just saw for the first time, I believe, and handed to me by a colleague. It was an article from 2015, and let's see if I pronounce the name correctly. Wittschieber. He was describing, I think it was Exhibit 26 today, and that referred to subdural hygroma. Do you recall that reference?
A. Yes.
Q. So in 2015, he's using the term subdural hygroma?
A. Yes.
Q. All right. And that article wasn't a research paper, was it?
A. This is a review of 100 papers evaluating the question of subdural hygromas in head trauma in infants.
Q. So it was really his opinion piece on --
A. No, I wouldn't agree with that categorization of an extensive review article, at all, as an opinion piece. Moreover, if you look through the references, some of it's based on his research, as well. But it's a review, extensive review and synthesis of a great deal of research, and to my mind, that carries a lot more weight than one person's opinion.
Q. Doctor, I just received it 15 minutes ago while you were

testifying, so I assure you, I'll give it a look. And thank you for pointing that out. That's a good place to go.

There was also some testing done, or at least some imaging of this child's head that you described.

A. Yes.

Q. All right. And you're not telling us -- or maybe you are, so correct me if I'm wrong. Are you telling me that a CT scan is a better way to determine if there's a skull fracture than an x-ray?

A. If you have a CT -- no.

Q. I apologize. I'm not a doctor.

A. That's an oversimplification. Sometimes some fractures are going to show up on a regular old x-ray than on a CT. However, a modern -- and by that I mean, right now -- CT scan done with very thin slices that enables you to do reconstructions and often a 3D view, so that you create a look as if you're actually looking at the outside of the head and you turn it around, that is something that can be very helpful in either confirming or rejecting the idea of a skull fracture. That simply is not available in this case.

Q. The testing could have been done, but it wasn't; is that correct?

A. I don't know what capabilities they had on their machine to do the very thin slices and the reconstructions.

Q. We have no evidence or finding that there was a skull

fracture, do we?
A. We have a suggestion from the x-rays. So that is evidence. I cannot confirm it, and I do not believe a CT can exclude it.
Q. Okay. So what we're saying is, it's possible, but we don't have any evidence confirming that there was any skull fracture?
A. Yes, I agree. Nor do we have evidence excluding it. At this point, it remains a possibility.
Q. The child, if you know, the child was, upon admission to UNM for some initial tests, he was taken from ICU to the regular floor, wasn't he?
A. I don't know. I have not reviewed the medical record.
Q. And that child was released and has had no permanent consequences from whatever happened on September 28th?
MR. MARSHALL: Objection. This is, I think, outside the scope, and I believe it was already asked and answered by the witness.
MR. SAMORE: I don't think it was asked.
THE COURT: I don't think it was. I'll allow it.
BY MR. SAMORE:
Q. If you know.
A. I'm sorry; what was the question?
Q. If you know --
A. I have not reviewed the record. So, I mean, I'll take

your word for it, but I haven't reviewed the record.
Q. Okay. But you don't know one way or the other if Calvin is just peachy fine today, or if he had problems; is that correct?
A. I have heard secondhand that he is doing relatively well, and that's as far as --
Q. Okay, that's fair. We're just asking if you know.
Was there anything in your examination -- and again, I think you just looked at the radiology. You never saw the child personally, did you?
A. That's correct.
Q. All right. Was there any sign of a skull, scalp or brain substance trauma, if you know?
A. Well, we've discussed the skull question already. The possibility of a fracture, that we're not certain of, but can't exclude. Scalp, was that one of your questions? Did not see any scalp injury.
Q. Was there a neomembrane on that MRI scan of September 30?
A. I don't think I can say for sure.
Q. What would a neomembrane imply, if it was seen there?
A. Chronicity. That is, there's some age.
Q. Now, you may have answered this. Your responsibilities at the hospital don't include diagnosing a neurological problem like this child had, do they?
A. Would you rephrase the question?

Q. I'll rephrase the question.
A. Thank you.
Q. When a child presents with a neurological problem like a seizure, who does the diagnosis? What specialty?
A. That's not me, you're correct. That would be the neurologist or pediatrician or neurosurgeon.
Q. And you are not qualified to diagnose child abuse, are you?
A. I look at trauma every day that I'm practicing, and so I am aware of some red flags. I'm not making the ultimate diagnosis, but there are things that would lead me to say, I'm concerned about the possibility.
Q. Fair enough. Would you say that you are -- you've heard of the triad that we've discussed today, and previous to this day?
A. Uh-huh.
Q. "Yes"?
A. What was the question?
Q. The triad. Retinal hemorrhaging, and we're talking about in an infant, retinal hemorrhaging, a finding of that, a finding of subdural hematoma, and a finding of some encephalopathy. That's the term that's used, triad. Are you familiar with that term?
A. I am.
Q. Are you a supporter that if the triad is found in an

infant without other explanation, that there is immediately suspicion on the caregiver for AHT?

A. There's a level of suspicion. I'm not the one making the diagnosis, as you pointed out.

Q. That's a fair distinction. All right, that was my question.

You described, and you showed us, I think, on the video, there was some small subdural hemorrhage. Would you describe that amount as miniscule? Small? How would you describe it?

A. I would say small.

Q. How big, if you put that into a size? And you may have said that, and if you did, I missed it. What would the size of that be?

A. I'm not very good at estimating volume. It would be, you know, maybe a few cc's, total.

Q. Could it be that big (indicating)?

A. If you had everything put together.

Q. How many cc's in a drop of blood, just a standard drop of blood? Can you characterize it that way?

A. No, I think it's more like about 20 cc's -- I'm sorry; drops?

Q. Yes, just a drop of blood.

A. How many drops is that?

Q. Say a drop of blood, about the size of a pin, the end of a pin, what would the number of cc's be in that?

A. That's much less than a cc.
Q. Okay, that helps me try to understand that. Thank you.
Couple final questions, and these are going to relate to the dating. I was trying to follow some of the testimony you had regarding when there's -- there's also Dr. Scheller's testimony -- acute, subacute, hematoma, hygroma. I'm going to use that generally now.
When you say it's difficult to date when the actual injury occurred, I'm just going to ask you to describe that in a little more detail, if you could. Do you mean when you look at it by the color, the color of the spot, it's whether it's cottony, whether it's darker? How does that work?
A. It's primarily relating to the color of the grayscale appearance. So on a CT scan, and the CT is much simpler, high density, which means acute blood, is usually, not always, but usually pretty white, and that changes over several weeks to get darker and darker as it goes through a normal process of breakdown.
However, with an acute subdural fluid collection, it's clear that sometimes you get cerebral spinal fluid leak in as well as blood. So a mixture of dark fluid and bright fluid may mean old, but it also could occur acutely.
Q. When you say old, could old be two or three months?
A. Potentially.
Q. Okay. So the injuries -- is it possible that, for

example, some of the findings you had that may -- that were suspicious for trauma, if that's what I think I understood your testimony to be, they could have occurred two or three months prior to September 28, 2014?

A. Yes, I believe some of it could. I think it's unlikely. I've explained the intraventricular blood, the posterior fossa blood. The evidence is strongly in favor that that was recent hemorrhage, and it is also possible that it was all recent. But, yes, some of it could be old.

Q. Could it be old -- could it be three or four months old?

A. I can't put a precise date on it.

Q. I'm not asking you to be precise, I'm asking you within your experience and your training, is it possible that any of the findings you had could have occurred from trauma as long as four months prior to September 28, 2014?

A. Perhaps.

Q. And there's no way, really, to know with any certainty?

A. Regarding the?

Q. Regarding when those injuries occurred, if, indeed, it was due to trauma. Pardon me; I misspoke. I said injuries. Those findings.

A. Those findings, I cannot put a precise date on them.

Q. That's just not within a reasonable degree of medical certainty, is it?

A. The bright spot on CT, the dark blood in the ventricle,

that's acute. Some of the posterior fossa is likely acute. But the broader areas, I cannot put a date on them.

Q. And one of the other issues that I think you rose, and please correct me if I don't state it correctly or precisely enough, but these injuries -- pardon me. I'm taking out the word injury.

When you have certain findings in your specialty and you don't have any explanation from a previous test of the child -- a birth trauma, I think was an example you used, but there can be other occasions that might explain why there might be a finding of a hygroma, a subdural hygroma, a subdural hematoma. Unless there are specific tests done on that child when it is doing its monthly well checks, if the child is asymptomatic, we wouldn't know if there was anything preexisting, would we?

A. I agree.

Q. One other question that I heard, or I'm going to follow up with, that my colleague asked you in direct, and please correct me. Is it possible that the findings you had, however they were created, could have occurred -- I think there were three findings that you mentioned specifically, and I may have misheard. But could they have occurred at three different times, whatever caused them to arise?

A. Possibly.

Q. And they could have occurred at one time; is that possible, too?

A. Yes. But in that case, not all old.

MR. SAMORE: Judge, I have no further questions at this time.

Doctor, thank you for your patience with my clumsy wording.

THE WITNESS: Thank you.

THE COURT: Is there redirect?

MR. MARSHALL: Just briefly, Your Honor.

REDIRECT EXAMINATION

BY MR. MARSHALL:

Q. On cross-examination, you were asked a question about, I believe it was Exhibit 26, the study on the hygromas from 2015.

A. Yes.

Q. Now, you were characterizing this as, I think, a review of many other studies; is that correct?

A. Yes.

Q. And why is that important? Why is that important for this kind of medical literature?

A. It provides a broad overview of the scientific and medical evidence that's available at that time. So it's not just an opinion, it's a summary and synthesis putting together a lot of different evidence, a broad survey.

Q. And there was some discussion, as well, there at the end, discussing about the one finding, that it was possible that it could be older; is that correct?

A. Yes.
Q. Now, in your experience, how does -- have you seen hematomas or hygromas that were months old?
A. You know, we keep coming back to, it would be hard for me to know if we didn't have an old study to compare it to. Weeks, yes. I'd have to look back and see how old we've documented.
Q. And if an injury in a child lasts for months, would it be -- I don't know if this is even possible. I'm sorry for maybe using layman's terms. But would you be able to say what kind of severity of injury could last for four months?
A. Not a severe one.
Q. Why is that?
A. With a severe one, I think you're much more likely to get accompanying brain injury. However, I'm not a pediatrician, I'm not a neurologist, and I recognize that in a very young infant, a neurologic examination is more challenging than in an adult who can respond to a neurologic -- you know, move this, do that. With a child, you're mostly observing and interacting in a different way.
Q. Okay. And again, if this is something outside your expertise, that's fine, but previously you had mentioned that normally some of the smaller injuries are resorbed relatively quickly.
A. Yes.

Q. Does that depend on the location, or does that depend on the type of injury? What causes that?
A. Subarachnoid blood usually resorbs pretty quickly. Intraventricular, a small amount resorbs quickly. A hemorrhage in the brain, itself, usually takes longer. Weeks to sometimes months. Subdural blood, it varies. It can sometimes take weeks, several months in adults. Again, in infants, I'm not sure how much data I have with evidence to show how long they're followed.
Q. I don't know if you can say, but would a patient be symptomatic if this had been a month long injury? Would they have shown some sort of other symptomatology at other points?
A. I think we're getting outside my expertise as a radiologist.
MR. MARSHALL: No further questions, Your Honor.
THE COURT: I've got --
MR. MARSHALL: Oh, I have two things to do, just briefly at this point, Your Honor. I think there's Exhibit 26, and I think even Exhibit 25 that we tendered outside the exhibit binder. I just wanted to ask that we move those into evidence as a part of our presentation here today.
MR. SAMORE: Same objection, Judge, and certainly I understand the Court's ruling.
THE COURT: And Dr. Hart, his findings, that is in this binder; right?

MR. MARSHALL: I'm not 100 percent sure.

MR. SAMORE: They are not, Judge.

MR. MARSHALL: Then, Your Honor, at this time we'd like to move that in, as well as the images as a part of the disc, and we can provide -- I don't have an extra copy with me today, but I can provide them under separate cover, a disc to the Court for the exhibit of the MRI and CT and x-ray scans.

THE COURT: Well, for purposes of the record, I think, since Dr. Hart was asked questions about his findings, I think whatever report he issued ought to be a part of this record.

As far as Exhibits 25 and 26, I understand counsel's objection, but I'm going to go ahead and admit them for purposes of the hearing.

MR. MARSHALL: Yes, Your Honor.

(Government Exhibits Nos. 25 and 26 admitted.)

THE COURT: So I guess in terms of Dr. Hart's findings, in what form were they in? Was that in written form, or was it on a disc?

MR. MARSHALL: Both, Your Honor. We have a paper record. My only problem is, I have a double-sided copy and there is extraneous information. So I'll get a clean copy to the Court and to defense counsel.

THE COURT: That's fine.

MR. MARSHALL: And also, we would submit the imagery

which is on a disc for the CT and MRI scans, just for the purposes of a complete record.

THE COURT: Okay.

MR. SAMORE: And may I? On behalf of the defense, Judge, we would just ask that we leave that open to objection. I'm very optimistic that working with our colleagues, we'll get a chance to look at it and it will all be correct and we'll admit it. But we'll get that work done. I think it's clear that we all have a good bit of work to do after today.

I would also ask that because of the way the evidence came in and the timing of it, and our previous objection, that at least the doctor not be released from his subpoena subject to being recalled at a later time when we finish this hearing.

THE COURT: Well, we can take that up if we need to. But, yes, I don't have a problem with that. But let me -- I did have a couple of questions that I wanted to ask Dr. Hart.

In the years I've been doing this, I've found that there's a lot of overlap among various medical specialties, and I was going to ask, as a neuroradiologist, you were called into this case to, I guess, look at the CT scan and interpret it with your findings.

THE WITNESS: Mostly the MRI. The CT was done at a different hospital.

THE COURT: So you did the MRI?

THE WITNESS: Yes.

THE COURT: Where was the MRI done?

THE WITNESS: At UNM.

THE COURT: And the CT scan was done at the community hospital?

THE WITNESS: Yes.

THE COURT: Okay. Based on your training and experience, is a neurologist qualified to interpret a CT scan and an MRI?

THE WITNESS: A neuroimaging fellowship that's done by a neurologist typically is not as extensive as a neuroradiology fellowship. The American Board of Medical Specialties, that's the umbrella organization that's most recognized, in the mid 1990s created a certification, a test for certification in neuroradiology, and because of concerns from neurologists and neurosurgeons who were sometimes interpreting these scans, the Board, the umbrella organization, set up a pathway for neurologists to take the examination. To train, do some additional training, and take the examination. And neurosurgeons. And I think relatively few have chosen to do that. Instead, there was a separate pathway set up by an organization that's not under this American Board of Medical Specialties. So there are differences in training.

Radiology I think involves a lot more training and understanding regarding the physics of the CT, MRI, and so on. A neuroradiologist does some procedures that few -- well, in

the past, few neurologists did. Angiograms, putting a catheter in and interpreting the angiogram from injecting contrast dye into the head or elsewhere. Myelograms, which I do. Those usually do not fall under a neurologist's training.

I'm a radiologist, and I have some -- maybe they would be viewed as turf questions. But I think that the level of training is higher for neuroradiology than neurology.

THE COURT: In terms of the standard of care, the appropriate standard of care, as you understand it, at what point are -- in other words, are you called in on any type of head injury? What's the threshold level of an injury that a neuroradiologist such as yourself would be called in to interpret, or is it just routinely done?

THE WITNESS: At our hospital, we interpret all the CT and MRI of the head, the neuroradiologists do. Or we have radiologists trained in emergency radiology who do that, as well. But it would all be, at our hospital, all be interpreted by radiologists. Does that answer your question?

THE COURT: Yes, that does. What is the protocol when you find a situation where you will make an interpretation, and say a neurologist or a treating physician will disagree?

THE WITNESS: Oh, we talk. We encourage them to talk to us. Most of the time, we explain to them why we feel as we do, and my experience is most of the time they say, oh, now I

see, I agree.

THE COURT: And that would be based on the more extensive training that the radiologist has --

THE WITNESS: Yes.

THE COURT: -- in this area?

THE WITNESS: I mean, we're human, and once in a while we miss something or they have information we don't have, and occasionally after we talk I might put an addendum on a report. In fact, there was a minor addendum in this case, but that wasn't really a disagreement, it was just looking at it and noting some additional findings.

But we talk, and if there is a major disagreement -- it's very, very unusual for that to happen. We are really regarded as the best standard of care as far as interpretation.

THE COURT: Okay. Do counsel have any questions of Dr. Hart in light of my questions?

MR. MARSHALL: No, Your Honor. Thank you.

MR. SAMORE: Not at this time, Judge.

THE COURT: All right. Thank you, Dr. Hart. You may step down.

THE WITNESS: Thank you.

THE COURT: What's counsel's preference? We're at 2:00.

MR. NAYBACK: If the Court is so inclined, we could take this up on December 13th and probably finish this hearing

completely.

THE COURT: Okay. Is that acceptable? Again, part of the situation today is my scheduling issues.

MR. NAYBACK: That's quite all right, Your Honor. If we have -- I don't know how much. We'll call two more, I would say, witnesses who may go a little bit longer than Dr. Hart. But if we have six or eight hours on the 13th, we'll certainly get through this hearing.

THE COURT: Okay. Is that acceptable to you, Mr. Samore?

MR. SAMORE: I'm sorry, Judge, when did we agree to December 13th?

THE COURT: That's a date I have available. Does that work for you?

MR. SAMORE: I will have to check. I will make it work for me.

THE COURT: Well, why don't you do this. When I step out, why don't you and Mr. Nayback -- Mr. Garcia controls the calendar here. Let's go ahead and -- the witnesses are here, so before everybody leaves, maybe get a firm setting on the calendar, because otherwise it may fill up.

And let me just mention this. I'm going to allow you to supplement, in terms of cases, particularly that Massachusetts case, the appellate decision. You've already tendered it?

MR. SAMORE: We did. It is before Mr. Garcia right now, Judge, and a copy was provided to the Government.

THE COURT: Ultimately, to me, this comes down to what the U.S. Supreme Court and the Tenth Circuit has held, and I'm quoting this out of -- this is a typical standard that I've used in other opinions. But, in Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, the United States Supreme Court explains that: "Rule 702 assigns to the District Judge a gatekeeping role to ensure that scientific testimony is both reliable and relevant." The gatekeeping function involves a two-step analysis.

First, the Court must determine whether the expert is qualified by knowledge, skill, experience, training or education to render an opinion. Second, if the witness is so qualified, the Court must determine whether the expert's opinions are reliable under principles set forth under Daubert and Kumho Tire.

Now, I recognize that the Government has raised challenges to qualifications, but for purposes of this, just for the sake of argument right now, let's assume that the defense has overcome the qualification. The second part -- and again, I'm quoting the Tenth Circuit, noted as recently as 2016.

"Although many factors may bear on whether expert testimony is based on sound methods and principles, the Daubert

court offered five non-exclusive considerations." They're non-exclusive, and that is: "Whether the theory or technique has (1) been or can be tested; (2) whether the theory or technique has been peer-reviewed; (3) whether the theory or technique has a known or potential error rate; (4) whether the theory or technique has standards controlling the technique's operation; and (5) whether the theory or technique has been generally accepted by the scientific community." That Tenth Circuit opinion is Etherton v. Owners, 829 F.3d 1209.

And then it goes on to state: "The Tenth Circuit has reiterated that a District Judge asked to admit scientific evidence must determine whether the evidence is genuinely scientific as distinct from being unscientific speculation offered by a genuine scientist." That's Dodge v. Cotter, 328 F.3d 1212.

And then the Supreme Court in Daubert stated that: "The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate."

So, we can go very far afield in this case, but again, I've articulated the legal standard that I'm going to follow.

So with that, we'll be in recess. And then I'm going to ask counsel to confer with Mr. Garcia, and then before the witnesses who are going to be testifying on the 13th leave, if we could verify that that works in their schedules. Otherwise,

let's pick another date and just get it on the calendar.

So with that, we'll be in recess. Thank you.

(Proceedings adjourned at 2:04 P.M.)

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, Plaintiff, vs. PATRICK DURAN, Defendant.	No. 1:14-CR-03762-WJ Daubert Hearing - Vol. 1

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I, Mary K. Loughran, CRR, RPR, New Mexico CCR #65, Federal Realtime official Court Reporter, in and for the United States District Court for the District of New Mexico, do hereby certify that pursuant to Section 753, Title 28, United States Code, that the foregoing is a true and correct transcript of the stenographically reported proceedings held in the above-entitled matter on Monday, November 19, 2018, and that the transcript page format is in conformance with the regulations of the Judicial Conference of the United States.

Dated this 5th day of December, 2018.

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