1. Transcript of Proceedings for *Lightbourne v. State*, Case No. 81-170-CF (electronic submission); Transcript Excerpt, Testimony of Dr. Mark Dershwitz.

IN THE CIRCUIT COURT OF THE FIFTH JUDICIAL CIRCUIT,
IN AND FOR MARION COUNTY, FLORIDA
CASE NO.: 81-170-CF

STATE OF FLORIDA

vs.

IAN DECO LIGHTBOURNE,
Defendant.
/

VOLUME IV, PAGES 483-620

PROCEEDINGS:	Evidentiary Hearing concerning lethal injection (Diaz issue)
BEFORE:	Honorable Carven D. Angel Circuit Judge Fifth Judicial Circuit In and For Marion County, Florida
REPORTED BY:	Noelani J. Fehr Stenographic Court Reporter Notary Public State of Florida at Large
DATE AND TIME:	May 21, 2007; 2:15-5:10 p.m.
PLACE:	Marion County Judicial Center Court Room 3A 110 N.W. 1st Avenue Ocala, Florida 34475
APPEARANCES:	SUZANNE KEFFER, Esq., and ANNA-LIISA JOSELOFF, Esq., and ROSEANNE ECKERT, Esq., and NEAL A. DUPREE, Esq.,and CAROLINE KRAVATH, Esq. Capital Collateral Regional Counsel 101 N.E. 3rd Avenue, Suite 400 Fort Lauderdale, FL 33301 Attorneys for Defendant

APPEARANCES: KENNETH S. NUNNELLEY, A.A.G., and
BARBARA C. DAVIS, A.A.G., and
CAROLYN SNURKOWSKI, A.A.G.
Office of the Attorney General
444 Seabreeze Blvd., 5th Floor
Daytona Beach, Florida 32118
Attorneys for State

ROCK HOOKER, A.S.A.
State Attorney's Office
19 N. Pine Street
Ocala, FL 34475
Attorney for State

MAXIMILLIAN J. CHANGUS, Esq.
Office of General Counsel
Florida Department Of Corrections
2601 Blair Stone Road
Tallahassee, FL 34399-2500
Attorney for Department of Corrections

ALSO PRESENT: Gail Watson, Judicial Assistant
Robert McLean, Law Clerk

I N D E X

Page

State's Witnesses

Mark Dershwitz
Direct Examination (Mr. Nunnelley) 486
Voir Dire (Mr. Dupress) 493
Direct Examination Con't (Mr. Nunnelley) 494
Cross Examination (Mr. Dupree) 530
Redirect Examination (Mr. Nunnelley) 611

Certificate of Reporter 620

E X H I B I T S

Page

State's Exhibit Number 2 488
CV of Dr. Dershwitz
State's Exhibit Number 3 502
Chart on Thiopental concentration
State's Exhibit Number 3 502
Chart on Probability of consciousness
State's Exhibit Number 4 502
Chart on Thiopental concentration, 200 minutes
State's Exhibit Number 5 522
AVMA Press release

***REPORTER'S NOTE: Transcript continued to Volume V.

AFTERNOON SESSION

May 21, 2007 2:15 p.m.

(Thereupon, the Honorable Judge Carven D. Angel entered the courtroom and the following proceedings were had:)

THE COURT: Okay. We're resuming our

hearing. Let's call the next witness.

MR. NUNNELLEY: Your Honor, pursuant to agreement, the State calls Dr. Mark Dershwitz out of order.

THE COURT: Okay.

MARK DERSHWITZ,

having been produced and first duly sworn by the Clerk of the Court as a witness on behalf of the State, was examined and testified as follows:

THE WITNESS: I do.

DIRECT EXAMINATION

BY MR. NUNNELLEY:

Q State your name, if you would, sir?

A Mark Dershwitz.

Q How are you employed, sir?

A I work for the University of Massachusetts Medical School and UMass Memorial Health Care.

Q What is your educational background, sir?

A I have a bachelor's degree in chemistry, a medical degree, and a Ph.D. in pharmacology.

MR. NUNNELLEY: May I approach, your Honor?

THE COURT: Sure.

BY MR. NUNNELLEY:

Q Dr. Dershwitz, I am showing you what is marked as State's Exhibit 2 for identification. And for the record, that would be the CV of Dr. Dershwitz that was previously provided to opposing counsel.

Do you recognize that document, sir?

A Yes.
Q What do you recognize that document to be?
A That's the CV that I prepared on February 5th, 2007.
Q Does the document fairly and accurately relect your training, education, and professional experience?
A Yes.
MR. NUNNELLEY: I would offer the CV into evidence at this time, your Honor.
MR. DUPREE: I don't have an objection, I just want to find out, if I could ask a question, whether or not it's updated. He said this was of February of 2007, so since February of 2007 if there's any additions to that CV?
THE WITNESS: There are none.
MR. DUPREE: Then I have no objection. No objection, Judge.

THE COURT: Admitted.
(Thereupon, the above-referred-to item was marked for identification as State's Exhibit Number 2 and was received in evidence.)
BY MR. NUNNELLEY:
Q Dr. Dershwitz, you're an anesthesiologist; is that correct?
A Yes.
Q If you could, sir, tell us, I guess maybe in fifty words or less, what an anesthesiologist does?

A Many lay people think that anesthesiologists just put people to sleep; but, in fact, we are in charge of the entire peri-operative care of the patient. So we do pre-operative evaluations, we take care of the patients in the operating room, and then we take care of the patients afterward, either in the recovery room or the Intensive Care Unit. And many anesthesiologists also are intensive care physicians and or pain management physicians.

Q Okay. Are you familiar with the drug from your work as an anesthesiologist known as sodium thiopental?

A Yes.

Q Does that drug have another name?

A Well, there's a trade name, Pentothal Sodium, and the official name is actually thiopental sodium.

Q Okay. Are you also familiar with the drug known

as pancuronium bromide?

A Yes.

Q Does that drug also have a trade name that's used with it, or to refer to it?

A Yes, the trade name Pavulon.

Q And I'm assuming you're also familiar with the drug -- with potassium chloride?

A Yes.

Q Does -- that probably does not have a trade name, does it?

A Not that I'm aware of.

Q Okay. Do you use, or have you used in the past, those three drugs in your practice as an anesthesiologist?

A Yes.

Q Are you familiar with the effects of these three drugs on a human being?

A Yes.

Q What is the use of, Dr. Dershwitz, thiopental sodium?

A Typically, in an anesthetic it would be used as the induction agent, which means that the medication is given intravenously to put the patient to sleep. It is possible, although very unusual, to give further doses of thiopental to keep the patient asleep. But far more often it's just used to put the patient to sleep.

Q And when you're using thiopental sodium to put the patient to sleep what is the next step that an anesthesiologist will take in that operative process?

MR. DUPREE: Your Honor, I apologize for interrupting. I've got an objection to predicate at this point in time, because we have not established this man's expertise. The State has not tried to qualify him as an expert, and he's going on about drugs and what their effects are. I think we need to establish a predicate as to what his expertise would be.

BY MR. NUNNELLEY:

Q I'll go back into it. Dr. Dershwitz, how long have you been practicing as an anesthesiologist?

A Since 1986.

Q And in connection with your training as an anesthesiologist have you had occasion to use the drug thiopental sodium?

A Yes, many times.

Q In connection with your work as an anesthesiologist have you had occasion to use the drug pancuronium bromide?

A Yes.

Q In connection with your work as an anesthesiologist since 1986, was it?

A Yes.

Q Have you had occasion to use the drug potassium chloride?

A Yes.

Q Are you a board certified anesthesiologist?

A Yes.

Q How long have you been a board certified anesthesiologist?

A I was first board certified in 1987, and I voluntarily recertified in 2005.

Q And you are a faculty member of the University of Massachusetts?

A Yes.

Q What do you teach at the University of Massachusetts?

A I have two primary teaching responsibilities. I'm responsible for the educational program for our residents who are in training to been anesthesiologists. I'm also the

course co-director of the second year medical pharmacology course that's given to all of the medical students.

Q In addition to your medical degree as an anesthesiologist you also have a Ph.D. in pharmacology; is that correct?

A Yes.

MR. NUNNELLEY: Your Honor, I would offer the

witness as an expert in the field of anesthesiology at this time.

MR. DUPREE: I'm sorry, in the field of what?

MR. NUNNELLEY: Anesthesiology.

MR. DUPREE: Is that it? If it's as to anesthesiology, I have no objection, your Honor.

THE COURT: Proceed.

MR. DUPREE: Thank you.

MR. NUNNELLEY: Also pharmacology, your Honor, given his training, education, and experience. I misspoke.

MR. DUPREE: Your Honor, I would object to predicate on that -- on those grounds.

THE COURT: Do you want to voir dire the witness?

MR. DUPREE: Thank you, Judge.

MR. NUNNELLEY: Your Honor, again, I renew my objection to Mr. -- I know the Court's ruled. I don't want to call cat the judge's rule, but again, I renew my objection to Mr. Dupree acting

both as an advocate and a witness. It's a clear violation of the ethical rules.

MR. DUPREE: Whoa, whoa.

THE COURT: I overrule the objection. Go ahead.

MR. DUPREE: Judge, I've got take an exception to being called non-ethical. I mean, that's -- that's a little bit much, I think.

VOIR DIRE EXAMINATION

BY MR. DUPREE:

Q Sir, I just want go over your educational background with you a little bit. Can you tell me which college you graduated from?

A I have a bachelor's degree in chemistry from Oakland University in Rochester, Michigan.

Q And where did you go to medical school?

A Northwestern University in Chicago.

Q And you became a doctor there?

A I received my medical degree from Northwestern, as well as my Ph.D. in pharmacology.

Q And where did you train after that?

A I did an internship at the Carney Hospital in Boston. I did a residency in anesthesiology at Mass General Hospital in Boston. And I did a research fellowship also with the Department of Anesthesiology in Mass General in Boston.

Q Okay. Are you a pathologist, sir?

A No. I am a toxicologist, however, though.

Q Do you do forensic toxicology?

A As a consultant, yes.

Q Is that part of your expertise?

A Yes.

Q And you -- but you did not have to do any pathology?

A I do not practice pathology, but I often consult for many different groups as a toxicologist.

Q Have you ever been declared an expert in any court of law as a forensic pathologist?

A Not as a forensic pathologist but as a toxicologist.

MR. DUPREE: Thank you, your Honor.

THE COURT: Proceed.

MR. NUNNELLEY: Your Honor, for the record, I assume since I have heard no further objection Mr. Dupree has none.

DIRECT EXAMINATION

BY MR. NUNNELLEY:

Q Now, Dr. Dershwitz, you were talking about thiopental sodium being the induction agent in anesthesia, correct?

A It is one of the induction agents that can be used.

Q And when you say an induction agent, what does that mean? What is the next step, if you will?

A Typically, after the patient is rendered

unconscious with thiopental other medications are given to keep the patient asleep for the duration of the surgery.

Q Would those be either intravenous medications or inhaled medications?

A Usually it's a combination of both.

Q Okay. What is the usage of pancuronium bromide in surgery?

A It's a paralytic agent that by paralyzing the skeletal muscles makes it easier for the surgeon to operate in cases where such muscle relaxation is advantageous.

Q Okay. And what would be the use of potassium chloride?

A Well, potassium chloride is a salt, and it is a common component of the intravenous fluids that we use.

Q Okay. What is the typical induction dose of thiopental sodium?

A In an eighty kilogram person it would be typically around three hundred to four hundred milligrams.

Q Have you had occasion, Dr. Dershwitz, to review the August 16th, 2006, protocols for carrying out lethal injection that are -- were produced by the Department -- the Florida Department Of Corrections?

A Yes.

MR. NUNNELLEY: May I approach, your Honor?

THE COURT: Sure.

BY MR. NUNNELLEY:

Q Dr. Dershwitz, I am showing you what is marked as Joint Exhibit 1. I would ask you to take a look at that document and tell us if you recognize it, sir?

A I have read it before.

Q Does that document set out the dose of thiopental sodium that is used in an execution?

A Yes, it does.

Q What dose of thiopental sodium does the August 16, 2006 protocols set out?

A Five thousand milligrams, or five grams.

Q How does a five gram dosage of thiopental sodium compare to the normal induction used of thiopental sodium in surgery?

A Well, it's a huge overdose.

Q Have you also -- let me ask you, also, sir, in the proto -- the protocol also sets out the dosage of pancuronium bromide that is used in an execution by lethal injection in Florida, doesn't it?

A Yes.

Q And what dosage does it set out for pancuronium bromide?

A One hundred milligrams.

Q And how does that dose compare to the typical dosage employed in surgery?

A That's a huge overdose.

Q Does the August 16, 2006 protocol set out a dosage of potassium chloride to be used in carrying out an execution by lethal injection?

A Yes.

Q What dosage does the protocol set out?

A Two hundred and forty milliequivalents.

Q And how does that dosage compare to a typical dosage used in medical practice, or in surgery, of potassium chloride?

A Well, typically we don't think of giving potassium chloride as a dose, but our most commonly used intravenous fluid has potassium chloride in a concentration of four milliequivalents per liter. So every time the patient gets a liter of fluid the patient gets four milliequivalents of potassium chloride.

Q And how long would that -- over how long a period of time would that liter be administered?

A Well, that varies tremendously from case to case, depending on how much the blood loss is, but it could be as rapidly as every, you know, five to ten minutes, or slower over an hour or two.

Q What would be the effect of a dose of two hundred and forty milliequivalents of potassium chloride on a human being?

A If given rapidly it should stop electrical activity in the heart.

Q What would be the effect of a dosage of five grams of thiopental sodium on a human being?

A It's lethal by two different mechanisms. It will cause the person to stop breathing, and it will also stop or cause the circulation to decrease to such a degree that no meaningful amount of circulation persists.

Q And the same question for the dosage of pancuronium bromide, what would be the effect of that dosage on a human being?

A It will paralyze all the skeletal muscles in the body.

Q Do you have a judgment as to how long that paralysis of the skeletal muscles will last?

A After a dose of one hundred milligrams, many, many hours.

Q Okay. And do you have a judgment as to how long a person who had received five grams, five thousand milligrams, of thiopental sodium would remain unconscious, assuming they did not die?

A And that's a very large assumption, because it would take extraordinary efforts to keep their circulation going. But if they maintained circulation and ventilation the average eighty kilogram person given five thousand

milligrams of thiopental would sleep for about fourteen hours.

MR. NUNNELLEY: May I approach, your Honor?

THE COURT: Sure.

BY MR. NUNNELLEY:

Q Dr. Dershwitz, I'm showing you what is marked as

Joint Exhibit 2, and ask you if you would review that document and tell us if you recognize it, sir?

A Yes.

Q What do you recognize that document to be?

A That is a revised lethal injection protocol that is dated May 9th, 2007.

Q Let me ask you this first of all, have the dosages of drugs that are employed or set out in the two protocols, the August 16th, 2006 protocol and the May 9, 2007 protocol, changed?

A No.

Q Has the method of the delivery of those drugs changed?

A No.

Q Based on a comparison of the two protocols, the May 9, 2007 and the August 16, 2006 protocols, do you have a judgment as to whether the May 9, 2007 protocols have added safeguards beyond those found in the August 16, 2006 protocols?

MR. DUPREE: I want to object. It's beyond the scope of his expertise.

THE COURT: Overruled. You may answer.

THE WITNESS: The primary difference is the inclusion of a pause during which the personnel will assess the inmate for the presence or absence of unconsciousness.

BY MR. NUNNELLEY:

Q Do you feel that to be an improvement?

A Well, I think an improvement is not a, you know, medical term, but it is a significant change.

Q Doctor, let me -- let me ask you this, in the course of -- in your work as an anesthesiologist have you had occasion, or do you have the occasion, to administer pancuronium bromide or a similar paralytic drug in close succession to the administration of an anesthetic agent?

A Yes, often.

Q Can you -- and the explanation may be a little bit beyond what we need here, but what would be the circumstance when you as an anesthesiologist in your care of a patient would administer the paralytic drug quickly, rapidly, after having administered the anesthetic?

A In most anesthetics where we induce anesthesia with an IV drug and then paralyze the patient, the anesthesiologist pauses after the induction agent and

confirms that the patient is unconscious before giving the paralytic drug.

However, there's a technique called rapid sequence induction, whereby the paralytic drug is given immediately after the hypnotic drug in order to cause the patient to be become paralyzed and permit the insertion of a breathing tube as rapidly as possible.

And the scenario in which we perform this is when the anesthesiologist is concerned that the patient is at risk for aspiration, meaning stomach contents coming up the esophagus from the stomach and then going down the trachea

into the lungs, which can be catastrophic. So when we have a patient who is at risk for aspiration we perform such a rapid sequence induction.

Q Okay. Dr. Dershwitz, I asked your earlier about the -- about how long a person would remain unconscious after having received various doses of sodium -- thiopental sodium. Have you prepared any charts or grafts that will help elaborate upon your testimony?

A Yes.

MR. NUNNELLEY: We showed these to you all last Thursday. May I approach, your Honor?

THE COURT: Sure.

BY MR. NUNNELLEY:

Q And Dr. Dershwitz, I'm showing you exhibits that

are marked as State's Exhibits 3, 4 and 5 for identification, and ask you if you would review those documents, sir.

A Yes, I drew them.

Q Starting the with State -- with exhibit --

MR. NUNNELLEY: Well, I want to offer them at this time, your Honor.

MR. CHANGUS: Any objection?

MR. DUPREE: No, your Honor.

THE COURT: Admitted.

(Thereupon, the above-referred to items were marked for identification as State's Exhibit Numbers 3, 4, and 5 and were received in evidence.)

BY MR. NUNNELLEY:

Q And Dr. Dershwitz, we have blown that chart up for your -- for your use. Can you -- this is State's Exhibit 3. Can you explain to Judge Angel what we are showing in State's Exhibit 3? It's the red button, supposedly.

A Okay. This is what we call a pharmacokinetic model that's based on a certain number of assumptions. And in order to create this graph, which predicts the blood concentration of thiopental on the Y Axis, note that that's a logarithmic scala, and time following the completion of the injection on the X Axis, and note that that's also a

logarithmic scale.

And so I assumed that the patient was eighty kilograms in size, was otherwise metabolically normal, and that the thiopental five thousand milligrams was administered over a period of 2.5 minutes.

And then this curve right here depicts how the thiopental concentration will decline as a function of time during the first twenty minutes following completion of the administration of the drug.

Q And at the -- okay. At the twenty minute mark, and this is in micro -- micrograms per milliliter --

A Correct.

Q -- correct? What would be the drug concentration when you run this out to the twenty minute mark?

A The twenty minutes, the thiopental concentration is calculated to be 54.7 micrograms per milliliter.

Q Is that a concentration level that is consistent or inconsistent with consciousness?

A At that concentration a person will have a .0000094 percent chance of being conscious.

Q Okay. Thank you, sir. Now, if you would turn to State's Exhibit 4.

A (Complies.)

Q State's Exhibit 4 seems to -- well, explain State's Exhibit 4 for us, if you would, sir?

A Okay. This is a graph that one could use to determine the probability of consciousness as a function of the concentration of thiopental in the blood. And so at low thiopental concentrations, let's say below five micrograms per mill, there's a high probability of being conscious.

The fifty percent mark is a concentration of around seven, so at seven micrograms per milliliter about fifty percent of the patients will be conscious and fifty percent will be unconscious.

And as the concentration increases, the probability of unconsciousness also increases, so that at twenty micrograms per mill, again, we have a probability of consciousness of only about 0.02 percent.

Q And to kind of -- I know we've changed measure -- or systems of measurement here, but to get a -- to get this, the fifty percent probability of consciousness, I believe you said how many micrograms per milliliter would that take?

A Seven.

Q How much sodium thiopental would have to be

introduced or injected into a person to get a concentration of seven micrograms per milliliter?

A Well, that depends on how long one waits. You know, one could achieve for a short period of time a concentration of seven with as little as one hundred and fifty to two hundred milligrams in the average person, but

they would not remain asleep for very long.

Q That was one hundred and fifty to two hundred milligrams?

A Correct.

Q Okay. Now, doctor, let me ask you to turn to State's Exhibit 5, if you would, sir.

A Okay.

Q And explain for us, if you would, State's Exhibit 5 and what it depicts.

A Here the model is exactly the same as in Exhibit 3, except that the X Axis has been carried out to two hundred minutes, or little bit beyond three hours.

And here, again, we see that the thiopental concentration of the blood decreases as a function of time. And at two hundred minutes the thiopental concentration is predicted to be 13.4 micrograms per milliliter, which corresponds to a probability of consciousness of about 0.6 percent.

Q And at thirty minutes the probability of consciousness is what, sir?

A .000029 percent.

Q And this, again, like Exhibit 3, is assuming an eighty kilogram man and a five gram dose of thiopental sodium administered over two and a half minutes?
A Yes.

Q Thank you, Dr. Dershwitz. Let me collect the exhibits before I forget and get in trouble with the clerk, if you'll excuse me.

Now, Dr. Dershwitz, I'm assuming that thiopental sodium is normally injected intravenously into a person when it's used by an anesthesiologist; is that correct?

A Yes.

Q If sodium thiopental is injected into an individual subcutaneously instead of intravenously what would be the effect of it?

A Well, the onset of the pharmacological effect would be very delayed, and it would also hurt very much.

Q Would -- why would it hurt?

A Well, thiopental as used clinically is a solution at a pH between ten and eleven, and normal physiologic pH is 7.4, so when one injects such a basic solution subcutaneously it will burn a lot. A solution of pH eleven is well in the direction of the sort of solution that lye-based drain cleaners would be.

Q Would it be reasonable in your experience to expect someone to complain if thiopental sodium was being injected into them subcutaneously?

MR. DUPREE: Objection.

THE COURT: Overruled. You may answer.

25 THE WITNESS: That's my clinical experience

1 when I've given it to patients with a
2 malfunctioning intravenous catheter.
3 BY MR. NUNNELLEY:
4 Q How often in a hospital setting does one find a
5 malfunctioning intravenous catheter, doctor?
6 A It typically depends on who put it in and how long
7 it's remained in place.
8 Q Would you characterize it -- I'm probably asking
9 this as a lawyer, it may not be in good medical terms -- is
10 it a rel -- is it a common or an uncommon thing for an IV to
11 malfunction in a hospital setting?
12 A Well, I'm not sure what the definition of common
13 is, but many patients require IVs to be replaced
14 intermittently because of, you know, malfunction if the IV
15 needs to stay in place for many days.
16 Q Are there some drugs that are used in the practice
17 of anesthesiology that are uncomfortable to patients even
18 if -- when they are injected intravenously?
19 A Yes. The most commonly used intravenous
20 anesthetic today is called propofol, and it burns a lot in
21 some people even when it's put into a properly functioning
22 IV.
23 Q Do these people typically complain about the
24 effect of it?
25 A Many parents complain as they're falling asleep.

And a few patients will scream at the top of their lungs as they're falling asleep.

Q And going back, if we could, to thiopental sodium going -- being injected subcutaneously. Is it fair to say that the loss of consciousness would be slower?

A Yes.

Q Is thiopental sodium a fat soluble -- a lipid soluble drug, or is it something of some other sort of chemical makeup?

A Well, in the bottle, or in the syringe, at pH ten to eleven it's very water soluble. But as soon as it come into contact with biological tissue, it is buffered to the biological tissue's pH of 7.4 and then it becomes highly lipid soluble.

Q Does that mean it absorbs rapidly?

A It absorbs more rapidly than medications that are not lipid soluble, but it's still relatively slow compared to the intravenous administration route.

Q Okay. Is Pavulon also a lipid soluble drug?

A It is not. And that is independent of pH

Q In putting this -- putting this discussion in the context of an execution carried out by lethal injection, if we assume that thiopental sodium is injected subcutaneously into the inmate, that the IV line is properly flushed with saline, and then pancuronium bromide is injected through

that IV line subcutaneously, do you have a judgment in your professional opinion as to which one of those two drugs would be absorbed the more rapidly by the individual?

A The thiopental.

Q Doctor, I'm asking a question that probably exhibits a keen sense of the obvious, but if a person who is receiving anesthetic -- an anesthetic drug -- let me back up. I didn't ask that very well.

In the context of an execution in Florida, and we know what -- you know what the three drugs are, if the inmate is reported to be moving, perhaps speaking, breathing, licking his lips, and turning his head, would these actions be consistent or inconsistent with that inmate having been paralyzed by pancuronium bromide?

A Well, if the inmate were completely paralyzed they would be unable to move. So if the inmate is exhibiting motor movements, than that person could not be completely paralyzed.

Q What happens with thiopental sodium after the person dies?

A The blood concentration continues to decline rapidly in a similar fashion as shown in those graphs that I drew and which you previously displayed.

Q Is there a technical term for what is going on when the pental -- thiopental is dissolving or distributing?

MR. DUPREE: Again, your Honor, I am going to object. This is beyond the scope of him being an

anesthesiologist, and that's what they qualified him as.

MR. NUNNELLEY: He was qualified as a pharmacologist, too, I thought.

THE COURT: Overrule the objection. You may answer.

THE WITNESS: The process is called post mortem redistribution.

BY MR. NUNNELLEY:

Q Is there a great deal of research in the context -- is there a great deal of research into post mortem redistribution of thiopental sodium?

A There's actually no published research on that topic at all.

Q Are you aware of any research that has been done into post mortem redistribution of thiopental sodium?

A Yes.

Q Can you describe that research for us, sir?

A In several states Medical Examiners have drawn and compared blood samples from executed inmates. The first blood sample drawn within a few minutes of the pronouncement of death, and the second blood sample drawn either hours later, or the next day at the time of autopsy. And the --

MR. DUPREE: Your Honor, I have an objection on hearsay grounds. I have no idea where this is coming from. There is no predicate for this at all.

MR. NUNNELLEY: It's part of his opinion,

your Honor, he can testify to it.

MR. DUPREE: It's not even a peer -- it's not even a peer reviewed argument. This is something he heard from somewhere.

MR. NUNNELLEY: I don't think we need to be talking about peer reviewed articles, your Honor.

THE COURT: Overrule the objection. You may answer.

THE WITNESS: And these blood samples were then submitted for toxicological analysis. And the lab reports, many of them, were supplied to me for review.

And in each of these cases the thiopental concentration that was obtained from the blood drawn immediately after death was high and consistent with a miniscule probability of consciousness, whereas in all cases the blood sample drawn hours later was very low and, in fact, in many cases was consistent with a high probability of consciousness.

BY MR. NUNNELLEY:

Q Based upon -- based upon this do you have an opinion as to what, if any, conclusions can be drawn based upon a level of thiopental sodium in an executed inmate's blood if that blood was not drawn immediately after the inmate died?

MR. DUPREE: Objection, your Honor. Again,

predicate, beyond the scope of his expertise.

THE COURT: Overruled. You may answer.

THE WITNESS: If the blood concentration is high, it would just mean that it was even much higher at the time of death. If the concentration is low, it is impossible to draw any meaningful conclusions from it.

BY MR. NUNNELLEY:

Q Are you familiar with an article that was published in the medical journal the Lancet which reported very low levels of sodium thiopental in the blood of various executed inmates?

A Yes.

Q Have you read that article?

A Yes.

Q Are you familiar with the research techniques that were employed by the authors of that article?

A Yes. They reviewed post mortem toxicological

results just as I have.

Q Do you have an opinion based upon your training, experience, education, and expertise as to whether or not the conclusions set out in that Lancet article can be supported?

A The authors concluded that a very, very high fraction of inmates were probably conscious during their executions. However, based upon the significant delay between the pronouncement of death and cessation of circulation and the obtaining of the blood samples, it would

be inappropriate in most of those cases to extrapolate backwards and try to use the post mortem blood concentration as a method of determining what the concentration was just prior to death.

Q And, doctor, you have testified your -- in addition to being an anesthesiologist your degree -- you also have a Ph.D. in pharmacology?

A Yes.

Q Have you also worked in or been exposed to toxicological analysis?

A Yes, from many different points of view.

Q Describe for Judge Angel, if you would, your experience in the field of toxicology?

A First of all, toxicology is a branch of pharmacology. And my actual Ph.D. dissertation involved the

toxicological effects of a particular medication. For most of my research career I have been primarily interested in the pharmacokinetic and pharmacodynamic effects of medications.

And what that means is, the pharmacokinetic effects is the time course of the medication as measured and depicted on those graphs that you saw already.

Pharmacodynamic analysis predicts the particular pharmacological effect as a function of the blood concentration.

Now, most drugs have both desirable and undesirable effects. And so as a pharmacokineticist, when I

have done these studies, we have been able to draw models in which we are able to predict as a function of the blood concentration both the desirable, that is the therapeutic effects, as well as the undesirable, that is the toxic effects of a number of different medications.

MR. NUNNELLEY: Your Honor, at this time I would offer Dr. Dershwitz also as an expert in the field toxicology.

THE COURT: Any questions?

MR. DUPREE: No questions, your Honor.

THE COURT: So ordered.

BY MR. NUNNELLEY:

Q Doctor, are you familiar with a subsequent article

subsequent to the Lancet article that was by the same authors and purported to draw roughly the same conclusions?

A Yes. Although, the authors extended their analysis beyond just looking at post mortem blood concentrations.

Q And this article appeared in an online journal, I guess, did it not?

A Yes, the Public Library Of Science.

Q Is that a peer-reviewed entity?

A No.

Q Does the Public Library Of Science article suffer from the same deficiencies as does the Lancet article?

A The authors refer to their conclusions that they expressed in the Lancet article. And surprisingly, in addition, they did not offer any discussion based upon, for

example, the letters to the editor that were written to the Lancet that questioned some of their, you know, conclusions.

There's two other areas in the PLOS article in which I believe the story that they were attempting to tell is incomplete.

Q How is the story incomplete, sir?

A In one case, referencing a Dutch study, and keeping in mind that in the Netherlands euthanasia is legal and physicians may legally assist in euthanasia, they quoted a Dutch study that said that thiopental by itself even in

high doses is not lethal.

And I think it's silly for the Dutch authors to have made such a conclusion because the largest dose from the Dutch study was only two grams of thiopental. And I can certainly imagine that in some subset of the population two grams is not necessarily lethal.

But for the Dutch authors to contend, and for these American authors to repeat; that thiopental at the highest dose is not lethal is completely inconsistent with what we know about pharmacology.

The other area that I believe their discussion was incomplete is that they reviewed some lethal injection records in which it appeared that the potassium chloride did not cause the cessation of electrical activity in the heart as rapidly as would be expected. And they used that as an argument that perhaps potassium chloride is not effective in stopping the heart.

There is a plausible explanation that may have applied in some of these cases that at least should have been discussed, it should be raised as a possibility. And that is that with the very large doses of thiopental that are used in some states the circulation can slow to such a trickle that the pancuronium and the potassium chloride that are injected sub -- subsequently might literally remain in the arm.

And I believe that there are very good reports, or raw data, from some California executions in which the potassium chloride appeared not to work. And I believe that a plausible explanation is because California also uses five thousand milligrams of thiopental that subsequently administered drugs literally did not circulate.

And I'm not saying that that is always the answer in all cases, but it is a plausible explanation that should have been --

MR. DUPREE: Objection, your Honor. Not -- is this just beyond the degree of real medical certainty, that's a plausible explanation?

THE COURT: Overruled. You may answer.

THE WITNESS: I raise this just that in a scientific article authors have a responsibility to discuss all possible explanations for their data, those that are likely as well as those that may be unlikely. And so this is a plausible explanation that should have been considered by the authors.

BY MR. NUNNELLEY:

Q And the fact that they did not consider that explanation is a deficiency in that article; is that what you're saying?

A Yes.

Q Doctor, let me ask you this, do you have an opinion to a reasonable degree of medical certainly as to what the effect of the administration of five grams of thiopental sodium followed by one hundred milligrams of Pavulon, followed by two hundred and forty milliequivalents of potassium chloride would be on a human being?

A Yes.

Q What is it, sir?

A It's lethal.

Q If that series of drugs in those doses is administered to a human being in the proper sequence through a proper -- through a properly functioning IV line will the individual have any perception of pain?

A No. Once the thiopental is administered nothing that is done to the inmate after that is perceptible by the inmate.

Q What is the most common, in your experience, IV mal -- Intravenous Line malfunction in a hospital setting?

A Well, actually, the most common malfunction is when the IV is accidentally or deliberately ripped out by the patient.

Q Okay. And the second most?

A The second most common malfunction is when the IV for whatever reason or by whatever mechanism, is relocated from the tip of the catheter to -- from being in a vein to

outside of the vein.

Q And if it's outside the vein that would be a subcutaneous delivery of the drugs, would it not?

A Yes, it would be in a subcutaneous space.

Q And in the hospital setting how do you, as a medical professional, go about making sure that an IV is functioning properly, placed properly, and working like it is supposed to be working?

A Well, since a large fraction of the IVs that we take into the operating room are not placed by me or one of my colleagues we typically do check them. And we typically employ a number of tests.

We would open the IV clamp wide and see how rapidly the fluid would flow. It should typically flow more quickly if the bag is raised by, you know, making a greater effect of gravity.

We would also look at the IV site to make sure that there's no accumulation of fluid that's palpable at the IV site.

Q And shifting back to the context of an execution in Florida under the May 9, 2007 protocols, do there -- does there appear to be an adequate or appropriate assessment of the inmate's level of consciousness after the thiopental sodium is administered and before the Pavulon and potassium chloride are administered?

A Well, my understanding is it's not written in the protocol. My understanding is that the inmate would be stimulated by --

MR. DUPREE: Objection, hearsay. If it's not in the protocol it's hearsay, your Honor.

MR. NUNNELLEY: He's an expert, your Honor.

MR. DUPREE: Your Honor, it's not -- it's not in the protocol, he just said that. It's got to be coming from somewhere else. It's got to be hearsay.

THE COURT: Overrule the objection. You may answer.

THE WITNESS: My understanding is that the inmate will be tested for presence of reflexes, like the lash reflex. A conscious person, if you touch their eyelashes very lightly, will blink; an unconscious person typically will not.

That's probably the most common first assessment that we use in the operating room to determine when a -- when a patient might have crossed the line from being conscious to unconscious.

I understand, also, that the -- that the inmate will have his name spoken and -- and be told to do something like, open your eyes, or

something like that.

BY MR. NUNNELLEY:

Q You also, I believe, teach Basic Life Support, do you not, or advanced life support?

A I actually don't teach it, but I am certified in BLS and I have taken the course many times.

Q And just for the record, BLS is Basic Life Support, correct?

A Yes.

Q And Basic Life Support is CPR, right?

A And other things, but that's the typical thing that the Red Cross or the Heart Association teaches nonprofessional people who may be in a position to be first responders.

Q And just for the record, BLS or Basic Life Support is intended for persons other than medical professionals, isn't it?

A It's intended for everybody, actually.

Q Okay. And in the context of Basic Life Support are lay people taught how to undertake to determine whether or not someone is unconscious?

A Yes. The first step when one activates BLS, and the way they teach it in the course is the mannequin is lying on a table. The student is taught to run up to the mannequin, shake her, and say, Annie, Annie, are you okay?

If Annie doesn't respond, as she typically won't,

then Basic Life Support will be started.

Q And these are steps that are within the capability of a lay person?

A Yes.

Q Doctor, I'm showing you what is marked State's Exhibit 6 for identification and ask you if you would review the document, sir?

A Yes.

Q Are you familiar with that document?

A Yes.

Q What do you know that document to be, or what do you recognize that document to be?

A Well, the first page is a press release that was sent out by the American Veterinary Medical Association. And the remaining pages is the AVMA's 2000 report on their panel on euthanasia of animals.

Q And what is the press --

MR. NUNNELLEY: Well, I want to offer that document into evidence at this time, your Honor. I believe it's been agreed to, anyway.

MS. KEFFER: I don't think we agreed. We both listed it, so no objection.

THE COURT: Admitted.

(Thereupon, the above-referred-to item was

marked for identification as State's Exhibit Number 6 and was received in evidence.)

BY MR. NUNNELLEY:

Q And you're familiar with the press release issued by the American Medical -- American Veterinary Medical Association?

A Yes.

Q What does that press release concern?

A The AVMA issued a press release that basically said, and I'm paraphrasing this, that the -- their 2000 report of the AVMA panel on euthanasia should not be applied to the injection of humans -- the execution of humans by lethal injection.

Q Are you familiar with the 2000 AVMA report on euthanasia?

A I read it. I certainly haven't memorized it. It's quite long.

Q As a medical professional do you have an opinion as to whether that press release and the AVMA's statement about the application of its report to lethal injection in humans should be respected?

MR. DUPREE: I object, your Honor, to relevance.

MR. NUNNELLEY: It will become relevant, I am going to tie it up, your Honor.

THE COURT: Subject to tying it up, overruled.

THE WITNESS: Well, I think that the lengthy report that the AVMA issued in 2000 should only be considered applying to -- or should not be considered applying to lethal injection because

they issued a press release specifically saying so.

MR. NUNNELLEY: Okay. May I approach, your Honor? Give it back to me and I'll return this one to the clerk before she comes after me again.

MR. DUPREE: I don't know if that was tying it up, your Honor, so I still object as to relevance.

MR. NUNNELLEY: Your Honor, if I might -- if I might be heard, it will get tied up with a subsequent witness that I expect the defense to be calling.

THE COURT: Okay. Go ahead.

BY MR. NUNNELLEY:

Q Doctor, do medical professionals use any kind of a scale to rate perceived pain?

A Yes. Typically adults are asked to -- to grade their pain, since pain is not a vital sign, on a zero to ten scale. And children are given a series of faces that range

from a happy face to a frowning face to attempt to gauge their degree of pain.

Q Do you have an opinion as a medical professional where on the pain scale a subcutaneous injection of thiopental would fall?

A Based on my experience of giving thiopental to people with malfunctioning IVs, it's in some persons significantly painful. And although I can't necessarily put

myself in their -- in their place, based upon how loudly some of them scream, some of them experience significant pain, perhaps seven, perhaps eight.

Q And applying the same scale to Propofol, which is a drug that you use frequently in your practice now, where would it fall?

A Propofol is probably even a little more painful. Based on my experience, a majority of patients complain of some pain as they're falling asleep. And, as I said, a small subset literally scream at the top of their lungs.

Q But you use Propofol anyway?

A Yes, because all other things considered it is still the best intravenous anesthetic we have.

MR. NUNNELLEY: Judge, if I could have just a moment to sort out what exhibit I'm hunting for.

THE COURT: Sure. Let's take a short break, about five minutes.

(Thereupon, a short recess was taken.)

THE COURT: Okay. Resuming our hearing. Proceed with the last witness.

MR. NUNNELLEY: Thank you, your Honor. Judge, I have just a very few more questions for this witness. I'm not sure that we got it clear on the record. I had offered Dr. Dershwitz as an expert in the field of anesthesiology, pharmacology and toxicology. I'm not sure we got an acceptance of him as an expert in anesthesiology and pharmacology.

THE COURT: Yes.

MR. NUNNELLEY: Okay.

BY MR. NUNNELLEY:

Q Now, doctor, let me ask you this. Would it be correct to say that there are various techniques that a lay person can be taught to employ in assessing whether or not a person is conscious or unconscious?

A Yes.

Q And let me ask you this, sir. Is -- to you as a medical professional, is depth of anesthesia the same thing as the absence of consciousness?

A No.

Q Okay. What's the difference?

A Depth of anesthesia is something that we do often

in the operating room, and in my opinion that takes an expert, an anesthesiologist, a nurse anesthetist, or someone with equivalent training to determine based upon physical examination and various objective signs, like vital signs, how deeply anesthetized a particular person is.

Whereas consciousness in this context is an all or none thing, like pregnancy. You are either conscious or unconscious. And lay people can be readily trained to determine if somebody is unconscious.

MR. NUNNELLEY: If I might approach, your Honor.

BY MR. NUNNELLEY:

Q Dr. Dershwitz, I'm showing you a box which is

labeled as State's Exhibit 1. If you would open it. The box has already been cut open, it's not taped any longer. But if you would open that box and look through it and tell me when you're through, sir.

A Okay.

Q Do those -- do the items contained therein appear to be standard medical equipment --

A Yes.

Q -- or apparatus? Which is the proper term?

A Well, these are the typical medical supplies that someone might use to start an IV and give some medications intravenously.

Q Okay. Let's go through and identify the various items in there, if we could, sir. It makes no difference where you start, whatever is convenient for you.

A Okay. The first item one is a liter bag of normal saline.

Q One liter would be one thousand milliliters?

A Milliliters, or approximately a quart.

Q Okay.

A The next would be an IV tubing set. And I'm looking for the length. It doesn't say. But one end of this would be inserted into a hole in the bag, and the other end of this would then be attached to an IV catheter that was previously injected -- inserted into the patient.

Q And doctor, let me stop you right there. Does -- you called this the IV set, correct?

A Or IV tubing.

Q IV tubing. Does the IV tubing have a priming volume denoted on it?

A It doesn't jump out at me. It might be listed on it somewhere. But it's probably somewhere in the vicinity of ten milliliters, give or take a little bit.

Q And just so we're clear on what we're talking about here, the priming volume of that --

A I just found it. Excuse me. It's seventeen milliliters.

Q That would be how much fluid is contained within the tube from top to bottom?

A Yes, from one end to the other.

Q Okay. Okay. Go ahead, if you would, with the rest of the items in there, sir.

A Okay. Here we have a twenty gauge intravenous catheter that would be used to be inserted into a vein and would be connected to the tubing at the other end. One end is connected to the bag, the other end would be connected to this.

We have a couple of different sizes of syringes, a twenty milliliter syringe and a sixty milliliter syringe. And a blunt tip needle that would be screwed on the end of the syringe and then subsequently inserted through a septum in the tubing that would cause the person to be able to inject the contents of the syringe through the IV tubing and into the person.

And there's also two extension sets of thirty

inches in length that could be used to make the IV tubing longer. This tubing says it's one hundred and six inches, so if one needed to increase the length one could add as many of these thirty inch extension sets as one needed.

Q Okay. Let's go back to the syringes, if we could, sir. There are two sizes in there, I believe; is that -- is that right?

A There's a twenty milliliter syringe and a sixty milliliter syringe.

Q Okay. And doctor -- okay. Let me ask you this, close to the last question. How long would it take to inject the contents of that sixty CC syringe into an IV port that was properly running, or improperly running even?

A Well, part of it depends upon the overall resistance of the tubing as well as the size of the IV catheter itself. But in my experience a sixty milliliter syringe should be able to be emptied at about one to two milliliters per second --

Q And --

A -- so someplace between thirty and sixty seconds.

MR. NUNNELLEY: Okay. If I could have just a moment, your Honor. I pass the witness, your Honor.

MR. HOOKER: Ken, do that right there.

MR. NUNNELLEY: I did all that.

MR. HOOKER: Okay.

THE COURT: Tender the witness.

MR. DUPREE: Thank you, your Honor.

CROSS EXAMINATION

BY MR. DUPREE:

Q Good afternoon, doctor.

A Good afternoon.

Q Sir, how did you first become involved in this case?

A At sometime last year Mr. Nunnelley called me.

Q And do you know -- do you recall when last year he called you?

A My estimate would be sometime in the fall, but I couldn't be any more specific than that.

Q And he called you -- he -- Mr. Nunnelley -- Nunnelley personally called you?

A I believe so.

Q And do you recall what it was he wanted you to do?

A I don't have any specific recollection of our first conversation, but I would assume that it had something to do with being an expert in a case.

Q Did he tell you what case?

A Actually, I didn't learn the name of the case until just a few days ago.

Q And what was that?

A Lightbourne.

Q And you said the fall, could you narrow it down any more than that?

A No, I can't.

Q Is there any documentation that you would have

submitted to the State of Florida -- I'm assuming you're being paid today for your testimony?

A Yes.
Q And do you submit bills to the State of Florida?
A I will, I have not yet.
Q Have you done anything in terms of documenting your time?
A I probably wrote down on some scraps of paper some extended conversations, the lengths of them. But the first conversation I had with him was so short that I probably didn't record it.
Q Did Mr. Nunnelley send you any material for you to review at that point in time?
A At that point in time, no.
Q Did he -- did he subsequently send you some material?
A There are four documents that I received through you, all of which have been admitted as exhibits here. The current and previous execution protocols. The final report from the Governor's Commission on Lethal Injection. And the Department Of Corrections reply. So that's the total of four documents.
Q Okay. Do you know when he sent you that material?
A It's all been within the last few weeks.
Q Prior to the last few weeks had you received any documentation whatsoever from the State of Florida?
A No.

Q You had not received the August 16th protocol, August 16th, 2006?
A No.
Q Have you had any contact with any Department Of Corrections personnel in this case?
A No.
Q Not at all?
A I guess it depends on your definition of Department Of Corrections. I've talked to a few lawyers, and I'm not sure who works for who.
Q Okay. Well, let's -- let's start with that. Who have you talked to?
A Primarily with Mr. Nunnelley. When I testified before the Governor's Commission I believe it was Ms. Snurkowski who first contacted me about that, and so we had some conversations pertaining to my testimony before the Governor's Commission. And --
Q And let me stop you right there, sir. I'm sorry. What did -- what conversations did you have with Ms. Snurkowski with regard to the lethal injection Commission?
A Scheduling a time to be able to testify by phone since I was not able to travel to Florida during that time that the committee was meeting.
Q Did she provide you with any reports, any documentation?

A No.
Q Did you ask for any?
A No.
Q Did she tell you what the substance of your conversation -- I'm sorry. Did she tell you what the substance of your testimony in front of the lethal injection Commission would entail?
A She told me that it would primarily involve trying to figure out what, if anything, went wrong with the execution of Angel Diaz.
Q Did you ask to see any autopsy reports at that time?
A No.
Q Did you speak with the toxicologist or the Medical Examiner in that case?
A No.
Q Have you ever talked to the toxicologist or Medical Examiner in that case?
A No.
Q Have you reviewed any of their testimony given before the lethal injection Commission in preparation for your testimony here today?
A No.
Q Have you had any -- other than the conversation you said you had with Ms. Snurkowski with regard to the

lethal injection Commission, have you had any other contact with her since that time?

A No.
Q Did you have any contact with her within the last day or two?
A We briefly spoke over lunch today.
Q And you recognize Ms. Snurkowski as the person just behind me to my left; is that correct?
A Yes.
Q And Mr. Nunnelley would be right next to her on her right; is that correct?
A Yes.
Q How about Mr. Hooker, have you had any conversations with him?
A Other than making small talk today to introduce each other, no.
MR. HOOKER: Well, I should say you don't know it, but I'm the person that called you about your plane flight the other day. I beeped you and you called me back. We were talking about how you were going to get from Orlando to Ocala. You decided to rent a car. And that was me.
THE WITNESS: Okay.
BY MR. DUPREE:
Q So you had that conversation with Mr. Hooker?

A Yes.
Q Okay. Going to the Department Of Corrections personnel, have you -- have you ever talked to Warden Bryant?

A No.

Q An Assistant Warden by the name of Dixon?

A No.

Q Have you talked to anybody that was involved in the execution of Angel Diaz?

A No.

Q Have you talked to any of the execution team members?

A No.

Q Have you talked to any of the medically -- medically qualified personnel that were there and present for Angel Diaz?

A No.

Q Have you reviewed any reports or any statements that were given by any of those members of the Diaz execution team?

A Only as it was incorporated in the Governor's Commission report.

Q Did you read -- review the Department Of Corrections Task Force report that was released on December 20th of 2006?

A Is that the reply to the Governor's Commission?

Q No, sir.

A Then, no, I did not.

Q But you did -- you did review the reply to the Department Of Corrections?

A Yes.

Q Sir, did you -- you said you have not had any

contact with anybody from the Department Of Corrections in terms of being either the Warden or the Assistant Warden. Have you spoken with any attorneys for the Department Of Corrections?

A Again, I'm not sure which of the attorneys that I've spoken with who works for who, but the three attorneys that have been named are the only ones with whom I've spoken to.

Q And that would be Ms. Snurkowski, Mr. Nunnelley, and what's the third person, and Mr. Hooker?

A And --

MS. DAVIS: Ms. Davis. I went and got him an brought him to the courthouse. That's the only contact we had, and then that was it. So I'm also an attorney.

BY MR. DUPREE:

Q How about Mr. Changus, Max Changus; have you spoken with him in the Department Of Corrections?

A No.

Q Did you -- have you talked to the Department Of Corrections secretary, Mr. McDonough?

A No.

Q I'm interested, sir. You said on direct examination that you had had -- even though it's not in the protocol -- I believe your exact language was -- even though it wasn't in the protocol you were aware of what the Department Of Corrections personnel were going to do to make

sure that a person who was subject to execution was going to -- how they were going to determine consciousness in that person?

A Yes.

Q Who did you have that conversation with?

A Mr. Nunnelley.

Q Mr. Nunnelley told you that?

A Yes.

Q When did he tell you that?

A Yesterday or today.

Q Do you know where Mr. Nunnelley got that information from?

A No.

Q And I believe you testified on direct, sir, that that is not listed in the protocol. There is nothing in there that tells you exactly how a person is going to be

determined to be conscious at the time that he's -- that the sodium thiopental is given; is that correct?

A Yeah, the details are not there.

Q Okay. Now, you have been involved in the litigation of these kind of issues around the country for the last couple of years; is that correct?

A Yes. I think I first participated in a case in the fall of 2003.

Q And since that time how many times do you think you've testified in court?

A I think this is the fifth.

Q And have you always testified on behalf of the

states?

A Yes, I have been called by the other side and after they've spoken with me they declined to introduce me as a witness.

Q Who declined -- who declined to do that, sir?

A There -- I don't remember the name off the top of my head, but I was contacted by Public Defender's Offices in at least two states; Oklahoma comes to mind, and I can't remember the other one. And I had lengthy conversations with them. And they ultimately decided not to call me as a witness.

Q So when you've testified in court you've only testified on behalf of the State?

MR. NUNNELLEY: Asked and answered. I object.

MR. DUPREE: I'll move on, Judge.

THE COURT: Okay.

BY MR. DUPREE:

Q How about affidavits, have you provided affidavits as part of your working with the states?

A Yes, I've probably provided affidavits in another six to eight states approximately.

Q How many different states would you say that you've given advice to?

A Well, I don't give advice, but I have given either court testimony, or testimony by video, or opinions by affidavit, I think in a total of ten or eleven states.

Q And you charge the states when you testify?
A Yes.
Q And how much do you charge?
A For testimony I charge three thousand dollars per day.
Q And how about an hourly rate?
A When I'm reviewing materials or doing calculations I charge four hundred dollars per hour.
Q Do you know how much you've charged the State of Florida so far to testify in regards to the Lightbourne matter?

A No, I haven't sent them a bill yet.
Q How about the lethal injection Commission, did you charge them?
A No.
Q Did you ever have any contact with the Governor's Office in this case, any member of the Governor's Office, the Governor, General Counsel for the Governor?
A No.
Q Either in the governor -- the former Governor's Bush's administration, or in Governor Crist's administration?
A No.
Q Have you reviewed any videotapes?
A No.
Q Any audio tapes?
A No.
Q Have you reviewed any medical records related to

Angel Diaz or any other inmate?

A No.

Q Have you reviewed the autopsy photos of Angel Diaz?

A No.

Q Have you reviewed the autopsy report?

A No.

Q Have you reviewed the toxicology report of Angel

Diaz?

A No.

Q Have you ever been to -- have you ever visited the death row here in Florida?

A No.

Q Did you have -- when you were going back and forth with the State, have you had any occasions to send any correspondence, either by way of E-mails or by letters?

A We have corresponded by E-mail primarily regarding logistic issues of when to schedule a phone call or when to schedule this trip.

Q Were you sent any kind of advance report or some sort of questionnaire, interrogatories, on behalf of the State telling you what they intended to talk to you about today?

A No. The sum total of everything I received are those four exhibits that I described already.

Q And did you have discussions with Mr. Nunnelley and or Ms. Snurkowski with regard to those exhibits?

A Yes. Mr. Nunnelley and I have had several telephone conversations.

Q And how many times would you say you've spoken with Mr. Nunnelley?

A Discussing material issues, maybe three or four times.

Q Did you provide any kind of a report to the State?

A No.

Q Any kind of written memorandum explaining what your position is?

A No. The only thing I submitted to them are the three figures that are sitting to your left.

Q And that would be the graphs; is that correct?

A Yes.

Q Okay. With regards to the graphs the -- what are these graphs based upon? How did you make these calculations?

A There are published pharmacokinetic parameters for thiopental and how it behaves in normal healthy humans. And the only real material important variable that one inputs into the equation is the patient's weight.

And then based upon a given dose and over how long a period it was administered I can then predict what the average blood concentration would be as a function of time.

Q And is that based on whole blood or plasma?

A Actually, thiopental is typically measured in whole blood. Although, there are other papers out there where they've used serum or plasma, but I'm typically basing

this on whole blood.

Q And are you familiar with the term Cp50?

A Yes.

Q And could you explain to the Court what that means?

A Cp50 represents the concentration of a medication that will cause half of a population to display a particular response.

Q And what is the Cp50 of thiopental?

A If -- well, first of all, it depends on which response you are asking about. But if you're talking about consciousness --

Q Yes, sir.

A -- the Cp50 for thiopental is typically taken at seven micrograms.

Q And is that something that you've independently determined?

A I have not done the experiments myself, no. I rely on the published work of others.

Q And who did you rely on to make that determination?

A The paper that I consider to have some of the best data is a paper whose senior author is Pinter Glass, G-l-a-s-s. And it's approximately from the early '90s.

Q Does 1992 sound familiar?

A It could be. I don't remember the date offhand.

Q And Dr. Glass made a determination that the Cp50

25 of thiopental is 7.3; is that correct?

A Yes.
Q Are you familiar with another paper by Dr. Stanski?
A Dr. Stanski has written many papers.
Q With regard to the Cp50 of thiopental?
A That applies to more than one paper. Can you be more specific or actually show me the paper?
Q Sure.
MR. DUPREE: May I have a moment, your Honor?
THE COURT: Sure.
MR. DUPREE: While they're looking, your Honor, I'll ask another question.
THE COURT: Uh-hmm.
MR. DUPREE: Oh, sorry.
MR. NUNNELLEY: Do you have more than one, counsel?
MR. DUPREE: Absolutely. Can I approach, your Honor?
MR. NUNNELLEY: Do you have one there with you, Mr. Dupree?
MR. DUPREE: I'm sorry?
MR. NUNNELLEY: Do you got more than one copy? Because what you left me is about a third of what you took up to the witness stand.
MR. DUPREE: Well, I can give you the other

one if you would like.

MR. NUNNELLEY: Are they all the same thing --

MR. DUPREE: Yes.

MR. NUNNELLEY: -- or is there more than one document?

MR. DUPREE: No, it's the same thing.

MR. NUNNELLEY: Okay.

BY MR. DUPREE:

Q Are you familiar with that paper, sir?

A I can't tell because I can't read it. I'm trying to read the -- the abstract, and I actually can't, so let me -- give me a few minutes to look through here to see if -- okay.

This is one of the many papers that this particular lab group has published on thiopental. In this particular paper this Cp50 that they are measuring has to do with movement, not consciousness. And movement has nothing to do with consciousness.

Q And what is the CP -- what is the determination of Cp50 in that paper?

A Well, there's -- I believe there are several. Let me thumb through here.

Q Of the thiopental?

A It ranges from 15 to 80 -- 15 to 79.

Q Okay.

A Whereas the patients didn't move at a Cp50 of 15, and it took 80 or 79 for them not to move in response to having a breathing tube put into their trachea, which is generally taken to being the most uncomfortable thing you can do to a patient.

Q So they were measuring the levels of pain; is that correct?

A No, they're actually measuring movement. Movement does not reflect pain, and this does not reflect consciousness. Movement is different.

Q Are you familiar with a textbook by Goodman and Gilman, the Pharmacological Properties of Parenteral Anesthetics?

A Yes.

MR. DUPREE: Again, may I approach?

MR. NUNNELLEY: Do you have something for us to read? Let's -- yeah. Is this my copy or is this something you want?

MR. DUPREE: Can I approach, your Honor?

THE COURT: Sure.

BY MR. DUPREE:

Q Have you had an opportunity to look at that table, sir?

A Yes.

Q And that book is that -- by the way, is that book authoritative?

A It is accepted a typographical error there, which

I have already pointed out to the author. I believe the author is Dr. Alex Evers of this chapter, even though it's not listed here. And he and I have spoken about that. And it's going to be fixed in the next edition.

Q Well, what does -- what does it say right there, sir? It says 15.6; is that correct?

A Yeah, and doctor --

MR. DUPREE: Your Honor, I'm going to object. That's a total hearsay. It's in the book. I'm asking him to look at what is there.

THE WITNESS: But I'm testifying that that's a typographical error based --

MR. DUPREE: Your Honor, I would move to strike as hearsay.

THE WITNESS: -- based upon my assessment.

MR. NUNNELLEY: Your Honor, he's badgering the witness. Can we go one at a time at the very least?

THE COURT: I'll sustain the objection. Just restate the question and let the witness answer the question.

MR. DUPREE: Judge, I asked the question. He

went beyond the question.

THE COURT: All right. Well, we'll sustain the objection.

BY MR. DUPREE:

Q Would you agree with me, sir, that if the noxious