6. Deposition of Dr. Mark Dershwitz, *Alderman v. Donald*, Case No. CA1:07-CV-1474.

Dr. Mark Dershwitz

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

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JACK E. ALDERMAN,

Plaintiff,

vs. CA 1:07-CV-1474

JAMES E. DONALD, ET AL,

Defendants

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DEPOSITION OF DR. MARK DERSHWITZ, taken on behalf of the Plaintiff, pursuant to the Massachusetts Rules of Civil Procedure, before Judith A. Twomey, Registered Professional Reporter and Notary Public within and for the Commonwealth of Massachusetts, at the Holiday Inn, Logan Airport, Boston, Massachusetts, on Tuesday, October 2, 2007, commencing at 9:40 a.m.

APPEARANCES

MICHAEL A. SIEM, ESQ.
ELIZABETH K. QUINN, ESQ.
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for the Plaintiff

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For the Defendant

PROCEEDINGS

DR. MARK DERSHWITZ, having been duly sworn, was examined and testified as follows:

EXAMINATION BY MR. SIEM:

Q. Good morning, Dr. Dershwitz. My name is Michael Siem. I'm with the law firm of Clifford Chance, and we're representing Jack Alderman in this litigation.

I understand you've been deposed several times before, but I just want to go over a couple of things. Since we don't have a videographer here, if you could just speak and not gesture. If there's any questions that I ask that you don't understand, please ask me to repeat myself. Otherwise, I'll assume that you understand the question.

At any time during the deposition, if you need a break, let me know. The only thing I ask is if a question is pending, please wait until answering the question before taking a break.

Have you taken any prescription medication in the last 24 hours that would

impair your ability to testify today?

A. No.

Q. Dr. Dershwitz, can you please state and spell your name for the record, please.

A. Mark Dershwitz, D-e-r-s-h-w-i-t-z.

Q. Can you please give us your home and business address, please.

A. Home is 33 Wildwood Drive, Sherburne, Massachusetts. And business is Department of Anesthesiology, University of Massachusetts, 55 Lake Avenue North, Worcester, Massachusetts.

Q. Dr. Dershwitz, what do you understand your role as an expert to be?

A. To provide scientific-based testimony and answer the questions that I'm asked.

Q. Do you believe that you're supposed to advocate a position in this case?

A. Absolutely not.

Q. Are you supposed to rebut any assertions made by Mr. Alderman's experts?

A. If they say something that's

scientifically incorrect, I will attempt to correct it.

Q. And you understand that you're charged with the duty to give your independent and impartial expert opinion and, of course, not supposed to argue a position for either side?

A. Yes.

Q. And you understand you're not supposed to be an agent for the defendants?

A. I am not.

Q. And you feel that you've done that here, correct?

A. Yes.

Q. Dr. Dershwitz, do you have any personal interest in this litigation?

A. No.

Q. Do your patients who you treat know that you aid states in these litigations?

A. I have no idea.

Q. Have you ever asked them?

A. No. They've never asked me.

Q. Do you post it on your wall or CV anywhere?

A. No.

Q. Do you think if they knew that it would affect their decision to use you as a doctor?

A. I doubt it.

Q. And why is that?

A. Because I don't think it matters. I'm a good anesthesiologist, and whether or not I give scientific testimony on behalf of states in these sorts of cases or on behalf of plaintiffs or defendants in medical malpractice cases isn't relevant to how good a doctor I am.

Q. Have you ever attended an execution?

A. No.

Q. Not as a witness or a participant or an advisor in any way?

A. No.

Q. Have you ever asked any witnesses on the other side not to testify, such as Dr. Henthorn?

A. No.

Q. And, sir, what is your personal

opinion about the death penalty?

A. I don't discuss that.

Q. Are you confident that it doesn't bias your opinion in any way whether you're for or against the death penalty?

A. Absolutely. And, in fact, no expert on behalf of inmates has ever found a problem with any of my scientific calculations. And, in fact, Dr. Henthorn, who you just quoted, and I are actually writing a review article together on the pharmacology of the medications used in lethal injection, and we have no meaningful scientific differences on any of these questions.

Q. And, in most cases, most people agree that if the amount of chemicals that are intended to get in the drug, in the body, they actually get there, though a person is not likely to suffer pain, correct?

A. Well, I haven't taken a poll on this, but I think that any scientist who takes the opposite opinion is probably misinformed.

Q. And I think most -- and we could agree, then, that your opinion is basically on

if the drugs get in the body, not the risk associated with them not getting in the body, is that correct?

A. I think, in general, that's true.

Q. And, sir, you've opined in some 15 states that lethal injection is a safe and reliable process, is that accurate?

A. If the protocol is implemented as written, yes.

Q. Have you reviewed the protocol in Georgia?

A. Yes.

Q. Have you reviewed all three versions of that?

A. I have a version in my possession. I don't know about other versions.

Q. If you could pull that out, please.

A. I could tell you.

Q. While we're on that, do you have any other notes or documents with you that we could see today?

A. I was provided this by Mr. Drolet's office. And so the protocol that I

reviewed was dated June 7, 2007.

Q. We're going to have to get a copy of that somehow. If you could just -- the front page, I think, has an index, is that correct?

A. Yes.

Q. Could you just read for the record what documents you reviewed, because we were not provided them prior to the deposition today.

A. I did not review most of the articles on this list.

Q. Which ones -- but you were provided all of those?

A. I was provided everything on this list, and I reviewed a small fraction of them.

Q. Can you please tell us what you were provided.

A. What I was provided, number 1, the complaint; 2, the Georgia Department of Corrections 2007 Protocol; 3, trial testimony of Nurse Sandra Cook; 4, trial testimony of Nurse Julia Ann Ridgeway; 5, trial testimony of Nurse Wanda Davis; 6, trial testimony of

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Lieutenant Tommie Stewart; 7, Report of Plaintiff's expert, Dr. Steven Kern; 8, report of Plaintiff's expert, Dr. David Varlotta; 9, affidavit of plaintiff's expert, Dr. Mark Heath; 10, article by Dr. Kyle Janek, J A N E K; 11, execution file of Jose High 2001; 12, execution file of Tracy Housel 2002; 13, execution file of Ronald Spivey 2002; 14, execution file of James Hightower, June 2007.

Q. And which documents did you review in preparing your expert report?

A. The Georgia Department of Corrections 2007 Protocol, the report of Dr. Kern, the report of Dr. Varlotta, and the affidavit of Dr. Heath.

Q. And why didn't you review the other documents?

A. Because I didn't think that they were relevant to my opinions.

Q. And, Doctor, you've opined in about 15 states now that lethal injection is a safe and reliable process, right?

A. As I answered before, if the protocol is implemented as written.

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Q. And if these protocols were determined to be unconstitutional in any way, would you be professionally embarrassed by that ruling?

A. That's a legal opinion to which I have no expert opinion.

Q. So, if the Supreme Court in base found that the method of execution used in Kentucky is cruel and unusual, it won't hurt your professional opinion, that's your statement?

A. I don't have an opinion on that.

Q. And, sir, are you a member of any pro-death penalty groups?

A. No.

Q. Have you ever been?

A. Not that I know of.

Q. Have you ever been a member of any anti-death penalty groups?

A. Again, not that I know of.

Q. And you don't know if you've ever been at all; you don't think you have ever been?

A. As far as I know, no organization

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of which I am a member has ever taken a position on the death penalty.

Q. How about the ASA?

A. The ASA, as far as I know, the president issued a recommendation which I'm not sure is binding on the membership. But he basically recommended that anesthesiologists not get involved in doing executions, and I think that's pretty good advice.

Q. And how about the AMA, are you a member of that organization also?

A. I'm actually not a member of the AMA, but I adhere to their Guidelines for physician participation in executions which explicitly permit the provision of medical testimony, and that is what I limit my role to do.

Q. So, you never provide technical advice to states in preparing protocols, is that your testimony?

A. No, I don't. What I do do is answer questions, and I have a long paper trail of talking to both attorneys as well as reporters -- far more reporters than attorneys

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-- in terms of the science behind this. And, so, for example, if somebody were to ask me to provide and discuss advantages and disadvantages of different types of protocols, I will answer those questions. But, in my mind, the decision on what is better is not a medical decision or a scientific decision, it's a public policy decision. So, I do not ever say what I think is better.

Q. So, you never recommend to a state to use one IV or two IVs?

A. No. But I would say that using the military or NASA analogy of redundancy, that it is reasonable to assume that if one has redundant systems, there's overall less risks.

Q. And you've never recommended to a state to use one drug instead of three drugs? You may give them the pros and cons, but you don't recommend what they should do?

A. Correct.

Q. And you wouldn't recommend to a state how to change their protocol in any way; you may give them pros or cons?

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A. Correct. There have been some states that showed me protocols. And when they asked me questions, I've said, this doesn't make scientific sense. And then they've gone ahead and made some changes in response to that. But I'm not the one who told them that they should do it.

Q. So, you've never sent an e-mail to a Department of Corrections official telling them they should use two IVs instead of one IV?

A. No.

Q. And you've never sent an e-mail to a Department of Corrections official telling them that they should use one drug instead of three drugs?

A. No.

Q. And you've never sent an e-mail to a Department of Corrections official telling them they should change a protocol to make it clearer?

A. Not that I could recall. If I don't understand something, I would say, I don't understand this, or it could be made

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clearer. But whether they decide to change it is up to them.

Q. So, in no way have you ever recommended doing one thing over another?

A. I believe I've been quite careful not to do that.

Q. But if we had an e-mail chain that showed that, could that change your opinion?

A. I would have to read it and decide whether or not your interpretation is the same as mine.

Q. Would you think that that would be -- let me strike that. Do you think recommending doing one thing over another thing would be considered providing technical advice?

A. It depends on the context.

Q. So, how about recommending using two IVs instead of one, would you consider that to be providing technical advice?

A. No, because that is based upon the well-documented experience in other fields where redundancy decreases risk.

Q. So, how about recommending to a

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state that they should use one drug instead of three drugs?

A. I have never done that. I have discussed in great detail the advantages and disadvantages of one drug versus two drugs versus three drugs, and I have left it to the states to determine which is better.

Q. But if you had recommended to a state to use three drugs instead of one drug or one drug over three drugs, would that be providing technical advice in violation of the AMA Guidelines?

A. It would be, and I've never done that. I realize that there are people who think that I have done that, but they are wrong.

Q. How about telling a state that they should change their protocol, would that be providing technical advice under the AMA Guidelines?

A. I think it depends on the specific change. As I've said, I have received protocols that didn't make sense, and I told them that, scientifically, it made no sense,

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and it was up to them to actually make the change. And the example would be in the states whose protocols included giving thiopental after potassium chloride. And I've told them that that makes no scientific sense because you're giving a drug after cessation of circulation, and, therefore, it can't do anything. And after receiving that expert opinion, as far as I know, two states elected to change the order of the medications that were given.

MR. SIEM: I'd like to just mark as Exhibit 1 the AMA Guidelines. It's called E-2.06 on capital punishment.

(Dershwitz 1 marked for identification.)

MR. SIEM: I'll also mark at this point the letter from the president from June 30, 2006, the president of ASA, Observations Regarding Lethal Injection, written by Orin Guidry.

(Dershwitz 2 marked for identification.)

Q. Have you seen these documents

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before, sir?

A. Yes.

Q. And the Exhibit 2 is the message from the president that you referred to earlier?

A. Yes.

Q. And the AMA Guidelines, those are what we were discussing earlier?

A. Yes.

Q. And I'd like to mark -- sir, have you -- there has been some question as to -- in regard to when pancuronium bromide and thiopental mix, what occurs. If they mix together in an IV line, what occurs?

A. There's a precipitate forms that has a good chance of plucking up the IV catheter.

Q. And what is that precipitate?

A. Well, I think it depends on which chemist you ask, because there is a published paper that says the precipitate is thiopental. There's some unpublished data that suggests it's pancuronium. And, from a medical point of view, it matters not a whit which one it

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is, because the precipitate will still plug up the IV.

Q. Well, it does matter in this case in that you've testified throughout the country that it's pancuronium bromide, and you've referenced to courts and you've told courts that it is pancuronium bromide.

A. That's an incorrect statement, because I have not testified across the country. That particular question has only come up in a couple of states. In most states, they don't care, because it's not important. And, scientifically, it doesn't matter what the precipitate is made out of. And if it turns out that one chemist is right and one chemist is wrong, it makes absolutely no difference to the fact that you have to make sure that the two drugs do not mix in a syringe or in the IV line.

Q. Can you cite to one single published document that says that pancuronium bromide is what precipitates?

A. No, it hasn't been published.

Q. And who is going to publish this

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article?

A. He's not.

Q. And who is this person you rely on for this information?

A. He declines to be identified because he doesn't want people like you bothering him.

Q. Did you do any NMR specter analysis on the chemical that is the precipitate?

A. He actually did several types of spectroscopy.

Q. And what is the pH of a solution for sodium pentothal?

A. The typical clinically-used pH is between ten and 11.

MR. SIEM: Let's mark as Exhibit 3 the document on pentothal. It's a ten-page document entitled, "Pentothal, Thiopental Sodium for Injection."

(Dershwitz 3 marked for identification.)

MR. SIEM: And then I'd like to mark as Exhibit 4, "Pancuronium Bromide

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Injection, Solution, Hospira, Inc.", Dershwitz 4.

(Dershwitz 4 marked for identification.)

MR. SIEM: And then Dershwitz 5 is "The effect of pancuronium on the solubility of aqueous thiopentone." It's a technical report.

(Dershwitz 5 marked for identification.)

Q. Sir, in your expert opinion, when you write expert reports, do you usually rely on an unnamed source in support of your opinion?

A. Usually not.

Q. So, it's a rare occurrence that you would not at least disclose who the individual is that gave you that information, correct?

A. At the time I wrote the expert report, the experiment that I described had not been done.

Q. But you're relying on it now to say that the -- please let me finish -- the

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precipitate that forms is pancuronium and not the thiopental?

A. No, what I'm saying is that there is a scientific controversy, and I don't care which of the theory of scientists are right.

Q. We do care, because you have testified on this, and I think it absolutely goes to your credibility whether you've testified accurately in other cases or not.

A. I've made mistakes before, and if this turns out to be a mistake, I'll let the judge decide if it affects the rest of my credibility.

Q. What is the pH solution of pancuronium bromide?

A. That I'll have to look up. It's on the acidic side. Here, it says pH 4, approximately.

Q. And if you -- what is the actual precipitate that you assert comes -- let me strike that. What is the actual precipitate that forms when you mix these two drugs together?

A. My best guess at this point in

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time in 2007 is it probably depends upon the exact conditions of mixing because, certainly, this paper from the Canadian Journal of Anesthesia from 1987, these investigators thought they got thiopental as the precipitate, and my colleague thinks he got pancuronium as the precipitate. And it might very well be that there were differences in the process by which the two things mixed. But, in all honesty, at this point, I could care less.

Q. But you still stand by your testimony in these earlier cases?

A. I think it depends on which year. For example, in 2004 when I testified in Kentucky, there was no -- or my colleague had not done this experiment -- so, I did not have that data. And, at that point, I was discussing it based upon what I considered to be reasonable organic chemistry principles. And at that time they presented me on the stand with papers that I had never seen before and didn't have a chance to review.

Q. So, your declaration or your

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testimony in Reed where you indicate that Dr. Heath is in error in his contention that the mixing of the standard solution, the thiopental sodium and pancuronium bromide, will cause the thiopental sodium to precipitate and thus become inactive. In fact, when these two medications are mixed, it is the pancuronium bromide that precipitates and becomes inactive, while the thiopental sodium retains its full activity. And that was in 2004.

So, in 2004, you thought it was pancuronium, correct?

A. I did.

Q. And you did no research to determine whether it was pancuronium or thiopental?

A. It was based upon everything I know as a good organic chemist.

Q. And how about in Reed, you say, which is also in 2004: "Thiopental is a pH 11. Pancuronium is about pH 4. And, therefore, the pancuronium would precipitate. It's actually the other way around. When

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thiopental and pancuronium mix, it is the pancuronium that precipitates and is rendered inactive, but the thiopental is not rendered inactive." Correct, you also testified that in 2004?

A. Yes. And, furthermore, that is also based upon the fact that there is far more thiopental present than pancuronium. And, so, regardless of the nature of the precipitate, if it turns out that the precipitate is indeed a hundred percent thiopental and it precipitates, since there's so many grams of it, the amount that will precipitate as a response to the pancuronium will still render the overall solution to be highly effective as an anesthetic, assuming the IV catheter doesn't get plugged up.

Q. But at the time you made this testimony, you had no research regarding what the precipitate is, correct?

A. Correct, no studies had been done by my colleague, but I was speaking on the basis of well-understood organic chemistry principles.

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Q. And what are those principles?

A. That pancuronium is present in solution of one milligram per milliliter, along with a buffer. Thiopental is present in solution at 25 milligrams per milliliter, along with a buffer. The syringe -- typically, this varies from state to state -- may have a hundred milligrams of pancuronium, but anywhere from 2,000 to 5,000 milligrams of thiopental.

So, if one mixed the entire contents of the pancuronium syringe with the entire contents of the thiopental syringe, there would still be grams of thiopental activity remaining.

Q. But that doesn't change the fact of what the precipitate is; that just determines whether it's active or not, correct?

A. And that was part of the answer that you read. I said that the thiopental would retain, essentially, its full activity.

Q. Sir, but you've testified in several courts with great surety that

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thiopental is not what is the precipitate, and you still maintain that, despite the fact that you've seen articles --

A. Article.

Q. -- an article, as well as just a simple review as a chemist. Reviewing the data sheets on the drugs clearly shows that it's the thiopental acid that is what's --

A. Actually, the data sheets do not suggest that.

Q. That's wrong. Let's look at the data sheet for thiopental.

Under "compatibility" on the thiopental, do you see that?

A. No.

MR. DROLET: What document?

MR. SIEM: It's Dershwitz 3. I think it's page 6 or thereabouts. And it says "compatibility."

Q. Do you see that?

A. Yes.

Q. And it says: "The stability of pentothal solutions depends upon several factors, including the diluent, temperature of

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storage, and the amount of carbon dioxide from room air that gains access to the solution. Any factor or condition which tends to lower pH, i.e., increase acidity, of pentothal solutions will increase the likelihood of precipitation of thiopental acid."

Can you find one statement in the pancuronium document that says that it will precipitate out in a non-acidic situation in Exhibit 4?

A. I haven't read it, but I'll assume it's not there.

Q. So, outside of your mysterious friend who apparently did this study, there's not a single document that supports your assertion to numerous courts that it's pancuronium, correct?

A. I would take issue with that statement. However, one must understand that the argument that you are making has absolutely no clinical relevance at all. However, if it turns out that I'm wrong and someone, a third person, does an experiment where the mixing occurs under many, many

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different parameters and conditions, and if that shows that the precipitate is always invariably thiopental, then I'll possibly concede that I'm wrong. But it doesn't change what's really important in this case or any case, and that is that great pains need to be taken so the thiopental and pancuronium do not mix outside of the body.

Q. But it still doesn't -- you testified with great assurance to courts in Bays, Okin, and Reed, that it is absolutely pancuronium. And at the time, you had done no research, had done no testing, yet still assured the courts that it was absolutely pancuronium and attempted to take Dr. Heath to task on this. And, still, after I've shown you this good evidence that shows your assertion is absolutely incorrect, you still stay by that position, is that correct, sir?

MR. DROLET: Is there a question there?

A. And the reason I stand by it, and the reason my colleague does not want to publish this is because he doesn't want to

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talk to you, and he doesn't want to be badgered by you like the way you're badgering me right now.

Q. I don't think I'm badgering you. I think I'm asking a question. And rather than answer the question, you continually say something that is nonresponsive to the question I've asked.

The courts in Bays, Okin, and, and Reed heard your testimony, and you as a technical expert assured them that it was absolutely the pancuronium bromide that precipitates out. How can a court trust your testimony if you did no research on a subject, yet assured them that it was pancuronium that was precipitating out, despite the evidence to the contrary?

A. I will answer that in two ways. First of all, what I testified then is based upon well-accepted organic chemistry principles. Second of all, where you're referring to my testimony that you're trying to discredit, on all of the pharmacokinetic and pharmacodynamic calculations I've done,

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not one credible pharmacologist has found any reason to criticize any of those predictions that I have made. And those, of course, make up the bulk of my opinion in this case.

Q. But it does go to your credibility, correct?

A. I strongly disagree with that.

MR. SIEM: I'd like to mark as an Exhibit an e-mail forward from Julian Davis to Debbie Inglis and Gayle Ray, dated April 25, 2007.

(Dershwitz 6 marked for identification.)

MR. SIEM: Exhibit 7 is a document entitled "Dershwitz Expert Report," which is dated September 15, 2007.

(Dershwitz 7 marked for identification.)

BY MR. SIEM:

Q. Let's first turn to the e-mail. Why don't we start with your expert report. I'm sure you've seen that report.

A. I wrote it.

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MR. SIEM: Mr. Drolet.

MR. DROLET: I have a copy.

Q. In this report, you indicate first that -- why don't we go back to the e-mail. The e-mail first, in the second paragraph, you state: "I can tell you that the authors are not responsible scientists. They have never acknowledged errors made in their prior paper in The Lancet, even when good evidence has been presented that refutes some of their conclusions." Is that correct?

A. Yes.

Q. And have we done that here with the pentothal and the pancuronium precipitate?

A. Absolutely not.

Q. So, the fact that there are three documents, one of which specifically says it's the thiopental acid that precipitates, you still don't think that that's good evidence?

A. It's evidence, but it's not the sum total of the world's evidence.

Q. But you won't tell us who the individual is who did this mysterious NMR study, correct?

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A. First of all, I never said NMR. Second of all, his decision not to come forward is probably right, because he doesn't want you to call him tomorrow.

Q. Is there any other published paper or unpublished paper that you can cite to that supports your position?

A. I answered that already.

Q. Can you please answer it again, sir?

A. No.

Q. You're refusing to answer whether there is --

A. The answer to your question is no, if you would listen carefully.

Q. Sir, and if you could just look at the second paragraph of this report. You say: "The Dutch study only looked at thiopental of up to two grams." Correct? Do you see that in the last paragraph? And: "I agree that a two-gram dose of thiopental by itself is probably not lethal in everybody." Is that correct?

A. Yes, emphasis on "probably,"

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because, of course, that hasn't been studied.

Q. And, in your report, in your expert report, do you make any assertions as to what occurs and what the probability is of 2,000 milligrams of thiopental and whether that would be lethal in people?

A. Can you be more specific?

Q. Do you make any statements in your expert report that are inconsistent with your assertion in that e-mail?

A. I don't think so.

Q. Would you like to take a minute to read your report to make sure that you don't?

A. Why don't you point out to me the paragraph in question.

Q. Why don't you look at paragraph 18: "In fact, thiopental causes a decrease in blood pressure, and a dose of 2,000 milligrams is expected to cause a dangerous, possibly fatal, decrease in blood pressure in a patient undergoing clinical anesthesia."

A. Yes.

Q. So, that's consistent with your statement in the e-mail, correct?

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A. Because what I say in my expert report, that based upon our clinical experience -- and my clinical experience includes giving doses of thiopental up to 3,000 milligrams to patients -- those patients required aggressive attempts of resuscitation to keep their blood pressure within tolerable ranges. And, so, I say in my expert report that two grams or 2,000 milligrams of thiopental is expected to cause a dangerous and possibly fatal decrease in blood pressure. I do not think that there's an anesthesiologist on the earth who will not agree with that statement.

In my e-mail here, I said that thiopental by itself is probably not lethal in everybody, meaning that it might be possible for somebody somewhere to survive a dose of two grams of thiopental given by itself.

Those two statements are absolutely in agreement with one another.

Q. I just wanted to clarify for the record what you were saying in that paragraph. You provided an expert report in

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Okin, is that correct, in a case called Okin in Maryland?

A. I have certainly provided expert testimony in Maryland.

Q. And in that expert report, you provided some of the charts that are similar to the ones you provided in this case, correct?

A. Yes. My recollection is -- but I'm sure you'll correct me if I'm wrong -- but my recollection is, in Maryland, they had asked me to base my predictions on -- not on an average human of 80 kilograms, but on a person who was much larger, because I believe the inmate was substantially greater than 80 kilograms.

Q. Right. 130 kilograms, does that sounds right?

A. If that's what I wrote. I do recall that they asked me to base my predictions on the actual size of the person, because he was large.

MR. SIEM: Can you mark the Affidavit of Mark Dershwitz. It is a

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number of pages, and it's dated May 24, 2004.

(Dershwitz 8 marked for identification.)

MR. SIEM: The next exhibit, some charts that were filed in Kentucky, a four-page document, and it says: "Probability of Consciousness, Thiopental."

(Dershwitz 9 marked for identification.)

Q. Have you seen these before, sir?

A. I assume that these are all graphs that I made in the past.

Q. If you could look at those graphs and compare them to the graphs of what you filed in Maryland, can you explain to me why the amount of thiopental that you assume, that you assume is in the one in Kentucky versus Maryland, can you explain the difference and the difference between the probability of consciousness?

A. Can you be more specific?

Q. Well, if you look at the ones in

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Kentucky, the numbers that you have are different than those that were included in Maryland.

A. Can you be more specific?

Q. Can you look at the graphs that you filed in the Okin case. And if you look at Exhibit B, it says the time, the thiopental concentration, and the probability of consciousness, correct?

A. Is that Exhibit B?

Q. Yes.

A. Okay.

Q. And then compare them to the ones that you filed in Kentucky. The thiopental concentration is much higher in the one filed in Kentucky versus the one in Maryland. Can you explain the difference?

MR. DROLET: Again, which page are you referring to now? There's four pages here.

MR. SIEM: If you look at Thiopental mcg versus mL, it has arterial thiopental concentrations. And it reads, after five minutes, 65.0441, 36.4, and

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33.7.

Then you look at Exhibit B to the Okin report, it says that the thiopental concentration is 30.15, 23.46, 21.61.

A. First of all, my recollection is -- and I would have to check my files to confirm this, which I don't have with me -- my recollection is, in the predictions I made for the state of Maryland, they asked me to assume a large -- a larger than average value for the weight. And I would -- I may have put that in my expert report. I did. On page 4 of my expert report, I assumed a --

MR. DROLET: This is Exhibit 8?

A. In Exhibit Number 8, on page 4 of my expert report, I assumed a weight of 130 kilograms, which is not quite twice the average size that I usually use, because I usually take 80 kilograms as the size of an average person.

Also, the Maryland expert report says that the administered does is 3,000 milligrams of thiopental. I do not recall what the dose that Kentucky uses. Do you have

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that expert report available to you?

Q. I don't. But my understanding is it was also 3,000 milligrams.

A. Well, if you are correct -- and I have no information here to confirm or refute that -- if one looks at the 120-minute time point --

Q. Okay.

A. -- if we assume that the dose of 3,000 milligrams is the same in both jurisdictions, then the difference in concentration is explainable solely on the basis of the size of the inmate, 80 versus 130 kilograms. If we look at the early time points, like five and ten minutes, there is also a difference that is attributable to the speed of the injection. And although I don't have the information in front of me, it is clear to me that I assumed a slightly more rapid injection in Kentucky than I did in Maryland. And if I did so, it was based upon information that I was provided at the time.

Q. And what are the variables that you input into your charts? What are the

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different variables that go in to generate this graph?

A. The variables that I need to know, first of all, are the published pharmacokinetic parameters for thiopental, which are derived from a paper from Don Stanski. And those variables, of course, will remain constant for all of the different predictions I have done in all of the different states.

The next parameter I need to know is the value for the person's weight, which I assume to be 80 kilograms, unless I'm told otherwise.

And, finally --

Q. I don't mean to stop you. I just want to mark as Exhibit 10 -- is this the article you were discussing, the Stanski article?

A. No.

MR. SIEM: Let's mark it anyway.

A. The article by Stanski is published, I believe, in the Journal of Anesthesiology, and it's probably from the

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early '90s. But they did a study that permitted them to determine the typical pharmacokinetic parameters for thiopental that permit someone to then make a prediction of blood concentration as a function of time following a given dose.

Getting back to the assumptions, the other thing that I need to be either told or assume is the amount of time that it takes to inject the total dose of thiopental.

Now, the total administered dose will affect the probabilities of consciousness that I calculate at the larger values for time. Where the administration of thiopental is more rapid as compared to less rapid, there will be some differences in the early time points, and the differences will become less and less as the time increases.

Now, the differences may be meaningful to a statistician, but they are not meaningful to a clinician, because they remain a tiny fraction of one percent for all of those early time periods.

Q. Okay. But you also assume that

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the full amount of thiopental that's intended to go in the vein actually goes in, correct?

A. Absolutely. Every one of these predictions is based upon the entire dose specified in the protocol being successfully delivered to a working IV.

Q. So, if some of that or all of that thiopental doesn't get in the vein, then your predictions and assumptions would not be accurate, correct?

A. Correct.

Q. Dr. Dershwitz, in the two grams or 2,000 milligrams that are used in Georgia, is that dose lethal in and of itself?

A. It is probably lethal in a very, very high percentage of the population, but, clearly, that experiment has never been done in a human.

Q. Right.

A. And I am basing my guess on my experience of giving similar doses to patients for non-anesthetic reasons and then needing to vigorously support their circulation with other medications.

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Q. And how long would it take, based on your knowledge, for someone to die of that 2,000 milligrams?

A. That's a really good question, because we do not have a definition of the moment of death on which all or even most physicians agree. And, so, if thiopental is given by itself in a large dose, there's two different physiologic changes that will occur simultaneously that can contribute toward death.

First of all, 2,000 milligrams will render virtually every patient apneic, meaning they will stop breathing. And, so, as time goes on, the oxygen concentration in the blood will fall. And due to decreased oxygen delivery to critical organs, especially the heart and the brain, those organs will become injured and, then, irreversibly injured, and then death will occur.

Simultaneously, thiopental has a huge effect to decrease blood pressure and circulation. And, so, at the same time that the oxygen concentration in the blood is being

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decreased, delivery of that poorly-oxygenated blood is also decreasing.

And, so, as decreased oxygen delivery to critical organs proceeds, at some point, those organs will be injured, and then irreversibly injured, and then the person will die.

So, the exact moment of death is hard to quantitate, because it depends upon the technology that is used to ascertain that moment of death. And in an ICU, we have a lot more technology available than one would have in a death chamber when, presumably, the only thing would be a stethoscope.

That said, I would predict that circulation will become undetectable in a matter of a few minutes where "few" is a number in single digits, but I can't be more specific than that.

Q. Do you know how long it takes in Georgia for an execution to be completed?

A. I think it depends on your definition of "start" and "finish."

Q. Have you reviewed any execution

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logs which would give you that information?

A. No.

Q. Have you read any news articles that would give you that information?

A. No.

Q. Have you asked counsel for any information regarding that?

A. No.

Q. So, you have no idea how long they take; they could take a half hour or under five minutes, correct?

A. I actually suspect that under five minutes is probably not feasible. And I also suspect that it usually shouldn't take a half hour from the time -- starting from the time the medications are given.

Q. In your medical opinion, what is it that actually kills the inmate in the execution process?

A. Again, that's a hard question to answer because there's a lot of processes that are going on simultaneously. Most fundamentally, what kills the person is the decrease in oxygen delivery to critical

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organs.

When one uses the three-drug protocol in which the last drug given is potassium chloride, the potassium chloride is expected to stop all electrical activity in the heart and, therefore, cease circulation rather suddenly.

So, the most immediate proximate cause of this decrease in oxygen delivery is the stoppage of the heart by potassium chloride.

Q. Did you know that in Georgia they use, I think it's an EKG machine, to measure heart rate?

A. They use an electrocardiogram machine to look at the electrical activity of the heart, and heart is just one piece of information that's derived from that. And potassium chloride would be expected to cause the ECG to turn into a flat line.

That by itself does not necessarily cause death, because we routinely cause potassium chloride-induced flat line in the operating room.

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What causes death is the subsequent decrease or cessation in oxygen delivery to critical tissues.

Q. Do you know how they pronounce death in Georgia?

A. I do not specifically know what the physician is looking at.

Q. Okay.

A. But the physician, obviously, has different forms of data available to him or her that would help them make a decision.

Q. And you've never asked counsel for that information?

A. No. It's not important to me.

Q. But you've reviewed the June 7, 2007 procedures, correct?

A. I've read it. And if there is a specific definition of "death" in there, I just don't recall.

Q. But in and of itself, would thiopental at two grams stop the heart sufficiently to flat line the ECG machine in under ten minutes?

A. Almost certainly not. And the

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reason for that is that after oxygen delivery to the heart is diminished to the point that the heart is irreversibly damaged and circulation stops, electrical activity actually persists for a long time. Long, meaning, in my experience, well over a half hour, often more than 45 minutes. And I have this experience based upon providing anesthetic care for brain-dead organ donors in the operating room where I know that after cessation of all circulation, electrical activity in the heart persists for many, many, many minutes.

So, using an ECG to determine death following a dose of thiopental by itself would be a poor choice.

Q. And in the time frame that we've been discussing with Pavulon or pancuronium bromide, as they used in Georgia, would that in and of itself kill the inmate to flat line the ECG?

A. If pancuronium were given by itself, the mechanism of death will be the similar to thiopental, because, after a few

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minutes, the person will become paralyzed and unable to breathe. So, therefore, there will be again a decreased oxygen delivery to critical tissues, and the heart will stop beating mechanically long before the electrical activity stops in that scenario.

Q. So, in Georgia, since they use an ECG machine to pronounce death, it's likely -- or, I'm sorry, the potassium chloride is what actually stops the heart, is that correct?

A. The potassium chloride is expected to cause the electrical activity of the heart to cease once it's delivered to the heart.

Q. If you use pancuronium by itself, that would be a pretty torturous death, correct?

A. It would be uncomfortable.

Q. Only uncomfortable?

A. I think it depends on your definition. But, certainly, lots and lots of people have been paralyzed awake for scientific studies, and no one that I know has described it as pleasant. And, certainly, a person who is being executed by pancuronium

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and nothing else is going to first experience weakness and then shortness of breath and then paralysis and being unable to breathe, and they will experience very significant air hunger before they lose consciousness.

So, I don't want to get into the qualitative terms of the gradations of suffering, but it will be unpleasant.

Q. It would be pretty terrifying too?

A. I think it's expected to be very terrifying.

Q. If you only use the two grams, as they use in Georgia, two grams of thiopental, will that stop the circulation in under ten minutes?

A. It's hard for me to answer that question beyond a reasonable degree of medical certainty, because the right answer is I don't know. I know that the blood pressure will fall to a dangerous degree. But whether or not every single person will have their circulation suspended to the degree that death can be pronounced within ten minutes, I really don't know.

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Q. If you gave them the 2,000 milligrams -- if you gave someone 2,000 milligrams, would they be able to start breathing on their own at any point?

A. Again, at that dose, it's very unlikely, but I can't say that it's going to be certain.

MR. SIEM: I'd like to mark as Exhibit 10 a document entitled "Chapter 31, Measuring Death of Anesthesia," written by Donald R. Stanski and Seven L. Shafer.

(Dershwitz 10 marked for identification.)

MR. SIEM: I'd like to mark as Exhibit 11 the Opening Expert Report of David Varlotta, D.O.

(Dershwitz 11 marked for identification.)

Q. Have you seen that document before?

A. If this is the one that was provided to me, I did read an expert report of Dr. David Varlotta in this case.

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Q. If you could just get your expert report, which -- in this case, Exhibit 7 -- if you could look at paragraph 26 of that report and paragraph 17 of Dr. Varlotta's report.

A. (Witness complied.)

Q. Paragraph 26 of your report, I'm sorry, and 17 of Dr. Varlotta's.

In your statement, in your report, you state: "Dr. Varlotta cites postmortem thiopental concentrations as evidence that some inmates were conscientious during their executions." Correct?

A. Yes.

Q. Did you read Dr. Varlotta's deposition?

A. Yes.

Q. And do you still stand by that statement?

A. Where he says that the state of Georgia has no proof that it has in fact adequately anesthetized condemned inmates, and the autopsy range of 2.5 milligrams per liter is associated with nearly a one hundred percent probability of consciousness. So,

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therefore, by citing that value of 2.5 milligrams per liter, he believes that that inmate had a high probability of being conscious during his execution.

Q. Did you read his deposition, not his expert report? I think you thought I said expert report, but his deposition in this case?

A. I was not provided or, if I was provided it, I didn't read it.

Q. In this statement, he doesn't say that this stands for that proposition. What he says is: "This data does not prove that condemned inmates were adequately anesthetized." In fact, during his deposition, he said, "This doesn't prove anything." Is that correct?

MR. DROLET: Are you testifying? He wasn't there for his deposition.

A. It is my contention that the method used to obtain blood samples in Georgia provides no meaningful scientific evidence for consciousness.

If the blood concentration is at

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least in the high teens, one can conclude that the inmate was likely unconscious. Because from what we know about the processes involved, it is possible to have an artifactually low value for thiopental postmortem, but there's no process that can cause an artifactually high value. So, high values are reassuring. Low values obtained inappropriately should not be used as evidence that the inmate was awake.

Q. I think Dr. Varlotta is saying that here. He agrees with you, that this information shows nothing. Because he says that the state of Georgia has no proof that it has adequately anesthetized condemned inmates. Did I read that correctly, sir?

MR. DROLET: What was the question?

MR. SIEM: Did I read that correctly?

A. You did. And I believe that there is a difference in interpretation of that statement between how you read it and how I read it. But since it is the topic sentence

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of that paragraph, I interpret that to mean that if the state of Georgia has no proof that they have adequately anesthetized condemned inmates, since he is an expert on behalf of the inmate, then, he believes that there is evidence, especially since he quotes a value of 2.5 milligrams per liter, which every anesthesiologist will agree is associated with a nearly universal probability of consciousness.

Q. And your position is that to believe that these were accurate data showing what the concentrations were at death would be ridiculous, correct?

A. Essentially, yes.

Q. And, so, anyone who believes that would be incorrect?

A. Yes.

Q. Do you know a Dr. Kris Sperry, sir?

A. That name does not ring a bell.

MR. SIEM: I'd like to mark as Exhibit 12 testimony that was provided by Dr. Sperry in a case called State of Florida

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versus Ian Deco Lightbourne, dated July 20, 2007.

(Dershwitz 12 marked for identification.)

Q. Have you seen this testimony before, sir?

A. No.

Q. If you could turn to page 23, and I'll just read it aloud. It says: "Is it fair to say at least 12 hours and more like 14 or 15 hours passed before the blood was drawn?" And they were referring to Angel Diaz, who was executed in Florida. And Dr. Sperry's answer is: "Well, again, but it all depends on exactly when he was declared dead, but that would be most likely because the autopsy was done again the next morning."

The question: "Okay, do you have an opinion as to the accuracy rather than efficiency, if you will, of blood drawn that long after death and reflecting on examination the level of thiopental sodium present in the person at the time they died?"

And then there's an objection.

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And the response is: "Well, yes, if blood is drawn from a peripheral site, especially, say, from the groin area or internally from large vessels away from the heart, then the level of sodium pentothal that is found in analysis of those specimens would then be, I would say, reflective of, basically, exactly what the level was in their blood at the time they died."

Do you agree with his statement?

A. No, he's wrong, because he obviously does not have access to the data that I have. And I should also add I'm not sure if Chris is a man or a women. So, if it turns out that Dr. Sperry is a woman, change all of my answers to hers.

Q. It's a man.

A. Dr. Sperry clearly would change his mind if he had access to the postmortem redistribution data that I had available to me.

(Short pause.)

Q. But you think he's absolutely wrong regarding this?

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A. He is wrong, but it may be based upon inadequate information.

Q. And what would be that inaccurate information?

A. I didn't say inaccurate. Inadequate.

Q. I'm sorry, inadequate. What would be that information that you have that he as the medical examiner for the state of Georgia would not have?

A. Since 2005, the medical examiners in several states have drawn paired blood samples in executed inmates, one sample being drawn as close to the time of death as possible, the second blood sample being drawn many hours later at the time of autopsy.

Invariably, when these paired blood samples have been obtained, the concentration of thiopental drawn in the death chamber has been, my recollection is, universally, greater than 20. Whereas, the values drawn at autopsy have typically been in single digits. And these paired samples prove that the process of postmortem redistribution

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occurs with thiopental. And in contrast to many other drugs whose concentrations increase in the blood following death, the concentration of thiopental in the blood decreases following death.

Q. Dr. Dershwitz, you've held yourself out to be an expert in toxicology, correct?

A. I have a graduate degree in that field, and I recognize that toxicology is a very broad field, but there are certain areas in that that I am certainly expert.

Q. And when have you testified as a toxicologist or on toxicology, in what cases?

A. There have been a number of medical malpractice cases in which I was admitted as a toxicology expert. And this sort of toxicological and postmortem data on thiopental has been offered in some but not all death penalty cases.

Q. Can you provide the name of those cases?

A. I may or may not be able to check my records and come up with the names of those

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cases, I'm not sure.

Typically, in a medical malpractice case, when the case is over, in order to adhere to the Hippo rules, I destroy all of the files. So, I actually have almost nothing remaining from medical malpractice cases in which I've testified.

Q. And based on your expertise, can you identify some of the major treatises or texts in toxicology?

A. Certainly, there are textbooks, general textbooks in toxicology. There's also general journals in toxicology. And there's also more specialized texts that refer to specific areas, like industrial poisoning, heavy metal poisoning, gaseous poisoning, et cetera, et cetera.

Q. Can you name any of those?

A. Probably what is considered to be the most commonly used generalized text in this country is a book whose senior authors or the name of the book is "Casarett and Doull." First name, C A S A R E T T. Second name is D O U L L.

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Q. And have you ever published papers on toxicology?

A. Yes, I have.

Q. Can you point those out on your CV?

A. If we just go to the original reports that start on page 13 of my CV, the first seven papers which are derived from my thesis work are all toxicological papers.

9, 10, and 11 are toxicological.

14, 17, 18, 20, 26, 28, 29, and 30.

Q. Do you believe that forensic toxicology is an area in which one needs special qualifications in order to testify reliably?

A. I think it depends on your definition of "special." If a person has adequate training and/or experience and/or knowledge in the area, then they should be accepted as an expert, as I have been, in some areas.

Q. Would you expect the medical examiner for the state of Georgia to be able

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to be qualified to testify as an expert in forensic toxicology?

A. Yes, but it doesn't mean that he's not capable of making a mistake due to inadequate information. And the data that I presented to you has not yet been published or put in a textbook. So, I am not accusing him of being ignorant. I am suggesting that once he sees the data that I have seen, he will probably change his mind.

Q. But most people agree with you on the postmortem redistribution, correct?

A. No. Well, it depends on your definition of "most." There are certain people who have written on the usage of postmortem thiopental concentrations and have drawn assumptions and conclusions that are probably not right. And, so, for example, the very well-known and well-referenced paper that was in The Lancet that stated that a huge fraction of executed inmates were awake during their executions, that conclusion is almost certainly wrong.

Q. And Dr. Heath agrees with you on

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that, correct?

A. I am unsure what his opinion on that is, actually.

Q. Did you know that they wrote in to The Lancet to tell them it was likely postmortem redistribution and why the numbers were so low?

A. I have read his letter in which he was concerned about their conclusions. But at the time he wrote that letter, the data that I am discussing was not known to him. So, he was speaking hypothetically. I believe he has seen the data that I have discussed with you, but I don't know if he's rendered an expert opinion on that.

Q. And what is that data?

A. The data consists of the paired concentrations drawn in several jurisdictions showing that between the time the blood was drawn in the death chamber and the time the blood was obtained at autopsy many hours later, the blood concentration of thiopental decreased substantially.

Q. What jurisdictions are those?

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A. Connecticut, North Carolina, and Montana.

Q. And no others?

A. There may be others, but those are the ones I have in my possession right now.

Q. So, you don't have Maryland samples?

A. I have Maryland blood samples that were drawn in the death chamber, and those are all, my recollection, reassuringly high. But I do not believe the Maryland medical examiner drew paired concentrations in each of those inmates. And if those data exist, I haven't seen them.

Q. How about Georgia?

A. As far as I know, there's no attempt in Georgia made to obtain a blood sample in the death chamber.

Q. Florida?

A. I don't know.

Q. Texas?

A. I don't know.

Q. California?

A. The answer is I don't know to

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every other state.

Q. Okay, I just wanted to make sure. And are you -- you indicated you were writing an article regarding this or publishing this information?

A. Yes.

Q. When do you intend to do that?

A. Well, there is a symposium scheduled in March on the death penalty, at which Dr. Henthorn and I are both going to speak, and we intend to write a review article on the pharmacology of the medications used in lethal injection. I expect it will be initially be published in a Law Review Journal based upon this symposium, and we intend to ask permission to also published it in a scientific journal following that.

Q. And why are you putting this in a Law Review article first?

A. Because the proceedings from the symposium are intended to be published in a Law Review Journal.

The symposium is being held at Fordham University Law School.

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MR. SIEM: Why don't we take a break. We've been going a little over an hour.

MR. DROLET: Sure.

(Short break.)

MR. SIEM: Back on the record.

Q. Dr. Dershwitz, what is the proper place in the body from which to draw blood for a postmortem toxicological analysis?

A. It's probably less important specifically where the blood is drawn from and more important to know exactly where the blood is drawn from. So, for example, what I mean by that is if a needle is stuck in the groin in a corpse with no pulse, one might hit the femoral artery or one might hit the femoral vein, but the interpretation of the sample will be different, depending on whether it's arterial or venous. So, it's less important that it's arterial or venous, but, more important, that it be accurately identified.

Q. And what about testing, is it better to test serum or plasma?

A. It doesn't matter in a living

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person. But in a corpse, you actually probably can't get plasma, because plasma implies that the blood has been anticoagulated right after being drawn. And, in a corpse, the coagulation process starts shortly after death. So, my understanding is most labs actually assay whole blood for thiopental when it's obtained postmortem.

Q. How about taking a -- brain versus blood, which is more accurate, do you think?

A. We certainly want to know what the brain concentration is. And you could obtain thiopental samples from a corpse from the brain, but one would not know how to interpret them, because we don't have those comparators in living people. And, of course, we will probably never get them. So, we use blood concentration as a surrogate for a brain concentration based upon our studies either in patients or normal volunteers.

Q. If you could just turn back to Dr. Varlotta's expert report, that paragraph we were talking about earlier. I think it's paragraph 17. If those numbers that he gives,

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2.5 milligrams per liter to 19 milligrams per liter, were the amounts in the inmate at the time of death, would those be sufficient to render them unconscious for the procedures of using potassium chloride?

A. Well, certainly, a concentration of 2.5 milligrams per liter is associated with an almost universal probability of consciousness, whereas, a concentration of 19 is associated with a very high probability of unconsciousness.

Q. Would that be sufficient to render a patient or an inmate unconscious so that they would not feel pain from the potassium chloride?

A. That depends upon your definition of "feeling pain," because, certainly, even in an unconscious person there are responses to pain, typically manifested as an increase in heart rate and blood pressure that we see in clinical anesthesia, all the time. What's important is that the person is unconscious. And whether part of the brain responds to the noxious stimuli by manifesting a sympathetic

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discharge is irrelevant in the context of a judicial execution.

Q. What do you think the minimum amount or minimum concentration should be for an inmate to be sufficiently unconscious to not feel severe pain from the potassium chloride?

A. Your question doesn't make sense, because perception of pain and unconsciousness are different. But if one refers to the Exhibit D in my expert report, there is a table that lists the probability of consciousness as a function of the thiopental concentration. And, certainly, concentrations above the mid-teens are associated with a minuscule probability of consciousness. But what is actually sufficient, to use the word that you used in your question, is not a medical definition, it's a legal or public policy definition.

Q. So, for you, a definition of "consciousness" is either they're unconscious or they're conscious, correct? Is that what you're saying?

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A. For the purposes of Exhibit D, consciousness was determined as an all or none thing.

Q. Okay. So, it doesn't -- this chart doesn't indicate whether an inmate can realize that they're feeling -- realize that they're being executed or if they're feeling pain; it's just telling us whether they're conscious or not?

A. An unconscious person is incapable of realizing anything.

Q. Even if they're under just light anesthesia, they're unconscious at that point?

A. A person who is unconscious is incapable of experiencing the environment and has no ability to realize anything.

Q. So, consciousness is not a spectrum; it's an all or nothing thing?

A. For are the purposes of this discussion, yes. There are certainly ways of grading sedation and hypnosis, and hypnosis meaning a pharmacological term pertaining to sleep, not what people do in Las Vegas nightclubs. That can be graded in terms of

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the depth of sedation and the depth of hypnosis, but that's not the same thing as determining consciousness as an all or none phenomenon like pregnancy.

Q. But you treat it as something like pregnancy, correct?

A. For the purposes of this discussion, yes.

Q. And why is that?

A. Because that is what is most relevant in my understanding to what the state's goal is. In order for an execution to be humane, the inmate should not be able to perceive anything that happens to him or her following the administration of thiopental. And, so, if the inmate is unable to perceive that, then I think people on both sides agree that the execution is humane.

If the inmate were to manifest an autonomic response, meaning a change in heart rate or blood pressure, that might mean that some part of the brain is perceiving pain. But if consciousness is still absent, that could not be equated with any sort of

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suffering.

Q. But because of the use of pancuronium bromide in the execution, they wouldn't be able to give any signal that they actually are feeling pain, is that correct?

A. If they are unconscious, whether or not they have pancuronium, they cannot express an opinion, because the person who is unconscious cannot interact with environment.

Q. I understand that, sir. But if you use sodium pentothal and you put it in the body, the intention is to render the inmate unconscious, correct?

A. Yes.

Q. And if they are under light anesthesia, they may appear to an untrained eye as unconscious, correct?

A. Well, again, the definition of "consciousness" is rather specific. But if you hypothesize that an inadequate dose of thiopental was delivered, then it is possible that the person could be lightly sedated and not unconscious.

Q. Then if you use the pancuronium

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bromide, it would prevent them from indicating that they were suffering any pain?

A. So, a conscious person who's experiencing pain and wishes to cry out --

Q. Correct.

A. -- after several minutes, would be prevented from doing so by the pancuronium, because it would paralyze their skeletal muscles.

Q. Sir, how do you assess anesthetic depth?

A. Assessment of anesthetic depth is completely different from assessing the presence or absence of consciousness. The absence of consciousness is only one factor that goes into the overall assessment of anesthetic depth.

In my opinion, as I have written in a number of chapters, the state of general anesthesia is associated with multiple factors, including loss of consciousness, analgesia, which is relief of pain, muscle relaxation, oblation of certain important reflexes, and amnesia. So, therefore, I

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consider the general anesthetic state to include all of those five things. And, therefore, the depth of anesthesia includes an assessment, as best we can, of those five things.

Whereas, the assessment of the presence or absence of consciousness is only one factor that goes into that overall assessment of general anesthesia.

Q. Do you know if Georgia assesses whether an inmate is conscious or unconscious prior to injecting potassium chloride?

A. From my reading of the protocol, there is no assessment done of the presence or absence of consciousness.

Q. And do you think that they should assess the absence or -- the absence of consciousness prior to injecting potassium chloride?

A. Like I have said in other jurisdictions, there are advantages and disadvantages to adding that step, and I leave the ultimate decision to the policymakers.

Q. Okay. So, you've never

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recommended to a state that they should or shouldn't measure for anesthetic depth or consciousness prior to injecting sodium pentothal -- or, I'm sorry, potassium chloride?

A. First of all, I have never even thought about the wisdom of assessing anesthetic depth in this environment, because that would require a very experienced clinician, an anesthesiologist or a nurse anesthetist, to be at the inmate's side. And I believe that is logistically impossible to occur. So, therefore, when I discuss the assessment that may or may not be performed, it's always with the intention of evaluating the likelihood of consciousness. And I believe there are advantages and disadvantages to adding that step in a protocol. And I have discussed them in detail. But it is up to the various jurisdictions to decide whether they choose the advantages and disadvantages of one method versus the other.

Q. Sir, is 4.4 milligrams per liter of thiopental a lethal dose in a body?

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A. It's certainly not lethal.

Q. And if someone testified that it was lethal, they would be incorrect?

A. I think it depends on -- it would depend on what sort of information they had on how it got there. But with more information, I don't want to stick my neck out and say the person is wrong. But a snapshot of 4.4 milligrams per liter is associated with a high probability of consciousness. And without knowing what may or may not have transpired before that, it's very difficult to say that it would or would not be lethal.

Q. But you wouldn't think at that level it would be lethal?

A. No. But if it were much higher a period of time before that, it could have been. But I need more information to really render an expert opinion.

Q. Sir, how did you prepare for your deposition today?

A. I reread my own expert report, and I reread the expert reports of Drs. Kern, Varlotta, and Heath, and I reread the Georgia

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Protocol or parts of the Georgia Protocol, because a lot of it that pertains to nonpharmacological maneuvers is not relevant to my opinion.

Q. Did you speak to anyone in preparation for your deposition?

A. I spoke to Mr. Drolet two days ago, I believe.

Q. For how long?

A. I don't recall exactly. Maybe an hour.

Q. And what did you discuss?

A. I have no specific recollection of what we discussed.

Q. How about a general recollection?

A. The only thing that I specifically recall was that he asked me if I would be able to testify on what my graphs would look like if the assumption for the duration of thiopental injection was increased from one minute to two minutes. And since I couldn't do that off the top of my head, I actually went and prepared a new analysis based upon the assumption of a two-minute infusion.

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Q. Do you intend to do any further analysis for this case?

A. Not unless I'm asked to.

Q. But at this time you have not been asked to?

A. Correct.

Q. So, the full -- your full opinion is contained in that report, as well as the new graphs that were provided to us less than 24 hours ago?

A. I might have an expert opinion in response to a question that is not covered in my expert report. But that will probably depend more on what you ask me than what he asks me.

Q. Can you indicate what that is, please?

A. No. It depends on what you might ask me.

Q. I don't understand your statement.

A. You could ask a question to which I have an expert opinion. But without hearing the question, I can't predict what that might be.

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Q. Okay. Besides the documents you just mentioned, were there any other documents that you've reviewed in preparation for your deposition?

A. No.

Q. And you brought those documents with you today in your binder, correct?

A. Yes.

Q. At the break, I'd like to look at the binder just to see -- to ensure that those are the documents that are contained in there. So, if you could provide that to us, I would appreciate it.

Did you review all the documents that were cited in Dr. Varlotta's, Dr. Kern's, and Dr. Heath's expert reports?

A. No.

Q. Did you ask for those?

A. I was sent them. I didn't ask for them. I was sent them, but I didn't review them.

Q. And why didn't you review them?

A. Because they didn't seem to be important to me in forming my opinion.

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Q. But you were very critical of all three of those individuals, correct?

A. In selected areas, not in all areas.

Q. Don't you think it would have made your testimony more accurate if you actually looked at the information they based their opinion on?

A. No.

Q. And you reviewed the Georgia procedures of June 7, 2007?

A. Parts of it, yes.

Q. And you didn't review any of the prior procedures?

A. I don't think I have them.

Q. And did you review any depositions or transcripts of depositions in this case?

A. No.

Q. Did you take any notes while you were preparing for your deposition?

A. No.

Q. How many drafts of your report did you provide?

A. The first draft, I didn't view it

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as a draft. My first version of my expert report had two typographical errors that were pointed out to me that I changed. And those typographical errors were that I referred to the writing of Dr. Heath as an expert report, and they asked me to change it for accuracy to an affidavit. So, that was the version of the expert report that you received.

Q. Okay.

A. And then after they asked me to figure out the subtle changes that would occur if the thiopental were given over two minutes instead of one minute, I prepared a modified version of Exhibits B and C and then made small corrections to the various paragraphs that refer to B and C.

Q. Okay. What were you asked to do when the state approached you about this case?

A. I don't have a specific recollection. But since my expertise usually involve discussing the pharmacology of the agents, that formed the beginning of my expert report. And then I pointed out a few places where I disagreed with the writings of three

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of the experts for the inmate. And that constitutes my expert report.

Q. Did they ask you to do anything specific?

A. I don't recall the specifics at all.

Q. Did they give or send any e-mails to you indicating what to do?

A. I don't think so. I think it was by phone.

Q. Have you corresponded at all by e-mail or fax in this case?

A. I don't do faxes. My correspondence with Mr. Drolet mostly involved the logistics of today and then also included e-mailing him the revised figures that you now have.

Q. And did you speak with anyone else besides Mr. Drolet in preparation for your deposition?

A. I think there was a phone call where Mr. Snelling was on speaker phone also.

Q. And when was that?

A. I believe it was two days ago.

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Q. Did they give you any advice on how you should answer questions?

A. Of course not.

Q. Did they provide you any sample questions that they thought may be asked?

A. No.

Q. Why don't we get the procedures out, June 7, 2007 procedures.

(Short pause.)

MR. SIEM: Let me mark as an Exhibit -- I'm going to mark as Exhibit 13 a document bearing Bates numbers Alderman 001757 through 001787, and it's entitled, "The Georgia Department of Corrections Lethal Injection Procedure."

(Dershwitz 13 marked for identification.)

Q. And, again, you didn't look at any of the prior protocols, correct?

A. I don't believe I was sent any other versions.

Q. Do you think those were relevant to your opinion?

A. I don't know.

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Q. Have you ever asked to see a copy of those?

A. My understanding is that if this is the procedure that they intend to use in this specific case, then any other procedures are not relevant.

Q. If you could look and let me know, what is the preparation of thiopental? What is the concentration that they have in their procedures?

(Short pause.)

A. The specific concentration is not mentioned. The typical clinical concentration that's used is 2.5 percent, in which two grams would then be in 40 milliliters -- excuse me, one gram would be in 40 milliliters. For one gram to fit in a 60-milliliter syringe, it could be no more than 3.75 percent. But, more likely, since the kits that they are purchasing intend the solution to be made at 2.5 percent, that's probably the concentration they're using, although it's not stated here explicitly.

Q. Do you think it's important for

the procedures to indicate what concentration they should use?

A. It's important for the people who are doing it to know how to do it right. Whether that is required to be written down here or they obtain that information somewhere else is something for someone else to decide.

Q. Do you know in Georgia who prepares the drugs?

A. It says: "The designated staff members will prepare lethal injection syringes."

Q. Do you know their qualifications?

A. No.

Q. Do you think someone who prepares these should be somewhat qualified?

A. They should know how to prepare the syringes, which is something that's not terribly difficult to do.

Q. And what is the minimum set of qualifications they should have in preparing the syringes?

A. They should have been shown how to do it by someone who knows how to do it. In

the days when we used thiopental in anesthesia, our thiopental syringes were usually prepared by anesthesia techs, and they were shown how to do it.

Q. But the anesthesia techs have some training, correct?

A. They are trained to do their specific job. It's not something that one goes to college for. It's on-the-job training.

Q. And who trains them?

A. Typically, other anesthesia techs.

Q. And who trains the anesthesia techs? Someone above them has to train them, correct?

A. Well, there are typically people considered administrators in the chain of command, and they are responsible for training their subordinates.

Q. And are they supervised when they prepare the syringes?

A. Typically, not.

Q. So, you would just let an anesthesia tech bring you a drug and say, this

is what it is, and just assume that they've done it correctly?

A. That's the way we practice. And, furthermore, most of the medications today are prepared by pharmacy techs, again, who receive on-the-job training, and they are responsible for preparing a significant number of the drugs that we use.

Q. And don't you think, as the procedures are supposed to indicate to these corrections officers, whoever is preparing the drugs, don't you think they should at least be given the concentration that they should prepare the drugs in?

A. The actual concentration is less important than, actually, either being told how to do it or following the instructions that might be in the package insert. But it's not up to me to decide the best method to inform them on how to do their jobs.

Q. Okay. Thiopental can come out of solution, correct, after mixing?

A. If one makes a 2.5 percent solution, the package insert says it's stable

for a day. And, in reality, there are data that show that it's actually stable for three days at room temperature.

Q. But it does come out of solution, correct?

A. One of the things that can happen after it's been sitting around for many, many, many days is that it starts to precipitate. But that does not occur in the span of a few hours to a day.

Q. But in the package insert, it does say that it could be affected by temperature, correct?

A. It certainly should be kept at room temperature after it's prepared and not subjected to high temperatures, although low temperatures are safe, because that actually extends the shelf life if its refrigerated but not frozen.

Q. Or the pH could also affect it, correct?

A. The only way the pH will change is if it's mixed with some other chemical or medication.

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Q. Such as pancuronium bromide, correct?

A. For example, yes.

Q. And there's charts and solubility charts for thiopental in relation to pH, correct?

A. Yes.

Q. Have you ever reviewed those, sir?

A. I have probably seen it a long time ago, but I don't remember for sure.

Q. Did you review them for pancuronium bromide?

A. No, I did not.

Q. But you have for thiopental?

A. I can't say that I reviewed it. I know that thiopental is stable in solution at pH 10 to 11. And as the pH drops, it becomes less and less stable as the pH drops. But I can't tell you specifically at what pH one has a certain amount of precipitate.

Q. Do you know in Georgia whether they use IV bags or not?

A. I don't recall, and I can't tell from reviewing these pages whether it

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specifically says so.

Q. Do you think it's a good idea or a bad idea to use IV bags?

A. It's neither. There's advantages and disadvantages to confirming the patentcy of an IV with using gravity flow versus injecting saline or a similar fluid through a syringe.

Q. And what are the benefits of using IV bags?

A. That one could continuously monitor the characteristics of the flow so that changes would be readily recognized. The advantage of using a syringe is that one could inject a lot more fluid under pressure than one could obtain by gravity flow. So, if the catheter was not in a vein, the swelling that would occur would be more quickly and more readily perceived.

Q. And do you know if anyone does monitor the injection site in Georgia?

A. I believe I've been told that the nurse is supposed to look at that, but it doesn't specifically say here, as far as I can

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tell.

Q. And who told you that, sir?

A. Mr. Drolet.

Q. But you haven't read anything in the record that indicates that?

A. It doesn't specifically say here, as far as I can tell.

Q. So, the only thing you're relying on is representation by counsel for that assertion?

A. Yes. There might be somewhere a job description or a list of responsibilities for the various people in the vicinity, but I don't know what they are.

Q. Do you think that's important in forming your opinion, to know that information?

A. I'm not going to provide an expert opinion on the likelihood of something going wrong, so the answer is no.

Q. But isn't that exactly what Dr. Varlotta has testified regarding and Dr. Kern?

A. And as I wrote, I will accept the possibility of any conceivable thing going

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wrong as a possibility. But I don't know the likelihood of any of those things going wrong, nor do I believe do they. So, I can't provide expert testimony one way or the other, and I will not.

Q. Do you think there's an increased likelihood that those things will go wrong if you use untrained people?

A. Rather than say trained versus untrained, which is an all or none phenomenon, I would say that the experience level of the people doing specific tasks is less likely to go wrong with more experience as opposed to less experienced people, but it's a continuum.

Q. So, the least experience would mean the more risk; the more experience, the less risk?

A. In general, I think that's a true statement.

Q. And the IV placement, where do you think is the best place or the advantages of placement of the IV in peripheral versus a central line?

A. There is advantages and

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disadvantages to each. Most patients can have successful intravenous access obtained peripherally because, clearly, that's how we do it with the vast majority of our patients in the hospital. And, so, the overall risk of pain and injury is less with a peripheral IV.

On the other hand, if a person has bad vasculature, for whatever reason, or difficult-to-access veins, then, at some point, it's reasonable to proceed from futile efforts at obtaining peripheral IV access to obtaining access in a larger vein. And I tend not to use the term "central access," because a reasonable insertion point is the femoral vein. But, almost certainly, that will not be a central line, because the length of the catheter will not be long enough for it to constitute being a central line, although I recognize that many people misuse the term "central line" to include femoral IV access.

Q. So, when Georgia uses in their procedures the term "central line," they're really referring to femoral line or femoral access?

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A. I think when the physician places an IV catheter either in the jugular or subclavian or femoral vein, I'm interpreting that to mean that all of those fall under the category of a central line. But using the typical catheter from a kit, which is 15 to 20 centimeters in length, if it's inserted through a jugular or subclavian approach, it would be linguistically considered a central line. But if inserted by the femoral approach, that same 20-centimeter catheter could not be officially in the central circulation.

Q. Let's start with the jugular. Inputting an IV line into the jugular, does that take some kind of skill?

A. Certainly, it takes more experience and experience of a different kind than putting in a peripheral IV.

Q. Let's first stay with the jugular. What kind of qualifications would someone need that you would feel comfortable with them putting a line into the jugular?

A. My litmus test has always been

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that whoever does a vascular procedure on an inmate should do that same procedure as part of their usual and customary day job. The initials after their name are completely irrelevant. It depends upon whether or not they have the experience and continuing experience to do that in patients. And if they do such a procedure on patients, then I think it's reasonable for them to be considered qualified to do that same procedure on an inmate.

Q. Do you know the qualifications of the doctors who are involved in putting in the line in Georgia?

A. I have no specific information.

Q. And have you asked for that information?

A. No, because it's not relevant to me.

Q. How is that not relevant, sir?

A. Because it's not up to me to vet an individual. I'm more than happy to discuss what I consider to be general qualifications, but it is up to someone else to decide whether

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a specific individual is or is not qualified.

Q. In running a line through the subclavian -- is that what you indicated earlier? Is that the term?

A. The subclavian vein is another reasonable point to try if peripheral IV access cannot be obtained.

Q. Is that more or less difficult than putting it in the jugular?

A. It's neither. It really depends on the specific level of experience of the individual. And, so, for example, anesthesiologists are more likely to go to the jugular approach. Surgeons are more likely to go to the subclavian approach. And that has to do with the traditions of their respective specialties.

Q. For the subclavian approach, what is the minimum skill that you would think would be appropriate in that situation?

A. If the person regularly does that as part of their day job, that should be adequate to qualify them to do it in an inmate.

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Q. With regard to the peripheral line, what kind of qualifications or minimum qualifications would you feel comfortable with?

A. The same.

Q. The timing of administration of the three drugs, do you have any information regarding how long it takes to inject the drugs?

A. Well, based upon the request that was given to me to make the assumption that thiopental might go in over two minutes as opposed to the one minute that I had originally assumed, completely on my own, for the first version of my expert report, I am assuming that it's approximately two minutes for the thiopental.

Q. And that again is based on representation of counsel?

A. Yes.

Q. Is there anything in the procedures that tell you what the timing is between the drugs?

A. No.

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Q. Is there anything in the procedures that tells you after the thiopental to wait before starting with the pancuronium bromide?

A. I believe there's a flush step in there.

Q. But there's no indication that they should hold off and monitor the inmate prior to inducing or injecting the pancuronium bromide?

A. No.

Q. And there's no procedure or nothing in the procedures to tell someone to stop before putting in the potassium chloride?

A. No.

Q. And is there any pain associated with injecting pancuronium bromide?

A. Physical or somatic pain, no.

Q. Do you know a Ms. Carol Weihrer?

A. Yes. But she was paralyzed awake during her surgery. So, the pancuronium was not causing her pain; it was the operation on her eye that was causing her pain.

Q. So, the pain that she was feeling

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through her veins wasn't the pancuronium?

A. No.

Q. And even though it's an acidic, it still wouldn't cause any kind of pain in the veins?

A. It's actually acidic in the vial. But within milliseconds of being exposed to the venous blood, it's almost instantaneously buffered to physiologic pH, which is approximately 7.4.

MR. DROLET: I'm going to go check out.

MR. SIEM: I'd rather take a break because you're defending the deposition, and I don't like to switch attorneys.

Why don't we take a quick break, and you can check out, and then we'll resume.

MR. SNELLING: Five minutes.

(Short break.)

BY MR. SIEM:

Q. Sir, is there any proof that you've seen in Georgia showing that the two grams of thiopental actually gets in the

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inmate's veins?

A. It's hard to say what constitutes definitive proof. But what I would consider most suggestive would be a blood sample drawn within a few moments of death.

Q. And they haven't shown you that, correct?

A. It's not been done.

Q. Do you think that's something that they should do?

A. I think it's something every jurisdiction should do.

Q. Do you know why Georgia doesn't do it or these other jurisdictions don't do it?

A. I have no specific knowledge of Georgia. I have been told elsewhere that the responsible personnel have been uncooperative.

Q. Again, going back to the procedures, there's nothing in the procedures indicating the timing of the drugs, correct?

A. In terms of the specific duration of each syringe over which time it should be injected, as far as I can tell, it is not specified in the protocol.

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Q. Is there any concern about giving too much thiopental?

A. No.

Q. And the two grams, you feel, is sufficient, if properly delivered, to render a patient sufficiently unconscious so that they're not aware of the pain of potassium chloride?

A. The answer is yes. But the term "sufficient" doesn't make linguistic sense in this context. The way I would phrase it is the average person will sleep for in excess of two hours following a dose of thiopental. And, of course, that amount of time is far longer than an execution is expected to take. A two-gram dose should provide a more than adequate duration of unconsciousness to complete an execution.

Q. Is there a risk if you use more than two grams of thiopental that the circulation of the body will be insufficient to allow circulation of the pancuronium bromide and the potassium chloride?

A. That is a theoretical concern that

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I have raised in other areas of testimony. I have noticed that states that use five grams of thiopental seem to be more likely to choose to give an extra dose of potassium chloride, because sometimes they do not achieve flat line ECG in the amount of time that's expected. And my interpretation of that is that the depression of circulation caused by a dose as large as five grams may cause the potassium chloride to remain more in the arm and not circulate to the heart. I can't prove that. I admit that. It's never been studied. But it is a plausible explanation that I offer, but not an expert certainty.

Q. Is potassium chloride alone painful?

A. It is expected to be, based upon the misadventures of giving highly-concentrated potassium rapidly to humans.

Q. In the time frame that they inject the drugs in Georgia, do you expect that what actually stops the heart is the potassium chloride?

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A. Yes.

Q. So that by -- their basis for measuring death in the procedures, it would be the potassium chloride that ultimately does it, correct?

A. I believe so. I have not seen ECG tracings from Georgia.

Q. Neither have we.

A. But I have in other jurisdictions. And those ECG tracings that I have seen cause the ECG to go from what appears to be relatively normal to deranged and then to flat line in a time span approximately of a minute. And I can think of no other plausible explanation for such a thing to happen other than the effects of potassium chloride.

Q. Do you know anything about the qualifications of the nurses who are involved in executions?

A. I have no specific knowledge.

Q. How about the doctors?

A. I have no specific knowledge.

Q. So, you don't know if they're properly trained to perform the tasks that

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they are given in the procedures?

A. I have no specific knowledge.

Q. You don't know any of the training of the corrections officers who are involved in the executions, correct?

A. I have no specific knowledge.

Q. Are there any medical procedures or pharmaceuticals that you use in your practice that you used 30 years ago?

A. Certainly, I use thiopental today, but not as an anesthetic. It is still the drug of choice for producing what we call brain protection. So that when there is the planned deliberate interruption of blood flow to the brain, such interruption is sometimes preceded by a dose of 2.5 to three grams of thiopental in the typical-size patient, and that has been shown to decrease the risk of stroke. So, I do use thiopental occasionally for that purpose in my practice today.

Pancuronium is a drug that I can't remember using in many years, because we have shorter-acting drugs available.

Potassium chloride is a

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constituent of the IV fluid that I use in almost everybody.

Q. But your procedures and the chemicals that you use are constantly being updated, is that correct?

A. In general, that's true. But to toss out an old drug and replace it with a new one demands that the advantages and disadvantages are considered and that the newer drug should have a clear advantage to the older one.

Now, the reason we primarily use a different drug than thiopental to start an anesthetic today, is that even in the typical dosage of approximately 300 milligrams to start an anesthetic, thiopental is associated with more nausea and more hangover than the commonly-used medicine today. Of course, those effects are irrelevant in the context of an execution.

Interestingly, the drug that we're most likely to use to start an anesthetic today is commonly associated with a lot of pain on injection. So, if that medication

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were used in an execution, it would provide the possibility of more pain experienced by the inmate prior to he or she falling asleep.

Q. But you're constantly testing new drugs in your practice and constantly updating the research and literature that you do?

A. I wouldn't say constantly, because the typical drugs that we use in anesthesia are not new. And, in fact, most drug development is done by drug companies. And, in fact, the typical drugs that we use in anesthesia, which consists of intravenous anesthetics, intravenous analgesics, and the volatile inhaled anesthetics, as far as I can tell, there's not very much coming down the research pike at all.

Q. But you keep current on the current medical technology, correct?

A. In general, that's a true statement.

Q. And they didn't do that in Georgia, in the Georgia procedures? These haven't been updated, correct?

A. I don't understand your question.

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Q. The procedures that are used for executing inmates in Georgia are the same ones they've been using since the 1970s, is that correct?

A. I have no idea.

Q. Georgia has been using it since 2000. You don't know anything about the making or the design of the original protocol that was used in lethal injection?

A. Now I understand your question. In general, the three-drug protocol in its original incantation, I believe, dates from the late 1970s. There have certainly been some modifications made to that over the years, because my understanding is there were times in the early application of this that people attempted to mix all three drugs in the same syringe but with not very good results. And, so, I would say that there has been some evolutionary changes in the protocol, but, certainly, nothing revolutionary.

Q. And do you know if at that time they ever tested this three-drug protocol on animals?

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A. Certainly, many of us who have done animal experimentation and have needed to euthanize animals have used similar protocols to do so.

Q. Have you used the exact same protocols?

A. I haven't, but others have used potassium chloride to terminate an experiment in an animal that was previously anesthetized with thiopental and pancuronium, and it certainly works.

Q. But have there been any clinical studies that you know of to test the use of these three drugs?

A. In humans, of course not.

Q. How about in animals, any clinical testing, phase 1 tasting?

A. No, but that doesn't make any sense.

Q. You don't know of any animal testing that anyone has done clinically to use these three drugs in this combination?

A. Well, certainly, it's been done in animals.

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Q. And we're using pancuronium, sodium pentothal, and potassium chloride?

A. Yes.

Q. And when has that been done?

A. I can't specifically give you a time frame, but the protocol is a permissible method of euthanasia in animal species.

Q. So, this protocol is consistent with the AVMA standards for euthanizing an animal?

A. Certainly.

MR. SIEM: I'm going to mark as Dershwitz 14 the AVMA Guidelines on Euthanasia, Alderman 002662 through Alderman 002700.

(Dershwitz 14 marked for identification.)

Q. Can you show me in there where it says you can use these three drugs in combination for euthanizing animals?

A. First of all, it would take me forever to come up with a specific location. But, in general, the process of euthanasia as done, for example, in a research environment,

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great latitude is given to the animal care committee in an institution to provide for the safe use and care of laboratory animals. And there is no doubt in my mind that it is considered permissible to take an animal that is successfully and adequately anesthetized with thiopental and paralyzed with pancuronium to terminate that animal's life with potassium chloride.

Q. I don't think that was my question. My question, sir, is are the procedures consistent with the AVMA Guidelines on Euthanasia?

A. Yes.

Q. And you believe that they are ensuring proper anesthetization prior to giving pancuronium bromide and potassium chloride?

A. I don't understand the question.

Q. Do they monitor in any way to make sure that the person who is given thiopental are at a proper anesthetic depth before inducing paralysis?

A. Are you asking me about the

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animals or humans? You keep bouncing back and forth.

Q. The procedures. Do the procedures --

A. Which procedures now? I'm confused. Please start over.

Q. Can you tell me whether the 2007 lethal injection procedures in Georgia allow for any monitoring of the individual after they are given thiopental?

A. The answer to that is no. When you said 2007 procedures and handed me the AVMA thing, I thought you were referring to that.

Q. Are there any requirements in the AVMA Guidelines that require monitoring prior to giving potassium chloride?

A. Typically, yes.

Q. But they don't do that in Georgia, do they?

A. No, they don't.

Q. So that would be inconsistent with the AVMA Guidelines, correct?

A. Yes.

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Q. And you indicated earlier that the procedures, the 2007 procedures in Georgia, were consistent with the AVMA Guidelines?

A. If I said that, it was because I didn't understand your question. You keep bouncing back between 2007 procedures of Georgia and 2000 AVMA procedures without being specific. So, I'm very, very confused.

Q. Sorry that you're so confused, but these are called Guidelines, and those are procedures. I thought I was very clear. If you didn't understand, I apologize.

A. It's completely unclear to me, so you might have forced me to misspeak.

Q. So, what you're saying is that the 2007 Georgia Lethal Injection Procedures are inconsistent with the 2007 AVMA Guidelines on euthanasia, correct?

A. If you then extrapolate from animals to humans, which the cover page says you should not do, but if you were to do that, they are inconsistent.

Q. Can you turn to your expert report in this case, sir.

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A. (Witness complied.)

Q. And turn to your CV, please. Have you seen this document before, sir?

A. I wrote it.

Q. And this is your CV, correct?

A. Yes.

Q. And this is a current version of your CV?

A. If it's dated July of 2007, yes.

Q. Anything changed since you provided the CV to us?

A. Not since July of 2007.

Q. Do you keep different versions of your CV for different purposes?

A. No, but I update it when it's appropriate.

Q. How often do you update it usually?

A. When I feel like it.

Q. Where did you go to college, sir?

A. Oakland University.

Q. What was your degree from Oakland?

A. Chemistry.

Q. And when did you graduate?

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A. 1974.

Q. And you went to medical school, correct?

A. Yes.

Q. Where did you go to school?

A. Northwestern University.

Q. And when did you graduate, sir?

A. From medical school, in 1982.

Q. And did you do any post-graduate work?

A. I did a residency and a research fellowship in anesthesiology at Mass General Hospital.

Q. Any other post-graduate work besides those?

A. I did a transitional residency at Carney Hospital.

Q. Sir, what is your current employment and teaching status?

A. I am employed by the University of Massachusetts Medical School, as well as the U-Mass Memorial Health Care, and I teach anesthesia practice to our residents. I'm actually responsible for the educational

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endeavors of my department as the vice-chair. I also teach part of the pharmacology course to the second-year medical students at U-Mass, and I'm the course co-director for that course.

Q. And what are your current responsibilities and duties in those positions?

A. I think I just described them.

Q. So, you don't have any other responsibilities besides those?

A. That's not what you asked. I also give anesthesia in the operating room.

Q. And how often do you act as an anesthesiologist?

A. Typically, two or three days a week.

Q. And prior to -- so, what is your current position at U-Mass?

A. I thought I just answered that.

Q. Can you repeat it, please.

A. My title is professor and vice-chair of anesthesiology and professor of biochemistry and molecular pharmacology.

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Q. And what was your position before that?

A. Before that, I was an associate professor of anesthesia at Harvard Medical School and associate anesthetist at Massachusetts General Hospital.

Q. And prior to that?

A. I was a resident.

Q. And where was your residency?

A. At Mass General.

Q. Do you do any clinical work?

A. I just answered that. I give anesthesia two or three days a week.

Q. And that's the only kind of clinical work you do?

A. Yes.

Q. And you train residents in anesthesiology also?

A. Yes.

Q. And what licenses or certificates do you hold, sir?

A. In terms of state medical licenses, I'm licensed in Massachusetts and Maine. I'm also Board Certified in

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anesthesiology, and I voluntarily re-certified two years ago.
Q. And why did you re-certify?
A. Because I felt like it.
Q. Do you have any obligation to re-certify?
A. No, because my Board Certification is not time limited.
Q. Do you do any research?
A. Not anymore.
Q. When did you stop doing research?
A. A few years ago, as I transitioned from my previous job to my current job, I finished some research projects that were ongoing, and that was it.
Q. Who were those for?
A. I don't understand the question.
Q. Were they for any companies?
A. Not at that time.
Q. Who funded that research?
A. The last few studies I did were not funded.
Q. So, how did you get the money to do that research?

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A. We didn't use money.
Q. What kind of research did you do?
A. Well, for example, the last few publications that I have, papers 27, 28, 29, 30, and 31, were all done without external funding.
Q. What was the last year that you did research?
A. Well, for example, the paper that is number 31 was just accepted for publication a few months ago. So, we were tying up the loose ends and writing the papers as recently as a few months ago.
Q. And when will that be published?
A. Any minute.
Q. And who's publishing that?
A. Anesthesia & Analgesia.
Q. Are you planning on attending the ASA conference next month?
A. I am.
Q. And are you speaking at the conference?
A. I'm not giving a lecture; I'm moderating a session.

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Q. And what are you moderating?
A. I'm a member of the committee on, I believe it's called drug disposition. And, so, as a member of that committee, I typically moderate a session that that committee sponsors.
Q. Are you speaking at all about lethal injection?
A. No.
Q. Do you intend to attend any conferences or speeches on lethal injection?
A. As I told you, there's a symposium at Fordham University in March that I've been invited to give a lecture on the pharmacology of these agents. That is the first invitation I've received on this topic. And, as far as I know, it's the only one forthcoming.
Q. Sir, have you ever published on anything on barbiturates?
A. I've certainly written about barbiturates as part of the several chapters I've written on intravenous anesthetics.
Q. Can you point those out on your CV, please.

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(Short pause.)
A. On page 16, books 2, 3, and 4.
And starting on page 16 and extending onto page 17, the chapters in books, 1, 2, 3, 8, 9, 10, 11, 12; extending onto page 18, 15, 16, and what should be 18, but is mislabeled 16.
Extending onto Reviews and Educational Materials, 2 and 7.
Under Non-print Materials, 1, 2, and 3.
And since the abstracts, in general, just reflect other publications, I don't need to go through those.
Q. Okay. How about on short-acting barbiturates?
A. The same.
Q. How about on sodium thiopental?
A. The same.
Q. So, all of those articles are specifically on sodium thiopental?
A. Not specifically. They included as a larger discussion in intravenous anesthetics.

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Q. Were you the principal research on all of these articles and books, book chapters?

A. These are not based upon my own research.

Q. What are they based on?

A. Others' research.

Q. Were you the principal researcher on any of these?

A. I was the researcher on none of them. They are all chapters or review articles that are not based upon original research of mine.

Q. And who would you say has greater expertise in the area of thiopental than yourself?

A. It depends on the specific sub-area, because one can do a lot of different types of research on thiopental. For example, there's still very active research on the mechanism of action of thiopental, which I do not hold myself out as an expert. But on the pharmacokinetics of thiopental, I am probably as well-informed on

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it at this moment as just about anyone.

Q. But you haven't done any research yourself on it?

A. No.

Q. Have you ever published anything on neuromuscular blocking agents?

A. Again, as part of some of those book chapters, some of those book chapters also include discussions of neuromuscular blockers.

Q. And pancuronium bromide specifically?

A. It would be included under the pharmacology of neuromuscular blockers.

Q. Can you point those out on your CV, please.

A. Starting on page 16, under Books, 2, 3, and 4. Under Chapters and Books, 1, 2, 3, 9, 11, 12, 15, and 18, which is mislabeled on page 18.

Q. Right.

A. Under Reviews and Educational Materials, 2. And that's it.

Q. Have you published anything on

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potassium chloride?

A. It has been discussed in some of the review books that I've authored.

Q. Can you point to those on your CV, please.

A. Some of the consideration pertains to potassium ion and not necessarily potassium chloride. Because once it's administered, it's no longer potassium chloride. But the considerations of that would include, on page 16, Books, 2, 3, and 4; in Chapters and Books, 1, 2, and 3; on page 18, the last thing listed under Chapters, which should be numbered 18 instead of 16. And that's it.

Q. Sir, when were you first contacted about this case?

A. My recollection is sometime over the summer, but I can't be more specific than that.

Q. Do you recall who contacted you?

A. It was Mr. Drolet.

Q. And you were contacted specifically about this litigation, correct?

A. I believe so.

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Q. Are you providing any other consultation services to the state of Georgia besides just providing an expert report in this case and possible testimony?

A. I don't view what I do as consultation; I view what I do as being an expert. And it is possible they may ask me other questions that go beyond what this case involves. And if I'm able to answer them in an expert way, I will. And if I can't, I won't.

Q. Were you ever consulted by the Georgia Department of Corrections or the Georgia Attorney General's office before your work in this litigation?

A. No.

Q. Have you ever been asked to comment on the Georgia Lethal Injection Protocols, separate and apart from this case?

A. No.

Q. What is your rate of compensation?

A. $400 for stuff I can do on nights and weekends. And $3,000 a day for testimony that takes me away from the University.

Q. And is that the rate you normally charge?

A. It's the only rate that I charge.

Q. So, you don't charge any different states any different rates?

A. And I don't charge lawyers for different types of cases different rates.

Q. You were recently retained by the state of Alabama as a consultant, correct?

A. As an expert witness.

Q. And what is the scope of your retention in Alabama?

A. I would view it as identical to this. They have a case which I was supposed to testify in Montgomery on this Thursday. And I believe that because of the recent Supreme Court action, that case was put on hold. But I was prepared to fly to Montgomery on this Thursday and provide testimony in court.

Q. Your understanding is, in relation to Alabama, is you were only going to provide expert testimony and not review their procedures, per se?

A. If they asked me questions about their procedures, if I could answer them, I will.

Q. Are there any states that you are not testifying as an expert but provided expert advice?

A. I don't think so, because when states have contacted me, it was typically due to ongoing litigation.

Now, in a number of cases, it turns out that my opinion was not needed because, for example, some legal decisions would be made not based upon the science but because of procedural things. I may not be using the right words. But there were times where I've talked to states about cases, and then the need for a deposition or a trial became unnecessary because, for reasons not based upon the science, a particular case was dealt with without a trial.

Q. Okay. You were retained by California, correct?

A. I provided an expert opinion in California.

Q. And was your retention in connection with the revisions or changes to the California protocols?

A. They asked me -- there was one attorney from California who I discussed a lot of things with. After the decision that came down, my understanding was they were told, either use one drug, or, if you use a three-drug protocol, you have to have an anesthesiologist do it. That is my lay interpretation of the decision. And, so, as they tried to figure out how to stay in compliance with the judge's order, as well as handle ongoing litigation, I talked to someone and answered a lot of their questions.

Q. Did you review draft protocols in California?

A. I don't think so. But I have no specific recollection whether the conversations we had were based upon information I was provided verbally or information that they might have e-mailed to me. I just don't remember.

Q. So, if someone indicated that you

were shown 14 proposed protocols and asked to opine on which protocol meets can constitutional standard, that would be an inaccurate characterization of what you did?

A. I can't imagine that I saw 14 different versions of anything. It's possible that they may have discussed different permutations. But I think if I was sent 14 versions of protocols, I would have remembered that.

Q. But are you assisting in any way with their updating of the protocols?

A. I think, based upon the sort of questions that they asked me, they wished to obtain expert explanations on what might happen, for example, if they chose to use one-drug protocol consisting of only thiopental.

My recollection is most of our discussion involved -- revolved around what would happen if they gave thiopental in a large dose and nothing else. That is my recollection.

Q. And what would happen if you give

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a large dose of thiopental alone?

A. For example, the five-gram dose, which I believe California was considering, it would be very similar to what I described to you earlier today, and that is the person would stop breathing, and their blood pressure would fall a lot, much more after five milligrams than after two grams, and the person would die due to decreased oxygen delivery to the tissues.

Now, when I told you that it might be conceivable that there might be a small fraction of people who could survive a two-gram dose of thiopental, it is inconceivable to me someone could survive a five-gram dose. But as far as I know, that dose has never been given to a human under any clinical circumstance all by itself.

Q. And when you were retained in California, what did they ask you or what did they tell you you were going to be doing?

A. We had these discussions on the phone. And if litigation was going to happen, they might ask me to write either an expert

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report or an affidavit like I had done in the past.

Q. Did you testify in California?

A. I certainly didn't testify in person. Whether something that I did over the phone constituted testimony, I don't recall, because I don't recall if I was under oath, for example.

Q. Okay. And were you asked in that case about the three drugs that were used?

A. Certainly.

Q. And optimal IV sites?

A. Again, "optimal" is not the word I would use. There's advantages and disadvantages to doing things different ways.

Q. How about adding dye to each of the syringes?

A. I don't recall if that was brought up or if there was a specific goal in mind there. I just don't recall.

Q. Were you asked about the optimum amount of saline?

A. Again, "optimum" is probably not the right word. I might have discussed the

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dead space in IV tubing as a function of the length of the IV tubing and, so, what amount of flush is needed to clear the dead space.

Q. Were you asked about the best rate of flow in relation to that?

A. You mean flow of the --

Q. Of the IV?

A. Of thiopental?

Q. No, I'm sorry, of the IV line.

A. I have no specific recollection. It's possible, but it's such an unimportant thing that I can't remember.

Q. And were you asked -- I think you were asked this in California and in Tennessee -- the merits of executing an individual by thiopental alone, correct?

A. Again, I would never talk about the merits; I would talk about the advantages and disadvantages of -- which I could provide a list on both sides.

Q. What is the advantage of using thiopental alone?

A. The major advantage is that, as far as I can tell, it almost completely

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removes even theoretical risks that the inmate could suffer from pancuronium or potassium chloride while awake, because those two medications would not be given.

The major disadvantage is that it would be imprudent to use flat-line ECG to ascertain death, because I do not think it would be a good idea to have the witnesses have to sit there for a half hour or 45 minutes or longer.

So, it would be more physiologically correct to ascertain death by looking for the absence or cessation of circulation, which should be perceptible within a matter of minutes, a few minutes being single digits.

Q. Are there other pharmaceuticals that you could use to execute an inmate that you would only need one drug, for example, pentaobarbital; would that be an effective chemical they could use?

A. Yes. The disadvantages of using pentaobarbital is that we do not have adequate human pharmacology information that would

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permit me to make the pharmacokinetic and pharmacodynamic predictions, as I have done.

So, I view using pentaobarbital as a disadvantage compared to thiopental because of less available and less state of the art pharmacological information.

Certainly, at low doses, pentaobarbital is much longer-lasting than thiopental. But once doses reach the gram range, there's no meaningful difference in duration.

Q. Is pentaobarbital used in your practice as an anesthesiologist?

A. I can't remember the last time I used pentaobarbital. It was probably for ICU sedation when I was a resident.

Q. So, it's something that no one uses or most people don't use in regular practice today?

A. The one niche where pentaobarbital remains used is it has a very long safety record as a nighttime sedative in pregnant women. And some obstetricians prefer to continue to use pentaobarbital by mouth as a

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nighttime sedative for women, just because of its long safety record. But that is not universally accepted in the OB/GYN literature.

Q. How about Dilantin?

A. That's one of the trade names. The chemical name is phenytoin.

Q. What are the advantages of using that as opposed to using sodium pentothal as a one-drug execution?

A. It's a terrible idea, because phenytoin is not a sedative.

Q. That would be a horrible drug?

A. It would be horrible.

Q. Did anyone ever ask you in Kentucky whether that would be a good drug to use or not?

A. Certainly, the idea of phenytoin has been brought up, but not as a single drug. Phenytoin has been brought up as an alternative to potassium chloride because, in large doses, phenytoin will also stop the heart. And, again, that has happened in therapy due to misadventures of giving the drug too quickly. So, phenytoin might be less

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painful compared to potassium chloride if the person were accidentally awake, but it probably doesn't act as fast as potassium chloride, which is a disadvantage.

So, like many of these questions, there's an advantage and a disadvantage, and I leave the balance of the decision to someone else.

Q. Sir, one of the things that you took issue in your report is Dr. Kern's assertion that pancuronium bromide provides no medical purpose in the execution, correct?

A. It is up to others to decide, but I wish to point out that many witness reports of executions have included descriptions by the witnesses that they were troubled by quote-unquote convulsions on the part of the inmate. Now, a convulsion or a seizure is almost impossible to imagine in this context.

Q. Why is that?

A. Because thiopental is the best anti-convulsant in medicine.

On the other hand, it is known that potassium chloride will cause, in

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addition to stopping the heart, will cause widespread stimulation of nerve and muscle tissue throughout the body. And, certainly, those involuntary muscle contractions have been misperceived by witnesses as consistent with suffering on the part of the inmate.

So, one effect of pancuronium will be to mitigate the magnitude of these involuntary muscle contractions.

If a jurisdiction were to decide that that is a good idea, pharmacologically, it makes sense. If they were to decide it's a bad idea and permit the muscle contractions that occur involuntarily to occur at their maximum degree, that would be their decision also.

Q. So, the use of pancuronium, your understanding, is more for cosmetic purposes than any medical function in the execution process?

A. I disagree with your characterization of this as cosmetic.

If one drug prevents an adverse effect of another drug, I consider that to be

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pharmacologically meaningful.

Q. But the inmate wouldn't feel the involuntary muscle contractions if they were properly anesthetized, correct?

A. In fact, after the delivery of two grams of thiopental or any larger dose successfully into the circulation, nothing that is done to the inmate could possibly be perceived by the inmate.

Q. So, your understanding of the pancuronium bromide is to prevent the muscle shakes from potassium chloride, is that accurate?

A. I think that's the primary pharmacological effect of pancuronium.

Q. Is there any other reason to use it?

A. I can think of none, but some people have certainly considered the advantages and disadvantages and considered the advantage to outweigh the disadvantage, and that's their decision.

Q. But pancuronium is not necessary to prevent hypoxic seizures that might cause

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the catheter to be dislodged?

A. No. And, furthermore, although I have mentioned in other jurisdictions that there is a slight theoretical chance of a hypoxic seizure, since thiopental is such a good anticonvulsant, I think the overall risk of that is small. But I can't put a number on that to a reasonable degree of medical certainty.

Q. Would people that are given three to five grams thiopental, could they start breathing on their own again after a few minutes?

A. It's most unlikely.

Q. And what is the most reliable indication of breathing? Is it the movement of the apex of the chest, or how would you define it?

A. The most reliable way of assessing ventilation would actually be to measure the volume of inhaled and exhaled air.

Q. How about just from visual inspection?

A. There is no reliable way, in my

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opinion, to solely look at chest movements. Because, for example, under general anesthesia, patients often become obstructed due to relaxation of the soft tissue in their posterior mouth. They continue to make chest movements, yet no air is exchanged. And, so, therefore, we train our residents not to rely on chest wall movement as a means of assessing the adequacy of air movement.

Q. And, Dr. Dershwitz, do you know whether three to five grams of thiopental will cause complete circulatory collapse in a hundred percent of cases?

A. It will not.

Q. It will not?

A. And the reason I know that is because, certainly, at three grams, most of the persons given potassium chloride achieve a flat line within a small number of minutes.

MR. SIEM: Why don't we break for lunch, since I'm going to start a new context.

(Luncheon recess.)

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AFTERNOON SESSION

BY MR. SIEM:

Q. Dr. Dershwitz, in your report, is there a list of all documents that you reviewed?

A. Yes, that's paragraph 4.

Q. And is there a list of the cases that you've testified or been deposed in in the last four years?

A. I don't have it with me. I'd have to generate that.

MR. SIEM: We would ask that that be provided, Mr. Drolet.

MR. DROLET: You may ask.

Q. And for the report, did you tour the execution chamber?

A. No.

Q. Have you seen any pictures or photographs or diagrams of the execution chamber?

A. No.

Q. Do you think that's relevant to your expert report at all?

A. No.

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Q. Did you review any of the depositions in this case?

A. No.

Q. Did you speak to any execution personnel?

A. No.

Q. Did you review, other than the three expert reports of Dr. Heath, Dr. Varlotta, and Dr. Kern, did you review any other expert reports in this case?

A. No.

Q. Did you review any of the discovery provided to the plaintiff in this action?

A. I don't think so. I think it depends on your definition of "discovery," but I don't think so.

Q. Did you review what was provided by plaintiff in this litigation?

A. I'm not sure what that is, but probably not.

Q. Have you asked Georgia if they've had -- the defendants -- strike that. Have you asked the defendants if there has been any

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issues with executions in Georgia?

A. No.

Q. Do you think that's relevant to your expert report?

A. No.

Q. So, you're not aware if there were any problems with any executions in Georgia?

A. No.

Q. In your last paragraph, you indicate -- in the last paragraph of your expert report, you indicate that Dr. Varlotta and Dr. Heath and Dr. Kern describe things that might go wrong during the execution by the lethal injection process. None of them provide any evidence of the likelihood that any of these potential problems will occur in a future execution, correct?

A. As far as I can tell, there's nothing in there that we could use to provide a number on the probability that any of those potential things could indeed happen.

Q. So, you don't know if any of these things have occurred or not in Georgia?

A. I have no specific knowledge.

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Q. And you didn't review the documents that were cited in Dr. Varlotta's report or Dr. Kern's report related to what has occurred in executions in Georgia, correct?

A. No.

Q. What was your general assignment in this litigation?

A. I answered that already.

Q. Can you provide it to me again, please.

A. To discuss the pharmacology of the agents and to discuss any specific areas of the other experts with which I disagreed.

Q. You were not asked about the prison personnel, correct?

A. I don't recall any specific questions about that.

Q. And you weren't asked about the layout of the execution chamber at all, correct?

A. I don't believe so.

Q. And you weren't asked to compare and contrast execution protocols, were you?

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A. As I told you, I believe I was only provided with the latest protocol dated June of 2007.

Q. And can you generally summarize what your expert opinion is in this case?

A. If the right drugs are given in the right dose in the right order and through a working IV, there's minimal chance the inmate can suffer.

Q. And is there any dispute regarding that in this litigation?

A. I have no idea.

Q. But Dr. Varlotta doesn't dispute that, does he?

A. It doesn't sound like it, but I don't know for sure.

Q. And Dr. Kern doesn't seem to dispute that, does he?

A. Again, I haven't heard everything they have to say.

Q. And that's the only area that you intend to offer an expert opinion regarding, correct?

A. No. It depends on what other

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questions you might ask me, because you've asked me for expert opinions on lots of other things.

Q. But your intention from the defendants is only to provide that general opinion that you provided earlier and what's contained in your expert report, correct?

A. My expectation is what they will ask me on direct examination is pretty much what's in my expert report.

Q. And you're not being offered as an expert regarding the chamber, correct?

A. No, I won't give expert testimony on that.

Q. And the personnel?

A. I will discuss generalities regarding what I consider to be reasonable experiences that people should have. But I can't and, therefore, won't discuss individual specific qualifications.

Q. Are you offering expert testimony on whether this method of execution engenders the least risk for the inmate?

A. Since "least" is a legal

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definition, not a medical definition, I am willing to discuss the differences in risk of different permutations, but I don't have an expert opinion on "least," because I don't consider that to be a medical area.

Q. And are you endorsing the Georgia protocols, sir?

A. I endorse nothing.

Q. Is this the best possible way to perform an execution?

A. There is no definition of "best" that I find scientifically acceptable.

Q. Does it have the most advantages, this protocol, as compared to other protocols?

A. That's for the Georgia officials to decide.

Q. What's the benefits of using three drugs over one drug in an execution?

A. I already answered that. The advantage of three drugs is that there is an expected, easily reproducible endpoint that should occur in a shorter period of time, meaning ECG flat line, and that would permit someone, without laying hands on the inmate,

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to easily ascertain the time of death.

Q. But you and I agree or we've agreed today that it's possible just to give a lethal dose of thiopental and remove the potassium -- pancuronium bromide and potassium chloride, correct?

A. It is possible, but a prudent person would then avoid using ECG as the primary method for ascertaining death.

Q. What would be the appropriate primary method of assessing death?

A. A physiologically meaningful method would involve performing a physical examination and ascertaining the absence of ventilation and circulation.

Q. Are there any monitors that you could use for that?

A. Certainly, you could, but they would require rather sophisticated training to employ them.

Q. Have you seen any evidence from Georgia that shows -- that indicates the individuals that were being executed were properly anesthetized before being given

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pancuronium bromide and potassium chloride?

A. I have seen no evidence that supports or refutes that contention.

Q. Or if there was evidence supporting that finding, it would be within the possession of the defendants, correct?

A. I have no idea.

Q. But they're in the best position to obtain that evidence?

A. Presumably.

Q. Sir, and you've also said -- do you think that there's a likelihood at all of the risks that Dr. Varlotta outlines in his expert report?

A. Anything is possible. But from information that I have obtained outside official channels, meaning what I've read in the lay press, of the executions that seem to have gone poorly, the common factor has been, to my eyes, a malfunctioning IV. And all of the other theoretical things that could go wrong, I have not seen evidence that those indeed have gone wrong in the past, other than putting the drugs through a malfunctioning IV.

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I'm also not including the misadventures of decades ago, for example, when they mixed all the drugs in the same syringe, which I think nobody would agree is a good idea.

Q. So, what are the things that you're saying are the problems with the IV? What kind of things are you including in that with a malfunctioning IV?

A. If the IV is not in the lumen of the vein, then the medications will not be delivered to the circulation. And that would mean that the expected pharmacological effects would not occur in a timely fashion.

Q. And isn't that a great risk in these procedures?

A. It depends on your definition of "great."

Q. Can you put a percentage on it?

A. I can't. But my understanding is the denominator of lethal injection is hundreds of people in this country. And the number of cases where it seems that there was a relatively unambiguous malfunctioning IV, of

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which I'm aware, is probably measured in single digits. There might certainly be others, but the ones that I've read about in the lay press seem to be in the single digits.

Q. But you haven't done an analysis of the amount of botched executions or problematic executions, have you?

A. I don't have the data to do that.

Q. In fact, there have been problematic executions around the country, correct?

A. Certainly, there has been some that received great attention in the lay press.

Q. And Angel Diaz would be one?

A. Yes.

Q. Joseph Clark in Ohio?

A. Yes.

Q. And there's a number of others, correct?

A. Those are the two that come to mind right now that seem to have occurred in the last year or two.

Q. Do you know the facts regarding

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Mr. Clark's problematic execution?

A. The only facts that I can recall is that he appeared to retain consciousness for a longer period of time than would have been expected had the thiopental been delivered to a working IV.

Q. And whether or not there are issues in Georgia, you wouldn't know, because you haven't reviewed the records, correct?

A. I have no specific knowledge.

Q. What would happen if an unanesthetized patient or inmate received 50 milligrams of pancuronium bromide?

A. I already answered that. They would begin to feel weak. Shortly thereafter, they would have difficulty breathing. That difficulty breathing over a period of few minutes would progress to total paralysis and a feeling of significant air hunger, since they would not be able to ventilate.

Q. How quickly would the person feel the paralysis after injection?

A. Since no human has ever been given 50 milligrams in an awake state, what I'm

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telling you is an approximation based upon what I know about the kinetics of pancuronium. But when the typical clinical doses are given, the time to the peak effect is somewhere around five to seven minutes. And when larger doses are given, we expect that the onset would be more rapid. But how much more rapid, I can't tell you. But over a period of a few minutes, the person would progress from a little weakness to a lot of weakness to total paralysis.

Q. So, it would take a couple of minutes for a complete neuromuscular blockade to occur?

A. A few minutes, but I really can't refine "few" any more accurately than that.

Q. And we talked about this earlier, but what -- would that inmate or the inmate given pancuronium bromide, in and of itself, that could kill them by causing them to stop breathing, correct?

A. A dose of pancuronium in excess of, let's say, five to seven milligrams is expected to be fatal. But it would take quite

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a while for the person to die. They would lose consciousness first, but it would take quite a while for them to die.

Q. How long would it take for them to lose consciousness?

A. Again, it's hard to say. But the mechanism would be decreased oxygen delivery to the brain. And that would take a number of minutes. Probably less than ten. Certainly, more than a couple.

Q. And it would be a pretty horrifying or terrifying death?

A. It would be most unpleasant.

Q. And how long would it take them to actually die of the asphyxiation?

A. We typically believe that irreversible organ damage occurs three to five minutes after inadequate oxygen delivery to an organ. So, the point of no return might be achieved in a few minutes. But actual death may not occur for a few more.

Q. But they would become unconscious from oxygen deprivation, correct?

A. Yes, they would become unconscious

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a number of minutes before they would be clinically dead.

Q. And it would be cruel and unusual to intentionally administer pancuronium bromide with no analgesic or something similar to sodium pentothal, correct?

A. That's a legal definition. But from a medical point of view, I think it's a really bad idea.

Q. Can you quantify "really bad idea"?

A. The person would experience sensations that are very unpleasant.

Now, the use of the word "cruel and unusual" is clearly a legal definition, and I'm not an expert on the Bill of Rights. But I think it's a really bad idea to deliberately or even with a high likelihood administer a paralytic drug to an awake patient unless there is a mitigating circumstance where it is necessary for their medical well-being. And there are occasional situations where that's the case, but they are rare.

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Q. And what are the sensations that they would experience that would be so unpleasant?

A. For the third time, they will experience, first, weakness.

Q. Can you -- what do you mean, weakness?

A. Their muscles will feel weak. Typically, the muscle that they notice first as being nonfunctional is their eyelids. And colleagues of mine who have been paralyzed awake first describe the inability to keep their eyes open as one of the first sensations. Then they lose the ability to take a deep sigh breath. So, they're breathing more rapidly, shallower breaths, kind of like panting. And then that progresses to the inability to breathe at all. But as the they are unable to meet their ventilatory needs, they start experiencing air hunger, which is the need to take bigger and bigger breaths more frequently that they're unable to do.

Q. Then after the weakness and after

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the shallow breaths, what would the person feel?

A. The person would feel the sensation of being completely unable to move any muscle in their body.

Q. And how long would it take from that point to reach full unconsciousness?

A. I can't be more specific than a few minutes. But it would be certainly single digits.

Q. And you indicated that your colleagues have been paralyzed, correct?

A. I know a number of anesthesiologists who, for scientific purposes, have volunteered to be paralyzed awake.

Q. Wow. And were they put on some ventilation while they were doing that?

A. Sometimes yes and sometimes no. For example, there is a very interesting paper published in the mid-'80s performed by former colleagues of mine where the goal was to gradually administer pancuronium so that every muscle in the body was paralyzed except the

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diaphragm. The diaphragm is the most resistant. Because they wanted to measure diaphragmatic activity in the absence of all other muscles. And, so, because this was being administered by a trained anesthesiologist, they were safe, but they weren't comfortable.

Q. What would happen if an unanesthetized person was given 120 milliequivalents of potassium chloride?

A. Almost immediately upon the drug entering the vein, I expect that the person would experience a burning sensation at the site of the IV that would then progress proximally. Once the drug reaches the heart and the heart stops, then oxygen delivery to the brain would suddenly cease, and they would lose consciousness in a matter of seconds.

But prior to losing consciousness, they probably will also experience the pain due to oxygen deprivation of the heart, similar to the pain that someone has who has coronary artery disease and experiences angina. And, so, I expect that they will have

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a short period of anginal pain in addition to the pain of the medication itself.

Q. So, there would be pain upon administration from the burning; there would be pain from the heart being stopped, correct?

A. Yes.

Q. And it would be cruel or it would be unpleasant to intentionally administer anything that could cause this amount of pain without first anesthetizing the patient, correct?

A. Unlike paralyzing somebody who is inadequately sedated, which is occasionally necessary for the patient's medical well-being, I can think of no clinical scenario in which it would ever be defensible to give a large rapid administration of a concentrated potassium chloride solution, although it has happened accidentally.

Q. So, if someone was not properly anesthetized and then given pancuronium bromide, along with sodium pentothal, that would be a pretty horrible death, correct?

A. Not if they gave thiopental first.

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Q. No, if they didn't, though. So, removing thiopental, if a person is given pancuronium bromide and potassium chloride alone without thiopental, that would be a pretty horrifying death, right?

A. I think it would be miserable.

Q. And how would that person die, if you injected those serially, would they first feel the effects of the pancuronium bromide and then the potassium chloride, or how would -- what is the mechanisms that would occur following the injection of those drugs?

A. I admit this is completely hypothetical. But since pancuronium is the slowest onset of all the muscle relaxants we have available to us, if the pancuronium, followed by the potassium chloride were given in rapid succession, I suspect that the heart would stop before a significant pancuronium effect were present. And, so, I think that the cause of death would certainly be cardiac sensation -- cardiac cessation as opposed to decreased oxygen delivery from muscle paralysis.

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Q. So, you agree that the effective delivery of the right dose of thiopental to the brain in executions is critical for a humane execution, correct?

A. Yes. I would modify that to say, though, that the procedure is to deliver the medication through a working IV, and it is assumed that the person's body will then deliver it to the brain.

Q. And you would agree that there's some obligation to prevent that occurring without the thiopental being effective, correct?

A. Well, as far as I can tell, the intent of all of the protocols I've reviewed in the different states has always been to render the inmate unconscious before the delivery of medications 2 and 3.

Q. And that's the intent, correct?

A. Yes.

Q. But there's nothing that you've seen that shows that they've actually done that?

A. Not in Georgia. In other states,

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there have been methods that have been applied, but not in Georgia.

(Short pause.)

MR. SIEM: I'd like to mark as Dershwitz 15 a document entitled "Practice Advisory for Intraoperative Awareness and Brain Function Monitoring."

(Dershwitz 15 marked for identification.)

Q. Have you seen this document before?

A. Yes.

Q. And how do you assess anesthetic depth?

A. Well, I already answered that. In my mind, there are five components of general anesthesia, several of which we can measure as they're happening, some we cannot. But we attempt to measure the presence or absence of consciousness, the degree of analgesia, the response to various reflex stimuli, and leave something like amnesia, which is a necessary component of anesthesia, but that is something that can only be assessed post-op.

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Q. So, what kind of techniques would you use to assess anesthetic depth?

A. We can use both physical exam, as well as electronic monitors.

Q. In your practice, how do you do it?

A. Both.

Q. Do you ever just use only one of them, or do you usually use them in combination?

A. It depends on the specific case. Depending on the nature of the anesthesia, sometimes we get more information available to ourselves than others. But my goal would be to apply as many of these procedures or assessments as I can, as long as the nature of the surgery doesn't prevent some of them.

Q. And as a Board Certified anesthesiologist, do you keep up with the major publications in your field?

A. I try to.

Q. And you're familiar with the practice advisory I gave you, correct?

A. Yes.

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Q. And, sir, have you read the declaration of Carol Weihrer in this case?

A. I haven't read the declaration in this particular case. I have certainly read her first-person experience of her unfortunate operation where she was completely paralyzed and wide-awake during surgery on her eye.

Q. Has this -- has intraoperative awareness, has this occurred in your practice at all?

A. Certainly.

Q. And how often has it occurred?

A. Since I don't have the ability to measure this accurately in most of my patients, I rely on the studies that suggest that if we take all people who come to our ORs, intraoperative awareness has an incidence of between one in 200 and one in 500. We take all-comers. And subsets of the population may have incidents as high as one percent. And since my practice is a little more skewed toward the emergency and trauma cases, my own personal incidents is probably a little higher than average.

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Q. And in your expert report, you indicate that a rapid-induction sequence, there's a higher amount of intraoperative awareness, correct?

A. There's an increased incidence of intraoperative awareness when a rapid-sequence induction is performed.

Q. And that's what they do in Georgia executions, correct?

A. That is analogous. Now, since they're not doing what I consider to be clinical anesthesia, I won't use the term "rapid-sequence induction." But it is a close analogy.

Q. Would you say that the methods or the standards that are in that document that I just provided you of Dershwitz Exhibit 15 represent the prevailing standard of care for assessing anesthetic depth?

A. In general, that's true. There are some places in the article where I would have used slightly more specific language, because I am more persnickety than they are in terms of drawing a distinction between

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assessing depth of anesthesia and assessing the presence or absence of consciousness, which I view to be rather different, especially based on my research in this area. And since I'm not the editor of the journal, I couldn't do anything about it. But had I been, I would have asked them to use more precise language in some places. But, in general, I agree with what they have to say.

Q. What is your distinction between assessing depth of anesthesia and assessing the presence or absence of consciousness?

A. For the fifth time, consciousness is one component of general anesthesia.

Q. I understand, but you said in this article, in relation to this article, you don't agree with how they use these terms, and why don't you agree with them?

A. It would take me a long time to find it, but there are some places where I think the precision of their language is imperfect, but it doesn't detract from the overall recommendations that they make.

Q. If you could look at page 847,

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there's a definition of general anesthesia. Do you see that, number 2?

A. Yes.

Q. Do you agree with that definition?

A. That is one definition of general anesthesia. It's not the definition that I as a pharmacologist use, because I think the state of general anesthesia should include unconsciousness, analgesia, muscle relaxation, oblation of reflexes, and amnesia.

Q. They also give a definition of depth of anesthesia. Do you agree with that definition?

A. In their sub-heading 3, Depth of Anesthesia, they use the term "depth of anesthesia or depth of hypnosis." And connecting those two prepositional phrases with the conjunction "or," in my opinion, is misleading, because depth of amnesia and depth of hypnosis are two different things, and one is a subset of the other. So, I would have preferred that they not connect them linguistically the way they did.

But, again, these are minor

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linguistic objections that I as a perfectionist in my writing would try to change, if I could. But it doesn't detract from the very, very important overall recommendations and philosophy that's presented in this article.

Q. On page 850, there's a paragraph that starts "intraoperative monitoring." Do you see that?

A. Yes.

Q. And then it goes through clinical techniques on page 851.

A. Yes.

Q. And do you agree with these techniques that they provide?

A. First of all, they make the statement, intraoperative awareness cannot be measured during the operative phase of general amnesia. That is true, because to assess awareness, one must do a post hoc interview. But, on the other hand, the probability of intraoperative awareness can be assessed on a moment by moment basis based upon the employment of one of our brain function

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monitors that we have available.

Q. And what is the brain function monitor called?

A. Well, there's several on the market. One is the BIS Monitor made by Aspect Medical Systems. There's another one called the Patient State Analyzer that gives you the patient state index PSI. That's made by Physiometrics. And there's others.

Those can give you a probability that a person is conscious or unconscious at this moment in time. But because there is air inherent in any measurement, the only way to ascertain whether this prediction was indeed correct is to do a detailed interview post-operatively with the patient.

Q. And you can't do that at an execution, correct?

A. Correct.

Q. And do you know whether Georgia uses a BIS Monitor at all?

A. They do not.

Q. And do you know whether a BIS Monitor is affected by the use of pancuronium

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bromide?

A. It is, but probably not in a clinically meaningful way when doses measured in grams are used.

Q. Can you please explain that a little bit more? What do you mean by "clinically meaningful way"?

A. We know that a reasonable clinical target for the BIS value is a value between 40 and 60 intraoperatively. And a value of below 60 is associated with only a very tiny probability of awareness.

The reason we use a lower value of 40 is not so much because it's bad for the person, but values less than 40 imply that a less efficient anesthetic is being administered, because it may make the person take longer to wake up.

Now, when doses of thiopental measured in grams are administered, the BIS value will be in single digits. The probability of awareness is almost too low to quantitate.

Pancuronium, like all muscle

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relaxants, will have a very slight effect to depress the BIS value a little bit. Just like potassium chloride, we now know, in this dose, has the ability to increase the BIS value by maybe ten points.

When we're dealing with single-digit values, neither change is clinically meaningful.

Q. Do you think they have any meaning in the execution setting?

A. No.

Q. Sir, based on this paper, how does ASA recommend minimizing the risk of intraoperative awareness?

A. Using as much data as the clinician can have available to him or her and integrating all of that data to assess and then minimize the risk.

Q. Do you agree with these techniques that they provide?

A. In general.

Q. And what specifically – is there anything specifically you disagree with?

A. Well, actually, one area that I

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also qualitatively disagree with this paper is that I would have come out stronger in favor of employing electronic monitors in addition to the physical exam that we already perform on everybody. And I think that the ASA, for political reasons, chose not to come out as strongly in favor of an electronic monitor, as I would have chosen to do.

Q. What kind of political reasons would have prevented them from doing that?

A. Certainly, the employment of such a monitor adds cost. And since the American Society of Anesthesiologists represents practitioners from the highest ivory tower in a metropolitan area to the smallest hospital in a very, very small town, what recommendations they make as the leading entity in our specialty has to apply to all venues. And, so, therefore, I think that they made recommendations that can be most generally applied.

But, certainly, in my practice and in the environment in which I work, we are far more likely to use an electronic monitor than

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they would recommend here.

Q. So, you use a BIS Monitor, an electronic monitor, in your practice?

A. Not on everybody, but in a very significant fraction of the patients.

Q. Sir, can you get the AVMA standards that I gave you earlier. I have no idea what Exhibit they were marked.

A. 14.

Q. And, sir, have you ever performed animal euthanasia?

A. Yes, but not recently.

Q. And what methods did you use in euthanizing animals?

A. As a graduate student, when I did research on rodents, we typically did cervical dislocation as the means of killing the animal.

Later, when I did my research fellowship and I was working with pigs, the pigs were typically anesthetized with thiopental and pancuronium for the experiment. And then when the experiment was over, if I wished to euthanize the pig, I just gave a

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large dose of thiopental.

Q. Have you ever used potassium chloride to euthanize an animal?

A. Me personally, no.

Q. Can you explain what the AVMA recommends for death by potassium chloride injection?

A. I'd have to take the time to find it in here.

Q. You can do that, please.

A. It would be helpful if you knew the page. It also depends on the species, because they have this subdivided by species.

(Short pause.)

A. On page 12, there's a statement that says: "The use of a super-saturated solution of potassium chloride injected intravenously or intracardially in an animal under general anesthesia is an acceptable method to produce cardiac arrest and death."

Now, the concentration used in lethal injection is nowhere near super-saturated, but I think the general provision that they're discussing here is

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applicable.

In other words, once an animal or an inmate is rendered successfully unconscious with a general anesthetic agent, it really doesn't matter what is done to that animal or person afterward in terms of humaneness. And you could even envision, for example -- and I freely admit I'm not advocating this -- but if you rendered an inmate unconscious with an adequate dose of thiopental and then had that inmate drawn and quartered, it would be messy, but not inhumane.

Q. The assumption there is that they are properly anesthetized?

A. Absolutely. Everything I talk about with regard to the injection protocol is predicated upon the successful delivery of an adequate dose of thiopental into the circulation.

Q. And those AVMA Guidelines require monitoring to ensure that the animal is properly anesthetized before giving them the potassium chloride, correct?

A. Well, the phrasing that they used

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on page 12, it says that the injection of potassium chloride in an animal under general anesthesia is an acceptable method. Although it doesn't specifically say, it implies that the person taking responsibility for doing this also is taking responsibility to induce a state of general anesthesia.

MR. SIEM: Can you mark as Dershwitz 16 the opening expert report of Dr. Dennis Geiser.

(Dershwitz 16 marked for identification.)

Q. Have you seen this document before, sir?

A. No.

Q. And Dr. Geiser opines in this case that the 2007 lethal injection procedures are inconsistent with the AVMA Guidelines on euthanasia. And if you want to take a look at this, you can. Do you agree with that statement?

A. Since he appears to be a veterinarian, and I am not, when he says on page 3 that this would be unacceptable under

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the AVMA Guidelines, I would defer to him as a veterinarian expert.

On the other hand, it is interesting that the AVMA Guidelines specifically say on the cover that they are in no way intended to be used for human lethal injection.

So, I will leave it to others to decide whether or not these Guidelines should be applied to human pharmacology.

Q. Do you think that humans or inmates deserve less care than an animal?

A. No. But I think that an inmate given medications that are commonly used in clinical anesthesia is probably being treated to the same level of medical pharmacology as a human. And, so, as I pointed out in my expert report, in clinical anesthesia, we often give a hypnotic drug, followed by a paralytic drug, without assessing the presence or absence of unconsciousness. We do that commonly in patients.

So, I will leave it to others to decide whether or not leaving out the step of

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assessing depth of consciousness or presence or absence of consciousness is a good or a bad thing in a judicial execution.

Q. In what situations would you ever give them the -- someone a hypnotic and then a paralytic in your practice?

A. First of all, virtually everybody who is having surgery that is not elective and scheduled. So, virtually all patients who are having urgent or emergent surgery that have a general anesthetic get a rapid-sequence induction. In my practice, that's a significant fraction of my patients.

Furthermore, other indications for a rapid-sequence induction include obesity. Now, that's a general term. But many clinicians will choose to perform a rapid-sequence induction in an obese person.

Persons with a history of reflux is often a reason.

And, finally, persons with such anatomic abnormalities like a hiatal hernia.

Now, in each and every case, it's the responsibility of the clinician to balance

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the benefits and risks.

Now, certainly, the primary benefit of a rapid-sequence induction is the belief that it minimizes passive regurgitation and the risk of aspiration. The risk, of course, is that a paralyzed person who then cannot be intubated could be injured.

Q. And how often do you use the rapid-sequence induction, what percentage of your --

A. I can't tell you a percentage. It depends on the clinical scenario. But, for example, when I'm on call, virtually everybody gets a rapid-sequence induction, because virtually every case is unscheduled.

Q. And that's because you work in an emergency situation?

A. I think any hospital that does nonelective surgery, almost all of the nonelective cases, if the patients have a general anesthetic, they're probably going to get a rapid-sequence induction.

Q. Sir, if you look at Dr. Geiser's report and you look at paragraph 14, it says:

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"The 2007 AVMA Guidelines mandates that when potassium chloride is administered, it is of the utmost importance that the person administering the drugs be knowledgeable in anesthetic techniques and be competent in assessing anesthetic depth." And you have no knowledge of whether that's done in Georgia, correct?

A. What I would say in answer to this is that the AVMA has a policy, or they call it Guidelines. They specifically state that these Guidelines are not to be applied to judicial executions. And I'll leave it to others to decide whether or not applying it to a judicial execution is a good idea.

Q. Can you answer my question?

A. I did.

Q. I don't think you did.

A. Repeat your question, please.

(Question read.)

A. I actually believe that it is not done in Georgia, based on my best information.

Q. Thank you. Sir, what is an infiltration, if you could describe that for

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me, please.

A. It is the delivery of intravenous medication typically into the subcutaneous tissue outside of a vein.

Q. And does that occur frequently in your practice?

A. It happens. I don't know the definition of "frequently," but it certainly happens.

Q. How often does that happen?

A. I don't know.

Q. Do you have a percentage?

A. No.

Q. Do you have any idea?

A. No.

Q. Are you the one who puts in the IV in your situations, or do you have a nurse tech or someone else do it?

A. Typically, in my practice, I put the IV in when either the CRNA or the resident have been unable to do so.

Q. And, sir, what is an extravasation?

A. Extravasation is very similar to

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infiltration but, in my mind, the slight difference might imply that the IV catheter may be half in and half out of a vessel or maybe that there is a hole in the vessel around which some leakage can occur. But the end result is similar in that medication that is intended to be deposited into a vein is then deposited into the subcutaneous tissue surrounding the vein.

Q. Can an infiltration or extravasation be asymptomatic for a period of time?

A. Anything is possible. Whether or not it's completely asymptomatic depends on factors like how rapidly is the fluid going in, and what is the chemical nature of the fluid, because some fluids are more irritating than others.

Q. But how would you determine whether that was symptomatic? How would you determine whether one of those occurred, extravasation or the infiltration?

A. First of all, I don't think it's important to differentiate between the two.

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They're both bad.

Q. Okay.

A. And, so, in the days when we used thiopental for inducing anesthesia, if the IV was outside of the vein from the very beginning, almost all the time the person would complain of pain at the site, because the pH 11 solution being deposited subcutaneously hurts. It is certainly not a hundred percent sensitive, but a very high percentage of people who were awake and got thiopental subcu complained.

If IV fluid is going in, depending on the rate, you may or may not see swelling at the site. The more likelihood is, with greater infusion rates, there's a more likely ability to see swelling at the site of the IV catheter.

Q. And, so, the only way you would be able to determine that would be to monitor the site, correct?

A. Well, it depends on your definition of "monitor." You could potentially pick up infiltration from

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potassium chloride -- excuse me, from thiopental by asking the person, tell me if this hurts.

Q. But if they were unconscious, the only way that you could determine it is by monitoring the site?

A. Perhaps by physical exam. But if they were unconscious, that implies that some of the drug probably got in intravenously.

Q. But IVs do move. There are occasions where the IV line may move out of the vein, correct?

A. That's certainly possible. In my experience and the experience of my colleagues, a more likely scenario is that the IV was never in the right place to begin with. But sometimes an IV that used to work stops working. But that is a less likely scenario.

Q. And sometimes, do you ever have situations where there's back pressure?

A. If the tubing kinks or if the IV catheter is occluded or if so much fluid has been put in subcutaneously that there's no more capacity to accept fluid into this

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potential space, we expect to see back pressure.

Q. Does the length of the line affect the back pressure?

A. A little bit, but not a lot.

Q. How about the size of the syringes, would that give you a better -- the smaller the syringe, is it easier to determine whether there's back pressure?

A. Yes. But like with everything else, there's advantages and disadvantages. And as I've testified before, if multiple small syringes were used instead of a lower number of larger syringes, then that probably increases the likelihood of error in terms of selecting the wrong syringe or in terms of leakage from repetitive placement and removal of the syringes.

Q. Sir, do you ever induce anesthesia from a remote location?

A. I have done it, but not commonly.

Q. And under what circumstances do you usually do that?

A. I don't usually do it, but the

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circumstances in which I have done it was in a situation where a patient was undergoing a radiological procedure under sedation. In my definition of "sedation," a person is sleepy but awake. And because of movement, it was then decided that they needed to be unconscious.

I have given medication to produce unconsciousness from the control room without entering the radiology suite. I don't do it commonly. I've done it a few times in my life, but not a lot.

Q. And is there an increased risk by inducing or maintaining anesthesia from a remote location like that?

A. In that situation, the major risk would have been the patient stopping breathing, because I expected them to continue to breathe on their own. But I would have had several monitors available that would have notified me of that, and then I could have entered the control room.

When the intent is to render the person unconscious and apneic deliberately,

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then the risk is clearly less.

Q. And, sir, what is the purpose of using an anesthesia in general?

A. The purpose of anesthesia is to make the patient more comfortable for surgery, typically.

Q. So, it's pain reduction, is that usually what it is?

A. Or it could be, for example, as I just gave you the example, sometimes patients are given anesthesia so they will hold still during a procedure that is not painful.

Q. When you induce anesthesia from a remote location, do you ever do it where you can't see the patient at all?

A. If the patient is in a scanner, I might not have direct vision of them, but I have monitors that help me assess their physiologic functions.

Q. So, there's some way to monitor the patient, no matter what, even if you're in a different room or away from the person being induced?

A. Typically, that's the case, but,

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again, I don't think it's a good analogy to a lethal injection, because when I'm giving anesthesia, my intent is to keep the patient safe so that they will recover after the procedure.

If the intent is to kill the person, one does not need to employ the same level of safety monitors.

Q. But they do have to have some safety to make sure that the anesthesia is actually getting into the vein and that the person is actually properly anesthetized, correct?

A. In general, that's true, but, again, it comes down to the decision about the advantages and disadvantages of different levels and types of monitoring, and I leave those decisions to others.

Q. Sir, you testified before the Florida Commission, correct?

A. I'm not sure if I was under oath. I certainly spoke to them. But I'm not sure if our conversation constitutes testimony.

(Dershwitz 17 marked for

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identification.)

Q. Sir, on page 8 to 9, you indicate or you told the Florida Commission that I try to confine myself to the pharmacology of the agents at the delivery system and the monitoring systems, correct?

A. I said that, yes.

Q. What does that mean?

A. It means that the vast bulk of the areas on which I've testified have to do with questions on the pharmacology of the agents or how they're delivered or methods of monitoring anesthetic effects.

Q. So, if I understand you correctly and that statement correctly, you don't comment at all on the qualifications or the trainings of the persons involved in conducting executions, correct?

A. I will discuss and answer questions based upon general areas of what I consider to be experiences that certain persons might need to have. But I do not want to be questioned about the specific qualifications of an individual, whether named

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or discussed by pseudonym.

Q. And why have you attempted or why have you drawn this line between what is acceptable testimony and what is unacceptable testimony?

A. First of all, because there's a lot of areas in which I'm not an expert. So, anything that has to do with penology or things like that, I will leave to those experts.

So, for example, in terms of things like the layout and the specific training of individuals, I'll leave that to other experts.

But I wish to provide, as best as I can, expert opinions in areas in which I think I'm an expert. And if somebody asks me questions in an area where I don't think I'm an expert, I am not shy about telling them that I don't think I should be answering this.

Q. Do you have an opinion as to whether the individuals that were involved in the Florida execution and the execution of Angel Diaz were competent or properly trained?

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A. That's a very good question, because it seems to me that the basic problem in that execution is that they had two IVs, neither of which worked as intended.

Now, one possibility is that the person who put those IVs in had no idea what they were doing. The other possibility is that that person was having a bad day. And I have certainly had bad days in terms of being unable to put an IV in as fast as I would like.

So, I don't think it's fair for me to answer the question about competence, because I wasn't there. I don't know the person. And I don't know exactly what happened.

I will certainly agree that the intended consequences of the lethal injection protocol were not implemented as written.

Q. Do you have an opinion on whether the people involved in the Georgia executions are competent to perform an execution?

A. No. I think the definitions that I gave before about whoever puts the IV in

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should put IVs in as part of their day job is a general philosophy that I think is medically defensible, but it's up to others to implement that.

Q. Sir, you testified also in the Harbison case, correct?

A. Yes.

Q. Versus George Little?

A. Yes.

Q. Have you seen the opinion by the court in that case?

A. Yes.

Q. And one of the things that the court indicated was -- and this is on page 4, but it states: The committee reviewed materials concerning problems with the three-drug protocol being used in Tennessee, including a recent article where the medical examiner who advised the three-drug protocol in 1977 stated, "It never occurred to me when we set this up that we'd have complete idiots administering the drugs."

So, one of the things that he was taking into account or that the people who

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were involved in executions were taking into account is they believed that they were trained, competent people doing this, correct?

A. That's his opinion.

Q. Well, he was the one who designed the protocol, correct?

A. Right. But I don't know how carefully he's followed the cases since then.

Q. And one of the biggest problems -- and you've indicated this -- with executions is the use of an IV line and the risks associated with that, correct?

A. I believe of all the things that can go wrong, the data suggests that the most common area where there has been a problem has been an IV that was not intravascular.

Q. So, if you used complete idiots, as that article indicated, or untrained, unqualified people, that risk that there's an improper IV or a non-working IV is going to be greater, correct?

A. I don't know the answer to that. But without knowing specifics, I don't think I would use the term "complete idiots."

Q. What term would you use?

A. I would want to know more information.

So, for example, in the case of Angel Diaz, I don't know if the person who put the IV in was incompetent or was having a bad day. I have no information to choose between those two hypotheses.

Q. Do you know who put the IV in in Angel Diaz?

A. I have no idea.

Q. Did you ever talk to anyone to find out?

A. That wasn't important to me. I'm also assuming they would not have disclosed that information. But the bottom line is, people with greater experience can probably do a better job getting IVs in. But even very experienced people sometimes have a failed IV.

Q. But isn't getting a working IV an issue that is directly related to the skill and experience of the personnel?

A. In general, yes.

Q. And doesn't the skill and

experience relate to the circumstance of the setup?

A. I don't understand the question.

Q. That skill and experience that they have or they should have relates generally to the setup of the IV, putting the IV in the arm, making sure that everything is working properly. When they're injecting the drugs, they need to know if there is back pressure, why there is back pressure. All of those things relate to their skill and experience in doing these executions, correct?

A. Yes. Although I'm not sure that the person who puts the IV in is necessarily the same person who makes the injection. So, I think you have to separate these tasks.

Q. Why don't we separate them. So, someone who sets up the IV line, they should be properly skilled in setting up IVs?

A. I would say with regard to the IV, whoever puts the plumbing together, puts the IV in and convinces themselves that it's working, that person should do that regularly as part of their day job.

Q. And how about the person that pushes the syringes?

A. The person who actually pushes the syringes should have training and experience to know how to draw up the drugs if they're doing that, putting the syringe on the tubing, however it's done. There's lots of different ways of doing that. And getting a sense of what a normal and what a kinked IV feel like. And that's something that a person does not necessarily have to do as part of their day job. But as long as they have practiced this and rehearsed it, they could probably do a good job at it. But, again, it's not up to me to decide whether or not they know what they're doing. But they have supervisors who should be taking responsibility for that.

Q. So, based on this analysis, it really does matter what persons and what training that they have for those people that are involved in executions; it does matter to your analysis?

A. Yes. Human factors are important.

Q. And you don't take those into

account at all in your expert report, correct?

A. Because, first of all, I freely admit I am not an expert in fault analysis or human factors analysis. And, so, therefore, because I can't quantitate these things, I shouldn't be the one who gives an expert opinion on what's the likelihood of something going wrong.

Q. So, the minute there's something wrong in an IV in an execution in Georgia, your expert opinion is just out the window, correct?

A. Well, not necessarily, because if most of the drug went in, then my predictions are probably close to being right. If almost none of the drug went in, then my predictions are meaningless.

Q. So, the issue that Dr. Varlotta talks about and Dr. Kern talk about is that there is a risk and a substantial risk that all of the drugs are not getting into the person who's being executed, isn't that correct?

A. Well, I don't think the risk is

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substantial, but I can't quantitate it.
Q. But you don't really differ with their opinion at all?
A. Well, I think I do. Because when an IV is put in by someone with the requisite training and experience, far more likely than not, it's going to work just fine.
Q. But you're assuming that these people have the training and experience to do it, correct?
A. One would hope so. But, again, without further information that the state of Georgia is employing inexperienced people, I would be very uncomfortable using the word "substantial" to describe the risk. I recognize the risk as non-zero. I admit I can't quantitate it, but I don't think it's substantial.
Q. Have you ever commented on the skill and training required to carry out a humane execution?
A. I don't know.
Q. What things other than the skill would you think are relevant to the execution

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participants?
A. Well, first of all, I think we need to divide the various tasks. So, as I said before, the person who puts in the IVs should put in IVs as part of their day job and have lots of experience.
The people who put the syringe on the tubing and push the plunger on the syringe should have done that enough times under the watchful eye of someone else to make sure they know what they're doing.
Q. And how would you expect them to do it? Would you expect them to be doing it into human beings, into a bucket, into something that would provide resistance? How would you expect them to have proper training?
A. If the entire setup is put together just as it would be on the day of an execution, it is not necessary for them to inject even saline into a human to get a sense of what it feels like. They could dump it into a bucket. It would feel the same.
Q. Well, dumping it into a bucket would provide you no back pressure, correct,

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no pressure at all?
A. Of course, it would.
Q. Pushing a syringe going directly into a bucket --
A. I'm saying if they use all of the plumbing and tubing and everything that is used on an execution except, instead of the IV catheter being in an a human, they're dumping it into the bucket, I don't think a person could tell the difference. It's going to feel the same. Because whether the fluid is flowing into a vein or flowing into the bucket, it's going to feel the same. I can prove that.
Q. And, so, if they're injecting it into a human and there's a problem with the IV, will they recognize that there's a change in pressure?
A. They should be able to do so. And, for example, they could practice that sort of thing.
Q. Do you know in Georgia whether they practiced that sort of thing?
A. I have no idea.

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Q. Don't you think that's relevant to that your opinion?
A. I'm not giving an opinion on that.
Q. You're not giving an opinion whether or not someone is properly trained or is getting properly trained by injecting it into a bucket? I think that's what you were just testifying to.
A. I'm saying that it is certainly plausible to include injecting into a bucket as part of the training, but I'll leave it to others to decide what the necessary and sufficient parts of the training are.
Q. Okay. But you don't know what they do in Georgia?
A. Specifically, no.
Q. And do you think it's important to screen for the character of the people who are involved in the executions?
A. I don't have an expert opinion on that.
Q. How about a personal opinion?
A. Pardon?
Q. How about a personal opinion?

A. I think it depends on your definition of "character."

So, for example, is a person who is divorced of bad character? Some people might say yes, some people might say no. So, you need to provide me with a better definition of "character."

Q. Do you think they should be screened at all prior to being part of an execution?

A. Well, certainly, my understanding is no one should be employed by the Department of Corrections who is a multiply-convicted felon. I think that's just common sense. But I don't know where to draw the line.

Q. Do you think they should have good proper supervision when doing an execution?

A. Yes.

Q. Do you think that they should keep adequate and detailed records of an execution?

A. In general, yes. Different people might differ on what specific pieces of data need to be written down. But I think that things like the time that different

medications are given should be written down, and the time that the ECG goes flat line should be written down. But if I were writing the log form, that's the sort of stuff I would include.

Q. And you don't know if they do that in Georgia?

A. I was provided with logs, but I didn't look at them.

MR. SIEM: Why don't we take a five-minute break.

(Short break.)

BY MR. SIEM:

Q. Sir, we've talked about this a little bit before, but what function does pancuronium bromide serve in an execution?

A. I'm not sure "function" is the right word, but the primary pharmacological effect is to mitigate the involuntary muscle contractions caused by potassium chloride.

Q. And is it necessary in the execution process to cause death?

A. No.

Q. Is it necessary to, for any

reason, for the inmate himself?

A. Only in terms of the inmate wanting to minimize the perception of others that he or she might be suffering.

Q. Should the pancuronium bromide cause death in an execution that proceeds according to plan as outlined in the procedures in Georgia?

A. No. If everything happens according to the protocol, the proximate cause of the inmate's death should be the potassium chloride causing cessation of electrical activity in the heart.

Q. And does the inclusion of pancuronium bromide in the protocol or in the procedures add any risk to the process for the inmate?

A. It increases the risk of the possibility of unrecognized awareness, and it's up to others to balance that negative attribute with its positive attributes.

Q. And what are its positive attributes?

A. I just answered that question.

Q. Are the positive attributes those that you mentioned about the witnesses; is that what you're referring to?

A. Yes.

Q. I just want to make sure that there was no other positive attributes that you were referring to. Do you use such protocols as those set out in the Georgia Lethal Injection Procedures in your practice?

A. Generally not.

Q. And why don't you use them?

A. In general, anesthesiologists don't need to rely on something like cookbook instructions to know how to give an anesthetic, because we do it so often that it becomes second nature. It's part of our training and experience to do it right without following that sort of cookbook.

On the other hand, I will acknowledge that checklists are important. And, so, for example, at the beginning of the day, every anesthesiologist is supposed to use a checklist to check out the integrity of our machinery.

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Q. So, when people are carrying out these tasks for which they have little experience or expertise, do these procedures provide some useful guide to them?

A. First of all, I'm not sure that it is fair to say that everybody involved has little experience or expertise. But, in general, I believe that having a written list of instructions decreases the likelihood of error. There are certain other ways of decreasing error too, like by having people watch each other's work. But I think, in general, having a written list of things to do decreases the likelihood that something will be done incorrectly.

Q. So, it's important, then, that the procedures are very detailed in providing this information to those involved in an execution, correct?

A. Well, it may or may not. For example, it might be adequate, and I'll leave this decision to others, for there to be simply a reminder of what order the steps are to be done in. And in terms of how detailed

to make the protocol in terms of getting it done right, I'll leave that decision to others.

Q. Do you know if the procedures provide for all contingencies or any contingencies if there's something goes wrong?

A. Well, for example, somewhere in the protocol there is the provision for having a physician perform an IV if the IV team can't do so. But I will agree that you can't anticipate every contingency on earth.

Q. Do you think that they should at least prepare for the foreseeable contingencies?

A. I think, in general, that that is a reasonable thing. Whether it needs to be written down in detail, I'll leave that decision to others.

Q. But, to your knowledge, it's not set forth -- all contingencies or all foreseeable contingencies aren't set out in the Georgia Lethal Injection Procedures?

A. No.

Q. Sir, do you think that using

peripheral access for an IV is adequate for executions by lethal injection?

A. I already answered that.

Q. Can you repeat your answer, please.

A. There's advantages and disadvantages.

Q. Okay.

A. The advantages, it takes less expertise and experience to put in a peripheral IV. The disadvantage is it may be a little more likely to become nonfunctional than an IV placed into a very large vein.

Q. But you feel that it's adequate; you think it's adequate to do it. I think that was my question, not what the advantages are, what the disadvantages are. My question was do you think it's adequate to use a peripheral IV line in executions?

A. It's certainly adequate, because that's what we use for the vast majority of general anesthetic cases.

Q. And the complications we spoke about earlier regarding femoral central lines,

do you know how often they occur?

A. The use of the lines or the complications?

Q. The complications.

A. It varies on the experience of the practitioner, but I can't put a number on it.

Q. So, the less experience a practitioner has, the greater the risk it has?

A. I think, in general, that's a reasonable assumption.

Q. And what are those risks?

A. In the context of a judicial execution, we don't need to discuss risks like infection. So, the major risks, as I see them, would be, since each of these veins, jugular, subclavian, and femoral, is located near an artery, one misadventure would be to put the IV in an artery instead of a vein.

Another problem that is more likely with the subclavian approach than any other would be a pneumothorax, which is a collapsed lung.

Bleeding at the site of insertion is a potential problem. That should be less

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of an issue with the jugular or femoral approaches, because pressure could be applied to the site.

Those would be what I consider to be the most common adverse effects that are relevant here.

Q. You testified or provided a declaration in the Reed case, correct, in Virginia?

A. Yes.

Q. And in that you -- why didn't you tell the Supreme Court in that case about these risks?

A. I don't recall if I was ever asked. That was years ago. I don't remember the specific questions I was asked.

MR. SIEM: We'll get the declaration.

(Short pause.)

A. If it was in my declaration, I most certainly was not asked.

Q. In that declaration, sir, you stated that the insertion of an intravenous catheter into the femoral vein is not

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complicated.

A. I stand by that statement. In fact, of the three sites I mentioned, the femoral vein is probably associated with the least and least severe complications. It's also probably the easiest to do, because it is the largest peripherally-accessible vein in the body.

Q. And are you assuming at that point that someone skilled would be doing the femoral IV?

A. I'm assuming that whoever is doing it regularly does that procedure as part of their day job.

Q. Do you know who, in the Reed versus Johnson case, who performed the femoral line?

A. I have no idea.

Q. Did you alert the court to all the risks that are inherent in that procedure?

A. I don't recall if I was asked.

Q. In fact, by your declaration, you're expressly minimizing those risks by saying to the court in your declaration that

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it's very easy to do?

A. It is very easy to do for me.

Q. Do you think it's appropriate for prison guards to place femoral central lines?

A. Most likely, no.

Q. Do you know that they, in Virginia, that's who did it?

A. I have no specific knowledge.

Q. In Virginia, the prison guards are the ones who placed the femoral line in Reed; did you know that?

MR. DROLET: Are you asking a question or giving testimony?

A. If that were indeed the case, then it would go against my general litmus test that whoever does that procedure or any other procedure should regularly perform that as part of their day job. But if such a person does it regularly as part of their day job, it's actually a very easy procedure to do.

Q. Would knowing that prison guards were performing the femoral line at that time change your opinion as to the safety or appropriateness of the procedure?

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A. If I was told that this IV is going to be put in through the femoral vein by a prison guard who regularly does not do that as part of their day job on patients, I would have said that that does not meet the litmus test that I just annunciated.

Q. And you didn't research that or check with anyone who was putting in that line in the Reed case?

A. I was not asked.

Q. But you provided a declaration minimizing the risks inherent in putting in a femoral IV line?

A. Because, to me, it's an easy procedure to do, and I do it regularly.

Q. But it's based on your training and your skill?

A. Yes.

Q. And you don't know whether they were properly trained or properly skilled?

A. I have no specific knowledge.

Q. Just like in Georgia, you have no idea of what their training or skill level is of those involved in executions, correct?

A. Correct. But if a person, a physician, is chosen to put a femoral line in, that is typically a procedure which requires separate credentialing by a person's health care facility. And, so, that's the sort of vetting that should be done by the responsible personnel when selecting a physician to do a procedure.

Q. But you don't know that they do that in Georgia or not?

A. I have no idea.

Q. And you haven't researched that, correct?

A. No. But I think that's a reasonable thing to do, amongst others.

Q. What's a reasonable thing to do?

A. Making sure that a physician who is selected to perform a femoral venous catheterization on an inmate is credentialed to do that same procedure at the health care facility or facilities at which they have privileges.

Q. But you don't know in Georgia whether any of these individuals have those

credentials?

A. I said, I have no specific knowledge.

Q. And you haven't asked?

A. No.

Q. And they haven't provided you any information?

A. No.

Q. Sir, can we turn to your pharmacokinetic model that you provided in connection with this litigation.

A. Okay.

Q. What are the assumptions that you make about Georgia's procedures in relation to these or this graph?

A. The two assumptions that I made, I've already described.

MR. DROLET: Which graph are we talking about?

MR. SIEM: Exhibit B to his expert report.

A. That the inmate weighs 80 kilos and that the thiopental two-gram dose is delivered over a period of one minute.

Q. And what is the volume of the amount in the syringe? Is there any assumption you make with that?

A. No.

Q. Any concentration that you assume?

A. These calculations are independent of concentration or volume. They depend on the dose and over what period of time that dose is administered.

Q. And in this procedure -- I'm sorry, in the June 7, 2007 Lethal Injection Procedures, how is the rate of injection controlled in the protocol?

A. It doesn't say.

Q. So, there's nothing in there that would give you any indication?

A. No. I arbitrarily assumed a one-minute infusion for the administration for the version of my expert report which is dated September 15. And I subsequently did the calculations and revised my expert report to assume a two-minute infusion. And that version of the expert report is dated September 30. And there are minuscule changes

in the thiopental concentration that have no clinical meaning whatsoever.

Q. Has there been any medical dispute that a two-gram dose of thiopental effectively delivered to the circulatory system and which subsequently reaches the brain will produce a deep and protracted anesthetic state?

A. Hopefully, not today, but there has been in the past.

Q. But, today, in this case, you haven't seen anyone saying, that's not the case?

A. I don't think so.

Q. And Dr. Varlotta, to your knowledge, it's not in his expert report?

A. I don't think so.

Q. And Dr. Kern?

A. I don't think so.

Q. So, you're providing just an opinion that everyone kind of agrees with, correct?

A. However, I am told that this particular opinion is important to put forth in great detail, which is why I did so.

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Q. And why is it important to put forth in great detail?

A. I believe that's a question you need to address to Mr. Drolet.

Q. So, he never elaborated on it; he just told you this was important to put in in great detail in this case?

A. Essentially, since he had read prior versions of my expert report in other jurisdictions, he said that a similar level of detail should be done here, and that's what I did.

Q. And the assumptions of your model we went over, there's a working IV, that there was correct mixing and preparation of thiopental, and that the delivery of the intended dose actually reaches the brain, correct?

A. Reaches the circulation.

Q. The circulation?

A. Yes.

Q. Sir, what is the anesthetic state that equates to the seven, I guess it's micrograms per milliliter?

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A. Yes. Seven micrograms per milliliter is associated with a 50/50 probability of being conscious or unconscious.

Q. Would individuals be able to respond to verbal stimulation at that point?

A. Half, yes; half, no.

Q. So, your analysis on this is just purely unconscious, meaning there's no response to any stimuli, versus conscious, there's response to every stimuli; it's an either/or proposition?

A. Correct. But your definition is completely wrong, because there are stimuli that have nothing to do with consciousness that anesthesiologists could measure that I'm not discussing here, stimuli that result in changes in heart rate and blood pressure.

So, a typical definition of consciousness that is used experimentally could be something like the person's name is spoken and, if they open their eyes in response to their name, they're deemed conscious. If they don't open their eyes in response to their name, they are deemed

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unconscious.

Another paradigm might involve saying to the person, raise your right arm or raise your left leg. And if they follow the command correctly, they are deemed conscious. If they do not follow the command correctly, they are deemed unconscious.

Q. So, if you ask an individual here today if they can raise their right leg, and they raise their left leg, then, under your analysis, they would then be unconscious?

A. That's not my analysis, but that is a scientifically relatively-used paradigm as a definition of consciousness. Now, we are assuming that the person does not have, for example, right-left dyslexia and that they are able to perform the task in the undrugged state.

Q. Are there any medical journals or medical documents or anything published that would support your definition that you gave earlier?

A. I gave you two definitions, but I can give you two different references in which

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they are applied.

So, for example, paper number 22 in my list of peer review papers, we used the ability to follow a command, raise your left arm, raise your right leg, as the definition of consciousness, and that was for the purposes of developing the algorithm that is now built into the BIS Monitor.

The paper whose data I relied on to construct my Exhibit D, which is a paper by -- Peter Glass is the senior author. In that study, they used the response to the name of opening their eyes as the definition of consciousness.

So, there's no one definition that's used in all research. But all of the examples I gave you are scientifically defensible.

Q. Does your model that you've given, I guess, in B, C, and D, address what happens in the first minutes of thiopental delivery?

A. Do you mean while the drug is being -- in the process of being injected?

Q. Right.

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A. I have calculated that, but I did not plot it. If you refer to, for example, figure B or Exhibit B, between zero and one minute, the thiopental concentration will gradually rise.

Now, one of the problems of actually plotting that is, as you can see, both the X and Y-X, these are logarithmic axes. So, therefore, zero cannot be plotted.

So, furthermore, how the drug approaches its peak concentration, which in this graph is roughly 240 micrograms per milliliter, has no relevance to the discussion. And, so, I didn't feel the need to display that with the inherent difficulties of displaying very, very low concentrations as they approach zero.

Q. And you're familiar with Dr. Henthorn's work on modeling of the onset of thiopental, correct?

A. Very. And we have no meaningful disagreements on the onset of thiopental.

Q. And you agree that his models that he's used is accurate?

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A. In general, that's true.

In the case in Missouri, I did pick up a calculational error that he made that is only relevant when large doses of thiopental cause huge decreases in blood pressure. But that is an error that he and I intend to correct when we write our review article together.

Q. And you would agree that Dr. Henthorn is an expert in the onset of thiopental?

A. In general, yes.

Q. Do you think he's more or less knowledgeable than yourself about that?

A. I think that he and I compliment each other very well. And I am not going to have, excuse my French, a pissing contest about who is smarter.

Q. I don't think I was asking who was smarter; I was merely asking whether you think he knows more about the onset of thiopental than yourself, or would you just equate yourselves as similarly situated in the field?

A. I think that he's done a lot of

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experimental work on it. I think he would concede that I have applied others' work in doing far more theoretical calculations in this context than he has. And I don't think it is fair to quantitate who's better at this than the other.

Q. But you would agree that he's an expert in the field?

A. That's why I asked him to be my co-author on this paper.

Q. When you list the probability of consciousness, your analysis doesn't include the risk of human error at all, correct?

A. In terms of the inadequate delivery of the drug to the circulation, that is true.

Q. What are the risks that you know of that are risks of human error in these cases?

A. Well, possible things that I acknowledge that could happen and are pointed out by your experts' reports include things like giving the drugs in the wrong order or injecting the drug backwards into the IV bag

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instead of forwards into the IV catheter or making a mistake in terms of how the drug is diluted and drawn up and put into the syringe. And all of these are certainly possible. But I have not seen any evidence that any of these individual mistakes have actually occurred in the past.

As I've said, the most common mistake of which I am aware or the most common misadventure, because it's not necessarily a mistake, is the administration of the medication into, apparently, what was not a working IV.

Q. So, you've never seen any incidents where someone has inadvertently swapped the syringes?

A. I am unaware that that's happened in a judicial execution.

Q. So, in your review of the Missouri executions, you never saw that?

A. That information was never provided to me that the syringes were swapped.

Q. How about mistakes in calculating dosages, have you ever seen that kind of

error?

A. My understanding of what happened in Missouri is that the physician making up the dilution deliberately decreased the dose without telling anyone so that he could use a smaller volume of Injectate. But even though it was a mistake in terms of not following the protocol, what he did was a deliberate action on his part, as far as I can tell.

Q. How about errors in the IV insertion?

A. I said that.

Q. And that's occurred in some states, correct?

A. As far as I can tell, it's probably occurred twice in the last couple of years.

Q. That you know of?

A. As far as I can tell.

Q. And that your model doesn't take that into account, correct?

A. No.

Q. And problems with the IV at all, your -- that's not one of the assumptions you

make in the graphs that you've provided?

A. For the seventh or eighth time, no.

Q. And it doesn't take into account any human error whatsoever?

A. For the ninth time, no.

Q. So, you would agree that your modeling doesn't give the court a complete picture of the risks of the lethal injection process?

A. Nor is it intended to.

Q. And those risks should be factored in, as well, by a court, correct?

A. I would hope so.

Q. But you don't give any information regarding them?

A. Because I'm not an expert on fault analysis.

Q. So, the only people that you think qualify, are qualified to provide that information, are people who have a degree or some experience in fault analysis?

A. I think there are people who could examine all the available data and come up

with a number that would be a percentage or probability that, on a given day, something is going to go wrong. And, so, for example, NASA has a number on what is the probability that there is a catastrophic failure the next time a shuttle goes up, and that is not a reassuring number, but they have experts that gave them the best guess that they could come up with. And a similar analysis could be applied to this protocol. I'm not the one to do it.

Q. Sir, can you go back, I think it's either Exhibit 1 or Exhibit 2. It's the letter from Orin Guidry, president of ASA. Sir, do you agree with his statement?

A. In general, I agree with this, but I also think it's important to remain consistent with a separate statement that the ASA has separately given on expert testimony by anesthesiologists. And that says something like -- and I am not attempting to provide an accurate quote -- but it says something like anesthesiologists with expertise have a

responsibility to offer their expertise in court matters.

And, so, I am certainly attempting to do that. And I am also attempting to remain distant from any direct participation that would be viewed as unethical.

Q. And he also indicates in there that if the courts demand sufficient anesthesia, then the only way is to have an anesthesiologist prepare and administer the drugs, correct?

A. And it is my belief that if a court orders an anesthesiologist to personally administer -- replace the IV and administer the medications -- that will have the effect of terminating the death penalty in that particular jurisdiction, because I find it difficult to imagine an anesthesiologist participating in such a manner.

Q. But doctors have, to some extent, correct?

A. My understanding is that doctors have participated and also were promised anonymity, which turned out to be impossible

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to guarantee. And based upon those experiences, I think the likelihood of finding a willing physician or anesthesiologist to participate is going to become, essentially, impossible.

So, obviously, it's up to the state and the courts to balance what ultimately they consider to be most important.

Q. And if the courts just determine that someone has to be properly trained or has to be in a position to assess anesthetic death or that the person has been properly anesthetized, what are the qualifications that you feel are appropriate to do that?

A. First of all, as I said before, I do not believe that it is necessary to be able to assess anesthetic death during an execution. I believe that that requires a significant level of experience that's probably not achievable by people that don't give anesthesia on a regular basis. It is relatively easy to teach someone how to assess likelihood of consciousness or unconsciousness, and it would be possible to

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train laypersons or persons who are paramedics -- paramedical professionals, not necessarily paramedics but paramedical professionals -- to do something like that.

Q. How about correction officers, could you train someone like that to be able assess whether someone is conscious or unconscious under your definition?

A. From a theoretical basis, probably, because a reasonable analogy is the course that provides basic life support training offered by the Red Cross or the American Heart Association. The very first step in basic life support is to assess the presence of unconsciousness in the victim, because it has been determined that CPR or basic life support should not be administered to a conscious individual.

So, it is the explicit belief of the Heart Association and the Red Cross that laypersons can be taught to determine that a person is unconscious before proceeding with BLS.

MR. SIEM: I'm going to mark as

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Exhibit 18 a document from the New England Journal of Medicine, "Pharmacologic Paralysis and Withdrawal of Mechanical Ventilation at the End of Life."

(Dershwitz 18 marked for identification.)

Q. I'm sure you've seen this also.

A. I have read it.

MR. DROLET: I haven't read it.

MR. SIEM: It's a great read.

Q. So, you've read that article?

A. Yes.

Q. And you've probably been deposed on it several times?

A. Actually, I don't think so.

Q. In that article, it indicates that neuromuscular function should be restored to facilitate the ability of clinicians to assess the patient's comfort. Do you agree with that?

A. In general, that's true, unless there's a competing medical reason to keep them paralyzed. But, in general, these sorts

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of determinations are being done in patients for whom therapy, continued therapy, is considered futile. And in such a situation, a patient, in general, should not be paralyzed.

The one potential exception would be, in my mind, if a person had intractable seizure activity -- and, by definition, they would be unconscious at that moment -- it might be reasonable to give paralytic drugs to mitigate the motor manifestations of such a seizure. But such a seizure is always associated with unconsciousness, and that is readily determined with an EEG. So, it's not an absolute one hundred percent fits all cases guideline, but I think it should be applied in the vast majority of people who are at the end of life.

Q. I think we touched on this a little bit earlier, but the thiopental onset versus pancuronium bromide onset, which is going to be quicker, is it the thiopental or pancuronium bromide?

A. If they're given simultaneously?

Q. If they're given in serial, so you

give the thiopental first and then you give the pancuronium bromide.

A. In the typical doses we're discussing here of two grams, the person should be unconscious before the injection of thiopental is even completed because, in a typical person, consciousness is initially lost after about 300 milligrams have been delivered. The effect of the remaining 1.7 grams is simply to keep them unconscious for a longer period of time.

Q. Sir, how are drugs tested to determine whether they can be used on human beings, generally?

A. In general, they're tested on laboratory animals, as well as in in vitro systems.

Q. And they usually go through some kind of clinical trial first before they're readily available to the mass?

A. In general, first tried in human volunteers. And, so, for example, that's why some of my former colleagues were paralyzed awake in the study of new muscle relaxants.

And then they are tested in small numbers of patients who have the disease or clinical entity at phase 2.

And then phase 3 is the large-scale testing in, typically, thousands of patients to make sure that the drug is both safe and effective for the purpose it was intended.

Q. And would you ever use a drug that had not gone through these proper clinical trials?

A. Sometimes drugs are used in what's called a compassionate use when the lack of testing is considered to be less important than a person whose life may depend on the drug. But, in general, that's rare.

Q. Have you ever used a drug that has not gone through the proper clinical trials, to your recollection?

A. Well, I've certainly used drugs as part of their clinical trials. I've given drugs as part of phase 1 to volunteers.

Q. And when was the last time you did that?

A. Back in the '90s.

Q. And do you remember what drugs that was?

A. For example, I was involved in a number of evaluations of drugs before they were approved by the Food and Drug Administration, including several drugs for nausea and vomiting and an intravenous opioid named remifentanil.

Q. And do you know -- I think we touched on this before -- but the drugs that are used in the Georgia Lethal Injection Procedures haven't gone through these trials for these purposes, correct?

A. I would take issue with that, because thiopental, the intent in the operating room is to render a person unconscious, and that is the use for which it is being applied here.

The other two drugs are being used in manners that are readily predicted based upon animal and human pharmacology. But I will agree that there is no clinical scenario when such doses are being given intravenously.

Q. Do you know if these amounts or these dosage amounts have ever been tested on animals in this manner?

A. I don't know about pancuronium, but large doses of potassium chloride have certainly been given in a similar weight-related or weight-adjusted dose to animals.

Q. And, so, the use that they're using these drugs for in the lethal injection context, these would be considered something called off-label uses, right? There's nothing on the label to say, use this in a lethal injection or anything like that?

A. Well, the one thing I would take issue with, rendering a person unconscious, either in the operating room or as part of the lethal injection protocol, seems to me to be an on-label use of thiopental.

Q. When you use a drug, you have to be someone who's trained and skilled in that -- using that drug, correct?

A. In clinical scenarios, yes. But I don't believe that judicial execution is a

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medical procedure. And, in fact, some states have defined it as that, that it's not a medical procedure. So, I'll leave it to others to decide how much training and experience one needs to administer these drugs as part of a judicial execution.

Q. Do you know what part of the proper procedure is for using a drug off-label?

A. In general, there is no procedure. The responsible physician mentally balances the advantages and disadvantages and the benefits and the risks and then uses the drug.

Not a single day goes by in my practice that I don't use a drug off-label.

Q. So, you don't have to go through any review board or anything --

A. Absolutely not.

Q. So, you just use drugs whenever you want in any way, shape, or form?

A. In general, I try to confine myself to uses that are supported by the literature. But because getting FDA approval is such an expensive process, that for many

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drugs and for many indications, that process has never been done.

Q. So, there is no -- in your hospital or your setting, there's no internal review board or anyone that just says, we should try this off-label, or gives you permission to use this off-label?

A. There may be situations where a new drug about to be used for the first time for a particular indication might warrant some oversight by the Pharmacy Therapeutics Committee. But for the typical drug that I use off-label, there's so much literature supporting the safety and efficacy for the off-label use that we don't bother.

Q. But you could at least review the literature before using it?

A. Well, not on a daily basis, because some things are just used every single day in my practice in an off-label way.

Q. Can you give me some examples of those, please?

A. I'll give you an example. Fentanyl, which is one of the most

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commonly-used synthetic opioids in anesthesia, is not approved to be given by the spinal or the epidural route, yet the majority of my patients get it by the epidural route.

Q. How about using a drug off-label for a different purpose than it's intended?

A. That is an example of a different purpose for which it was intended.

Q. How about for treating a different type of illness than the one that it's labeled for?

A. Well, anesthesiologists rarely treat specific illnesses, so that's not a good analogy for me to opine on. But it is done.

Q. You can't remember one, though, that you've done?

A. For example, when I'm the pain consultant for my hospital, which typically happens one or two days a month, sometimes I use in people with chronic pain syndromes atypical analgesics that are not your typical pain relievers. These involve, more likely, drugs that are antidepressants or anticonvulsants. And most of these uses for

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antidepressants or anticonvulsants are off-label. And, so, I don't write these orders, because I'm a consultant in that scenario. I may recommend to the treating team to use a particular antidepressant or anticonvulsant as part of a multi-model drug regimen for a person with chronic pain.

Q. Sir, do you know why in California you were not ultimately called to testify in the litigations there?

A. My understanding was that because the judge ordered them to find some local anesthesiologists who would participate hands-on in the execution, they chose two local people to do that. And my understanding is, again, just from the lay press, those people backed out at the last minute.

Q. But did you testify in any of the cases in California?

A. Whether some of the information I provided by phone was under oath and recorded, I just can't remember. It's been too long.

Q. Did you ever go to the court to testify?

A. I have never been in a California court.

Q. Sir, you also provided some information to Tennessee in regard to the revisions of their procedures, correct?

A. I had two long conversations with members of their committee charged with coming up with revisions to their protocol.

(Dershwitz 19 marked for identification.)

MR. WIEM: We have marked as Exhibit 19 the Review of TDOC Electrocution Process. This is Exhibit 19. And just for the record, it's a document entitled, "Review of TDOC Electrocution Process, Rachel Jackson Building, Conference Room 6A, April 9, 2007," as well as a second document dated March 28, 2007, which is also a "Review of the TDOC Electrocution Process."

There's also one dated March 30, 2007. And, also, we'll have -- and we also will be marking -- then we're going to mark as Exhibit 20 the minutes of the meeting from April 12, 2007.

Q. So, sir, which meetings were you present for or by telephone or take part in any way.

A. I was present by phone for portions of the meetings held on April 9 and April 12.

Q. And what was your role in these meetings?

A. To answer questions.

Q. And my understanding is that you edited the minutes from these proceedings, correct?

A. The person who made the first draft of the minutes was not a certified court reporter, nor was that person aided by a recorded or a recording of the conversation. And that person made what I consider to be unacceptable mistakes in conveying what I had to say. I can understand sometimes how those mistakes can happen, but I wished to set the record straight as best as I could.

MR. SIEM: We're going to mark as Exhibit 20 the April 12, 2007 minutes.

(Dershwitz 20 marked for

identification.)

BY MR. SIEM:

Q. Sir, what was inaccurate about these minute meetings when you reviewed them initially?

A. First of all, the title, which referred to an electrocution process, was silly, because we never discussed electrocution, or at least not in my presence.

The most problematic statement came from the April 12 minutes that said Deputy Commissioner Ray stated that Dr. Dershwitz suggested the one-drug protocol.

That is linguistically incorrect. I certainly discussed with them on April 9 in great detail the advantages of the one versus the two versus the three-drug protocol. And if it turns out that Ms. Ray thought that the advantages so outweighed the disadvantages of the one-drug protocol, she could have concluded that I thought that the one-drug protocol was a good idea.

And since I often speak in very long sentences with many conditional phrases,

I only wish that there was an accurate transcription of this meeting, and that would have caused both myself and the court a lot less anxiety and waste of time.

Q. So, those are the only changes?

A. There were some smaller changes. To find them, I would need to put the two versions, my version and their version, side by side.

There was also a misinterpretation on my part. Let me see if I can find it.

For example, on the second page, which is unnumbered, of the April 12 minutes, in the second paragraph, it says: "Ms. Inglis asked if there was a problem pronouncing death based on a physical (no heartbeat). The physician told her there is no problem with it because this is the way it is done traditionally."

I interpreted the word "the physician" as referring to me, because I thought I was the only one they were talking to that day.

But where it says, "present,

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physician by telephone," it turned out that there were several physicians separately available by telephone.

And the physician that is referred to in that second paragraph, I found out later, after I had corrected it, they were quoting the physician who was actually present on-site during the executions.

So, this just goes to show you the problems that are associated when non-experts attempt to provide a transcript of something that is going to be very, very important, and they do so in a completely non-expert way. Because it's clearly confusing to any reader that there's only one physician who is being quoted at this point in time when, in fact, there was more than one.

Q. Is Tennessee the only jurisdiction that asked you about the advantages and disadvantages versus a one and three-drug protocol?

A. Well, we had long discussions in California with a member -- I don't know if it's the Department of Corrections or the

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Attorney General's office in California, but somebody from that state had many conversations with me about the advantages and disadvantages of the different varieties of protocols.

Q. Can you list the jurisdictions that you had these conversations with?

A. My recollection is Tennessee, California, and I also had recent conversations with Delaware where I very recently testified, and the question of different approaches to the protocol was discussed there also.

Q. But you don't provide them an opinion or a recommendation; you merely just provide the advantages and disadvantages?

A. That is my intent, and I hope I'm doing a good job at it.

Q. And do you feel that if you gave them a recommendation, it would be a violation of your ethical obligation as a doctor?

A. Yes, if I came right out and said that I think the best way to execute somebody involves this, I believe I would be behaving

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unethically, and I make every effort not to appear to have done so.

Furthermore, in all honesty, as I testified in Delaware, I could care less which ultimate protocol was chosen, as long as the person making the decision has received the best scientific information that I'm capable of providing.

Q. In these notes, do you state that there should be a physical exam taken of the inmate?

A. I talked about the advantages and disadvantages of assessing consciousness or unconsciousness after the thiopental was given and before the pancuronium was given. And I left the ultimate decision up to them.

Q. Do you know if Georgia uses an EKG machine?

A. My understanding is that in the protocol it says they do.

Q. And have you reviewed any EKG printouts from that?

A. Not from Georgia. From other jurisdictions, yes.

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Q. What do you see from other jurisdictions?

A. The EKG goes from relatively normal-appearing to disappearing to relatively flat line within a minute.

Q. And you would expect that to be similar to what happens in Georgia?

A. Assuming that the drugs were delivered through a working IV, yes.

Q. I think today you testified and in Forte you testified that consciousness is like pregnancy, and you're either conscious or you're not, and you're pregnant or not, right?

A. In general, that is a reasonable definition of "consciousness."

As a pharmacologist, I prefer to use the term "hypnosis" when one attempts to grade depths of the level of hypnosis.

Q. And can you cite any treatise or document that would support that definition?

A. Well, certainly, my own research that was published in the paper that I quoted to you earlier also used "consciousness" as an all or none thing. And the paper by Glass,

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whose data was utilized in my formation of Exhibit D, used "consciousness" as an all or none thing.

I will accept that there are people who wish to measure depths of unconsciousness. And as long as they are applying appropriate tests, then my only quibble with them is linguistic. I prefer to use the word "hypnosis" when we're talking about a graded variable and the word "consciousness" or "unconsciousness" when we're talking about a quantal variable.

Q. We talked a little bit about a thiopental concentration of seven micrograms per milliliter, producing an unconsciousness in 50 percent of the people?

A. Correct.

Q. What level is needed to produce surgical anesthesia in virtually all individuals?

A. That's a much, much higher number. But those studies required that the person not only or the patient not only be unconscious but have no blood pressure response to surgery

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and no movement in response to surgery. And in order to achieve a total anesthetic state, meaning not only consciousness is lost, but the patient doesn't move, and the patient doesn't have a sympathetic response to the surgical stimulus or the noxious stimulus, one actually needs thiopental concentrations of 50 to 75 micrograms per milliliter. And what that shows you is thiopental, although it's a very good hypnotic drug, it's a lousy drug to use by itself to provide the complete anesthetic state.

Q. And how much thiopental would you need just to put someone to sleep, in what concentrations?

A. It depends on what probability of consciousness one is willing to accept, and those numbers can be derived from my Exhibit D.

Q. And how much is necessary, do you think, to ensure that a person is insensitive to pain?

A. Are you speaking as part of clinical anesthesia or judicial execution?

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Q. How about let's first start in surgical anesthesia.

A. Well, almost no one that I know of would attempt to do an anesthetic today with only thiopental, because it's a lousy drug to achieve the complete anesthetic state.

Q. And how about in a judicial execution?

A. In a judicial execution, you should refer to Exhibit D in my expert report and determine what level of probability of consciousness you, assuming you're responsible for making the protocol, are willing to accept.

Q. And what has Georgia accepted, do you know?

A. Well, they apparently have accepted a probability that is only a tiny fraction of one percent through 30 minutes, and still less than one percent probability of awareness even 60 minutes after the administration.

Q. And, so, the amount of thiopental needed to put someone to sleep is going to be

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lower than the amount that's needed to render someone in an anesthetic state for surgery, correct?

A. Yes. But I expect that my answer is going to be widely misinterpreted. I don't think it matters if an inmate manifests a sympathetic response to the pain from potassium chloride if that person remains completely unconscious.

Q. How do you think that would be misinterpreted?

A. Because the inmate still might respond, in quotes, to a noxious stimulus at certain blood concentrations of thiopental. But if that person were indeed unconscious, that response is, from their perspective, subconscious and clinically meaningless, because they're minutes away from dying.

It would be different in clinical anesthesia where, in general, we attempt to keep the patient's blood pressure not too high and not too low.

Q. Sir, are you familiar with the work of Dr. Donald Stanski?

A. Much of his work. Not all of it, but, certainly, much of it.

Q. And you consider him to be a highly-qualified anesthesiologist, correct?

A. In general, yes, although I believe he's no longer practicing anesthesia. But he certainly pioneered many of the principles that we hold near and dear in our specialty.

Q. And you've actually used his papers to formulate these graphs, correct?

A. Yes.

Q. And Dr. Stanski says in his textbook that we marked as 10 that anesthetic depth ranges from one hundred percent probability of an easily-suppressed response, verbal answer, to a mild stimulus, e.g., calling one's name, and readily-suppressed responses, e.g., verbal answers, to a one hundred percent probability of non-responses to profoundly noxious stimulea, e.g., intubation, and responses that are difficult to suppress, e.g., trachea cardia. Table 31-1 lists the components needed to define

anesthetic depth.

It seems to me from his definition that it provides a range of anesthetic depth, and it's not an either/or proposition that you've taken.

A. Furthermore, he is speaking to an audience whose job it is to provide an adequate depth of anesthesia safely to a patient. And in such a scenario, it would be imprudent to ignore one component of the anesthetic state in favor of another.

So, by virtue of some of the very complicated graphs that he's drawn, one attempts to integrate the various components of the anesthetic state in a way that a clinician can find useful in taking care of a patient.

I would contend that in the context of a judicial execution, if the inmate is unconscious, it doesn't matter at all what that person's sympathetic nervous system is doing, as long as unconsciousness is preserved.

Q. So, your definition of being

pregnant or not, that analogy, is more for judicial executions; it is not for a surgical setting, is that correct?

A. Absolutely not. The assessment of consciousness as an all or none thing is one component of the global assessment of depth of anesthesia. But depth of anesthesia includes unconsciousness, analgesia, reflex oblation, muscle relaxation, and amnesia.

Q. It just seems to me that Dr. Stanski's definition, as compared to yours, is just inconsistent.

A. Absolutely not. You couldn't be further from the truth. Dr. Stanski, if he would be here, he would tell you that the presence or absence of consciousness is a very important indicator that is part of other indicators that one factors into the overall depth of anesthesia.

Q. But it doesn't -- so, your component or your either/or proposition is a component of his depth as he's defining it?

A. Yes.

Q. So, when you defined this to the

Florida Commission and to me earlier, it's really about being pregnant; it's an either/or proposition. The depth of anesthesia is much more complicated than just this either/or proposition that you're giving us today?

A. Correct. And that is why I admit that depth of anesthesia can be assessed only by very well-trained and very experienced anesthesia providers.

However, I also believe that for the purposes of a judicial execution that would be humane to my layperson's way of understanding humaneness, assessing depth of anesthesia is not necessary, because the other components of the anesthetic state, other than consciousness, are not important to the inmate, and they're not important to the state.

Q. In the execution of Angel Diaz in Florida or Angel Diaz, if a qualified person had been monitoring his anesthetic depth or whether he was conscious or unconscious, there would be no question whether Mr. Diaz in Florida suffered conscious asphyxiation, would

there?

A. It is my belief, and as I told the California Commission --

Q. I'm sorry, the Florida Commission, correct?

A. You're right, the Florida Commission. That if an assessment of consciousness was performed after the thiopental and before the pancuronium, I believe a reasonable person would not have proceeded to order the injection of the pancuronium.

Q. And it's true that a number of corrections, Departments of Corrections and courts are now requiring that there has to be some monitoring of whether someone is in a proper anesthetic depth or not, correct?

A. No. What they have ordered or adopted as part of their protocol is an assessment of the presence or absence of consciousness.

Q. So, North Carolina uses a BIS Monitor that we talked about or is attempting to use it, correct?

A. Well, they do use it. And what the BIS Monitor displays is a number from zero to a hundred. One can then look up on a table, which I've actually published, what is the probability of consciousness at this point in time. And other jurisdictions have adopted or are adopting physical examination typically using a graded stimulus that starts out trivial and proceeds to more intense to assess the probability of consciousness or conscious versus unconscious state prior to administering the pancuronium.

Q. And, in Indiana, your understanding is that there's also a determination whether the person is conscious or unconscious, correct?

A. When you say Indiana, are you referring to the federal correction facility in Terre Haute or the state of Indiana?

Q. My understanding is that Indiana, the state, requires the warden to talk to the inmate.

A. I have had no interaction with the state of Indiana, so I have no idea. I do

know that the federal protocol that's used in the prison at Terra Haute has a determination of consciousness step in the protocol after the thiopental and before the pancuronium.

Q. And, in Florida, they're going to attempt to also determine whether someone is conscious or unconscious?

A. I have no specific knowledge of that.

Q. Do you know if in California if they are going to do that?

A. I have no specific knowledge of that.

Q. Do you know anything about the Taylor case in Missouri, what the court has ordered in that case?

A. In Missouri, there is a determination of consciousness step in the protocol, and my understanding was that version of the protocol was found to be constitutional by an Appellate Court.

Q. Do you disagree with the court's decisions to require the Department of Corrections to monitor anesthetic depth?

A. I don't have an expert opinion on that. That's a legal determination that's way beyond my ability to balance the legal benefits and risks or advantages and disadvantages. So, I don't have an expert opinion on that.

Q. Are there any disadvantages to requiring the monitoring of an inmate before going to pancuronium?

A. If the person doing the monitoring is required to be a health care provider, exposing that person's identity to the witnesses could potentially be very deleterious to that person's career.

Q. But there are ways to prevent that, correct?

A. Well, certainly, the person could wear a ski mask, or the person doing the assessment could be a corrections person who was trained to do the assessment. That may not be as good as having a paraprofessional do it. But, typically, corrections personnel do not mind having their identities exposed to the public. These are all advantages and

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disadvantages over which I do not have an opinion.

Q. Do you know whether Georgia has any intention of monitoring whether an inmate is unconscious or conscious?

A. It's not in the protocol, as far as I can tell.

Q. And no one has given you information that they will or not do that?

A. As far as I know, the version of the protocol dated June of this year is the current version of the protocol.

Q. If an execution team member was to determine whether someone is -- if an execution team member is required to assess anesthetic depth or determine whether someone is properly anesthetized, how best would they be in a position to perform that task?

A. First of all, my answer would be different if that member of the execution team is a medical paraprofessional as part of their day job versus a person who is primarily a prison guard.

Q. Let's assume, first, let's go with

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a paraprofessional.

A. Second of all, that person is not assessing depth of anesthesia; they're assessing unconsciousness versus consciousness.

Q. Okay.

A. And there are relatively simple procedures that could be performed. Typically, one would move from a very benign stimulus, and one could proceed through several steps, each one being slightly more stimulating, to then convince oneself that the person is unconscious.

Q. And how about if it was a Department of Corrections person?

A. The algorithm could be the same. The difference would be that the latter person might not be doing such an assessment as part of their day job.

But, for example, this type of consciousness versus unconsciousness assessment is done by medical paraprofessionals all the time, EMTs, nurses, paramedics, et cetera, et cetera, and it's not

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difficult.

Q. Would you advise or would you say that there would be an advantage to having them at the bedside rather than doing it from a distance?

A. Well, typically, the first step in the assessment would be, without touching the person, call their name and ask them to open their eyes. So, that could be done remotely by intercom.

As the level of stimulus is increased to, for example, touching their eyelashes and gently shaking them and then possibly providing a noxious pinch, that would require somebody to be at the person's side.

Q. Do you think it would be proper for them to use like multiple modalities recommended by the American Society of Anesthesiologists?

A. Some of those modalities that are recommended by the ASA are not applicable in a judicial execution, because, for example, the ASA talks about monitors that could measure the level of anesthetics in the person, and

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that only applies to anesthetics that are given by inhalation. We don't have a real-time way of measuring the amount of thiopental in the body in real time. So, such recommendations by the ASA are not applicable here.

It is certainly possible to couple physical examination with an EEG monitor to provide two different types of information.

Q. So, what they could do -- there are many different ways that they could assess whether someone is conscious or unconscious, correct?

A. I guess it depends on your definition of "many." I could think of around a half a dozen different things that could be done realistically in the injection chamber.

Q. And none of those are done in the Georgia procedures?

A. As far as I know, no.

Q. Can you tell whether someone is properly anesthetized just by looking at their face?

A. That is an assessment that has

high specificity and low sensitivity to a statistician.

So, for example, if the person continues to voice objection to what's going on, clearly, they are not conscious, and, clearly, something amiss is happening if it's at a point in time where that person should be unconscious.

On the other hand, if the person is lying there peacefully or apparently peacefully, it's possible they're asleep, and it's possible they're just lying there peacefully wide awake.

Q. So, it would be difficult to do?

A. Well, a positive result has very different meaning than a negative result is what I'm trying to say. If the person is actively doing something indicating consciousness, that's great evidence that they are not unconscious. But if the person is lying there placidly, it is not such great evidence that they are indeed unconscious.

Q. Would you be able to tell -- if someone was given the sodium pentothal and

then given the pancuronium bromide, would there be any way from a distance to tell that they were anesthetized?

A. If the person was wide awake when the pancuronium bromide was starting to take effect, since the amount of time it takes to complete blockade of skeletal muscle is measured in minutes, not seconds, I expect that a reasonable wide-awake person would complain that they feel weak and they're having difficulty breathing.

Q. So, at what level would -- at what depth of anesthesia would someone have -- let's take a step back. At what amount or what concentration in the blood would prevent someone from alerting that they were feeling weak from the pancuronium bromide?

A. If they were conscious and were feeling weak or having difficulty breathing, I expect that they would at least attempt to vocalize that difficulty. And if they were unconscious, they would be unable to do so.

Q. So, again, it's either/or; they're either conscious or unconscious?

A. That is probably the most proper way to evaluate what's going on here.

Q. Do you know what parts of the body the inmate -- of the inmate are covered during an execution?

A. No, I have no specific knowledge.

Q. Do you know whether the nurse or anyone else can see where the site is for the IV access?

A. I have no specific knowledge.

Q. So, you don't know whether or not they could monitor whether it's been infiltrated?

A. I have no specific knowledge.

Q. One of the things that you've indicated is that anyone could really determine if someone is unconscious or conscious. Why does the American Society of Anesthesiology say that someone should be especially trained and qualified to do this?

A. They don't. They say that you need to be especially qualified to determine depth of anesthesia.

Q. So, you don't need to be specially

trained to determine if someone is conscious or unconscious?

A. Lots of lay people do it every single day, and lots of medical paraprofessionals do it every single day.

Q. Do you think the state of Georgia should monitor anesthetic depth?

A. Certainly not anesthetic depth, because that requires having an anesthesiologist at the bedside, and I think that's a bad idea, to ask an anesthesiologist to do that, or an anesthetist.

Whether or not they should make an assessment of the presence or absence of consciousness is something that only they can decide after they have properly considered the advantages and disadvantages.

MR. SIEM: Why don't we take a short break.

(Short break.)

BY MR. SIEM:

Q. Doctor, do you agree that blood pressure and heart rate can also reflect awareness?

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A. No.

Q. Consciousness?

A. There's actually excellent data to show that there's very poor correlation between consciousness and either movement and/or hemodynamic responses.

Q. How about consciousness?

A. I just said that.

Q. How about awareness? So, both consciousness and awareness equate?

A. Consciousness and awareness are the same thing. And there is very, very poor correlation with hemodynamic responses or movement.

Q. Is there any correlation?

A. Not in a meaningful way.

Q. How about to pain?

A. Same thing. Phrased another way, patients who have reasonable values for heart rate and blood pressure and who didn't move have been aware.

Q. Sir, in any of the EKG logs that you looked at, have you seen any that have indicated it's anything other than potassium

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chloride causing the death of the inmate?

A. No.

Q. Have you seen any other information that would show that any other drug besides potassium chloride was what actually killed the inmate?

A. No.

Q. So, if the inmate is alive until killed by the potassium chloride, there is a chance that they can experience pain and suffering from suffocation, as we've described with the pancuronium bromide, correct?

A. If they were conscious. And, furthermore, suffocation is the wrong term, because suffocation implies a mechanical obstruction to gas exchange, which is completely different from a person who is paralyzed and can't ventilate. Suffocation is what happens if you put a pillow over someone's face.

Q. So, what would you call it?

A. I would call it paralysis.

Q. And someone would be feeling that paralysis, there's a chance of that if the

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potassium chloride is what's killing the inmate, correct?

A. Assuming that the thiopental has not been successfully delivered.

Q. One of things you said earlier was you try to limit your comments to the pharmacokinetic issues, correct?

A. No, to pharmacologic issues in general. And that also includes things like the delivery of the medications and the assessment of the effects of the medications.

Q. You testified and provided an affidavit in the In Re Lewis in Ohio, correct?

A. I believe that might have been the very first case in which I was involved.

Q. And in that case you commented directly about the skills of the personnel involved in the execution, correct?

A. You would have to show it to me. I think I wrote it four years ago.

Q. In your declaration which I -- for some reason, we can't find -- you indicated: "I have reviewed information relating to the training and experience of the person who

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prepares the solution and administers the injections of the thiopental sodium, pancuronium bromide, and potassium chloride. It is my understanding that the person who administers these drugs is a licensed emergency medical technician paramedic. Under Ohio and Massachusetts law, EMT paramedics can prepare and administer drugs. Both Ohio and Massachusetts law are consistent with the requirements of the EMT Paramedic National Standards Curriculum."

Does that sound familiar?

A. Yes. So, for example, you suggested that I directly commented on the expertise, the training of this individual, and I was -- in contrast, I was speaking in terms of generalities there, that a person who works as an EMT paramedic and is required to mix up drugs and inject them as part of their job is probably capable of doing so as part of a lethal injection process. But I have no specific knowledge then or now of the individual who was responsible for this other than the fact that they were a licensed EMT

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paramedic.

Q. There's a couple of issues I have with your statement. First is, is an EMT qualified to administer intravenous and anesthetic drugs?

A. That depends on the jurisdiction, because EMT and paramedic definitions vary from state to state. So, for example, in Massachusetts, a paramedic has significantly greater training and is typically credentialed to do more things than an EMT is.

Q. How about in Ohio?

A. My understanding is, in Ohio, although it's been four years, my recollection was that they used a similar differentiation between EMTs and paramedics and that their paramedics were similar to the ones that we have in Massachusetts.

Q. And, sir, in this case in Ohio, they've actually had problems getting in IVs, correct?

A. There was a case that you quoted to me, whose name escapes me right now --

Q. Joseph Clark?

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A. -- where it appears that the IV was not in the right place.

Q. In fact, the ME who performed Mr. Clark's autopsy said that the multiple injection attempts suggests inadequate technical skills of the personnel involved in carrying out the procedure.

But your position is that people who are trained or EMTs are qualified to do this, correct?

A. I think, in general, that is a reasonable level of qualification. Because if we let these people regularly put IVs into our patients, isn't that a reasonable litmus test for letting this person put an IV into an inmate? Why should we require a greater level of expertise for putting in an IV in an inmate than putting in an IV in someone who is about to enter the health care system?

Q. But doesn't it show that the people who were involved in that weren't competent to do this?

A. No, because I also take issue with the medical examiner, because there were cases

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in which I had many, many, many attempts to put an IV in.

Q. 19?

A. I can't remember if I've had 19. I've certainly had two-digit numbers of attempts. And I'm really good at this. I'm really good. And I failed more than ten times. So, I think it should not be looked upon in a vacuum. One has to look at did this person have compromised veins? The answer is, I don't know. So, I can't draw conclusions from this without having more information.

Q. But you take issue with the ME who stated that this suggests inadequate technical skills of the personnel involved in carrying out this procedure?

A. He may or may not be right, but he hasn't provided enough information for us to draw a conclusion. For example, elsewhere in the autopsy, did he comment on whether the person had compromised vasculature? Was this person an inmate with track marks all over the place? Was this person morbidly obese?

Q. And, so, those are the things that

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you would have felt that you would need to know whether that person was trained or properly trained or not?

A. Not properly trained, whether they had good skills or not. If the patient had been on steroids for some reason, not the steroids that athletes may abuse, but the steroids that are used to treat immunological disorders, those drugs cause one's veins to become exceedingly fragile. And placing an IV in someone who has been on long-term steroid therapy can be very difficult. So, I'm not defending the person as being qualified or unqualified. I'm saying that I need more information before agreeing with the medical examiner in terms of the statement that was made.

Q. Do you know in Georgia whether they've had these type of issues in finding a vein?

A. I have no specific information.

Q. We talked earlier a little bit about evaluating the competencies of execution personnel, and it's something you're not

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willing to do, evaluating individual competencies, correct?

A. I'm not capable of doing so, remotely, so I'm not going to do it.

Q. Do you think that it's important for states to screen out the individuals to make sure that they have some level of intelligence, moral character, things like that?

A. I answered that already.

Q. Can you answer it again, please?

A. Yes.

Q. And that screening failed in Florida, correct?

A. I actually have no idea. I don't know if the person who put the IV in had an immoral character or not.

Q. How about the screening in Ohio?

A. I don't know.

Q. And how about -- it clearly failed in California, correct?

A. I don't know.

Q. They were on drugs; there were DUIs, post-traumatic stress disorder.

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A. I have no specific knowledge of that.

Q. One of the individuals, JD3 prisoner deserves pain because he's inflicted pain on others, right?

A. I have no idea.

Q. And you've never reviewed any of the testimony in California related to this?

A. By execution officials?

Q. Yes.

A. No, I haven't. I was never asked to.

Q. Sir, and your testimony in Taylor versus Proffer was that you indicated that I am aware -- I am unaware of a study in which a human was given a large dose of paralytic drug with no sedation and had their BIS measured concurrently, correct?

A. At the time and to this day, I don't know of someone who's been in the completely unsedated state, given a large dose of paralytic drug, and had their BIS value recorded.

Q. And when was your testimony in the

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Taylor versus Crawford case, do you recall?

A. I don't remember the date.

Q. Does June 13, 2006 sound familiar?

A. If you have data that suggests that's the date, I have no reason to quibble.

(Dershwitz 21 and Dershwitz 22 marked for identification.)

Q. Sir, in Exhibit 21, you can see the testimony I was referring to is at 313 to 314.

(Short pause.)

Q. Have you seen Exhibit 21 or 22 before, sir?

A. Presumably, I said everything in Exhibit 21.

Q. Have you seen that Exhibit? Have you seen that testimony before, or did you ever read your testimony?

A. No.

Q. And have you ever seen this article by M. Messner, MD?

A. No. I'm actually reading it with interest right now, if you'd give me a few minutes.

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Q. Take your time.

(Short pause.)

Q. Have you completed reading it, sir?

A. I've read the abstract.

Q. Have you seen this document before?

A. No.

Q. However, even though you hadn't seen it, did you do any research prior to testifying in the Taylor versus Crawford case that you were unaware of a study in which a human was given a large dose of paralytic drug with no sedation and had the BIS measured concurrently?

A. Certainly, before my testimony, since I was not expecting the question, I hadn't done a specific search, but I do keep a file on papers pertaining to the BIS Monitor. And, for whatever reason, this one had escaped my prior reading.

Q. So, you were incorrect, then, in your testimony. Do you think you should have done some research before testifying in that

way?

A. Absolutely not, because I had no idea that they were going to ask me that question. That was a completely unanticipated question. But I am, in general, familiar with the literature, since I was one of the people that did some of the earliest studies on this monitor as it was in development.

Q. And, sir, you also provided a declaration in Brown versus Beck, correct? Do you remember that case in North Carolina in the Western District? It's the third affidavit, I think, is what we're citing.

(Dershwitz 23 marked for identification.)

Q. Sir, paragraph 11, you state that it is my opinion beyond a reasonable degree of medical certainty that the utilization of the BIS Monitor as part of the execution protocol as described above will prevent the possibility of the inmate being awake during the administration of the pancuronium or potassium chloride. Is that correct?

A. Yes.

Q. What does the BIS Monitor do to prevent awareness?

A. What the BIS Monitor does is displays a value which is highly correlated to the probability of consciousness.

Q. But it's not the BIS Monitor itself. You mean that the persons interpreting the BIS Monitor can take steps based on reading and interpreting the BIS Monitor to prevent awareness, correct?

A. Their protocol mandated that the BIS Monitor was going to be observed by a physician and a nurse.

Q. So, those are the individuals who actually prevent someone from being awake or from preventing awareness?

A. As well as the pause built into their protocol that the pancuronium would not be administered until the BIS value had been dropped.

Q. What does it mean to be beyond a reasonable degree of medical certainty? What do you mean by that term? You use it quite often.

A. More likely than not.

Q. More likely than not?

A. Yes.

Q. So beyond 50 percent?

A. That is my understanding in non-criminal cases, that a reasonable degree of medical certainty means more likely than not. It's different from beyond a reasonable doubt, which is the standard in criminal cases.

Q. Is there a criminal or is there a legal term that says, "beyond a reasonable degree of medical certainty," or are you just interpreting that to be more than 50 percent?

A. My understanding, and this probably varies from jurisdiction to jurisdiction, but when I've testified in medical malpractice cases and have been instructed about whether my opinion is beyond a reasonable degree of medical certainty, the test that I have been told to use is is it more likely than not, yes or no?

Q. And don't you think that you should have done a little more research

regarding the BIS Monitors and pancuronium bromide and whether there was some information regarding that before testifying in the Crawford case as to an assurance there's nothing that you know of that would impact the BIS Monitor?

A. Well, there's certainly things that impact the BIS Monitor, and one of the first things I'm going to do after I leave here today is, because I have excellent contacts at Aspect Medical Systems, I'm going to ask them to explain to me why they think that this particular paper disagrees with so many other papers that showed that there's a great correlation between the BIS value and the probability of consciousness.

Now, I do note that the monitor that was used here is called a Monitor A1000, which is the first one that they introduced, and that is considered archaic. It's not the one that was used in North Carolina, and it's not used in any operating room anymore that I know of.

I also know that as time has gone

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on, they have modified their algorithm in an attempt to remove two types of interference. One is the interference from cautery devices used in surgery. The other interference is from muscle. So, that may or may not have affected this paper. But, right now, I'm not in a position to intelligently discuss this paper. But, clearly, its results are in contrast to the bulk of the other papers that have certainly undergone peer review.

MR. SIEM: Exhibit 24.

(Dershwitz 24 marked for identification.)

Q. You also provided a rebuttal report in Walker versus Johnson on February 3, 2006, is that correct?

A. Again, the names of these cases are not in the forefront of my memory.

Q. Do you know whether a BIS Monitor will work with an animal?

A. It actually will. I have knowledge that the BIS Monitor has been successfully used in pigs, as long as the pig was large enough to accommodate the electrode

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array.

Q. Do you have any knowledge regarding whether Aspect Medical -- is it Aspect Medical?

A. Yes.

Q. -- is in agreement that their BIS Monitor should be used in judicial executions?

A. They consider it to be an off-label use and, therefore, they oppose it.

Q. And if they had known in North Carolina that they were going to use that, they would have not sold it to them, is that correct?

A. They might have tried, but the entity that purchased the BIS Monitor in North Carolina is a hospital, and it is my understanding that a licensed health care facility is able to buy FDA-regulated medical devices. So, I'm not sure they could halt a sale to a licensed medical facility.

Q. You're not sure whether a supplier can decide who they sell to or not?

A. That's correct. Under FDA rules, my understanding is if you are a licensed

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health care facility, you can purchase an FDA-regulated medical device.

MR. SIEM: The next is 25, Scott Kelley affidavit.

(Dershwitz 25 marked for identification.)

Q. Have you seen this before, sir?

A. I sure have.

Q. And Mr. Kelley indicates that he believed that they were using this for medical purposes when it was sold?

A. It's Dr. Kelley.

Q. Dr. Kelley, thank you. And that he would have prevented the sale had they known the true purpose?

A. That is his statement. However, far be it from me to give you or anyone else legal advice. But it is my understanding that they cannot withhold sale of this device to a bona fide health care facility.

Now, what the health care facility does with it after it's in their possession is something else.

Q. And he goes through a list of

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concerns that he has regarding this use. And an example is paragraph 12: "The BIS Monitors have never been tested or submitted for approval or approved by the FDA for the use intended by the defendants." Correct?

A. Correct. He's describing an off-label use.

Q. "And, furthermore, as the operating manual notes, the BIS Monitor is intended for use under the direct supervision of a licensed health care professional or by personnel trained in its proper use."

A. And that is an FDA requirement.

Q. And do you know whether in North Carolina they were going to use that or not?

A. They were. The BIS Monitor was going to be monitored by a physician and a nurse.

Q. And it's still your contention that using a BIS Monitor is an appropriate use in executions?

A. I think there are advantages and disadvantages to using it, and one of the advantages is that it may decrease the overall

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risk of the inmate being awake and paralyzed under the effects of pancuronium. And one of the disadvantages of its use, as it turned out, in retrospect, to have been a legal lightening rod. And I have been told by other jurisdictions that despite the fact that the monitor has behaved well in assisting North Carolina, they are reluctant to enter into that additional type of litigation.

Q. Sir, as we talked about before, you testified before the Florida Governor's Commission in regard to the Diaz execution, right?

A. Not just the Diaz execution, but I spent more of my time, as I remember it, discussing their attempts at protocol revision and answering their questions about the protocol rather than trying to figure out what happened to Mr. Diaz.

Q. You didn't review the Florida procedures at all, correct?

A. I don't remember if they sent me a copy of a protocol or not.

Q. Well, during the commission, you

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indicated that you hadn't read them, you did not review the Florida protocol used to execute Mr. Diaz?

A. If I said it at the time, then that's accurate, because that was current information, which I can't keep track of this far in the future.

Q. And since that time, have you had a chance to review the Florida protocols?

A. I believe so, because subsequent to that, they retained me as an expert, and I testified. So, I can only assume that they gave me that to review. But you have to understand, my memory about these minutia is not great, and I have a hard time remembering which piece of paper I read on a given date.

Q. Do you have an understanding as to what occurred in Florida that caused this execution to be botched in Mr. Diaz's execution?

A. I can guess, but I can't say certainly.

Q. Can you guess for me, please.

A. I've already said that. I believe

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that he had probably two nonfunctional intravenous catheters.

Q. And do you know whether they followed their procedures in Florida when performing that execution?

A. I'm pretty sure they didn't because -- again, this comes from the papers, the press, not from anything official -- but my understanding is when they switched from the first IV to the second IV, they did not repeat the entire injection protocol as their protocol was supposed to be done.

Q. Do you know whether Florida's protocol is better or worse than Georgia's?

A. I have no opinion on that.

Q. Have you ever compared the two?

A. I would not compare anything like that.

Q. And why is that?

A. Because it's not up to me to decide what's better. I virtually never use the word "better" in a legal sense.

Q. Do you know if the risks inherent in the Florida procedure are also inherent in

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the Georgia procedure?

A. I might be able to compare them if I had the protocol at hand, but I have no specific recollection of what it does or does not say.

(Dershwitz 26 marked for identification.)

BY MR. SIEM:

Q. Before we get into that, so we can try and get this all done in one day, what are the changes that were made in this report as compared to your other report?

We're going to mark this as Exhibit 27.

(Dershwitz 27 marked for identification.)

A. On page 2, paragraph 6 --

Q. Can you just write them in there, or was it already changed in this one?

A. I don't understand.

Q. This is the corrected one?

A. It's not really corrected.

Q. It's changed?

A. It's a different version.

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Q. You also have your original expert report that I think I marked as an Exhibit, I think, 2?

A. If you'd like me to make a mark that shows you where the corrections are on this version --

Q. That would be fine.

A. On page 2 in paragraph 6, I assumed that the 2,000 milligrams of thiopental would be injected over a period of two minutes, instead of one minute.

Q. Okay.

A. And then on page 3, the probabilities listed in paragraphs 9, 10, 11, and 12 changed by a small amount.

Q. And how do you account for that change?

A. Because if the drug is given more rapidly, there is a higher initial peak concentration. But after a period of time, it essentially falls to the same level after about a half an hour.

So, the only difference that would be apparent to a statistician is, in Exhibit

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B, the five-minute time point. But even that one is not clinically meaningful, because whether the drug is given over one minute or two minutes, it's such a tiny fraction of one percent that the difference is meaningless.

Q. So, it's only in Exhibit B that there was a change?

A. Or C. The same table is inside the figure in B and C. And you'll find that the only meaningful difference in thiopental concentration occurs at five minutes in the table. But the corresponding difference in probability of consciousness is not clinically meaningful, because a tiny fraction of one percent is the same as a tiny fraction of one percent.

And, if you notice, the thiopental concentrations from ten minutes to 133 minutes are not significantly different.

Q. And those changes were made based on representations made by counsel?

A. What Mr. Drolet said is he would like me to be prepared to discuss my predictions if the drug was given over two

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minutes instead of one minute.

Q. But there's no discovery you've seen that it takes two minutes instead of one minute?

A. No.

Q. Just an assumption?

A. I assumed one minute on my own without asking anyone.

Q. Usually, do you ask when preparing these charts on how long it takes?

A. My recollection is usually not, because for doses of two or three grams, I usually assume around a minute. And for doses of five grams, I've usually assumed around two, two and-a-half minutes. Because that's probably how long it would take me to put the drug in. But if a particular jurisdiction is doing it slower, it will have a tiny, but not medically meaningful difference, in the overall behavior of the drug.

Q. If you could just turn to the Florida procedures again. I think it's Exhibit 26. If you look at -- under Specific Procedures, it says: Selection of the

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Executioners. Sir, it's on the first page.

A. I'm looking for something else.

Q. Okay.

(Short pause.)

A. Okay. Now, the specific paragraph you want me to look at?

Q. It's on the first page, 2A. It says: The Selection of Executioners. And it provides for the warden to do that, correct?

A. Apparently.

Q. And do you know if Georgia, in Georgia, who selects the executioners?

A. I have no specific knowledge.

Q. And in regard to B, the Selection of the Execution Team on the next page, 3065, in the bottom right, if you look at number 3, Selection of the Execution Team, the warden also selects the execution team members, is that correct?

A. Yes.

Q. And do you know if in Georgia whether they do that or not?

A. I have no specific knowledge.

Q. And if you look at -- if you read

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that same paragraph, it indicates that the team members are supposed to be appropriately licensed and credentialed, correct?

A. Is that paragraph 3?

Q. Yes, Necessary Licensure or Certification. Do you know if they require that in Georgia?

A. I have no specific knowledge.

Q. And if you'd turn to 10B, this provides for the designated members of the execution team to mix the drugs and prepare the syringes for a designated member of the execution team to insert peripherally by a designated member of the execution team in the presence of one or more additional members of the execution team, including an independent observer from the Florida Department of Law Enforcement will prepare the lethal injection chemicals as follows. Correct?

A. Yes.

Q. Do you know if they required that in Georgia?

A. I have no specific knowledge.

Q. In 12K, if you can turn to that,

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it indicates that there's a designated team member that should insert the IV, peripheral IVs. And if they can't find a peripheral IV, they do the central line, as we called it, or a peripheral venous access, in the next one, 12L. It says that, right?

A. Yes.

Q. Do you know if they have that in Georgia?

A. There's certainly -- my understanding is the provision is available for a physician to perform what they call a central line if the execution team can't get peripheral access.

Q. And then in 14E, which is a couple of pages later, it provides for some contingency plans. Do you know whether Georgia has any of these contingency plans?

A. I could only assume that these plans have been formulated because everything is done in duplicate. But I don't know if it's been specified like this.

Q. Okay. So, despite requiring appropriate licensure and credentialing,

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despite the warden selecting the execution team members, and all these other very complicated procedures and very broad direction, this didn't protect against the botched execution in Mr. Diaz, correct?

A. Apparently not.

Q. What would you need to know about the people who conducted Mr. Diaz's execution to know if they were qualified to perform the task they were assigned?

A. That's an impossible question for me to answer. It depends on the context of, for example, if they were working in my hospital as IV techs, I would want to watch them put IVs in and see if they did a good job or not.

Q. Would you want to know their training?

A. Training, to me, is less important than experience, because a person can complete their training, but if they don't have experience, they may not be very good at the task.

Q. And would you want to know their

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skill level?

A. To me, that is very dependent on their experience.

Q. But you also indicated earlier you'd want to know the frequency with which they performed these tasks, correct?

A. Typically, yes.

Q. And you don't know these things about Mr. Diaz's execution team, do you?

A. I have no specific knowledge.

Q. And you don't know them about the Georgia people either?

A. Correct.

Q. And it's undisputed at this point that Mr. Diaz's execution did not go as planned, correct?

A. It did not go as planned.

Q. And then it's undisputed that the drugs and chemicals were injected extravascularly, correct?

A. I think that's a reasonable assumption, although I'm not sure if that's been proven inclusively, but it's a very good hypothesis.

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MR. SIEM: Why don't we take a quick break so I can see if we have anything else. But I'm pretty close to wrapping up.

(Short break.)

MR. SIEM: Can we mark this as an Exhibit.

(Dershwitz 28 marked for identification.)

MR. SIEM: Article by Janek.

BY MR. SIEM:

Q. Dr. Dershwitz, prior to being retained in this case, you were provided an article from defendants entitled -- can you read the title, since I don't have a copy, please.

A. First of all, I think that the article was given to me after I was retained.

Q. When were you provided that article?

A. I don't specifically recall, but I'm quite sure they wouldn't have sent it to me had I not agreed to write an expert report.

Q. Do you know why it was provided to

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you?

A. I have no idea. The title of the article is "Attack on Texas lethal injections is bogus."

Q. Who wrote that article, sir?

A. State Senator Kyle Janek, Republican of Houston, an anesthesiologist.

Q. You haven't read the article?

A. No, I have not.

Q. So, you don't know whether you agree with that or disagree with it?

A. Right now, I have no opinion.

Q. And when were you provided that, do you recall?

A. It came in the same binder as all of the other materials. So, it was shortly before I wrote my expert report. And I think my expert report was initially dated early September, approximately. But I don't have a specific recollection.

Q. Was this provided in a letter to you, or was it sent from -- in like an e-mail form? How was this provided, this information?

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A. In a big box.

Q. So, they provided a box to you with a number of articles?

A. Yes.

Q. And one of them was the article by Dr. Janek?

A. That was in here, yes.

Q. And then you were also provided the execution file of Jose High, correct?

A. Everything on this list, I was provided. There was two other binders that I never even opened, and they're big, and they're in my car. So, I brought them, but since I never opened them, I didn't feel like dragging them in here, but they're on this list.

MR. SIEM: Have those documents, Mr. Drolet, been provided to us?

MR. DROLET: They're the same.

MR. SIEM: They're the same ones, okay.

Okay, I think that's it, unless you have any questions.

MR. DROLET: I have a few quick

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ones.

EXAMINATION BY MR. DROLET:

Q. Do you know in Florida who puts the IVs in?

A. I might have known at one time, but I don't specifically remember now.

Q. Are you aware in Georgia that a nurse does it?

A. That's what you informed me, yes.

Q. I'm going to direct your attention to the Georgia Protocol, to page 14. I hand you a copy here. Look at the last paragraph in regard to one of the duties of the nurse.

A. Shall I read it?

Q. Yes, if you could.

A. "An IV nurse will monitor the progress of the injection in the execution chamber during the execution process to ensure proper delivery of chemicals and to monitor for any signs of consciousness."

Q. So, would it be your testimony, then, that in Georgia there is some monitoring of consciousness?

MR. SIEM: Objection to form.

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A. That's the intent, but I have no specific knowledge to what degree that assessment is possible.

Q. If a person is snoring, is that going to be an indication of consciousness or unconsciousness?

A. If someone is given a hypnotic drug like thiopental and, shortly thereafter, begins to snore, that is highly correlative with the presence of unconsciousness.

Q. In regard to the use of the 60-cc syringes, is use of those something that a layman can be taught?

A. I think so, because technicians throughout the hospital are typically taught how to draw out medications and prepare syringes that will be used by others.

Q. Is it possible with that kind of syringe to do it in a way that would be considered too fast?

A. A 60-milliliter syringe has, inherently, a large amount of friction that opposes pushing down the plunger. And once that syringe is filled with liquid, it's very,

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very difficult to administer the drug too rapidly as far as a judicial execution is concerned.

Q. How long would it typically take to empty a 60-cc syringe of liquid?

A. If I had a 60-milliliter syringe and was pressing as hard as I could, it would probably empty at the rate of around two to four milliliters per second, depending on the rest of the resistance in the system.

Q. Now, is it possible to do the syringe too slowly in a lethal conclusion setting?

A. Only if it were so slow that one administered the pancuronium and potassium chloride at a point in time in which the inmate was likely regaining consciousness, which for a dose of 2,000 milligrams of thiopental doesn't occur, certainly, within the first half hour.

So, unless the administration of the drugs was truly inordinately slow, that should not produce a problem other than the overall prolonging of the execution.

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Q. Is it difficult to mix sodium pentothal?

A. The way the drug is packaged today, a syringe is supplied with 20 -- the syringe is supplied -- a 20-milliliter syringe contains 500 milligrams of powder, and, separately, there's a 20-milliliter vial that contains either saline or water, depending on the manufacturer. And one empties the diluent into the syringe and gives it a little shake, and the syringe is prepared.

Q. In hospitals, is this done in large quantities at times?

A. Not anymore. Years ago when thiopental was the standard drug we used to administer anesthesia, at the beginning of the day, somebody would make a large quantity of thiopental in a large container and then draw up 20-milliliter syringes, many, many dozens of them, for use throughout the operating room that day. But since the shelf life, once reconstituted, is somewhere between one and three days, after reconstitution and drawing into the syringe, the drug should be used

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within a day or two.

Q. Do IVs, once inserted, migrate on their own?

A. Sometimes.

Q. What would cause that?

A. It could be the fact that they weren't well situated in the vein to begin with, or it could be due to movement on the part of the person, or it could be due to the fragility of the person's veins, if such fragility is present.

But, in my experience, typically, what happens is that if an IV is nonfunctioning, it was probably nonfunctioning from the beginning. That seems to me to be a more common scenario than an IV that used to work perfectly and then stops working all of a sudden.

Q. Can an IV pop out and then pop back in again?

A. Well, certainly, anything is possible, but that seems even a less plausible scenario.

Q. And is there any necessity in a

lethal injection procedure to pause after the administration of sodium pentothal?

A. It's not necessary. It is part of some state's protocols to have a pause present. For example, North Carolina has a pause during which the BIS value is assessed. And some states, as well as the federal government, have a pause during which the presence or absence of consciousness is to be assessed. But it is not necessary to carry out the execution.

MR. DROLET: That's all I have.

MR. SIEM: I have a couple of questions regarding the 2007 Georgia procedures.

EXAMINATION BY MR. SIEM:

Q. Do the procedures outline the minimum qualifications needed for the nurse who is doing the monitoring?

A. As far as I can tell, they are not codified in detail.

Q. So, you don't see anything in there regarding their training qualifications?

A. Not specifically, no.

Q. And do you know the training of the nurse involved in executions?

A. I am told that this person is an IV nurse, meaning that this person puts in IVs as their day job.

Q. And who gave you that information?

A. Counsel did.

Q. But it's not in the procedures anywhere?

A. No, because, presumably, the state has the option of hiring somebody else at some future date. But my understanding is the current person is an IV nurse.

Q. And the procedures don't set forth that it needs to be an IV nurse who's involved in the procedure?

A. It doesn't state specifically.

Q. And it doesn't state any minimum qualifications necessary to perform the function she does?

A. No. I would say that the persons responsible overall for the execution have an obligation to make sure that the person has the requisite training and experience.

Q. But it doesn't say that in the procedures?

A. It doesn't specifically state, no.

MR. SIEM: Thank you. That's all the questions I have.

THE WITNESS: I, of course, would like to read and sign.

Dr. Mark Dershwitz

Subscribed and sworn to before me this ___ day of , 2007

CERTIFICATE

COMMONWEALTH OF MASSACHUSETTS)
: ss.
COUNTY OF SUFFOLK)

I, Judith A. Twomey, RPR, a Notary Public within and for the Commonwealth of Massachusetts, do hereby certify:

That Dr. Mark Dershwitz, the witness whose deposition is hereinbefore set forth, was duly sworn by me and that such deposition is a true record of the testimony given by the witness.

I further certify that I am not related to any of the parties to this action by blood or marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 15th day of October, 2007.

JUDITH A. TWOMEY, RPR
My Commission Expires 9/8/2011

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