COMMONWEALTH OF KENTUCKY
FRANKLIN CIRCUIT COURT
DIVISION 1

RALPH BAZE,	
PLAINTIFF	
v.	CIVIL ACTION No. 04-CI-01094
JOHN REES,	
DEFENDANT.	

[Street Address]
[City, State]

May 2, 2005

The HEARING in this matter began/continued at [time a.m./p.m.] pursuant to notice.

BEFORE:
ROGER CRITTENDEN
FRANKLIN COUNTY CIRCUIT JUDGE

APPEARANCES:

On behalf of Plaintiff:

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BRIAN JUDY, ESQUIRE

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C O N T E N T S

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P R O C E E D I N G S

THE JUDGE: There we go. You can move to strike. Mr. Middendorf, I believe that we are ready for the Commonwealth's testimony. Correct?

MR. MIDDENDORF: Thank you, Your Honor. Yes, Commonwealth calls Dr. Dershwitz.

Whereupon,

MARK DERSHWITZ

was called as a witness and, having been first duly sworn, was examined and testified as follows:

THE JUDGE: Okay. Do be seated here. Dr. Dershwitz, if you can face whoever is questioning you, I've got a marker so you don't have to turn around and look at me.

DIRECT EXAMINATION

BY MR. MIDDENDORF:

Q Doctor, could you please state your name for the court?

A Mark Dershwitz.

Q And could you please give the court your educational background?

A I have a Bachelor's Degree in Chemistry from

Oakland University. A Ph. D. in Pharmacology from Northwestern University and an M.D. from Northwestern University.

Q Could you please briefly discuss where you work and also your employment prior to that.

A Okay. Presently, I am the vice-chairman of the Anesthesia Department at the University of Massachusetts. I have been there since 2000. Prior to that, I was on the staff at Massachusetts General Hospital in Boston and a Faculty Member of Harvard Medical School.

Q Do you hold any licenses or certifications?

A I have a medical license to practice in Massachusetts and Maine and I am Board Certified in Anesthesiology.

MR. MIDDENDORF: Your Honor, if we could go ahead and mark this CV as exhibit, I believe we are on 5. If there being any objections, we ask that that be introduced.

(Commonwealth's Exhibit No. 5 was marked for identification.)

SPEAKER: No objections.

SPEAKER: All right. I'll go over it.

SPEAKER: Fine. Okay.

BY MR. MIDDENDORF:

Q Doctor, could you briefly identify why your

experience is uniquely relevant to this particular case, on the constitutionality of the substances of drugs used in the Commonwealth?

A First of all, two of the medications that are used as part of the lethal injection protocol are medications that are routinely used by anesthesiologists for the normal conduct of the general anesthetic in a person. In addition, my major area of research interest over the last 15 years has been to study both the time course and the effect of intravenous anesthetic agent thiopental.

Q Could you define the difference between pharmacokinetics and pharmacodynamics?

A Pharmacokinetics is the study of the time course of the medication. And pharamcodynamics is the study of the effect of a medication on a person.

Q So that would be important in the discussion that we are having today.

A Yes.

Q And then, you researched and published articles on these two issues?

A Yes, I have.

Q Have you researched and published any articles on short-acting hypnotics?

A Yes, I have.

Q Okay. And what typically was in that type of research papers discussed?

A Well, for example, a typical research protocol might involve a volunteer human who is given a medication and blood samples are drawn to measure the time course of the medication's effect as well as to measure certain effects of the medication, like for instance whether or not they are asleep.

Q Would you consider that type of drugs that you studied to be short acting barbiturates, like sodium thiopental?

A Similar, yes.

Q Have you received materials in anticipation of your testimony today?

A Yes.

Q Could you please tell us what you received?

A I received a detailed protocol for the carrying out of the lethal injection in Kentucky. I also received a number of autopsy reports, both from Kentucky and from other states on inmates who were given lethal injection preciously, that contained a toxicology report from your autopsy.

Q Did you research and your professional experience

assist you in analyzing these materials?

A Yes.

Q Do you now consider yourself familiar with Kentucky form of lethal injections?

A Yes, I do.

Q And what are the three drugs the Commonwealth uses in execution by lethal injection?

A The first medication is thiopental, which is classified as a hypnotic agent. That means that it renders the person unconscious. The second medication is pancuronium, which is a paralytic agent that causes paralysis of several muscles. And the third agent is potassium chloride, which in this case is given in high dose in order to cause cessation of the electrical activity of the heart.

Q And in the amounts that Kentucky administers, is each drug lethal in itself?

A Yes.

Q Let’s start with the first drug, sodium thiopental, 3 g. Have you analyzed how this drug affects a person when administered?

A Yes.

Q Could you please tell me about your analysis?

A Well, when a human of average size, I typically

use 80 kg as the size of the average human, is given a 3 g injection of thiopental, unconsciousness will occur in less than a minute. And the person will remain unconscious for hours afterwards.

Q What is the usual dose to induce general anesthesia in an average person?

A Well, again if we have an 80 kg person presenting for surgery, a typical dose of thiopental for an anesthetic would be about 300 mg.

Q Then how long would a dose to induce general anesthesia last if nothing else were given to the patient?

A Well, on average a dose of 300 mg would cause an average person to be unconscious for about eight minutes.

Q And how long should it take the individual to become unconscious if given a anesthesia for a dose to get general anesthesia?

A Again, less than a minute.

Q Have you ever given a 3 g dose of sodium thiopental to a patient?

A Yes, a few times in my career. The 3 g dose would be used in a situation where we are trying to achieve what’s called brain protection. And in a situation where a patient is having neurosurgery in which there is going to be the planned interruption of blood flow to the brain,

giving a large dose of a barbiturate like thiopental can make it less likely that the person will have a stroke during the surgery. So I have given 3 g of thiopental to a patient in such circumstances. In this sort of operation, first of all the 3 g dose of thiopental is not given as rapidly as it would be during an execution because the effect on the heart, in terms of blood pressure and cardiac output is so significant that a person would be difficult to resuscitate. So when I give 3 g of thiopental as part of a neurosurgical procedure, it's typically given over approximately 10 to 15 minutes. And that makes management of the blood pressure easier.

Q What other type of measures would you have to take to keep somebody alive if given a 3 g dose?

A I'd have to give medication both to keep the blood pressure up and to make the heart pump stronger.

Q But would it be significant steps?

A Yes. And after a 3 g dose in this scenario, this person generally sleeps for hours after their operation is over.

Q Have you prepared graphs to demonstrate your analysis for your testimony today, to indicate how long someone would be unconscious with the 3 g dose of sodium thiopental?

A Yes, I have.

MR. MIDDENDORF: Your honor, I'd like to mark this as Commonwealth's Exhibit 6.

SPEAKER: I have no objection to this.

THE JUDGE: All right.

SPEAKER: Thank you.

MR. MIDDENDORF: We would ask that that be admitted without objection.

(Commonwealth's Exhibit No. 6 was marked for identification and received into evidence)

THE JUDGE: Okay. Go ahead.

BY MR. MIDDENDORF:

Q Doctor, can you please explain the graph that you've put together to, I guess, to take levels of unconsciousness and the time periods?

A Okay. In these graphs, the x-axis is time in hours and I carried it out through ten hours. And on the y-axis is the probability that an average person of 80 kg would be unconscious following a 3 g dose of thiopental. And in order to make the y-axis more equally visualized, you know, that's a log axis, not a linear axis. And so what this shows is that the overwhelming probability, well over 99 percent of people are going to be unconscious for hours after a 3 g dose of thiopental. And the point at

which five percent of the population would wake up or 95 percent of the population would remain asleep is about two and a third hours following such a dose of thiopental. And approximately 50 percent of the population will awaken after about four and two-thirds hours.

Q Can you please talk about the way you come up with these numbers, the methodology to it?

A Okay. The way that this is done is a computer prediction based upon published experiments in normal humans in which they are given drugs like thiopental and the time course of the drug's effect and of the drug that courses throughout the body is measured. So a typical experience, a person would have an intravenous line in place for the administration of thiopental. They would also have a needle put into an artery for blood sampling of thiopental. And the scientists doing the experiment would also measure whether or not the person is unconscious by -- to find that whether or not they could follow simple commands, such as raise your right arm or raise your left leg. And so based upon previously published studies on humans given thiopental, I was able to draw this graph based upon giving a dose of 3 g of thiopental. Knowing how long it should last in the body and knowing what concentrations are associated with consciousness or

unconsciousness.

Q So given your graph, you predict that they will be unconscious for at least two hours. That any individual would be unconscious for at least two hours, on a very --

A 95 percent of the population would be unconscious for more than two hours. Well over 99 percent of the population will be unconscious for more than an hour.

Q Is sodium thiopental a constant or a consistently behaving drug that you can rely upon?

A Yes.

Q Okay. What is the likelihood of a person not behaving consistently after receiving this drug?

A It is relatively small. There are some people who may have some tolerance to the medication. For instance, a person who takes a barbiturate for prevention of epileptic seizures might have some tolerance, drug tolerance to thiopental. But that drug tolerance would be of the magnitude of a factor of two or three, typically. So if I were to give anesthesia to someone like that it would take 300 mg as a typical dose to put an 80 kg person to sleep. And if I had a patient who was taking a barbiturate for prevention of epileptic seizures, I might have to give 6 or 700 mg. You know, a factor of two to two and a half to three, in order to have them reliably go to

sleep. But in the case of this sort of dose that is being used for lethal injection, that is still so far -- potential factor higher than what is typically used and even somebody with inherent tolerance, there is still a very, very high probability that they are going to remain unconscious for a long time.

Q One drug that has been mentioned before is propofol. What is the difference between sodium thiopental and propofol?

A Propofol is a shorter acting drug, which is why it is more commonly used in anesthesia today, because we typically want our patients to wake up quicker so they can be more quickly discharged from the hospital. So, propofol is used more commonly than thiopental because thiopental is longer lasting.

Q Is it a fair statement to say that sodium thiopental is not used as much today because it has a longer hangover effect?

A Yes.

Q Okay, and can you please explain the hangover effect of sodium thiopental displayed --

A Well, the course of --

Q -- when --

A -- the drug --

Q I'm sorry.

A Even after the person wakes up they still have residual effects of the drug. And that "hangover" effect is residual sleepiness. And so if a person is having ambulatory surgery, the goal is to have them as wide-awake as possible so that they can leave the hospital as quickly as possible. And we can achieve that more quickly with a shorter acting drug like -- like propofol, as compared to an older drug like thiopental.

Q Phenobarbital has also been mentioned as an alternative to sodium thiopental. Does it make a difference which one of these is used, if given a 3 g dose of each?

A The 3 g duration of action of the two medications is not going to be meaningfully different. At a 300 mg dose, pentobarbital would be a slightly longer lasting than thiopental but at 3 g, the two drugs have about the same duration of action.

Q In your expert opinion, is Sodium Thiopental a humane component of the lethal injection process?

A Yes, it is.

Q After being administered this drug, what would the inmate's level of awareness be?

A After a 3 g dose of thiopental, the inmate would

be unconscious and will remain unconscious for hours if no other intervention were performed.

Q One of the things that is often mentioned is sodium thiopental is an ultra short acting drug. Given at 3 g, does it -- I know it is classified as that but the effects are much longer lasting. Is that a fair statement?

A Yes. I think the term ultra short acting is just by comparison to the other barbiturates. The classical pharmacology definitions of barbiturates are long, intermediate and short. And so phenobarbital, which is used in epileptic therapy, is classified as a long acting drug. And secobarbital, which used to be used, but rarely today, as a nighttime sedative was an intermediate acting drug. And thiopental and methohexital were classified as short acting drugs. And those terms are in relation to each other. But when thiopental was given in a 3 g dose, it is not a short acting drug. It lasts for many hours.

Q You said that you reviewed the materials that were used here in Kentucky. Is it important that sodium thiopental be given first in that series of drugs?

A It is critical that it be given first.

Q And in your expert opinion, what is the likelihood that the drug eliminates any unpleasant effects from the following two drugs?

A Well, after a 3 g dose of thiopental, the inmate is unaware of his or her surroundings and so nothing that happens to the inmate after the thiopental is given is perceptible to the inmate.

Q Are you familiar with the second drug in the series Kentucky uses, pancuronium bromide?

A Yes, I am.

Q Can you comment how that pancuronium bromide of 50 mg would affect an individual?

A Pancuronium bromide is a paralytic agent and therefore it impairs the functioning of several muscles. So in surgery it is typically given to make surgery easier in terms of causing muscle relaxation. It means that the surgeon doesn’t have to work as hard if the chest or the belly is open. It also causes a cessation of breathing but in the case of a lethal injection protocol, the primary effect of the pancuronium will be to decrease the involuntary muscle activity that will be subsequently caused by the administration of potassium chloride.

Q Would this high dose of pancuronium bromide increase or decrease the time it takes to paralyze an individual?

A The onset of paralysis is a function of the dose. So a normal paralytic dose in a human is 7 to 10 mg for

surgeries. So the dose that is being used in this protocol would have a more rapid onset because it is so much larger.

Q What type of awareness or experience of the effects of the pancuronium bromide would an inmate expect to experience or perceive after 3 g of sodium thiopental?

A None. Because as I said, after a 3 g dose of thiopental, nothing that happens to the inmate after that will be perceptible to the inmate.

Q The pancuronium bromide when limited from the Kentucky protocol and an inmate received 3 g of sodium thiopental and 240 mEq of potassium chloride, what would someone viewing the execution witness?

A Well, the administration of the potassium chloride would still cause the sensation of electrical activity in the heart. And the heart would stop beating in approximately the same time that it would under the current protocol. The difference is that the potassium chloride would also cause spontaneous muscle movements that is due to a direct effect of potassium chloride on muscle tissues. And so the inmate would appear to thrash or twist and even though the inmate is unconscious and wouldn’t feel that, this could be perceived by lay witnesses as suffering or discomfort.

Q So in your expert opinion, if you took that out,

even if the inmate had these reactions, they would not feel any pain, whatsoever.

A No, after 3 g of thiopental, nothing that happens after that to the inmate will be perceptible to the inmate.

Q The third drug, potassium chloride, 240 mEq, can you comment on the action of that drug?

A Potassium is a necessary chemical for life and if the level of potassium in the blood is either too high or too low, the heart will not beat properly, as well as many other biological processes will not occur properly. And when the blood concentration of potassium is raised by giving a rapid injection, the electrical activity in the heart is stopped quickly, and the heart stops pumping almost immediately.

Q There has been testimony that pancuronium bromide might interact with sodium thiopental and then eliminate each other by precipitating. Do you have any comments on that?

A Well, it is true that because thiopental as a solution is a pH 10 and pancuronium is a pH 4, if they physically mix with one another, there will be a precipitation reaction, in which the pancuronium will precipitate and will be rendered inactive.

Q Do you have a -- does it make a difference when

Kentucky uses 3000 mg of sodium thiopental and 50 mg of pancuronium bromide? If anything precipitates, are you going to lose any of the sodium thiopental?

A Well, you lose approximately 50 mg of the sodium thiopental in fact, leaving approximately 2,915 mg of thiopental to act after it directly precipitated the 50 mg of pancuronium.

Q Is that more than enough to render someone unconscious for a significant period of time?

A Yes.

Q Would you say up to two hours?

A At least.

Q Does the saline flush assist in assuring these medications act appropriately?

A Yes. Because the volumes in the saline flush is larger than the volume contained in the IV tubing. So when each medication is followed by a saline flush, it prevents the subsequent medication from mixing physically with the medication that was given previously.

Q Given the way the drugs are administered in Kentucky, the three-drug combination with the saline flush), how quickly is the prisoner actually put to death in this combination of an actual person or an average person, in your opinion?

A The answer to the question is difficult because it depends a little bit on the definition of death. In medicine, we really don't have a really good definition of the exact moment at which death occurs in a scenario like this. But what I can say is, if the medication given, one following the other, typically occurred in a four to five minute period, it still has -- before the potassium chloride circulates, the heart stops. And at that point, the lack of circulation is going to effectively cause the inmate's death.

Q And I assume that in your career you had either pronounced people dead, or been around when others have pronounced an individual dead. Is that correct?

A Yes.

Q Even though if somebody were to hit a tree in a motorcycle and die on the scene and brought in to the hospital, when would be the official time of death?

A Usually, when the person is first seen by a physician, and the physician realizes that there's -- you know, accident victim is non-resuscitatable, they pronounce them dead.

Q Do you have an opinion as to whether or not these three drugs when used in the combinations that we have in Kentucky, in the volumes indicated in the execution manual

cause undue pain and suffering during an execution by a lethal injection?

A They do not, because from the inmate's point of view, it's no different than undergoing a general anesthetic for surgery.

Q Do you have an opinion as to whether or not these three drugs used in the series and in the volumes indicated in the manual, are medically a humane form of execution?

A They are, for the same reasons.

Q Okay. Like to turn your attention to the materials of Dr. Heath that were submitted to you. Did you have his C.V.? Did you have the opportunity to look at that?

A Yes, I did.

MR. MIDDENDORF: Judge, and I don't remember what we marked that as. If I could approach, Your Honor?

THE JUDGE: Yes, go ahead.

MR. MIDDENDORF: Judge, do you need another copy?

THE JUDGE: No. No.

BY MR. MIDDENDORF:

Q Doctor, if you could just be -- give a comparison of your credentials as to Dr. Heath's?

A Well, like myself, Dr. Heath is a physician, and he's also trained in anesthesiology and he's Board

Certified in anesthesiology. He also does research and his major area of research is on the mechanisms of pain. I would say that my research on pharmacokinetics and pharmacodynamics of intravenous anesthetic agents is more germane to the topic that's under discussion today.

Q There has been previous testimony that there were no visible signs of infiltration in the Eddie Lee Harper case. All who testified here who viewed the execution state that Mr. Harper became unconscious almost immediately. Dr. Corey, the state medical examiner, was able to draw a drug level from various sites, both above and below the diaphragm.

And then Dr. Heath noticed nothing out of the ordinary on Mr. Harper's EKG, until one minute after the potassium chloride was flushed. Given that, can you state to a medical degree of reasonable certainty that the drugs entered Mr. Harper's body properly?

A Yes, it did.

Q And you were also able to review Eddie Lee Harper's autopsy result?

A Yes.

Q Did you prepare a graph to show sodium thiopental going into a -- an individual?

A Yes.

Q Okay.

THE JUDGE: Which number, please?

MR. MIDDENDORF: Number seven, I believe, Your Honor. May I approach?

THE JUDGE: Yes, please.

BY MR. MIDDENDORF:

Q Can you please explain to the court what this graph shows?

A Okay. This graph is different than the one I previously showed, because you'll note that there are no numbers on the x or the y axis. And the reason for that is that it's very difficult to do prediction on the venous concentration of a medication, following a dose of 5 or probably 3 g because of the enormous effect on the heart's ability to pump.

But this graph is loosely based upon some research that I'd done in the past, where arterial and venous blood samples were obtained simultaneously from people given intravenous medication. And there are certain things that we do understand very well when medications are given, and the blood samples are obtained simultaneously from the artery and from the vein.

Shortly after the medication is administered, the arterial concentration will be much higher. And with

anesthetic drugs, it's the arterial concentrations, which reflect what's actually going on in the brain. The venous concentration will never be as high as the arterial concentration. And furthermore, there will be a lag time between the time that the drug peaks in the arterial circulation as compared to the venous circulation.

So even though I don't actually have the extracts of quantitative in terms of time, the timeframe is hours, not seconds or minutes. And you can see that the dotted line, which reflects the venous concentration of an IV drug, is going to be much lower than the arterial concentration and it's going to peak several minutes later.

Now, this graph is based upon the effect of a typical anesthetic dose of thiopental, which is approximately 300 mg. I do not have the capability, and I don't think anybody else who is expert in kinetics and dynamics has the capability of predicting what's going to be the delay time between the arterial and the venous concentration in a normal person following such a large dose of thiopental as 3 g. But the time that it's going to take for adequate mixing throughout the body, so that at some point the arterial and venous concentration will approach one another, after 300 mg of thiopental it takes four to six minutes for adequate mixing throughout the

body. I can't tell you how long it could of take after 3 g, but it is going to be much, much longer. But I can't be more specific than that.

Q Can you explain how, once these drug are flushed, they circulate through the body?

A Thiopental is given typically into an arm vein. And so the medication travels from the arm to the heart. It then enters the right side of the heart and is pumped out to the lungs, where the blood is oxygenated. It returns to the left side of the heart and it is pumped out from there. Now, the heart nourishes itself with blood that is pumped from the left side of the heart.

So the heart will be exposed to the thiopental approximately the same time as the brain will. And after a 3 g dose of thiopental, the heart's ability to pump will be substantially depressed. So circulation will begin to slow, tremendously. But the patient will be unconscious at that point because it will have reached the brain.

Q So I believe you reviewed Eddie Lee Harper's autopsy results and the levels that were in both his, I guess, the heart and also some other sites.

A Yes.

Q Do you recall the amount that was in the heart?

A I believe it was 6.5 mg/L.

Q And what part of the heart was that taken from?

A That was taken from the right atrium.

Q Does that accurate -- accurately measure whether he was conscious or unconscious during the execution?

A It has nothing to do with the level of consciousness because the right atrium is essentially a venous blood sample and that concentration is expected to be a much, much lower than what the concentration at the same point in time would be in the brain.

Q What about the sites in the legs or any other sites in the body that was taken?

A The other venous sites have lower concentration and that is also what you would expect.

Q Dr. Watson, one of their experts testified that Eddie Lee Harper could have experienced pain and he testified that he solely based that on the 6.5 mg/L?

A Yes.

Q Okay, do you have an opinion as to the drug levels in the autopsy result?

A Well, I think Dr. Watson was misinterpreting the scientific data. As I said before all of the experiments that have been done, where people are given thiopental and effects are measured, all of those experiments that have been published rely on arterial sampling of the blood, and

so we know that a concentration of 7 mg/L is approximately the concentration at which 50 percent of the people will be awake and 50 percent of people will be asleep. But that 7 mg/L is based upon obtaining the blood samples from an artery, which then reflects the brain concentrations. It's not valid to compare concentrations of the drug like thiopental obtained from venous sampling, which is what is done in an autopsy, and use those numbers to try to predict what the brain was experiencing.

Q He also testified that he would expect a person's blood level to be right before death 3 mg/L if the autopsy levels were the same as Harper's as they ended up. He actually predicted that those thiopental levels would rise, once somebody had died. Do you an opinion as to that?

A I believe he must have pulled those numbers out of thin air because there is no scientific data to support that as far as I know. After a patient or an inmate dies, circulation stops. And so the process of distribution or redistribution, which is the process by which the medication circulates throughout the body and enters and bleeds the organs. That process stops.

Q Dr. Heath testified that sodium thiopental begins to deteriorate immediately. If Kentucky mixes the two drugs, two hours prior to an execution would the effects of

sodium thiopental be of any concern?

A No. Back in the days when thiopental was the most commonly used intravenous anesthetic, the hospital at which I worked made many liters of it per day in large batches. And then at the pharmacy, it was stored in 20 mm syringes and the pharmacy marked each of those syringes with an expiration date 72 hours following the time that which it was made. So at the point in time when we were using thiopental regularly in almost all of our patients when the pharmacy prepared it for us, they agreed that a 72-hour expiration date was safe for all of our patients.

Q One thing that has been suggested is a BIS monitor. Do you have any experience with a BIS monitor?

A I actually do. I was one of the investigators that assisted Aspect Medical Systems and thousands of BIS monitors. The BIS monitor is an EEG monitor in which a series of EEG electrodes are put across the patient's forehead. And the machine measures the EEG wave and uses an algorithm to present the clinician with a number that correlates with the likelihood of a particular patient being conscious or unconscious. And this is a monitor that is becoming more and more commonly used in anesthesia for surgeries because awareness under anesthesia while rare, is still something that we are endeavoring to make even rarer.

Now, you asked me about the possibility of employing a BIS monitor during an execution to confirm that the inmate would be unconscious. And I see one theoretic problem with that, and I'd have to admit I am using -- purely from a theoretical basis now, because we have never taken with our patient under anesthesia and given them this much potassium chloride as you are doing during an execution, but knowing what I know about how potassium chloride acts, since the BIS monitor is measuring very, very tiny voltages on the forehead that are coming from the brain, when the potassium chloride causes widespread stimulation of skeletal muscles, I expect that those voltages that will be produced will overwhelm the EEG voltage that the monitor is trying to measure and I would predict that a significant artifact will be introduced into the monitor's ability to a subconscious level.

Q So what -- in layman's terms you are saying it might give a perception that they are aware even though they aren't?

A Well, actually what I think is going to happen is whether the monitor detects artifact, it stops because of the depth of anesthesia? In other words, it has an algorithm that looks for artifacts and when it detects artifacts, it stops displaying data. So what I think is

going to happen if a BIS monitor were used for an execution, is once the potassium chloride caused skeletal muscle to be stimulated, the digital read out from the BIS monitor, I believe, will go blank.

Q If you took pancuronium bromide out and still used the BIS monitor and there was some involuntary muscle reaction, would that show consciousness on the BIS monitor?

A Again, it could possibly show evidence of consciousness, but I think more likely, the digital read out will go blank.

Q Okay. What about the use of a pressure cuff during an execution?

A Well, I expect the 3 g of thiopental are going to cause the inmate's blood pressure to become very, very low. So if a blood pressure cuff were placed on the inmate's arm and hooked up to one of the automated machines that is used for measuring blood pressure, I suspect that the machine would be unable to measure blood pressure at all. Because these machines are not accurate at the extremes of blood pressure.

It might be possible to take blood pressure the old-fashioned way, meaning a person that places a stethoscope on the arm, to fill up the blood pressure cuff and listen for sounds. It might be possible to take a

blood pressure that way, but I think using an automated machine is probably not going to be successful.

Q But giving 3 g of sodium thiopental, would either of these make a difference?

A Make a difference in terms of how?

Q Determining -- if it were given properly, 3 g of sodium thiopental with a blood pressure cuff or a BITS monitor have any usefulness on whether the person is conscious or not because you know what the result is going to be?

A Well, first of all blood pressure does not correlate with consciousness very well at all. But if the blood pressure were to drop to nearly unmeasurable levels it should confirm the fact that the thiopental was doing what we expect it to do. But I don’t think that measuring blood pressure is going to be confirmatory in terms of the likelihood that the inmate is conscious or unconscious.

Q Do people other than doctors and nurses insert IVs in hospitals?

A Yes.

Q How often does that take place?

A All the time.

Q Would it be a fair statement to say that often medical residents are taught how to insert IVs by

phlebotomists or members of IV teams in hospitals?

A Yes. Today, because medical residents are supposed to be taking care of patients including (inaudible) as we call it (inaudible) than they did years before, almost all hospitals now have teams of technicians for doing things like putting an IV and doing other things that the interns and the residents usually have to do. And so most hospitals now have IV teams that are made up of technicians who draw blood, who put IVs and do things like that.

Q And if those people have the experience that is needed, they can certainly insert an IV?

A Yes.

Q Do you have an opinion as to whether the drugs used in Kentucky's execution protocol will result in a humane death?

A I believe they do.

Q I have no further questions, Your Honor.

THE JUDGE: Thank you. Mr. Shouse?

MR. SHOUSE: First, can we take a 5-minute break before cross-examination?

THE JUDGE: Well, we're going to take about a 15-minute break probably in about 30 minutes.

MR. SHOUSE: Okay. That's fine.

THE JUDGE: Well, I didn't tell you all but at some point in time as soon as this gentleman gets finished with the jury, I've got to go talk to the new jury for about 15 minutes and then I will probably recess about 12:00 o'clock anyway, so --

MR. SHOUSE: Yes, sir, I think we'll be finished by then.

THE JUDGE: Okay.

SPEAKER: Certainly.

CROSS-EXAMINATION

BY MR. SHOUSE:

Q Okay. Good morning, Doctor.

A Good morning.

Q We were briefly introduced this morning, but again, my name is Ted Shouse. Along with Mr. Barron and Ms. Balliet, we represent Mr. Baze and Mr. Bowling.

Now, first of all, I just want to talk about one thing you said on your direct examination. And I'm sorry I don't have enough Xeroxes for this, so I'm just going to come up --

MR. SHOUSE: May I approach the witness?

THE JUDGE: Please.

BY MR. SHOUSE:

Q Can you read -- and again, I'm sorry, I don't

have enough Xeroxes, but I think you've -- now, you testified on the record that where you used to work they would miss out a big batch of sodium thiopental and that you were under the impression that the pharmacist said that it could be used for 72 hours.

A That's correct.

Q Okay. Can you take a look at this, which was provided as part of the discovery and I assume what that is part of the packaging sort of for the thiopental sodium. Can you read right over here on the right-hand side where it says "Contents should"?

A Yeah, it says "Contents should be completely reconstituted and used within 24 hours." And that's based upon the information given to the manufacturer. At Massachusetts General Hospital where I used to work, the pharmacy did its own stability studies and convinced themselves that 72 hours was a safe time to label the syringes for their expiration. And so based upon their published study, a 72-hour expiration time was more reasonable than 24 hours.

Q Okay, but this manufacturer says use it within 24.

A Correct, because they didn't do a long enough stability study.

Q Does it say anything about stability studies on here?

A No, but I know that that's what they reported to the FDA.

Q Okay, so this says 24 hours.

A Yes.

Q Okay. I believe you also testified that if sodium thiopental and potassium chloride were used without the Pavulon -- is it okay if I call it Pavulon instead of pancuronium bromide?

A You could, but it's very unlikely that Pavulon is the medication being given to the inmates.

Q Okay, I'll call it pancuronium bromide then. Now, you testified that if sodium thiopental in the amounts designated in the protocol and potassium chloride were used without the pancuronium bromide, you said it would kill the inmate, is that correct?

A Yes.

Q And you also testified that it wouldn't hurt any more than what's currently employed, is that correct?

A Yes.

Q Okay. Now, you're a Board-certified anesthesiologist?

A Yes.

Q And you have a Doctor of Pharmacology degree, right?

A Yes.

Q You don’t have a Doctor of Pharmacy degree?

A No.

Q Okay. What privileges do you enjoy at the University of Massachusetts Medical Center?

A I’m a staff anesthesiologist.

Q Okay, okay. So you only do general anesthesia?

A I give all kinds of anesthesia.

Q If it’s final anesthesia?

A Yes.

Q Okay. Central lines, you can insert a central line?

A Yes.

Q Okay. And ideally, in your professional experience on a day-to-day basis, you want your patient to survive the operation?

A Oh, yes.

Q Okay. Death is not the desired outcome of what you do on a daily basis?

A No.

Q Okay. Now, are you an expert in toxicokinetics?

A Yes, I am.

Q You are? Okay. Are you an expert in metrokinetics (phonetic)?

A There is no such word in the dictionary.

Q Okay. Well, do you know what that means? Do you know --

A I can advance (inaudible) position for that.

Q Okay. Do you -- are you an expert on postmortem redistribution of drugs?

A I'm quite familiar with the topic.

Q Well, didn't you testify on direct examination that once the person dies that redistribution stops? Is that your position?

A Well, there's two different definitions of redistribution.

Q Okay.

A In the one case, redistribution is the practice by which the medication is distributed throughout the body to various organs. There is also a process by which -- and I believe this is what you're alluding to, that the medication can diffuse from tissue back into the circulation after death. And that process occurs to a small but not significant degree with a drug like thiopental.

Q Okay, so it does occur with thiopental?

A To a small but not very significant degree.

Q Okay. Now, you said you are an expert in toxicokinetics?

A Yes, my doctorate in Pharmacology is primarily a toxicological research degree.

Q Okay, have you published anything on toxicokinetics?

A Well, again, that’s a word that you or somebody else made up. I’ve published substantially on toxicology.

Q Okay, but on toxicokinetics, the effect of massive fatal doses of drugs on someone’s body, have you published anything on that?

A Well, that’s not the definition. I’ve published extensively on kinetics and I’ve published extensively on toxicology and I’ve published extensively on what you’re calling toxicokinetics.

Q Okay. Have you ever written anything about thiopental?

A Yes.

Q Okay, what?

A I have both book chapters and review articles on thiopental. The standard anesthesia manual that is used by almost all of the anesthesiologists in the country has a chapter on intravenous anesthetics, which I’ve authored for

several editions.

Q Okay. Have you -- are you an expert in forensic pathology?

A No.

Q Okay, an expert in forensic toxicology?

A No, I have a working knowledge of it.

Q Okay, but you're not an expert in those fields. Now, pharmacokinetics and pharmacodynamics, those specialties deal with the effect of -- properties of the time-effective drugs in living people, is that fair to say?

A Yes.

Q Okay. Now, you've submitted affidavits and you've testified on this subject that we're here to -- about today in a number of states, is that right?

A Yes.

Q Okay, Ohio?

A Yes.

Q Maryland?

A Yes.

Q South Carolina?

A Yes.

Q Virginia?

A Yes.

Q California?

A Yes.

Q And now Kentucky?

A Yes.

Q Okay. Now, Mr. Middendorf went through several charts with you that were prepared for this, well, occasion. You've prepared similar charts for other states, is that correct?

A Yes, depending on what does of thiopental they use.

Q Okay, right. I mean, it's state-specific. I mean, that each chart you've prepared has been state-specific.

A Well, some states that use the same dose, don't require a different chart.

Q Okay, okay. Are you familiar with something called "anesthesia awareness"?

A Do you mean "awareness under anesthesia"?

Q Right, it's often called "intraoperative awareness".

A Yes, I'm very familiar with it.

Q Okay. What's the incidence of anesthesia awareness?

A Well, the -- to use the proper term, the incidence of awareness under anesthesia is between 0.2 and

0.5 percent if you take all patient kinds for surgery.

Q Okay, and that’s about 1 in 500?

A Give or take a little bit.

Q Okay, but that’s a ballpark?

A Approximately.

Q Okay. And those are clinical numbers, right?

A Yes, based upon real people having real operations.

Q Right, real operations on medical doctors.

A Yes.

Q And with medical doctors applying the anesthesia to the patient.

A Correct.

Q And presumably with surgeons performing the surgery.

A Yes.

Q And these are in hospital settings.

A Yes.

Q Okay, okay. These aren’t where the anesthesia has been administered by an EMT or a phlebotomist from another room, are they?

A No, but it’s also -- it goes for the approximately one-tenth of the anesthetic that’s given during that diffusion.

Q But again, these are medical doctors administering?

A Yes.

Q Okay. Now, are you familiar with an organization called the Joint Commission on Accreditation of Healthcare Organizations?

A Yes.

Q Okay. And UMass Memorial Medical Center is accredited by that organization, isn't it?

A Yes.

Q Okay. Now, are you familiar with something the Joint Commission calls a Sentinel Event Alert?

A Yes.

Q All right. And are you familiar that that organization issued a Sentinel Event Alert last October 6th on the topic of anesthesia awareness?

A Yes.

Q Okay, you've seen that report, right?

A Yes.

Q Okay. Now, I'd like to show you that report if I could.

MR. SHOUSE: Your Honor, may I approach?

THE JUDGE: Please.

BY MR. SHOUSE:

Q Now, could you read the highlighted portion on page 1, please?

A Yes. It says, “Monitoring patients under general anesthesia to prevent anesthesia awareness can be challenging. Despite a variety of available monitoring methods, awareness is difficult to recognize while occurring. Typical indicators of physiologic and motor response such as high blood pressure, fast heart rate or movement or hemodynamic changes are often masked by the use of paralytic agents to achieve necessary muscle relaxation during the procedure as well as the concurrent administration of other drugs necessary for the patient’s management such as beta-blockers or calcium channel blockers.”

Q Okay, just for a second there, this organization, the Joint Commission on Accreditation of Healthcare Organizations, the same organization that accredits the hospital where you work, they use the expression “anesthesia awareness.” Is that correct?

A Yeah, but that’s not the term that anesthesiologists use. We use the term “awareness under anesthesia.”

Q Okay, could you turn to page 2 of that Sentinel Event Alert and read the highlighted sentence please?

A It says “Avoid muscle paralysis unless absolutely necessary, and even then, avoid total paralysis by using the only -- only the amount clinically required.”

Q Okay. Thank you. Now, just jump ahead for a second. Pancuronium bromide is a paralytic agent, is that correct?

A Yes.

Q And in the dosage used in Kentucky’s lethal injection protocol that would cause total paralysis, is that right?

A Yes, it will.

Q Okay. Now, would you say that -- and I’m just going to keep calling it anesthesia awareness because I am not an anesthesiologist, if that’s okay. Would you say that anesthesia awareness is a significant problem, is a real problem?

A Yeah, we are concerned about it in my specialty.

Q Okay, okay. What are some ways to monitor for anesthesia awareness? It says in that report that it is difficult to monitor for it.

A The usual way that it is monitored is by the experience and skill of the clinician giving anesthesia. There are numerous machines that could also be employed, and they are becoming more widely employed, but I wouldn’t

say that they are a standard of care yet.

Q Okay, what is the standard of care now?

A The standard of care is not to use them.

Q Okay. What do you do to monitor for anesthesia awareness at UMass?

A We have tested anesthesia monitors in some but not all of our operations.

Q Okay. If you don’t have that, what would did you do?

A I monitor the patient.

Q Okay. Tell me how.

A I don’t understand the question.

Q How do you know that the patient that’s been operated on in a case where you are the anesthesiologist is in fact in a surgical point of anesthesia? What do you do?

A Well, I monitor their blood pressure and their heart rate and I look at their eyes and I look at the surgical field and I look at the amount of anesthesia that’s in their body and I put all of these things together to come up with an assessment.

Q Right, because you’re a Board-certified anesthesiologist --

A Yeah

Q -- with, I believe, over 20 years’ experience.

A Approximately.

Q Okay. So you take their blood pressure.

A Yeah.

Q Would their corneal reflex be a way to see if someone is under the effect of anesthesia?

A That's one reflex that one could look at.

Q Okay. What are some others you could look at?

A Other reflexes?

Q Uh-huh.

A You could look at airway reflex, for example.

Q Okay. Is there -- could you squeeze their trapezius muscle?

A That would be a silly thing to do under surgery.

Q Okay. Well, give me some more then. Okay, so you said that the corneal reflex was one; what are some others?

A Well, airway reflex is to see if there is any response to intubation of the airway.

Q Okay, is there anything else?

A I think that's more than enough.

Q Okay, okay. What about noxious stimuli? What about subjecting them to something painful, to see if they're --

A Well, we're certainly doing that.

Q Right, but I’m talking about anesthesia awareness if they’re paralyzed.

A If they’re paralyzed but the surgeon does something noxious their heart rate and blood pressure will go up.

Q Okay, heart rate and blood pressure will go up. Okay, now, if they weren’t paralyzed -- if an inmate weren’t paralyzed by the pancuronium bromide, you’d know if they were under the effects of the anesthesia, right?

A I don’t understand the question.

Q Well, potassium chloride, that hurts when it’s injected in this amount, is that correct?

A Yes, it does a lot.

Q It hurts a lot. So if you injected that into me standing here now, everybody in this room would probably know it because I would be screaming, I take it?

A Correct.

Q Okay, so if we didn’t use the Pavulon, all right, and the sodium thiopental weren’t working, we’d know that as soon as the potassium chloride was injected, is that correct?

A Yes, you’d also know that the thiopental weren’t working well before you started the injections of anything else.

Q Okay, how?

A Well, there is a couple of different ways, but first of all, let us assume that the IV were not in the vein.

Q Okay.

A Which is one theoretic way for the thiopental not to work. Because thiopental is a solution of pH 10, ordinarily, you would expect when the medication goes in intravenously that the person will lose consciousness in less than a minute, and the thiopental is a painless injection. If the thiopental were to go into any tissue sites other than a vein, the inmate would not be unconscious and that -- and they would be in extreme pain; they would scream out.

Q Okay. So is it your testimony that there are ways to see if the anesthesia is taking place? Corneal reflex, let's just stick with that. You could use a corneal reflex to see if they were under the effect of anesthesia, is that correct?

A Well, that's one way, but that's not a specific way.

Q Okay, I think you also testified on direct examination that "the old-fashioned way of taking blood pressure," using a stethoscope might work, is that correct?

A Well, you can take a blood pressure with a stethoscope, and it’s more likely to be able to determine a blood pressure when a blood pressure is substantially below normal.

Q Substantially below normal.

A When a automated blood pressure machine is likely to fail.

Q Okay, so an automated machine might not work, but the old-fashioned way might?

A To measure blood pressure, it’s very -- well, yes.

Q Okay, great, thank you. So -- okay, if the sodium thiopental has been injected but the pancuronium bromide hasn’t, all right, so we’re at the stage where the inmate has been anesthetized.

A Yes.

Q Okay, and there are different planes of anesthesia, is that correct, difference planes of consciousness?

A “Plane” is an archaic use that only applies to ether.

Q Okay. Are there different levels of unconsciousness?

A That’s not a term that a neurophysiologist would

use, but I can say that there could be different degrees of consciousness or unconsciousness.

Q Okay, well, I'm not a neurophysiologist, obviously. Well, let me ask you this, you talked about some of the studies that were done to produce your graph and things?

A Yes.

Q And you said that those were based on giving commands to the patient?

A Yes, the accepted definition of consciousness or awareness in researching my specialty is the ability of the person being studied to follow a simple command like "Raise your right arm" or "Raise your left leg." So that person is given a particular medication of that particular (inaudible) and they are then asked, "Raise your right arm, raise your left leg" et cetera. If they follow the command, if they execute the command correctly, they are deemed to be awake and conscious, and if they do not, then they are deemed to be unconscious. And these are people who are motivated to, you know, to do the study.

Q Right, exactly. But you would agree that that's a different level of stimulation, telling someone to raise their right leg and injecting them with potassium chloride?

A Yes, subjecting them to potassium chloride is

painful, similar to a surgical stimulus.

Q So you might sleep through “Raise your right leg, sir,” but you might not sleep through something far more stimulating, is that fair to say?

A Possibly yes and possibly no. There is not a very close correlation between hypnosis and anesthesia -- and I’m using the term hypnosis as a pharmacologist, which would mean unconsciousness.

Q Okay, okay. Well, that raises something else. You said you had written on short-acting hypnotics, but you’ve never written anything on short-acting barbiturates, have you?

A Yeah, I told you that I have several book chapters on intravenous anesthetics I have authored.

Q Okay. Do you remember testifying in a case in Virginia on August the 30th of last year? The case of *James Edward Lee versus Gene M. Johnson*.

A Yes.

Q Okay, just one second.

MR. SHOUSE: May I approach the witness, Your Honor.

THE WITNESS: Thank you.

BY MR. SHOUSE:

Q Now, what’s the title of that document I just

handed you?

A It says, “Complete transcript of the hearing in front of the Honorable Henry E. Hudson, United States District Court Judge.”

Q Okay. And if you could just turn to page 2 for just a second.

SPEAKER: Page 2 or --

MR. SHOUSE: Page 2.

SPEAKER: Oh, I guess -- okay, page 2.

BY MR. SHOUSE:

Q Right, what the index says there, do you see that?

THE JUDGE: Okay.

THE WITNESS: Yes.

BY MR. SHOUSE:

Q Okay. And that says you were the witness, right?

A Yes.

Q I mean, you’re just -- it’s just Q and A from here on, I just want to make sure that it was you testifying. Can you go to page 6 please?

A Yes.

Q Line 13, “Question: Have you researched and published any articles on short-acting barbiturates?” What was your answer?

A My answer was, “Not short-acting barbiturates but a closely related series of medications that are used in routine anesthesia.” That’s a different question that he’s asked me. He put the word “research” within there. I have not personally done research on thiopental, but I’ve still published extensively on it based on others’ research.

Q Okay, okay. So that one word makes your answer different?

A Yes.

Q Okay. Just one second. You’re familiar with the story of a woman named Carol Weihrer, right?

A Yes, I’ve heard about her unfortunate experience under anesthesia.

Q Okay. And I believe you said in that same hearing there in Virginia that her experience was “awful”?

A Yes. Anytime the patient is completely aware under anesthesia, I agree it’s awful.

Q Okay. Now, let’s go back and talk about some of the drugs that are used in Kentucky’s lethal injection protocol.

A Okay.

Q Now, what purpose did you say the sodium thiopental served again?

A Sodium thiopental renders the inmate unconscious.

Q Okay. How does that work on the brain?

A Nobody knows.

Q Okay. We don't understand how that works?

A We know a little bit about the fact that thiopental primarily interacts with the neurotransmitter system called GABA, which stands for gamma amino butyric acid, but at the specific molecular level, it's not understood how any general anesthetics work.

Q Okay. Now, in your expert opinion, how much of the sodium thiopental would have circulated through an inmate's body after 3 minutes under the Kentucky protocol?

A I think it's very difficult to predict because the variability from person to person in terms of the 3 g delta on their cardiac output is going to be very substantial.

Q Right. So --

A So not very much will get circulated.

Q Okay. Now, it's your position that a person with a true and accurate reading of 7 -- and we're going to just assume that it's a true and accurate reading, okay, of 7 mg/L of thiopental in their blood would have a 50 percent probability of being conscious and a 50 percent probability of being unconscious. Is that your position?

A If the blood was obtained from an artery.

Q Right, I’m saying -- I’m assuming these are true and accurate numbers.

A But in addition, it has to be a true and accurate number but also obtained from an artery.

Q Okay, okay. What if you took it from the brain?

A Well, the analytical technique has not been validated for actually measuring brain concentration from the medication. And so arterial sampling is used as a surrogate for brain concentrations but that doesn’t validate it for all class of anesthetic drugs.

Q Okay, so if you had a true and accurate arterial reading, it would be -- and it was 7 mg/L, that would be a 50-50 change of consciousness?

A Correct.

Q Okay. Now, what function did you say the Pavulon served?

A The pancuronium --

Q I’m sorry, pancuronium bromide?

A -- is going to decrease the ability of potassium chloride, given subsequently, to cause involuntary muscle movement.

Q Okay, but those are the involuntary muscle movements.

A Correct.

Q And you testified that if the anesthesia -- if the anesthesia has been given properly, if the sodium thiopental has been given properly, then those -- is spasm a fair word to use?

A It is actually not a spasm. It is a muscle contraction.

Q Okay. But that muscle contraction would be unconscious.

A It would not be perceptible to the inmates.

Q Okay, okay. Now, the pancuronium bromide, that's a neuromuscular blocking agent. Is that correct?

A That's correct.

Q Okay. Now, is it necessary under Kentucky's protocol or under any protocol to insure humane death that the inmate may be paralyzed? Is that a requirement?

A That's not a medical decision. That is a sociological decision.

Q Okay, okay. But as you said here today and in another testimony that it would match maybe an unpleasant sight from the witnesses.

A Correct.

Q Okay, okay. Now, you testified to this on direct. I just want to make sure. You said that -- okay, our protocol, as you know, calls for one drug to be

injected and a saline flush and then another drug, and a saline flush and then another drug.

A Yes.

Q Okay. Now, what would happen if the sodium thiopental and the pancuronium bromide came in contact with one another?

A The pancuronium bromide would precipitate.

Q Okay. May I approach the witness, Judge? Okay. Do you comply with this, Doctor?

A Technical report, the effect of pancuronium on the solubility of aqueous thiopentone.

Q Okay. Could you turn to the last page? And do you see a highlighted portion there?

A Yes.

Q Could you read that please?

A It says here, “In summary, insoluble thiopentone is the precipitate formed when aqueous thiopentone is mixed with pancuronium, the principal clinical risk of inadvertently mixing thiopentone and pancuronium with the resultant loss of intravenous access.”

Q Okay. Let me ask you a question. Doesn’t that say the exact opposite of what you just said?

A It does. May I have a moment to review the paper to see why?

Q Certainly, certainly.

A Let’s see what they did here. The preparation that they are using here I do not believe is the preparation we use in the United States. It says under message, “A commercial preparation of sodium thiopental with sodium carbonate.”

Q Uh-huh.

A That’s a buffering agent. I don’t believe we use that in this country.

Q And you think that makes the difference here?

A I believe it does because what we are dealing with here is a very simple pH hydration of an acid versus a base and if you added a previous buffering agent that could distort the result. I can tell you having shown this to residents many times that if you mix thiopental and pancuronium or other drugs that are low pH together, you get a precipitate and then out of the precipitate is the hydrochloride salt which is mixed.

Q Okay, I understand. But this says the exact opposite of your testimony. Is that correct?

A But they are using a medication different than what I’m using.

Q Okay, okay. Thanks. Could it precipitate pancuronium bromide and sodium thiopental clog an IV line?

A Absolutely.

Q Okay. Now, this is -- Judge, this is a small subset of what's been introduced as Plaintiff's Exhibit 1. May I approach?

THE JUDGE: Yes.

MR. SHOUSE: Just for clarification --

BY SPEAKER:

Q The last question you asked, could it precipitate sodium thiopental (inaudible) pancuronium bromide clog an IV line.

A Yes, sir.

Q Let me answer the two. The line, I think, is coming from the syringe.

A Yes, sir.

Q If they mix together, it could block the line.

A Yes, sir.

Q But the potassium chloride would not go through. Is that what you think will happen?

A Actually, if a precipitate forms after the thiopental were given and the pancuronium mixed with it, it would actually block the pancuronium from being cannulated into the -- to the inmate's circulation, which is why after the thiopental was given, the line was flushed with saline to prevent the ability of different medications to mix

inside the IV line. No precipitate forms when the medication is mixed inside the body.

Q Oh, it is only inside the line.

A It is only inside the IV line.

Q Okay.

BY MR. SHOUSE:

Q And they flush the saline flush to prevent that?

A Yes.

Q Okay. Could you, first of all, look at the document I just handed to you?

A It says, “The execution of lethal injection.”

Q Okay. Could you flip to page 4 of that please? Do you see item 16?

A Yes.

Q Okay. Could you read that please? It is continued on the next page.

A “A final order to proceed and the microphone turned off, a designated team member will begin a rapid flow of the lethal chemical in the following order. Sodium thiopental, 3 g. Note: If it appears to the warden that the condemned is not unconscious within 60 seconds of the command to proceed, the warden shall stop the flow of sodium thiopental on the primary site and order that the backup IV be used which contains new flow of sodium

thiopental.”

Q Number 2?

A Number 2, saline 25 mg.

Q And that is the flush?

A That is the flush.

Q Is it your testimony that 25 mg of saline is enough to flush the line?

A That is a typographical error as you need 25 mm.

Q Okay. 25 mg, as printed here, is not enough to flush that line?

A Correct.

Q Is it fair to say that -- is it fair to say that 25 mg is about a quarter of a drop of water?

A 25 mg is much less than a teaspoon.

Q Okay. Thank you. Now, let’s talk about your charts that you prepared for this case. Now you prepared about five charts, I believe. Right?

A Yes.

Q Okay, but these two are the two that have been -- and do you have those there?

A Yes.

Q Okay. And those are Commonwealth 6 and -- sorry Defendant 6 and 7. Now, all of these charts and all the charts you prepared that weren’t introduced into evidence,

those were based on -- well, I guess it is originally probably 2 g. Did you prepare some charts based on 2 g of sodium thiopental?

A Yes. To my recollection, I've done this calculation from 1.5 to 3.5 g depending on the state, and what their protocol is.

Q But some of --

THE JUDGE: Jim follow up with Mr. Goodburton's (phonetic) part.

SPEAKER: This is probably a pretty good spot to break, Judge.

THE JUDGE: Okay. Let's take a recess for approximately 20 minutes --

SPEAKER: 20 minutes.

THE JUDGE: -- to go to the restroom.

SPEAKER: Thank you.

(Recess)

THE JUDGE: Dr. Dershwitz. Go ahead.

BY MR. SHOUSE:

Q Yes, just before I recommence, just as a matter of housekeeping, this technical report, the effect of pancuronium on the solubility of aqueous thiopentone.

A Yes, sir.

Q I'd like to move (inaudible).

A Yes, sir.

Q (inaudible) Plaintiff's Exhibit 24.

SPEAKER: All right. Okay.

(Plaintiff's Exhibit No. 24 was marked for identification.)

SPEAKER: Thank you.

MR. SHOUSE: Thank you. And then again, just adding a bunch of caution and I know we've had a lot of exhibits introduced. I don't want to -- I don't want to needlessly introduce new things, but this package insert that was supplied by the Defendant, I'm not entirely sure if that page has been marked individually as an exhibit. It might be included in another one, but I'm not sure.

SPEAKER: I've seen it, but I don't know what to include on the thing, but if you want to mark it, go ahead.

SPEAKER: Have it admitted as Plaintiff's 25.

(Plaintiff's Exhibit No. 25 was marked for identification.)

SPEAKER: No objection.

SPEAKER: Oh, okay. We'll include it.

BY MR. SHOUSE:

Q Thank you. Okay, Doctor, now, again, these charts, two of them have been introduced into evidence; these are based upon 3 g of sodium thiopental actually

getting into the inmate.

A Yes.

Q Okay, okay. Now, does the concentration of the solution of thiopental matter?

A In terms of what?

Q Well, I mean, can you -- can you over-dilute sodium thiopental?

A I'm -- I don't think I understand the question.

Q What is the therapeutic concentration of sodium thiopental?

A 25 mg per milliliter.

Q Okay, okay. So, 25 mg per liter. I mean, 2.5 mg per liter.

A No.

Q No?

A 25 mg per milliliter for a 2.5 percent solution.

Q There you go. I got confused.

A That's the standard therapeutic concentration.

Q 2.5, okay, there you go. Now, you've got the -- the lethal injection protocol there, a small part of it.

A Yes.

Q So, that -- your charts are based on that concentration.

A No. They are based upon the dose of 3 gm.

Q Okay. Concentration doesn’t matter?

A Concentration doesn’t matter within reasonable ranges.

Q Okay.

A In other words, if you increase the concentration from 2.5 percent to 5 percent --

Q Uh-huh.

A -- the drug works the same, but it hurts on injection.

Q Okay.

A So, 2.5 percent is chosen because it is painless on injection.

Q Okay.

A If you diluted it more, it still works and it would just require a larger volume and take longer to inject.

Q Okay. Can you take a look in there and tell me where it says that the concentration of the sodium thiopental is for lethal injection, Kentucky?

A I hope to (inaudible).

Q Okay. Thank you. How does the sodium thiopental come from the manufacturer?

A As a solid.

Q Okay. What do you do to mix it up?

A We mix it with an (inaudible).

Q Okay. With what, I'm sorry?

A (inaudible).

Q Okay. And what is that in this case?

A It depends on the manufacturer. Usually, it is sterile preservative free water.

Q Okay. Do -- is it hard to mix up?

A No.

Q Okay. Judge, may I approach?

THE JUDGE: Please.

BY MR. SHOUSE:

Q What does that look to you, Doctor?

A It looks like the package insert for 1 g of thiopental.

Q Okay. Could you turn to page 2? Could you please read the highlighted portion?

A It says, "This drug should be administered only by persons qualified in the use of intravenous anesthetic."

Q Okay. Thank you.

SPEAKER: Judge, if I could mark that and have that entered as Plaintiff 26.

THE JUDGE: All right.

(Plaintiff's Exhibit No. 26 was marked for identification.)

SPEAKER: No objection.

BY MR. SHOUSE:

Q All right. Now the pancuronium bromide paralyses the inmate. Is that correct?

A Yes.

Q Okay. If you just injected the amounts -- the does of pancuronium bromide specified in the Kentucky protocol, would that cause the inmate to suffocate?

A Suffocate is the wrong word, but it was cause them to become apneic, which means unable to breathe.

Q Okay.

A And they would ultimately die of hypoxemia.

Q Okay. Inability to breathe?

A Yes, amongst other things, inability to move any muscle.

Q Okay. But that is like suffocation, right?

A Suffocation is generally a mechanical obstruction to the airways. This is a paralysis of all skeletal muscles including the muscles of ventilation.

Q Okay.

A So they'd be completely unable to breathe as well as unable to move any other skeletal muscle in their body.

Q Would that be a painful way to die?

A I'm not sure pain is the right word, but it would

be extremely unpleasant.

Q Okay. Scary?

A Yes.

Q Agonizing?

A I would say that that is the case, yes.

Q Okay. Now, potassium chloride, that would burn if it were injected into a conscious person. Is that correct?

A At this concentration, yes.

Q Yes, okay. When I'm talking about these drugs, I'm obviously talking about them in terms of the dosages used in the Kentucky lethal injection protocol.

A Yes.

Q Okay. It would burn a lot?

A Yes.

Q And we've already talked about how and I don't want to misuse the word. I was saying spasm, but involuntary muscle contractions would occur?

A Yes.

Q And that might not be pleasant to look at?

A Yes.

Q And the Pavulon masks those spasms?

A Yes.

Q Okay. Are there other drugs that would stop the

heart without contractions?

A There are lots of drugs that when given in overdose could stop the heart. I can’t think of anything off the top of my head that would work as rapidly as potassium.

Q Okay. How about digoxin?

A Digoxin would work extremely slowly to stop the heart.

Q Okay. But would there be attendant convulsion with that drug? And again, I’m -- convulsion, contraction -- would there be attendant contraction with that drug?

A No, but an overdose of digoxin would take minutes to hours to bring the heart to a stop.

Q Okay. How about Dilantin?

A Dilantin would stop the heart within a few minutes.

Q Okay.

A Not as fast as potassium, but it would stop the heart within a matter of minutes.

Q Would there be attendant muscle contractions with Dilantin?

A No.

Q Okay.

A Probably not.

Q Okay. All right. Now, different problems can arise in sighting an IV. Is that a fair statement?

A Yes.

Q You can go to the vein.

A Yes.

Q Through the vein, okay. You can have problems finding a vein to begin with.

A Yes.

Q Okay. A vein can collapse?

A That is not a medical term.

Q Okay. What is the medical term for that?

A I don’t know.

Q Okay. What else can go wrong in sighting an IV?

A The intravenous catheter could be somewhere other than inside the vein, I think a generic description of an IV malfunctioning.

Q Okay, okay. Now, this has been introduced already I’m sure. But I’m not sure of the number, Judge.

SPEAKER: May I approach?

THE JUDGE: Yes.

SPEAKER: Thank you.

BY MR. SHOUSE:

Q Thank you, Judge. What is that, Doctor? But first, have you ever seen this before?

A Yes.

Q Okay. What is it?

A This is a diagram of the intravenous lines that were placed in inmate Edward Harper.

Q Okay. Does it indicate that they had a problem sighting an IV in Mr. Harper's left arm?

A Yes, there was one attempt failed and two attempts that were successful.

Q Okay. Now, let me ask you this. Can anybody start an IV in the neck area?

A It depends on their training experience.

Q Okay. That's what I was getting at. Not just anybody can do that?

A Well, I would say it that applies to an IV. You wouldn't want anybody to start an IV. It depends on the training and experience.

Q Okay. If you were starting an IV in the neck under the current Kentucky protocol, what vessel would you be shooting for?

A Generally, the external jugular vein.

Q Okay. Is that like putting in a central line?

A It is not exactly the same thing. A central line is a generic term for an intravenous catheter that is inserted of significant length and then threaded until it

is almost at the point of the heart.

Q Okay.

A Whereas an IV put in the neck doesn't necessarily need to be threaded all the way to the heart. That would take about 8 to 10 inches worth of tubing to do that.

Q Okay.

A Whereas you could put an IV in the neck that is only 2 inches long and it wouldn't be considered a central line.

Q Okay. But you are shooting for the external jugular vein there?

A Yes.

Q Okay. That requires some training. Is that fair to say?

A I would say that anybody who is putting in an IV anywhere needs a certain level of training and experience.

Q Okay. Now, I'd like to show you something else. May I approach the witness?

THE JUDGE: Yes you may.

MR. SHOUSE: Actually, that I will mark and introduce this as Plaintiff's Exhibit number 27.

(Plaintiff's Exhibit No. 27 was marked for identification.)

THE JUDGE: There is no objection?

SPEAKER: No objection.

THE JUDGE: All right.

BY MR. SHOUSE:

Q All right, have you ever seen this document before, Doctor?

A Yes, it was part of the package of information that was sent to me.

Q Okay. Now, does this look like something -- or does this look like it contains what would be needed to provide someone after the process of lethal injections had begun if for some reason it should be called off?

A Do you mean to resuscitate somebody?

Q Yes, sir. Exactly, to revive an inmate.

A No.

Q It does not look comprehensive?

A Well, no. This lists the three medications --

Q Right.

A -- that are used to cause a lethal injection.

Q Right. And do you see under each one, there is reversal under the sodium thiopental, there is reversal under the pancuronium and there is reversal under potassium chloride?

A Yes.

Q Okay. That’s what I’m asking about. Does this

look like this encompasses what would be needed to reverse the effects of these drugs?

A I don't think it is a comprehensive list because for instance, after a 3 g dose of sodium thiopental --

Q Uh-huh.

A I expect that to be -- inmates would require a medication to increase the blood pressure and the force of contraction of the heart beat.

Q Okay. What are some of those medications?

A Drugs like epinephrine for instance.

Q Okay. Anything else?

A Many other medications in the same class --

Q Okay.

A -- could be used.

Q Okay. Now, but -- okay, so when the sodium thiopental -- we've got IV access and EKG monitoring and you are talking about epinephrine. Now, down here in the Pavulon, we've got atropine, respiratory assistance and monitoring. Does that mean oxygen?

A Well, actually, after pancuronium --

Q Uh-huh.

A -- one could give the atropine and the neostigmine to try to counteract the drug's effect, but the more important would be to provide what you might call

artificial ventilation.

Q Okay.

A And it really doesn’t matter if the person is paralyzed. You can keep them alive indefinitely by providing artificial ventilation.

Q Okay. So you need to put a tube down their throat to assist them in breathing?

A No, you can do it by mask.

Q oh, okay, okay. But you would need to be breathing for them, in other words?

A Correct.

Q Okay, okay. Do you see any reference to that in here at all in this sheet that you have in front of you?

A No.

Q Okay. Now, under potassium chloride, under reversal, do you see what’s this gastric lavage?

A Yes.

Q Okay. Is that an appropriate thing to contemplate to reverse the effects of this drug?

A Not just given IV.

Q Okay. So that’s -- that wouldn’t do any good at all?

A Correct.

Q Okay. How about the sodium bicarbonate, glucose,

and insulin infusion or dialysis? Is that appropriate?

A All of these are theoretical things that could be done, but with the dose of potassium chloride that calls for the protocol, it is most unlikely that they would be effective.

Q Okay, okay. Now, let me show you something else here. Judge, I'd like to have this admitted as Plaintiff's 28.

THE JUDGE: Okay.

(Plaintiff's Exhibit No. 28 was marked for identification.)

SPEAKER: No objection.

THE JUDGE: This was the -- that kit of the --

SPEAKER: Oh, it was turned over last week.

BY MR. SHOUSE:

Q Okay, Doctor. Now, on this list, do you see anything on this list that indicates dialysis equipment? Is there any -- are there any of these things on this list that are dialysis equipment?

A The most important thing if you are going to do dialysis is a dialysis machine and it is not on here.

Q Okay.

A But it is also unlikely to be effective.

Q Okay. Do you see insulin on this list?

A No.

Q Do you see neostigmine on this list?

A No.

Q Okay. Now, EMT is Emergency Medical Technician. They don’t usually use thiopental, right?

A It depends. I -- in some jurisdictions, they might very well be taught to intubate in the field and they might give a sedative drug to make it more comfortable for the person. And thiopental would be one of the reasonable choices.

Q Okay. But it is not used much anymore, right?

A It is used less commonly. The protocol, when you want somebody to wake up quickly.

Q Okay. And that is because of this hangover effect?

A Yes.

Q Okay. What level of thiopental in the blood needs to be maintained to conduct a surgical procedure?

A It depends on what else is being given and it is very rare to rely solely on thiopental as the sole medication for a surgical operation.

Q Okay.

A And so typically what we would do, if we were doing what’s called balanced anesthesia, we would give one

medication to cause the person to be asleep, a different medication to relieve pain, a different medication for muscle relaxation. And that is what we call balanced anesthesia.

Q Okay.

A And if we were using thiopental to cause unconsciousness, we would aim for a concentration somewhere in the, you know, 10 to 12 range, which is a very high probability of unconsciousness.

Q 10 to 12 what?

A Milligrams per liter.

Q 10 to 12 mg per liter to conduct surgery?

A Yes.

Q Okay. Are you familiar with the book called Disposition of Toxic Drugs and Chemicals in Man by Randall Baselt?

A No, I'm not.

Q You are not familiar with that?

A No.

Q Okay.

SPEAKER: Your Honor, we're going to go through about five or 20 more articles, we would ask that the witness have the opportunity to read all of them before being questioned.

SPEAKER: Actually, there --

SPEAKER: I don’t know how many more we’re going through today.

SPEAKER: Just this one.

SPEAKER: Just this one.

SPEAKER: Okay, can he have the opportunity to read through --

THE JUDGE: Sure, certainly.

SPEAKER: Review the entire article?

THE JUDGE: Sure.

SPEAKER: Depends on what the question is, I think.

BY SPEAKER:

Q Doctor, do you see a highlighted portion there in the -- under blood concentrations, under the drug thiopental?

A Yes.

Q Okay. Could you read the highlighted portion regarding blood concentrations?

A Okay. “By monitoring corneal reflex and trapezius muscular response, the doctor found that the plasma-thiopental levels of 39 to 42 mg/L, was suitable for surgical anesthesia.

Q Okay, that’s a lot more than 10, isn’t it?

A Correct, because this would be relying on thiopental as the only medication to blunt all surgical responses to the -- like major abdominal or major thoracic surgery.

Q Is there another anesthesia used in Kentucky's lethal injection protocol?

A No.

Q Okay. So 39 to 42 mg/L is what this text indicates, is that correct?

A But also the inmates not having a surgical procedure.

Q Okay, but the potassium chloride would hurt a lot if injected?

A Yes, but not like a surgery procedure.

Q No, but it would hurt a lot?

A It would hurt some, yes, but not like having your belly and your chest cut open.

Q Okay, but do you agree that this is very -- do you agree that this is a very, very serious procedure we're discussing today, the execution of an inmate?

A I think it should be taken very seriously, yes.

Q Okay, so therefore necessary safeguards and protocols should be in place?

A I agree, yes.

Q Okay, and so this says that you conduct surgical procedures -- 39 to 42 mg/L are suitable and that is four times more than 10 mg/L?

A Correct, but when I described the value of 10, I'm using other medications for other purposes within my anesthetic regimen.

Q Okay, that's fine. Judge, I'd like to mark that (inaudible) as Plaintiff's Exhibit 29 and have it admitted.

THE JUDGE: Admitted.

(Plaintiff's Exhibit No. 29 was marked for identification and received into evidence.)

BY SPEAKER:

Q Now, have you reviewed Mr. Eddie Lee Harper's toxicology data?

A Yes, I have.

Q Okay, so you're aware that Mr. Harper was injected with 2 g of Sodium thiopental during his execution?

A Yes.

Q Okay. Do you remember preparing a graph in the -- for a case in South Carolina?

A Yes.

Q Okay. Is this --

A That's right.

Q Yes, okay. Now, looking at this graph that you prepared for the case in South Carolina, what does it indicate to you -- level of thiopental should be -- blood concentration after 2 g of thiopental of sodium in the average man within 20 minutes, and if we look at that little box within a box, what does it indicate, the level of thiopental should be after 20 minutes?

A About 22-1/2.

Q Well -- about 22-1/2?

A Yes.

Q It’s exactly 22-1/2 isn’t it?

A Well, that’s the average predicted for an average person.

Q Okay. But this is at 22.5.

A Yes.

Q Okay. Now, I’d like to take a look at the Virginia transcript one more time, please. Could you turn to page 11, okay, you there?

A Yes.

Q You see down on Line 15, an answer begins?

A Yes.

Q Could you read just that paragraph down the line 24?

A “This graph is purely pharmacokinetic analysis.

The plasma concentration of the thiopental would be achieved after 2-g dose to an average male and the time for recovery is 20 minutes. And so there is -- within a minute of the injection, the blood concentration is rather high, it's approximately 250 mcg/ml, which by the way is the same as mg/L."

Q Uh-huh.

A "And please note that the "Y" axis on this graph is larger than the scale could permit meaningful visualization. And over a period of 20 minutes, the plasma concentration drops approximately 25 mcg/ml.

Q Okay, so 2 g of sodium thiopental in South Carolina is 22.5, but in Virginia is 25, is that fair to say? In page 11.

A I believe, when I testified here, I was eyeballing it off the graph, not having the box to look at.

Q Okay, but 25 is different than 22.5?

A And -- you're close.

Q Okay, but they're different?

A And I believe -- as I said, I eyeballed it off the graph, and it could've been off one or 2 mcg.

Q Well, 2-1/2, actually, right?

A Approximately.

Q Okay, 25, is 2.5 more than 22.5, is that fair to

say?

A Yes.

Q Okay. Now, you've testified here today and I believe you testified in many places, or submitted affidavits that you believe that blood from the heart is the most reliable way of determining the level of thiopental in the brain, is that correct?

A If it's from the left side of the heart.

Q Okay, okay. Where have you, or in what affidavit -- and I'm pretty sure I've got a full catalogue here, of the affidavits you submitted. When is the -- when have you ever mentioned the left side before today?

A I just took it for granted, because pharmacokineticists would be interested in arterial blood samplings, and I've always said that arterial blood samplings is the gold standard for all kinetic analyses that just assumes that the left side of the heart, because the left side of the heart keeps the arterial circulation.

Q Okay, you just testified a few minutes ago that this is an extraordinarily important thing -- the State, the Commonwealth -- putting someone to death was that what you said a few minutes ago?

A Yes.

Q Okay, and you have never mentioned the left side

before today?

A Because I was never asked.

Q So you just assumed in preparing your affidavit?

A Yes, because all state of the art kinetic analyses use arterial blood samplings, and arterial blood samplings comes from the left side of the heart.

Q And you've never included that in any affidavit or testimony --

SPEAKER: Objection, asked and answered.

SPEAKER: He did answer that.

SPEAKER: Okay.

BY SPEAKER:

Q Now, let's take a look at Mr. Harper's toxicology report.

SPEAKER: I'm sure these have been introduced already.

BY SPEAKER:

Q What's that Doctor?

A It says, "Laboratory report, toxicology and there's a number of medications listed here.

Q Okay, where does it indicate that the blood -- well, first of all, where was this specimen taken from?

A Just his heart.

Q Just his heart, okay. And what level of

thiopental was found in -- first of all, this is Mr. Eddie Lee Harper’s toxicology report, right?

A Yes.

Q Okay, what level of thiopental does it indicate was found in Mr. Harper’s blood?

A 5.5 mg/L.

Q Taken from the heart?

A Yes, I actually discussed this in detail with Dr. Corey personally.

Q Uh-huh.

A And she told me that she --

SPEAKER: Objection, Judge, objection.

SPEAKER: I’m --

SPEAKER: Objection.

BY SPEAKER:

Q Okay, now you did testify a little while ago that 7 mg/L, you have a fifty-fifty chance of being conscious, is that correct?

SPEAKER: Your Honor --

SPEAKER: I’m going to object to this.

THE JUDGE: Wait, wait, wait, let’s -- let him -- he’s got an objection, go ahead.

SPEAKER: Your Honor, he’s relying on Dr. Corey’s statement as to (inaudible) opinion on this blood sample,

and he’s an expert and he’s going to rely on hearsay testimony to --

THE JUDGE: Well, I guess you can give an opinion on that, will do that, go ahead.

BY SPEAKER:

Q Now, you testified a little while ago that a person with 7 mg/L of thiopental has a 50-50 chance of being conscious?

A In arterial blood.

Q Exactly. So if we assume -- (inaudible) assume something, that this is accurate, then Mr. Harper had more than a 50 percent probability of being conscious when he was executed.

A Except that I know that this isn’t arterial blood.

Q Okay, but if this is accurate?

A I’m sure it’s accurate, but it’s not arterial blood.

Q Okay. Now, do you remember talking to a reporter for (italics) The New York Times, back in September of last year?

A Yes.

Q And do you remember telling him, “The blood level should be a lot higher than 7”?

A Yes, if it’s arterial blood.

Q Okay, and do you remember telling him that you were disturbed by the 6.5?

A Because at that point in time, I did not know from where the blood sample was obtained.

Q Okay. I’m sorry I didn’t -- it’s not that there’s trouble, I’m sorry, you were troubled by that.

A Similarly, all of the blood specimen analyses that I was given for North and South Carolina -- all of those samples very simply stated, “blood,” and we have no information whatsoever from where they were obtained.

Q Okay.

A And we know based upon very good research in humans, that there is a huge disparity in thiopental concentration depending on from what part of the body the sample was obtained.

Q Okay. And is that because of postmortem redistribution?

A No, it’s because of the long mixing that is required, which gives equilibrium throughout the body.

Q Okay. You’re not a forensic pathologist are you?

A No, but I’m very comfortable discussing blood levels, medications and what they mean.

Q Okay. You’re not a forensic toxicologist are you?

A No, but I’m a toxicologist.

Q Okay. Now, all of the graphs you’ve produced, both here and for all those other states you’ve gone through, those are based on pharmacokinetic and pharmacodynamic models, is that correct?

A That is correct.

Q Okay. Now, we talked about Mr. Harper, he was injected with 2 g of sodium thiopental, but you’re now -- you’re aware that now (inaudible) switched to 3 g?

A Yes.

Q Okay. And are either of the two graphs that have been admitted here today about -- 3 g -- if you assume a 3-g dose on either of these charts?

A This graph where the SPs are numbered.

Q Commonwealth 6.

A Assumes a 3-g dose.

Q All right. How about the other one?

A The other graph is a qualitative description that is dose independent.

Q Okay. Now, you’ve prepared some other graphs for this litigation that weren’t introduced into evidence, is that right?

A Yes.

Q All right. And I’m going to apologize, I thought

these were going to come in through the defendants, so I'm not sure I have enough copies. Okay, may I approach?

THE JUDGE: Please.

BY SPEAKER:

Q We're going to have to share, 'cause I don't have a enough to around. Did you prepare this graph in preparation for this litigation?

A Yes, and this graph and the others were used to prepare the final graph, which I thought was easier to understand.

Q Okay, okay. Now, in that graph, the one that I just gave you. And Judge, I'm going to mark and ask that that be admitted as Plaintiff's Exhibit 30.

THE JUDGE: Okay.

(Plaintiff's Exhibit No. 30 was marked for identification and received into evidence.)

BY SPEAKER:

Q Now, in that graph, what does it say the level of thiopental should be after five minutes for the 3-g injection?

A 65 mg/L.

Q Okay, that's "65 mg/L," is that correct?

A Yes.

Q Now, did you prepare a similar graph for Maryland

-- for litigation in Maryland?

A I believe so. I just believe, that there was one prepared, but I don't recall.

Q Okay. Judge I'm going to go on ahead and ask that this be introduced and --

THE JUDGE: 31?

SPEAKER: 31, yes, Your Honor.

THE JUDGE: All right.

(Plaintiff's Exhibit No. 31 was marked for identification and received into evidence.)

BY SPEAKER:

Q Okay, what --

SPEAKER: We object to introducing this at this point.

THE JUDGE: Okay, well, I hoped you would -- definitely.

BY SPEAKER:

Q Okay, what does that show; the level of thiopental to be after five minutes?

A 30.15.

Q Okay, and that's less than half what you indicated would be the concentration in Kentucky?

A Yes, and it doesn't pertain to the same administered dose.

Q It does not pertain to the same administered dose?

A No.

SPEAKER: Okay, just a second.

BY SPEAKER:

Q 300 mg is 3 g?

A No.

Q 3000, I'm sorry.

A Yes.

Q Okay. May I approach one more time, Judge?

THE JUDGE: Yes, you may.

BY SPEAKER:

Q Just take a look at page 4 of that -- first of all, is that the affidavit you submitted in the Maryland litigation?

A Yes, and this is based upon an inmate who weighed 130 kg.

Q Right and we're going to get to that. I'm -- -- we're going to get to that.

A Okay.

Q You're jumping way ahead of me here; I'm not a doctor, I'm not an anesthesiologist, we're going to get to that.

A Okay.

Q Okay, on page 4, it says, "This is a 3-g dose,"

right?

A Yeah.

Q And it’s based on somebody that weighs a 130 kg, which is 110 lbs more than you assume for a Kentucky injection, is that fair?

A Correct. When I don’t know the demographics, I assume 80 kg as an average size for an adult human.

Q Right, understood, understood. So for a 176-lb man in Kentucky, you calculated 30.15 mg/L, is that right?

A No. You said Kentucky?

Q Right.

A So --

Q I’m sorry, you’re right. I’m sorry, I’m looking at the wrong one; 65 mg/L in Kentucky, 176-lb mass.

A 80 kg, 3-g dose at five minutes that should be about 65 mg/L.

Q Okay, and a 110 lbs more -- a man who weighs a 110 lbs more will have 65 mg/L?

A I believe (inaudible)

SPEAKER: It’s the opposite.

SPEAKER: It’s the opposite?

SPEAKER: Uh-huh.

BY SPEAKER:

Q All right. Say this -- let me try it again, let

me try it again, I'm getting myself confused out here.

SPEAKER: Excuse me.

BY SPEAKER:

Q 3-g dose, 286-lb man, five minutes, 30.15?

A Right, yes.

Q Okay. 3-g dose, five minutes, 176-lb man, you're at 65 mg/L?

A Yeah.

Q Okay. Now, do you remember testifying in Virginia, that increasing or decreasing weight would not change your calculations in any significant way?

A Yes, and that remains a true statement, because since the time span of an execution is typically 10 minutes, whether the blood concentration is 30 or 60 does not meaningfully change the probability and so I would submit that whether we have a probability of .001 or .01, I don't consider the probability meaningfully different.

Q Okay.

A And that's what I meant.

Q Okay, understood. But if we assume that your charts are correct, then a 110 lbs doubles the amount it could reasonably be expected to be found in the blood, and this article we just went over says that, "For surgical procedures, the plasma-thiopental level needs to be between

39 and 42 mg/L, and 30.15 is less than 39 mg/L, right?

A But I take issue with that value of 39 as being --

Q No, no, I understand you do. I mean, you said you --

SPEAKER: Now --

SPEAKER: Wait a minute, sir and then we can go ahead. Go ahead.

THE WITNESS: You pulled one number out of one paper as what is necessary for a certain level of surgical stimulation, and I could show you other papers with other degrees of surgical stimulation that suggested far lower levels of thiopental in the blood will result in unconsciousness.

BY SPEAKER:

Q Do you have any of those papers with you here today?

A No, because I didn’t think that they would be important to bring.

Q Okay.

A I could certainly submit them if you ask.

Q So 110 lbs makes a more than double the concentration difference?

A Yeah, the -- when thiopental is distributed

throughout the body, the size of the body is an important parameter that determines the final blood concentration.

Q Well, again, in Virginia, you said you remembered saying that the weight would not change your calculations, “In any meaningful way.” More than double isn’t meaningful?

SPEAKER: I would object to it Judge --

SPEAKER: He hasn’t --

SPEAKER: Question --

THE JUDGE: Please answer him, go ahead and answer it.

THE WITNESS: I was talking about the probability of consciousness, and the probability of consciousness does not change in a meaningful way until you get the level below approximately 15 mg/L.

BY SPEAKER:

Q Okay, now, the charts you prepared for Kentucky, for Maryland and South Carolina and some other states, you testified on direct examination that those are computer models, is that correct?

A Yes, they are predictions of how the drug should behave in a patient either with average demographic or with the specific demographics that I was given.

Q Okay, what were those demographics?

A Well, for instance, in Maryland, they asked me to do it based upon a very large person.

Q Okay.

A But in the absence of specific demographics, I assume 80 kg as the size of an average male.

Q Okay, you said on direct that your computer models were based upon published literature on experiments, what experiments were those?

A There’s a large body of literature on what happens when thiopental was given to patients in terms of how long it takes to circulate throughout the body, in terms of how long it takes to achieve certain blood levels, and what those blood levels mean in terms of the probability of consciousness.

Q And those are --

A And I relied upon those published numbers to perform my predictions.

Q And those are based on people who were intended to survive the administration of the thiopental, is that fair to say?

A Yes.

Q Okay, and in fact the people in those studies did survive those experiments, is that correct?

A Yes.

Q Okay, now, I notice on these chart sheets you submitted, there's no range of probabilities here. They're all exact. Probability of consciousness is, you know, .00006, .003 -- there's no range of probabilities here.

A And that's -- when I tried to use the word, "approximately," you jumped on me through that, but all of these are approximate.

Q Well, no, I mean, you used the word, "approximately," here today, but you didn't use the word, "approximately," in any of these graphs, did you?

A No, but there is certain experimental errors and if you wanted me to supply the 95 percent confidence intervals, I can do that.

Q Okay, did you bring any of the supporting data you used to produce these graphs with you to Kentucky?

A No, I wasn't asked to.

Q Okay. So all you produced were these charts?

A No, I produced a lot of things, but what I brought with me today or supplied to Mr. Middendorf were those charts.

Q Okay, okay. Did you use Eddie Lee Harper's toxicology data in producing these charts?

A No, because the toxicology data aren't applicable, because all of my predictions are based upon

arterial blood sampling and the only toxicology data we get from Mr. Harper is based upon venous blood samples obtained in autopsy.

Q Now, you referenced some North Carolina and South Carolina toxicology data, did you use any of that data in producing the computer models?

A No.

Q How many people who died as a result of the procedure -- were any dead people included in any of the experiments you've talked about?

A No.

Q Okay. Are any of your charts based on that information (inaudible) which says, "It requires 39 to 42 mg/L to conduct a surgical procedure?

A No, because this is based upon the probability of consciousness not the probability of relating anything to the surgical procedure.

Q Okay. Now, is it fair to say -- and I know this is really elementary, but again, I'm not a doctor. Is it fair to say that a graph is a visual representation of data?

A Yes.

Q Okay, and a graph can be interpreted by the viewer, is that correct?

A Well, I think it could be interpreted correctly or incorrectly.

Q Okay, I understand. Now, we have the third graph in the other litigation in other states, is that correct?

A Yes.

Q Including Ohio and South Carolina?

A Yes.

Q Okay. I just want to show you a couple of these.

SPEAKER: May I approach the witness?

THE JUDGE: How much --

SPEAKER: I'm almost finished Judge.

THE JUDGE: Oh, okay.

BY SPEAKER:

Q Now, those are two graphs, the one -- probably, I believe, you produced for litigation in Ohio, is that --

A Without referring to my record, I can't recognize these in terms of which State Courts they were prepared.

Q Okay, now, but you produced these for litigation in other states?

A Yes.

Q Okay. Now, could you read the title of one of them?

A The blood concentration up to 2g of thiopental sodium in the average man within 180 minutes.

Q And what's the title of the other one?

A Blood concentration up to 2 g of thiopental sodium in the average man within 180 minutes.

Q Okay, and then it's got a little insert, and it says, microgram, mcg, equals one millionth of a gram?

A That is not something I put on there, that's not my writing.

Q Okay, but that -- the time I've marked out there, did you do that? 1, 5, 10, 50, 100, 200 --

A Yeah.

Q -- and is that the blood concentration levels going up with that?

A Yes.

Q Okay. But these chart sheets produced Kentucky, they don't have any of that explanatory material on them, do they? Like for instance, this one, it doesn't even say what the time is, there's no unit?

A That is deliberate. I -- as I discharge that last graph, it's a qualitative description of how veinal sampling and arterial sampling differ, and it is deliberate that there would be no units put on that to the right atrium.

Q But we wouldn't know that without you testifying here today?

A That is correct.

SPEAKER: Okay. Judge, that's all the questions I have, but I'd like to introduce that Maryland affidavit, and appended graph.

SPEAKER: Judge, we object, there was testimony that there are bugs to this graph, which we didn't produce.

SPEAKER: No, no, those were Ohio and South Carolina, selective.

SPEAKER: All right. I want to say it goes the same for the Maryland Graph, this has got micrograms, details --

SPEAKER: It doesn't have it on the -- back here, on the ones that are attached to them.

SPEAKER: It's not labeled on there.

SPEAKER: I don't see it.

SPEAKER: On the -- on the -- it's on the affidavit.

SPEAKER: I thought he said graph.

SPEAKER: No, we -- we attached that -- graph attached to the affidavit --

SPEAKER: And that would be Plaintiff's Exhibit 32?

SPEAKER: Right.

SPEAKER: And that's all the questions I have for

the Doctor.

THE JUDGE: Okay, Mr. Middendorf.

MR. MIDDENDORF: Just a few follow up, Your Honor.

RE-DIRECT EXAMINATION

BY MR. MIDDENDORF:

Q This term of conscious awareness continues to pop back up and you said it is -- it happens in hospitals but very rare, is that a fair statement?

A I would best guess if you take all patients presenting for anesthesia, at some place in the vicinity of 1 in 200 to 1 in 500 will be aware under anesthesia, when that was not the goal.

Q In your experience, have you ever heard of a case of conscious awareness or whatever you want to call it when somebody was given a 3g dose to induce the coma?

A No.

Q So is it fair to say that this could always happen when you're trying to keep somebody very light under anesthesia, the only time it would happen and that's rare?

A Yes, almost all of the time when we administer an anesthetic to a patient, our goal, usually is to have the patient wake up at the end of the operation. Once in a while, we deliberately keep patients asleep, because of the

severity (inaudible) and sometimes, when we give very large doses of a drug like thiopental the patient remains asleep even though he's reluctant to wake up. And so for instance, in the case of intracranial surgery, well, let's say in aneurysm clipping, where I might give 3 g of thiopental for brain protection. It would be important for the neurosurgeon and myself to have the patient awake, as soon as possible to perform the neurological exam on the patient to make sure that there were no untoward effects of the surgery. But after 3-g of thiopental, we are unable to do so at the end of the operation, because specifically, the patient sleeps for hours afterwards.

Q So you can say to a medical degree of reasonable certainty that if given a 3-g dose to induce a coma, conscious awareness would never be a problem?

A No, if 3-g of thiopental is given intravenously a person is going to sleep for hours.

Q Is 25 milliliters enough of a saline flush to flush a vein?

A Yes.

Q What's the difference between 25 cc and 25 ml?

A The difference is only meaningful to a physicist, the two terms are exactly the same at 4 degrees centigrade, but a milliliter and a cubic centiliter are very, very,

slightly different at temperatures other than 4 degrees centigrade.

Q So if I had a syringe that was labeled, 25 cc of saline, would that be more than enough to flush a vein?

A Yes.

Q I believe, you were asked about the drugs that Kentucky uses, a little bit, seems like you've been talking about those quite a bit, and Your Honor, I don't recall what exhibit this is, or that -- or the drugs were in this. But those were the bottles that were used in Kentucky, 500 mg?

A Yes.

Q Would it be fair to say that you need six of those to obtain 3000 mg?

A Yes.

Q Is that that difficult to calculate?

A I don't think so.

Q Okay. Go to pancuronium bromide, if we use 5 -- 50 mg in Kentucky, and each one of those are 10-mg bottles, the only thing we would have to do is use five of those bottles?

A That's correct.

Q That's fairly easy to calculate.

A I believe so.

Q Potassium Chloride, if we use 240 mEq and each bottle is 60 mEq, would the only thing we need to do is get four of those bottles?

A Yes.

Q I think one of the exhibits you were also shown was those Banyan stat kits, and I believe it was Exhibit 77, do you recall seeing that?

A Yes.

Q I think one of the drugs that you said that could be used is Epinephrine, is that correct?

A Yes.

Q That could reverse some of the effects?

A Yes.

Q Is that listed on that page?

A Yes.

Q All right. Talking about some of the graphs that Mr. Shouse showed you, I believe Exhibit 30 was the one in Kentucky. Did you prepare the -- the one in Kentucky -- which was a 3-g base? Do you have a copy of that? There was testimony from Dr. Heitz (phonetic) that said Eddie Lee Harper died in five minutes. What's the probability of consciousness, if somebody has died in five minutes, under your graph, and you've given him 3000-dose --

SPEAKER: Objection, Mr. Harper didn't receive a

3-g dose.

MR. MIDDENDORF: I'm sorry, two.

SPEAKER: But that chart says, 3 g there.

BY MR. MIDDENDORF:

Q Let's just -- let's assume that Mr. Harper received a 3-g dose, there was testimony that he died, Edward Harper died in five minutes, under this chart, if given a 3-g dose, what's the probability of consciousness, for any individual?

A After a 3-g dose, five minutes later, the probability of consciousness is approximately 0.0000024 percent. And after a two grams, it's approximately 0.00006 percent.

Q Let's go to an hour, on -- under the Kentucky chart that you prepared, 3-g dose, after one hour, your average man, what is the probability of consciousness, if given a three gram dose of sodium thiopental?

A Its approximately 0.029 percent.

Q Okay, what about 2-g dose, and whether it was South Carolina or in Ohio?

A It's approximately 0.7 percent.

Q Okay, blood pressure monitoring could help monitor for consciousness before the potassium is introduced, is that correct?

A No, it is not; blood pressure has nothing to do with consciousness.

SPEAKER: Objection, Judge, this is outside of the scope of --

THE JUDGE: It's outside the scope of redirect.

BY MR. MIDDENDORF:

Q Is there a difference between sleeping and surgical anesthesia?

A Do you mean physiologic sleep at night?

Q Yes.

A Yes.

Q Okay. And finally, all your charts are based on computer models, correct?

A Yes.

Q You conducted no experiment yourself, correct?

A I had to conduct some of these experiments myself; some of my own data are included in some of these calculations.

Q Okay, what experiments were those?

A These were experiments in which people were given medications and the time course is measured.

Q Okay, what medications?

A Morphine and propofol.

Q But not thiopental?

A No, I used morphine and -- I used morphine and propofol in order to do some of the predictions that I made that described the difference between arterial and veinal samplings and the huge differences that are found in the arterial concentration and the veinal concentration.

Q But not thiopental?

A No, but exactly the same differences are found with thiopental based on the work of others.

Q Based on the work of others?

A Yes.

Q Thank you.

THE JUDGE: Let me ask one thing real fast. Doctor, are you aware of any group of medical community or anything in the country that has reviewed the lethal injection with a view toward providing the best medical advice to government as to how to carry on the lethal injection?

THE WITNESS: I am personally unaware of any official stand, but I certainly have not been involved in research on that, there could be opinions down there, which I'm not aware of.

THE JUDGE: Okay, right, thank you. Anything further?

SPEAKER: No, Your Honor.

THE JUDGE: Thank you, Doctor, you can step down. But Mr. Middendorf, do you have any -- is this your witness?

MR. MIDDENDORF: We have one more witness Your Honor, and Mr. Morgan is going to have him.

SPEAKER: Commissioner Rees, recall Commissioner Rees, we have a few more questions to him.

THE JUDGE: Rees -- how many, because I'm competing with another Judge here right now.

SPEAKER: I would say probably 10 --

SPEAKER: Judge, I'm going to object Mr. Morgan handling the witnesses. We've not been produced a notice of interim appearance in this case, last week when -- sorry, I can't recall her name here --

SPEAKER: Heric (phonetic).

SPEAKER: Heric, I'm sorry, Ms. Heric examined the witness, we received a courtesy call prior to that and we were told we hadn't introduced any notices of appearance in this case, but do you have any objection, we had an objection at that time. We do object to Mr. Morgan handling the witnesses and while we're on this, I was going to bring it up in the housekeeping matter at the end of the day, what it should be -- we're all this but I just wanted the video to reflect that Mr. Morgan has been an active

participant in the defense of this action.

THE JUDGE: All right.

SPEAKER: So we object Mr. Morgan handling any witnesses at this time.

THE JUDGE: Mr. Middendorf. I really don’t see a problem other than the problem that that’s the -- a time problem right now. But we can --

SPEAKER: Can we come back this afternoon?

THE JUDGE: We can sure, let’s go on and start. They’re not starting, they’re not going to start this -- why don’t you go and call your witness and --

Whereupon,

JOHN REES

was recalled as a witness and, having been previously duly sworn, was examined and testified further as follows:

MR. MORGAN: May I approach the witness.

THE JUDGE: Sir, please state your name again, for the record?

THE WITNESS: John Rees.

DIRECT EXAMINATION

BY MR. MORGAN:

Q And Commissioner, I'll remind you that you're still under oath. You've been Commissioner of the Department of Corrections, correct?

A Yes, correct.

Q And have been Commissioner from January 2004?

A January of '04.

Q In your capacity of commissioner, did you meet with members of the Department of Public Advocacy or other attorneys for the -- for the Department of Corrections sometime in the Summer or Fall of 2004?

A I did.

Q Was this before the present lawsuit was filed?

A Yes, it was.

Q About when does that mean?

A It was August -- July-August sometimes in that

time, I think the lawsuit was filed in August, as I recall.

Q Where was it?

A The meeting?

Q Yes.

A The meeting was in the conference room of the governor’s -- attorney general.

Q Who was at that meeting, sir?

A Mr. Roach (phonetic) was there, Mr. Middendorf, myself, I -- two, at least two of the individuals at -- at the table, not sure who else was there but -- yes, I think there was another attorney who worked with Mr. Roach, but I don’t’ -- I’m not sure about that.

Q What was your purpose in this meeting?

SPEAKER: Are we talking settlement here?

SPEAKER: No.

SPEAKER: Okay, go ahead.

SPEAKER: Your Honor, if I may, Your Honor, the reason I am calling -- that this witness is being called is because -- and either his and other witnesses questioned, it has been brought up as to why -- the fact that the protocol was changed and this witness is here to testify to why?

THE JUDGE: Okay, just about why it was changed, go ahead.

BY MR. MORGAN:

Q Okay, what was your purpose in that meeting sir?

A There I was the representative of the Department of Corrections who has responsibility of carrying out the execution work.

Q Okay, what did you say in that meeting?

A Mostly, I observed and listened to the discussions that went on among the other attorneys. One thing I do remember asking at the meeting was if there are problems with protocol, and it was apparent that there were problems with -- problems in the Department of Public Advocacy's perspective --

SPEAKER: Objection to that characterization of the Department Judge, we are individual attorneys.

THE JUDGE: All right, I'll sustain the objection, we can go on.

THE WITNESS: Well, it was obvious that various attorneys, settlement attorneys had difficulties with the Department's protocol, and I --

SPEAKER: So -- just so we're clear who's Department's protocol, the Corrections Department --

THE WITNESS: Corrections protocol, yes. And I asked those attorneys if they had recommendations or suggestions on how to improve it.

BY MR. MORGAN:

Q Well, what were you told?

A They refused to say anything in that regard.

Q Well, what decisions were made at that meeting?

A No decisions were made at that meeting.

Q But what actions did you take after that meeting, and later on regarding the lethal injection protocol?

A After that meeting, we had some discussions between Mr. Middendorf and subsequently Mr. Haeberlin and others. After the lawsuit was filed and we moved it forward, we did increase the amount of sodium thiopental. We brought a crash cart and did some other changes in the protocol from a technical perspective mainly addressing areas that we felt were concerns of the Department, was held against the Department.

Q Why did you make these changes then?

A Well, the protocol was being challenged, if we could improve the protocol to resolve any questions, why not do it.

Q Okay, what medical information did you have in making a decision to increase the sodium thiopental over from 2 g to 3 g?

A I’ve been in Corrections 30 years, so I’ve supervised and managed medical services, and sort of a

general measure with those types of issues. I had discussions with Mr. England (phonetic) and Mr. Middendorf concerning it. We reviewed literature regarding the medication, we went over queries and information and we had some discussions with Dr. Hubb (phonetic), generally at the Lafayette. We were concerned, we wanted to make sure we increased the dosage so that it could be safely and effectively done without creating additional problems. When we came to that conclusion, we saw that the -- it was even the commonsense decision, if we could do it without increasing problems regarding it, then why not do it.

Q So, a few questions to clarify some terms here, okay. In the protocol, is there a saline fluid flush that runs through the catheters -- catheter between each of the drugs, of the acid drugs that are given during the lethal injection?

A There is.

Q How much of it -- how much is that saline fluid?

A It’s 25 cc.

Q Okay, if the protocol reads 25 mg, what significance does that have to you?

A It’s obviously a typographical error.

Q Well, what -- what is the significance of this type of typographical error in --

A Everywhere else in the protocol it refers to cc, so, I -- (inaudible) this is a mistake, this is not struck.

Q Okay, have you yourself seen the practiced trials on the lethal injection, just stand there and pay some attention?

A On one occasion I had observed the anesthesia being -- during one of their -- one of their training exercise.

Q Okay, and how are these drugs given to during the course of this lethal injection?

SPEAKER: Judge, objection, it has all been covered in --

SPEAKER: Okay, okay, well if I may, it's given in a catheter, is that correct?

THE WITNESS: Yes, it is.

BY MR. MORGAN:

Q Does this syringe look to be about the same size of what you have seen before during the trial run?

A I guess that it does.

Q If you want -- may I approach the witness, sir?

THE JUDGE: Please.

BY MR. MORGAN:

Q If you will, just for the sake of the record, tell us from here, the left side of that syringe, what

those measurements -- what those numbers are and what the measurement's are, sir?

A Cc's

Q Okay. And what is your understanding -- well, let me just go to the point here. Is your understanding that that is filled up with the saline solution to the level of 25 cc?

A Yes, it is.

Q About what size needle is used during the course of a lethal injection in Kentucky?

A 18, sometimes 20.

Q Well, what's the difference in these gauges?

A It's like a shotgun, smaller the number the larger the size of the needle, and the individuals that are starting out the -- make that decision based on the individual characteristics. But that 18 is just a normal, certainly not at all large, it is actually a -- in fact it's smaller than what's normally used in the course of donating blood.

Q What's usually used during the course of donating blood?

A It would be 16, generally speaking.

Q How do you know that?

A I'm aware of it from an affidavit that was

provided by the Red Cross concerning the size of the needle used to draw blood.

Q Okay.

SPEAKER: That affidavit is still here.

SPEAKER: Not in this.

SPEAKER: Okay.

SPEAKER: We've not seen this affidavit. It's really hearsay, I can't read the signature, I've no idea who this person is, I can't read the name on this either, so --

SPEAKER: That's a little -- I don't think it's been raised as an issue?

SPEAKER: I don't think so either.

SPEAKER: Okay.

SPEAKER: Nothing was ever discussed that, there was any testimony about the -- not an issue in the case.

SPEAKER: The original affidavit is -- it's an honest point, Your Honor, if we could perceive the fact.

SPEAKER: Objecting to relevance.

SPEAKER: Yes, I'm objection on grounds of relevance, size of the needle was never really the -- issue, but it has some tangential value, but --

SPEAKER: I must say no relevancy, because it's not raised as an issue.

SPEAKER: May I respond to that --

SPEAKER: Sure.

SPEAKER: Well, I thought that it has been raised. We've heard many questions of witness about the size of a needle and about the difficulty inserting an IV, how it can go through the vein, how the vein can roll, lift or whatever. We've heard from a couple of witnesses now about the -- how to determine the size. We've heard from this witness, and I believe, at least one other that for those lethal injection protocols an 18 to 20 size needle, which is smaller than what's used by the American Red Cross during donating blood, so I think that it's actually being offered -- the relevance of that is being offered with a perspective, something that many folks can understand, I myself can visualize that clearly as to the ease in which that IV, if you will, is administered during the course of donating blood.

SPEAKER: I withdraw my objection, Judge.

THE JUDGE: All right, okay.

SPEAKER: I've just got one final -- three or four questions here Commissioner. Well, then, may this affidavit be admitted, Judge?

THE JUDGE: I don't -- I haven't seen the affidavit, I --

SPEAKER: And it isn’t the original.

THE JUDGE: -- is an affidavit from someone that that’s the normal size?

SPEAKER: Judge, I’m not object to the questions about the needle size, but the affidavit --

THE JUDGE: I’m going to say no to the affidavit, you guys --

BY MR. MORGAN:

Q Okay. Commissioner, what type needles were used on Eddie Lee Harper during the course of his execution?

A 18 was used in his arm, and a 20 was used in his left hand.

SPEAKER: Thank you sir, those are the only questions that I have --

THE JUDGE: Mr. --

MR. SHOUSE: Judge, if I could (inaudible) for minute.

THE JUDGE: Go ahead.

CROSS-EXAMINATION

BY MR. SHOUSE:

Q At this meeting that you attended, we didn’t have the protocol yet, did we? And by, “we,” I mean me, Ms. Balliet, and Mr. Barron in August?

A I don’t recall.

MR. SHOUSE: Well, I'd just like the Court to take judicial notice that that was like (inaudible). We didn't get that --

THE JUDGE: Was this before the suit was filed?

MR. SHOUSE: Before the suit was ever filed.

THE JUDGE: Then I'll take judicial notice of it unless you had it accidentally and you didn't have it --

BY MR. SHOUSE:

Q So if we didn't have the protocol, how could we have made suggestions on how to change it? We didn't know what was in it. You said at the meeting, we didn't make any suggestions.

A Is that -- was that the drug.

Q Yeah.

A I said that you -- when I asked the question because there were discussions concerning the various drugs used, specifically. And I had suggestions on how to change the protocol to deal with your concerns. The concerns that were raised in that meeting were specifically regarding the various drugs used.

Q But we didn't have the protocol at that time, did we? And by, "we," I mean the three lawyers prosecuting this case.

A I don't know. I don't remember.

Q That's fine. You're going to be there when the execution is conducted, is that correct? And by, "there," I mean at the Kentucky State Penitentiary.

A No, I'm -- I would be here at (inaudible).

Q Okay. You never consulted any medical personnel on the changes you made since this litigation began, is that correct?

A Personally, I did not -- admit to ordinary discussions of a general nature with Dr. Hobbs (phonetic).

Q Okay, you did not -- with these changes, you didn't add any equipment for monitoring consciousness, did you?

A No, we did not.

Q Did you speak to anyone up in New Jersey about how they do things there?

A I don't believe so.

Q Okay, did you -- you didn't look at any other chemicals that could have been used, did you?

A No, I did not.

MR. SHOUSE: I have nothing further, Judge.

SPEAKER: Judge, the only thing that we would ask is you take judicial notice that they received an open records request and they knew exactly what the amounts were of the drugs and the drugs that were used in Kentucky. So

--

THE JUDGE: Well, I think that -- they just didn’t know the protocol.

MR. SHOUSE: That was Exhibit number 1 in our complaint, Judge.

THE JUDGE: All right.

SPEAKER: Right, I just -- I want the Court to be aware that during that meeting, they were well aware of what we’re using.

THE JUDGE: Thank you. No other witnesses?

SPEAKER: No, Your Honor.

SPEAKER: I have a motion to make, however, which is that this American Academy of Forensic Sciences’ article (inaudible), which I think is Commonwealth or Defendant’s 1, is that correct?

THE JUDGE: Yes.

SPEAKER: And my understanding was that when it was introduced, it was introduced and the Court specifically said that it would be introduced because the Court supposed there would be some testimony about the article. And we’ve had no testimony in the Plaintiff’s case or the Defendant’s case, excuse me, about this article. So I ask that this article be stricken from the record.

SPEAKER: Their witness has testified about it also, Your Honor.

THE JUDGE: I've got a Commonwealth 1 and I've got a Defendant's 1. Well, I guess that's the same thing.

SPEAKER: Judge, we have a motion also as well. I don't how long.

THE JUDGE: Well, you're going -- you all are going to have to come back with motions after lunch then.

SPEAKER: Okay.

THE JUDGE: You're going to -- is this motion for a verdict again?

SPEAKER: Directed verdict, Your Honor.

THE JUDGE: Listen, we'll return after lunch at 1:30.

(Whereupon, a luncheon recess was taken.)

A F T E R N O O N S E S S I O N

(1:30 p.m.)

THE JUDGE: We're back on the record. Mr. Shouse has indicated that he will -- you're going to wait -- you're going to let us know tomorrow about it.

MR. SHOUSE: Yes, sir, hopefully, before lunch.

THE JUDGE: Okay, so you're going to let us know tomorrow about whether the need for a rebuttal witness -- or at least you're going to talk to Mr. Middendorf and then maybe I can see both of you tomorrow sometime?

MR. SHOUSE: That's just fine.

MR. MIDDENDORF: I'll be there, Your Honor.

THE JUDGE: Okay.

MR. SHOUSE: (inaudible).

MR. MIDDENDORF: Sure.

THE JUDGE: I don't think I have something planned, but I mean we can work around it --

MR. SHOUSE: -- after lunch.

THE JUDGE: Okay, we'll work around our schedules. And then I would anticipate, then after that I'll talk to you over that, if there is a rebuttal or even if there isn't a rebuttal. Mr. Shouse, I believe I'd indicated to you all that when I overruled your motion for Professor Harding to testify, that I'd indicated that the -

- what you'd -- since she was going to testify to or what you indicated she would testify to would be a history of what's been cruel and unusual, and I told you I'd give you the opportunity to argue that.

So I'll -- what I would anticipate is that it -- if you want to file some sort of brief trial brief at the conclusion, then both sides would be able to file a trial brief. And I'm not looking at a great deal of time, maybe 10 days and then I'll have the decision out too.

MR. MIDDENDORF: Judge, we were hoping that we wouldn't have to go through some sort of briefing schedule. We've now done, probably, about eight months of this and you've received numerous documents from both sides. You've now heard five days of testimony on this issue. I think the Court can make that determination and look at the law and make the ruling.

THE JUDGE: And Mr. Shouse.

MR. SHOUSE: We can have a trial brief in 10 days, no problem, Your Honor.

THE JUDGE: It'll be simultaneous, if you're going to file something, you can and if you don't, that's fine too. They can file whatever they want to.

MR. SHOUSE: Yes, sir.

THE JUDGE: All right, Mr. Middendorf, you had a

motion.

MR. MIDDENDORF: Yes, sir. Once again, Judge, we move for a directed verdict under Rule 50.01. Over the past five days, the Plaintiffs have speculated on what may happen. But they have presented no evidence that Kentucky's execution protocols will violate Mr. Baze's or Mr. Bowling's constitutional rights. And the evidence has shown that as long as an IV line is inserted properly, an inmate will experience a painless and humane death.

Dr. Dershwitz testified to that today. He said that if properly introduced, an inmate would be unconscious for hours. Their own expert, Dr. Heath, also testified that if given properly, the inmate would be unconscious for hours. So this really comes down to are there reasonable assurances that an IV can be inserted properly. That's the whole part of this case.

Glenn Haeberlin testified that the members of the IV team have a great deal of experience and you've heard that experience. He testified that since he has participated in practices with the execution team dating back to 1998 that he cannot recall a time when they couldn't find a vein. Glenn Haeberlin and Richard Pershing also testified that they are looking for leaks, for any swelling around the site, and for the inmate to be

unconscious during the execution. This is consistent with what every doctor's testimony would be that they should be looking for during that execution. If there is a problem, then Warden Haeberlin will switch to a second line. So Kentucky does have reasonable safeguards, if something were to go wrong.

And we have to look at this in light of (italics) State v. Valle, which states and I quote, "The Constitution does not assign the impossible task of eliminating all potential for a mishap in an execution procedure. The possibility of human error is implicit in every human endeavor."

Now, quickly touching on each drug. Sodium thiopental is still a very usable drug. That was consistent testimony from every one of the doctors. The dose Kentucky gives is more than enough to render someone unconscious. That is also consistent with Dr. Heath and Dr. Dershwitz. With regard to the pancurium bromide, this is also a very usable drug, which the testimony was. Dr. Watson, their expert, said in executing someone, pancurium bromide would have a use in stopping the heart.

Now, why do the Plaintiffs want potassium bromide out of the execution cocktail? They've -- you heard from Dr. Dershwitz, they -- and also Dr. Heath that there would

be involuntary muscle reactions. They want reporters to report on what they witnessed saying that an inmate was having involuntary muscle reactions during an execution. So it's about public perception, it's not about the science.

But both Dr. Dershwitz and Dr. Heath testified that even if you eliminated the drug, the inmate would not experience any pain. But the Department of Corrections seems to be more concerned in adhering to (italics) Weems versus The United States, in which it says, you have to take into account the dignity of the prisoner in death. The Department of Corrections does that. What is more dignified, whether somebody is having involuntary muscle reactions, when their family, potentially, is watching than having somebody go to sleep and not move during the course of an execution?

As for the potassium chloride, there is no dispute that it does what it is intended to do and that's stop the heart. Even Dr. Heath said that once it was induced or once it went into the inmate's system, like, Eddie Lee Harper, within a minute his heart stopped and he was dead.

The Plaintiffs have also shown no evidence that Eddie Lee Harper was conscious. The best their expert, Dr.

Watson, could say is that Eddie Lee Harper, and I'll put this in quote because this is what he said, "could have experienced pain." "Could" is not evidence. He even stated that post-mortem redistribution is basically a new science. And he also testified that that drug amount in the autopsy result is the sole reason that he is of the opinion that he could have been awake during the execution.

And you heard today from Dr. Dershwitz that those levels in Harper's autopsy are meaningless in determining whether they were conscious at death. Everyone else's testimony shows that Eddie Lee Harper was unconscious. But they don't want you to look at all those other factors, that the drug circulated through the body, that there were no signs of swelling, no signs of infiltration. They don't want you to listen to those because that doesn't help their case.

They want you to rely on the one autopsy result where even their expert said could have felt pain and it's a relatively new science. Even Dr. Heath testified that the EKG was what you would expect after redoing it. That is their expert.

Every challenge to this three-drug combination have failed across this country. And I've mentioned before, apparently, this is just our turn. Most recently,

in (italics) Beardslee versus Woodford, the Ninth Circuit, of all places, upheld a challenge to California's execution protocol. And they've used the same combination as we do. Thank you, Your Honor.

THE JUDGE: Thank you. Mr. Shouse.

MR. SHOUSE: Yes, sir. First of all, I want to reiterate my argument of last week, which is that obviously directed verdict, the motion must be taken in a light most favorable to the non-moving party and that all doubts and questions must be resolved in our favor. Having said that, however, I think that this is not even a close call on directed verdict. But I think that we, in fact, should be granted a directed verdict on several points.

First of all, their witness today Commissioner Rees admitted that there was no medical consideration given to the changes that have been in Kentucky's lethal injection protocol since the beginning of -- excuse me, of this litigation, no medical basis, whatsoever, no medical consultation. Their witness, Dr. Dershwitz, said that Harper's -- if Harper's numbers are correct -- if Mr. Harper's numbers are correct, then there is more than a 50 percent probability that Mr. Harper was conscious. The Constitution does not hold this Court --

THE JUDGE: I know what the witness --

MR. SHOUSE: A genuine issue of material fact is this, that of the validity of the Harper numbers. Dr. Dershwitz says they're no good. Dr. Watson and Dr. Heath have reason to suspect that they are good. Dr. Corey and Mr. Ward testified here last week that they had no reason to think that their work was substandard. Dr. Corey is a board-certified forensic pathologist. Mike Ward has been in charge of the Toxicology Department of the Medical Examiners Office in Kentucky here for over a decade.

The Defendants are taking absolutely no precautions to monitor their awareness. Dr. Dershwitz testified today that just an old-fashioned blood pressure cup and a stethoscope could help monitor for consciousness. Is that too much to ask? Dr. Heath and Dr. Watson testified there are different levels of consciousness. They said that there was a difference between a surgical plan of anesthesia, and being asleep, and being somewhere in the middle, between me standing here wide awake talking to this Court and being able to have an operation performed on me.

Dr. Dershwitz testified that all of his studies dealt what -- he first of all said that this idea of different levels of unconsciousness was, "an archaic term," and that all of his research on sedation levels dealt with

responses to verbal commands, “Lift your right leg.” I deal with that testimony here is there is a great deal of difference between being able to respond to a verbal command and having someone perform a surgical procedure on you. And it’s undisputed that the potassium chloride in this amount would be agonizing, that is the word Dr. Dershwitz used.

Dr. Dershwitz says that weight matters, the weight of the inmate matters. We went to his chart from Maryland and his chart from Kentucky. A 110 lbs difference more than doubles the blood level of the thiopental in the inmate. There is nothing in the protocol that takes into consideration the -- of the inmate’s weight.

Their witnesses, their doctors, their (inaudible) service administrator are all over the map on what you’re shooting for should you try to site an IV in the neck. We’ve heard jugular, carotid artery, two different kinds of jugular veins. They don’t even know what they’re going for if they try to insert an IV into the neck. And Dr. (inaudible), the chief medical officer of the penitentiary, said that if you hit the wrong thing, you’d sure know it because blood would go everywhere.

There’s no reference at all in this protocol about what the concentration of the sodium thiopental is to

be. Dr. Dershwitz said that a 2.5 percent solution is what's used for therapeutic doses and we've heard lots of testimony about 2.5 percent solutions. But there's nothing in that protocol that says that that is the concentration of thiopental that is to be used.

There is a definite genuine issue of material fact on how hard it is to mix these drugs. Dr. Dershwitz says, "No problem." And the Defendants' attorneys would have you believe that there are no problems with this at all. But that package insert, which was introduced to the evidence today says these drugs are only to be administered by someone who's trained in the use of intravenous anesthetic.

Maybe 25 mg of saline flush is a typographical error and maybe it's not. Are we to believe that corrections officers -- uniformed corrections officers are to look at that and say, "Oh, that must be a mistake. It must mean milliliters." No. We presume, I hope, that the corrections officers are reading the protocol and doing what the protocol says. And today that protocol says 25 mg, which is not enough of the saline flush to prevent the precipitation of the two drugs and a clogging of the IV line.

There's no medical investigation -- there has

been no medical investigation at all into the drugs that are used. Why these three drugs? Because everybody else does it. There's been testimony that the pancuronium bromide serves no purpose other than to shield the sensibilities of the witnesses.

It, in fact, increases the likelihood of anesthesia awareness because none of those, the corneal reflex, squeezing the trapezius muscle, none of those stimuli that you could use to monitor for anesthesia awareness will work because the inmate will be trapped in his body and would be completely paralyzed, couldn't respond even if he wanted to.

We know that the possibility of anesthesia awareness exists. If we prove nothing else in here, it's that such a condition does exist and does happen. Why not monitor for it before the Pavulon is administered? Before the paralytic is administered, why not monitor for anesthesia awareness?

We know that other viable chemicals exist that wouldn't have all of these problems, this three-drug cocktail and the paralytic that masks the anesthesia awareness. Dr. Dershwitz testified today that there were drugs that would do it without the spasms, without the muscle contractions that Mr. Middendorf just testified --

sorry, just talked about. He testified that there were drugs that would get the job done without that.

It took Mr. Harper five minutes to die. The thiopental did not kill him. The thiopental circulated throughout his system. It was the potassium chloride that killed him. This Court must decide the level of pain he experienced and whether the Defendants have done anything to avoid a reoccurrence of that episode.

The crash cart, they bring the crash cart in and say, “Well, look, Judge, we’ve done this in case we have to revive an inmate after the process has begun.” They’ve taken totally inadequate measures based on their own documents that they turned over in the discovery process. Dr. Dershwitz admitted that there are things that are needed to revive an inmate after the process begun -- has begun that is not on that (inaudible) 700 that they’ve bought.

There are things in one document the Department of Corrections produced saying we need to have this, that, and the other thing. But they’re not on hand. They admit that those things should be on hand, but they’ve done nothing to procure them.

The charts Dr. Dershwitz referred to today, he admitted they’re based -- they’re computer models based on

living people. That's what they're based on. There's no margin for error in those charts. They're based on other people's experimentation, other people's research. Dr. Dershwitz doesn't even seem to believe in post-mortem redistribution. If there is a genuine issue of material fact allowed in this case, that's one right there.

Our experts came in and said, oh, post-mortem redistribution is a complicated thing that needs to be taken into consideration when evaluating these blood levels. Dr. Dershwitz seemed to say today that he doesn't even believe such a thing exists. But there is a genuine issue of material fact that needs to be decided.

Mr. Middendorf has said throughout this case that we're asking the Court to hold the Defendants to a higher standard than a hospital. That's not entirely true, Judge, but in some level it is. The Eighth Amendment to the United States Constitution is higher than a negligence standard. In a medical malpractice suit, negligence is the standard. The Eighth Amendment requires more than a negligence standard.

There is a genuine issue of material fact on the qualifications of the experts. Dr. Dershwitz came in today and said he has a degree, he is a Doctor of Pharmacology. Dr. Watson was a Doctor of Pharmacy. Their relative

expertises and specialties contradict one another. The risk of unconstitutional suffering is a genuine issue of material fact this Court needs to decide after hearing our rebuttal testimony.

Precipitation, there we go. I showed Dr. Dershwitz an article on precipitation and asked him if the sodium thiopental and the pancuronium bromide are mixed together, which will precipitate. He said one thing, I showed an article and he admitted that the article said the exact opposite, thereby, increasing the risk of the precipitation in the line.

All of those things and a whole host of other things, I'm sure we'll talk about next Tuesday, are genuine issues of material fact that this Court needs to decide and that the Court should consider overruling the Defendants' motion for a directed verdict. We think that we are entitled to a directed verdict on at least four issues in this case.

Number one, we should directed verdict on sticking this IV in the neck. Their witnesses are all over the map on that, Judge. That is an unconstitutional risk of unconstitutional pain and suffering right there. They don't even know what they're shooting. And of course, we don't know what the IV team thinks they're shooting for

because we haven’t been allowed to talk to any of them.

The pancuronium bromide, it’s got to go. It’s an unconstitutional risk of masking the agony of the inmate. We’re never going to know as long as the pancuronium bromide is still there. Sticking someone with a needle for 60 mintues, they didn’t ask Dr. Dershwitz about that. That evidence that came in from Dr. Heath that that was wholly medically unjustified has come in uncontroverted. They didn’t ask Dr. Dershwitz one word about that part of the protocol, which allows the IV team to stick the inmate for 60 consecutive minutes.

And finally, Judge, their own expert admitted today that there are other drugs that can get this done without the unconstitutional risk of pain and suffering. For those reasons we ask the Court to overrule the Defendants’ motion for a directed verdict and grant our motion for a directed verdict.

THE JUDGE: I’m going to overrule both motions for a directed verdict. I’m going to allow you to decide whether you’re going to produce rebuttal or not.

SPEAKER: Okay, sir.

THE JUDGE: I will assume that based on the motions that you all have made and the arguments that you’ve made that once we conclude with whatever rebuttal

we’ll be able to get straight to the briefing and have the brief within 10 days and I’ll have them handed -- for you shortly thereafter.

SPEAKER: Yes, sir.

THE JUDGE: All right, okay, thank you. Call me tomorrow and we’ll know what we’re going to do.

SPEAKER: Yes, sir, we will.

THE JUDGE: Okay, thank you.

(Whereupon, the HEARING was adjourned.)

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