IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEBRASKA

LEROY CARHART, M.D., WILLIAM G. FITZHUGH, M.D., WILLIAM H. KNORR, M.D., and JILL L. VIBHAKAR, M.D., on behalf of themselves and the patients they serve, Plaintiffs, vs. JOHN ASHCROFT, in his official capacity as Attorney General of the United States, and his employees, agents and successors in office, Defendant.	4:03CV3385 April 6, 2004 9:00 a.m. Lincoln, Nebraska

VOLUME VI,
TRANSCRIPT OF TRIAL PROCEEDINGS,
BEFORE THE HONORABLE RICHARD G. KOPF,
UNITED STATES DISTRICT JUDGE

A-P-P-E-A-R-A-N-C-E-S:

FOR THE PLAINTIFFS:

PRISCILLA J. SMITH
JANET CREPPS
NAN E. STRAUSS
Attorneys at Law
Center for Reproductive Rights
120 Wall Street, 14th Flr.
New York, New York 10005

JERRY M. HUG
Attorney at Law
1823 Harney Street, #1004
Omaha, Nebraska 68102

FOR DEFENDANT:	ANTHONY J. COPPOLINO TERRY M. HENRY PREEYA M. NORONHA ANDREW I. WARDEN U.S. Department of Justice Civil Division - Federal Programs Branch P.O. Box 883 Washington, DC 20044
COURT REPORTER:	DAVID C. FRANCIS, RMR Official Ct. Reporter (Ret) 6300 Briar Rosa Drive Lincoln, Nebraska 68516

Proceedings recorded by manual stenograph, transcript produced with computer.

(Tuesday, April 6, 2004, at 9:00 a.m.)

THE COURT: Good morning.

MS. NORONHA: Good morning, Your Honor.

THE COURT: I'm feeling unusually active today. What about you? Counsel, you may proceed to call your next witness.

MS. NORONHA: Thank you, Your Honor. I believe Ms. Smith has one small housekeeping matter before we begin.

THE COURT: Sure.

MS. SMITH: Your Honor, again with the Chasen study, I'm sorry, but I was meant to file it under seal, and I need the Court's permission to do that.

THE COURT: You have it.

MS. SMITH: Thank you, Your Honor.

THE COURT: That's because of the copyright.

MS. SMITH: Yes.

THE COURT: Incidentally, while we are talking about that, I presume that doesn't -- the fact that it's copyrighted, you also doesn't have some sort of agreement that would preclude me from referring to it.

MS. SMITH: Not at all, Your Honor. It's okay to have it cited in sections of it, just not published in toto as it were. Thank you.

THE COURT: All right. Counsel, may proceed.

MR. COPPOLINO: Your Honor, the filing under seal

is not an admission into evidence.

THE COURT: No, sir.

MR. COPPOLINO: It's just that issue.

THE COURT: Yes.

THE COURT: Counsel, you may proceed.

MS. NORONHA: Thank you, Your Honor. At this time the defendant will call Dr. Kanwaljeet S. Anand to the stand.

MS. NORONHA: Your Honor, before we begin, I would like to use the courtroom technology during the presentation.

THE COURT: Good for you.

MS. NORONHA: May I have permission to have my colleague, Ms. Janine Johansen to sit by the camera to assist me?

THE COURT: Sure.

DR. KANWALJEET ANAND, DEFENDANT'S WITNESS, SWORN

THE COURT: You may proceed.

DIRECT EXAMINATION

BY MS. NORONHA:

Q. Good morning, Dr. Anand?

THE COURT: Good morning.

THE COURT: Doctor, that darn chair is bolted down to that box, which means that you can't move it, no matter how hard you try. So if you will put your elbows kind of on

that table in front of you, that will mechanically force you into the microphones and we'll be able to hear you. Go ahead, counsel

BY MS. NORONHA:

Q. Doctor, what is your occupation?

A. I'm a pediatrician specialized in the care of critically ill children and infants.

Q. Doctor, why are you testifying here today?

A. I'm testifying here because I was requested to do so by the U.S. Department of Justice, and based on my research over the last 20 years on neonatal pain and fetal pain.

Q. Doctor, if you could please turn to Defendant's Exhibit 524 in the binder, I believe, to your right.

A. Okay. I have it.

Q. Doctor, what is Defendant's Exhibit 524?

A. Its my curriculum vitae.

Q. Is this an updated and current copy of your CV?

A. The CV was submitted in January of this year. There has been a few changes since then.

Q. What changes have occurred since January?

A. There is a couple of papers that have been published as recently as three days ago, and I have also received an award from the Royal College of Pediatrics and Child Health. This is the highest award that the Royal College gives to a pediatrician outside of Britain.

MS. NORONHA: Your Honor, at this time I offer Defendant's Exhibit 524 in evidence.

MS. CREPPS: No objection.

THE COURT: It's received

BY MS. NORONHA:

Q. Dr. Anand, where did you go to medical school?

A. I went to medical school at Mahatma Gandhi Medical College in Indore, India.

Q. What degree did you receive?

A. I received the degree called M.B.B.S., which stands for bachelor of medicine bachelor of surgery, and is equivalent to the M.D. in the U.S.A.

Q. Did you do an internship after medical school?

A. Yes.

Q. Where did you do that internship?

A. I did that at Maharaja Yeshwantrao Hospital at Indore, and partly at Hindu Rao Hospital in Delhi.

Q. Did you do any post-graduate training after your internship?

A. Yes, after that, I was enrolled in a three-year post-graduate program to specialize in pediatrics.

Q. Where was that?

A. That at Maharaja Yeshwantrao Hospital in Indore.

Q. Did you complete that post-graduate training?

A. No. At the end of one year, I received a Rhodes

Scholarship and went to University of Oxford.

Q. How long were you at Oxford, Doctor?

A. From October 1982, to November, 1985. So about three years.

Q. What degree did you receive from Oxford?

A. I received a D.Phil., which is a Doctor of Philosophy under the Faculty of Clinical Medicine.

Q. Doctor, did you perform any research as part of your work at Oxford?

A. Yes. My thesis was focused on the hormonal and metabolic effects of surgery and anesthesia in the newborn infant. I also participated in some ongoing research with regard to fetal stress responses.

Q. Doctor, what were the results of your research?

A. To summarize, my research showed that newborn infants mount a massive hormonal and metabolic response to surgery, and that this response can be suppressed, to some extent, by giving adequate anesthesia during the operative procedure.

Q. Doctor, did you do any additional training, after you received your D.Phil from Oxford?

A. Yes, I moved to Children's Hospital in Boston, and Harvard Medical School for post-doctoral fellowship where I was in the Department of Anesthesia.

Q. What sort of work did you do in your post-doctoral fellowship at Harvard?

A. At that time, I was working on the stress responses or hormonal metabolic changes in babies having cardiac surgery, and showed that giving deep levels of anesthesia would suppress their hormonal response, but would also improve their mortality, meaning improve their survival and decrease the complications in the post-operative period.

Q. You mentioned you were also at Children's Hospital in Boston. What work did you do at Children's Hospital?

A. During this period, as a post-doctoral fellow, I was in the Department of Anesthesia, and I was an instructor, so I was teaching some of the anesthesia residents and pediatric anesthesia fellows various courses on neonatal anesthesia and analgesia, which is pain relief. I was also doing a course every year on statistics, as it's a applied to clinical medicine and research.

Q. What did you do after your time at Children's Hospital?

A. After this post-doctoral fellowship for two-and-a-half years, I started in a residency training program at Children's Hospital and Harvard Med, and that residency was in pediatrics for three years.

Q. What did you do after your residency at Children's Hospital?

A. I moved to Massachusetts General Hospital in Boston, and did a fellowship training in neonatal and pediatric critical care.

Q. Where did you go after your fellowship training?
A. In July of '93, I moved to Atlanta, and was appointed as Assistant Professor of Pediatrics, Anesthesiology, Psychiatry and Behavioral Sciences at Emory University School of Medicine.
Q. Did you do any research while you were at Emory?
A. Yes, certainly. I continued my studies on the physiology of pain and stress in early life, and at that time, synthesized the evidence that exists for the development of the pain system during fetal and neonatal life.
Q. Did you care for patients while you were at Emory?
A. Yes, I was a pediatric intensivist, so I was taking care of critically ill children who were admitted to the pediatric ICUs at Eggleston Children's Hospital and at Hughes Spaulding Hospital.
Q. Dr. Anand, what is your present position?
A. I'm presently a Professor of Pediatrics, Anesthesiology, Pharmacology and Neurobiology at University of Arkansas for Medical Sciences.
Q. What do you teach in your current position?
A. I teach pediatric critical care, and I teach the neurobiology of pain to medical students, as well as I provide training for pediatric residents and pediatric critical care medicine fellows, through my practice at

Arkansas Children's Hospital.

Q. Doctor, you're also the Director of the Pain Neurobiology Laboratory at Arkansas Children's Hospital?

A. Yes, I am.

Q. What is that?

A. That's basically a laboratory focused on the examination of long-term effects of pain, both true human as well as animal experimental studies, to try and look at the mechanisms for these long-term effects.

Q. What types of research are you presently conducting?

A. There is several different research projects that I'm involved in, broadly divided into clinical research and laboratory or basic science research. The clinical research mainly consists of directing and sort of running a randomized clinical trial, which is currently running in 16 different centers in the U.S., as well as in Europe. And on the laboratory side, there is several projects looking at experimental models of pain during early life.

Q. Doctor, are you presently conducting any research on pain in the human fetus?

A. No, I'm not.

Q. Have you participated in such research in the past?

A. I have participated in some fetal stress studies that were performed in University of Oxford.

Q. Doctor, you also serve on the Board of Directors of

Arkansas Children's Research Institute?
A. Yes, I do.
Q. Do you also care for patients in your present position?
A. Yes, I do. I take care of children who are critically ill and admitted to the pediatric ICU of the University of Arkansas Children's Hospital. I also spend some time on the sedation service, which is a service within the Children's Hospital providing deep sedation and light anesthesia to children in different parts of the hospital where they are undergoing procedures.
Q. What sort of illnesses do you see in the patients that you treat?
A. I see the entire gamut of critical illness in the pediatric age group. So my patients are from tiny newborns to about 18 or 20 years of age. And we see all of the major infections, trauma, various kinds of child abuse, all those things.
Q. Doctor, you mention that you administer sedation to your patients. Are you a board certified anesthesiologist?
A. No, I'm not.
Q. But you have an adjunct appointment in the Department of Anesthesia at the University?
A. Yes, I do, particularly since I have spent -- most of my research has been focused on the effects of anesthesia in the newborn, and so I help with training some of the

anesthesia residents and fellows as well.

Q. Doctor, are you board certified in a medical specialty?

A. Yes, I'm a Diplomate of the American Board of Pediatrics.

Q. Where are you licensed to practice medicine?

A. In the State of Arkansas.

Q. Doctor, approximately how many articles have you published?

A. About 200 articles have been published.

Q. Generally, what do these articles address?

A. Most of these articles are based on the development of the pain system, on the interaction between pain and stress in early life, on the management of pain. There is several chapters in textbooks of anesthesiology or pediatrics dealing with the subject of pain in newborn anesthesia.

Q. How many of your articles have addressed fetal pain?

A. Components of some of these review articles and chapters have looked at the subject of fetal pain, and there have been numerous other articles that have simply focused on fetal pain and fetal consciousness.

Q. Doctor, you're also part of the Maternal Fetal Research Network at the NIH?

A. Yes. There is a Maternal Fetal Research Network funded by the National Institute for Mental Health, and I'm part of that network.

Q. What is that network?
A. It's basically an association of multi-disciplinary researchers from the U.S., from Canada, from the UK, and a couple of other countries. And we all get together every six months to review what are the most important questions regarding the impact of adverse experiences during fetal life, and during neonatal life, and their impact on long-term outcomes.
Q. Doctor, do you perform any peer review of scientific studies and articles?
A. Certainly. I'm currently on the Editorial Board for the Journal of Critical Care Medicined. I was until recently on the Editorial Board of the journal called Biology of the Neonate. But in addition to that, I get journal articles from numerous anesthesiology journals, pediatric journals, pain related journals, neuroscience, behavioral neuroscience journals, which is dealing with the subject matter of pain and stress in the newborn and fetus. I also serve as a reviewer for grant applications submitted to the National Institutes of Health. The -- what was called the MRC in Canada is now called Canadian Institutes of Health Research, as well as similar federal grant agencies in the Netherlands, Germany, Austria, and Switzerland.
Q. Doctor, have you ever testified as an expert witness before?

A. Yes, I have.
Q. In what sort of cases?
A. In the last four years, I have testified in four different cases that are listed in my expert report.
Q. In what areas were you qualified to testify as an expert?
A. I was classified as an expert in pediatric critical care medicine and pediatrics in general.
Q. Doctor, now I would like to turn to the definition of pain. Could you please give us a definition of pain?
A. Pain is defined as an unpleasant sensory and emotional experience in terms of actual or potential tissue damage or described in terms of tissue damage.
Q. Doctor, what is the source of that definition?
A. This was the definition proposed by the Committee on Taxonomy of the International Association For The Study of Pain.
Q. What is the International Association For The Study of Pain?
A. This is an international body, a very large association, more than 7,000 members from many, many different countries consisting of clinicians, researchers, physiotherapists, multidisciplinary people all focused on the -- studying the phenomenon of pain.
Q. Do you consider this organization to be an authoritative

body?
A. Certainly.
Q. Are you a member of the IASP; is that the correct acronym?
A. That is, yes.
Q. And you are a member?
A. Yes, I am a member. I'm a member of the IASP, as well as the local chapter which is the American Pain Society, in the U.S.
Q. How does one become a member of the IASP?
A. Well, we have to file an application form, and we have to be nominated by two other members who are in good standing of the IASP. And that application is reviewed by the committee on membership, and over the course of a year, based on their recommendations, either membership is accepted or rejected.
Q. Doctor, if you would please turn to Defendant's Exhibit 590. I believe it's in the other binder to your left.
A. I have it.
Q. If you would please turn to page two of this document?
A. Um-hm.
Q. About halfway down, it says pain and gives a definition. Is this the definition of pain to which you were referring?
A. This is it, yes.
Q. Doctor, what is a sensory experience?

A. A sensory experience is simply the sensation of pain transmitted through nerves and fibers and registered in the brain.

Q. What is an emotional experience?

A. An emotional experience is simply the affective and motivational component of that experience; whereby the experience is judged as an unpleasant, noxious experience.

Q. The definition also has a note that states that the inability to communicate verbally does not negate the possibility that an individual is experiencing pain and is in need of a appropriate pain relieving treatment. What does that statement mean?

A. Basically the definition of pain is mainly focused on the description of pain given by a person with linguistic ability, and this note was added in May of 2001, to recommend that people who cannot communicate linguistically should still be considered as having pain, so this would include infants and small children. It would include adults with dementia. It would include all of the animal kingdom, and many other groups of patients who may not be able to verbally express their pain.

Q. Did you have any involvement in the addition of this note to the definition?

A. Certainly, yes. All of this started in October of 1996, when I had written an editorial that was published in the

journal called Pain, and this editorial challenged the current, at that time, the current definition of pain and said that it excludes people who are incapable of expressing their painful experience in a verbal manner. If I have a chance to add, we made several representations to the IASP and to the American Pain Society, and as a result of more than five years of work, really, this note was added by the Committee on Taxonomy.

Q. Doctor, the definition also states that pain is always subjective. What does that mean?

A. It means that the experience of pain is very much dependent on the individual that is experiencing that pain, so it means or the experience means different things to different people, and that's what is the subjectivity of pain.

Q. Doctor, do you need tissue damage to feel pain?

A. No, not necessarily. You can have a headache and that is pain without any tissue damage.

Q. Is there a difference between the perception of pain and the reaction to pain?

A. Certainly. In medical terminology, there are two components to the experience of pain. One is the afferent or sensory part of pain, which is simply considering the sensation and its perception within the brain. What follows downstream from that is reaction to pain, which is also

called the efferent part of the pain, set of concept or construct as such.

Q. So if there is no reaction exhibited, does that mean that a person has not experienced pain?

A. No, it does not.

Q. Why not?

A. Well, there is several situations where a person may not be able to react to pain. For example, a person may be given a dose of muscle relaxant and be completely paralyzed, and there will be no reaction to pain, yet the pain is registered and it is perceived. There is several different altered states of consciousness, and has been noted also in particular patients who have had light anesthesia during the operative procedure. And when they were woken up, they remembered the extreme pain that they had experienced during surgery. So the lack of a reaction does not mean that perception has not occurred.

Q. At this time, I would like to turn to fetal pain in particular. Doctor, do you have an opinion as to whether the fetus feels pain?

A. Yes, I do.

Q. What is your opinion?

A. My opinion is that the fetus is sensitive to pain from about 20 weeks of gestation and thereafter.

Q. Is your opinion to a reasonable degree of medical

certainty?

A. Yes, it is.

Q. Doctor, what is the basis for your opinion that the fetus can feel pain as early as 20 weeks gestation?

A. Well, a fetus cannot talk. We can't get any verbal expression. So we have to rely on other forms of evidence that would substantiate the experience that a fetus is undergoing, and those can be listed under the anatomical structures required for pain, the physiological responses to painful stimulation. Their various functional correlates and their various types of behavioral changes that occur, as a result of pain in the fetus.

Q. Doctor, at this time I would like to discuss the anatomical markers for pain you indicated. Before we discuss these as they appear in the fetus, I would like to ask you generally about what the anatomical structures for pain are in the human being. Would you please look at Defendant's Exhibit 641A.

MS. NORONHA: Your Honor, may I approach?

THE COURT: Sure, and you may have continuing leave.

BY MS. NORONHA:

Q. Dr. Anand, is Defendant's Exhibit 641A a true and accurate schematic of the anatomical structures required for a human being to experience pain?

A. A very simplified version.
Q. Will this demonstrative version assist you in your testimony today?
A. Yes, it would.
MS. NORONHA: At this time, I would like to ask Ms. Johannsen to place the demonstrative instrument on the camera.
THE COURT: Do you want to receive it for demonstrative purposes only?
MS. NORONHA: Yes, Your Honor.
THE COURT: Any objection?
MS. CREPPS: No.
THE COURT: It's received for that purpose
BY MS. NORONHA:
Q. Thank you. Dr. Anand, using this exhibit, please briefly describe for the Court the anatomical structures that are required for a human being to experience pain?
A. Certainly. The pain stimulus, or the input into the pain system, occurs from receptors on the skin and mucus membranes, which is that box right on top. And these receptors give rise to a nerve impulse, which is then transmitted through the sensory nerves into the spinal cord. These sensory nerves have connections with cells that are located in the back part or the doral part of the spinal cord. These collection of cells is called the Dorsal Horn.

And there is a complex circuitry in the Dorsal Horn of the spinal cord, whereby using this circuitry, the pain may be either accentuated, or modulated, or completely blocked at the level of the spinal cord. And all of these neuronal Al networks seem to converge onto projection neurons. These are nerve cells that have fibers going up the spinal cord to the centers located in the brain stem and the Thalamus, and that's where pain is registered at the level of the Thalamus. At the brain stem level, basically there is a number of connections helping to regulate the autonomic response to pain. So that if someone is subjected to a painful stimulus, there is a change in heart rate, blood pressure change, skin blood flow changes, things like that. And, finally, the pain is transduced in the Thalamus and then conducted from there to various cortical and subcortical centers, such as a list of subcortical centers, the Amygdala, which is the emotional processing area. It's part of the Limbic system, helps us to process emotions of fear, unpleasantness, things like that. It goes to the hypothalamus, which is the area that regulates stress responses. So that the release of adrenalin or cortisol, distress hormones, is regulated from there. The Thalamus has rich connections with the Hippocampus, which is the area for long-term memory and learning. So that the experience resulting in pain serves as a means to learn from. And

those are the main subcortical areas that are connected with the Thalamus. The Thalamus is also connected with the Insula, which is called the secondary somatosensory cortex, which basically is an area carrying the metarepresentation of the body, like an image of the body, in the Insula, and is focused on homeostatic that are transfused. Homeostatic emotions include things like itching, sensing of temperature, those kinds of things; hunger, thirst. It also connects -- could you move that up a little? There you go. The Thalamus also connects with what's called the primary somatosensory cortex, and that's where some of the interpretation of pain occurs, as well as the formulation of strategies to deal with the pain. Part of the cortex includes the anterior cingulate cortex, which is the area where attention is regulated from. So that if there is a painful stimulus, suddenly our attention goes to that, and that's how the transduction of pain occurs.

Q. Doctor, are all of these structures present and functional in the fetus, by 20 weeks gestation?

A. Yes, they are.

Q. Doctor, at this time, I would like to go through some of these individually and when they appear in the fetus. Would you please look at Defendant's Exhibit 641B. Doctor, is this a true and accurate diagram of the appearance of the anatomical structures required for the fetus to experience

pain?
A. Yes, it has most of the elements, although not complete.
Q. Will this demonstrative assist you in your testimony today?
A. Yes, it will.
MS. NORONHA: Your Honor, I would also like to admit Defendant's 641B for demonstrative purposes only.
MS. CREPPS: No objection.
THE COURT: It's received.
BY MS. NORONHA:
Q. Doctor, you first spoke about skin receptors. Are the skin receptors present and functioning by 20 weeks gestation?
A. They certainly are. Receptors first appear in the area of the skin around the mouth at about seven weeks of gestation. They spread to the rest of the face and actually the rest of the body, except the top and the back part of the head. There are receptors throughout the skin by 14 weeks of gestation. And by 20 weeks, all of the skin surfaces and mucus membranes have sensory receptors associated with pain.
Q. Next you spoke about sensory nerves. Are the sensory nerves present and functioning by 20 weeks gestation?
A. Yes, they are. The sensory serves actually are outgrowths from the developing spinal cord. So these nerves

grow through various segments of the developing fetus into the arms and legs, and they finally reach their target when they approach the skin. And at the time, when the nerves make contact with the fetal skin, that's when the receptors appear. So the fact that there are receptors in the skin is proof of the fact that sensory nerves have grown out to the surface of the body.

Q. Doctor, what is myelination of nerve fibers?

A. Myelination is simply the development of a sheath around the nerve fibers, which increases the conduction velocity of along that nerve fiber of a nerve impulse.

Q. Are sensory fibers myelinated by 20 weeks gestation?

A. Well, if one is simply looking at sensory fibers that transmit painful stimuli, then, no, they are not. The painful stimuli are transmitted by what are called A Delta fibers, which are thinly myelinated fibers. And, C fibers, which are unmyelinated fibers. And the C fibers are responsible for 80% or more of the transduction of noxious stimuli. So very few of the pain fibers actually need to be myelinated.

Q. So these unmyelinated or thinly myelinated fibers do translate pain in the fetus?

A. They certainly do. About 20 years ago, the -- in common medical parlance, it was thought that babies have nerves that are not myelinated, so they don't feel pain. Even if

one looks at what does myelination do; it simply increases the speed of conduction in that nerve fiber. And any loss of speed of conduction in the baby would be associated or would be completely offset by the shorter distance that the nerve impulse has to travel in the fetus or neonate.

Q. You also mentioned the Dorsal Horn of the spinal cord. Is that present and functioning by 20 weeks gestation in the fetus?

A. Yes, it is. The Dorsal Horn starts developing at the end of the first trimester. And by 20 weeks, it has generated the types of cells and the neuro transmitters, which are the chemicals for pain transmission, and the receptors required for transmission of pain.

Q. You also mentioned the brain stem. Is that present and functional by 20 weeks gestation?

A. Yes. The brain stem is actually one of the earliest areas to develop in the central nervous system. And by 20 weeks, it has differentiated and is capable of responding to incoming sensory information.

Q. What about the Thalamus? Is that present and functional by 20 weeks gestation?

A. The Thalamus starts developing at around seven or eight weeks of gestation, and really goes through a huge number of maturational changes with the appearance of various different cell types. There are structures within the

Thalamus that have a role only during fetal life. For example, there are some nuclei in the Thalamus that appear only during fetal life and then disappear. But by 20 weeks, the Thalamus shows a mature structure and is capable of responding to the incoming information.

Q. You mentioned several subcortical structures such as the Amygdala, the Hippocampus, and the Hypothalamus. Are they all functioning by 20 weeks gestation?

A. Yes, all of these structures develop, actually, in parallel. It's not -- the brain doesn't develop in isolation from each other, so these structures are there, the nerve cells are differentiating and forming connections. So by 20 weeks, there are rich interconnections between the Thalamus and the Hippocampus, the Thalamus and the Limbic system, for example, the Amygdala nuclei, and various other subcortical structures.

Q. Finally the cortex and the Insula. Are they present and functioning by 20 weeks gestation?

A. The cortex is the most advanced development from the point of view of evolution. So it is the last to develop. And the cortical neurons start accumulating from about eight or 10 weeks of gestation. And by 20 weeks, most of the neuronal migration has occurred. But up until the cortex receives input from lower centers, it remains a fairly isolated organ. The input from peripheral subcortical

centers first comes into the cortex from nonthalamic fibers by 13 weeks. And by 16 weeks, has fully penetrated the cortical layers. At that time, sort of nerve fibers have been growing from the thalamic nuclei up into the cortex, and they seem to reach there by about 16 or 17 weeks. In the mean time, while the cortex is maturing, there is these fibers are just sitting there. And then suddenly, at about 19 weeks of gestation, these fibers start sprouting in a very short period of time and form six orders of dendrites and fibers connecting with the cells in the cortex. So that whole process has occurred pretty much by the end of the 19th, early 20th week.

Q. So would you say the subcortical and cortical structures are linked together by 20 weeks gestation?

A. Yes, as far as the pain system is concerned, they are.

Q. Doctor, if you look at the demonstrative at 15 weeks gestation, it mentions the subplate zone of the cortex is formed. What is that?

A. Basically, it's right here. The subplate zone is a collection of cells that is underneath the cortex. You see, the cortex contains 20 billion neurons, and these neurons have to migrate and assume their very precise location, not only which part of the cortex they are going to go to, but which layer they are going to settle in. So the subplate neuron, collection of neurons, helps as a signaling station

that sort of tags each neuron passing -- migrating towards the cortex and tells it to go where it's supposed to be. This subplate also has rich interconnections with the Hippocampus, and the Thalamus, and the Limbic system. So when those fibers from these structures start growing towards the cortex, the subplate zone helps to sort out and direct these fibers to where they need to go.

Q. Are there also sensory nerves that don't route through the Thalamus?

A. There are no nerve fibers that don't have connections in the Thalamus. I wouldn't strictly call them sensory nerves. There are fibers that are nonthalamic in that sense, and do have connections with the cortical structures.

Q. What is their function?

A. Currently, not very well characterized. These fibers come from some of the brain stem structures which are below the Thalamus, so lower part of the brain. Some of these fibers come from the Pons and Medulla and mid brain. And some of these fibers also intracortical -- so the front part of the cortex gets connected with the back part of the cortex and things like that. So these are some of the origins of nonthalamic fibers.

Q. Are they present by 20 weeks gestation?

A. Yes, they certainly are.

Q. Doctor, now I would like to turn to some of the

functional indicators for pain that you mentioned. What do you mean by functional indicators?

A. Functional indicators are simply the mechanisms that suggest all of these structures and networks are actually functional. They are actually doing something. They are not just there as an anatomical entity.

Q. Can you tell us some of these functional indicators for pain in the fetus?

A. Certainly. To start out, from the receptors in the skin, when these receptors first appear, they are completely mature. They have the same firing properties, they secrete the same chemicals. They can generate the same frequency of electrical impulses that are carried along the nerve fiber. Other functional indicators of the actual nerve fibers are the speed of conduction. Then at the level of the spinal cord, there is -- you can map vertical areas of the skin onto a single cell. And what has been noted in the fetus and neonate, is that each cell at the level of the Dorsal Horn has a very wide area of skin that they are covering, and there is an overlap of the field of adjacent neurons, so that nothing is left to chance that the sensory information will come through to the Dorsal Horn of the spinal cord.

Q. Does the fetus have a sensitivity to touch by 20 weeks gestation?

A. Certainly, it does.

Q. In what way?
A. Fetuses will respond to tactile or touch stimuli from very early in gestation. For example, experiments done as late -- as long ago as the 40s and 50s, show that in early gestation, if you touch the face of the fetus, the fetus turns its face away from that stimulus. But later on in gestation, where touch occurs in the face, the fetus turns towards the stimulus which is the maturation of the rooting reflex, which the baby will need in order to breast feed after birth.
Q. Has the fetus exhibited a sensitivity to sound by 20 weeks gestation?
A. Yes, certainly. There is numerous experiments where fetuses have shown specific responses to acoustic or sound based stimulation. I remember the incident of a colleague of mine who was pregnant at about 22 weeks of gestation. She's a pediatrician as well. And her husband was putting up a swing and happened to drop accidentally drop one of the pipes that was part of the swing set and this made a loud clanging noise. And she reported that this fetus had a startled response. You see when a newborn baby is born, in response to a loud sound, they have what's called a Moro reflex which is a throwing out of the arms and legs. And she reported even at 22 weeks, there was a very specific Moro reflex that she could feel that the fetus had

exhibited. There are numerous experiments that have substantiated that. There were experiments where fetuses were exposed to a car horn, and when the stimulus was repeated on successive days, they were able to habituate, meaning they had learned, okay, there is this loud sound. I'm not going to get, you know, all flustered about it. I'm just interpreting that data which was showing increases in heart rate and motor activity, which the fetus was able to learn from those acoustic stimuli.

Q. What about sensitivity to light or taste at 20 weeks gestation?

A. There is limited data on sensitivity to light, but there are experiments that have been done to show that fetuses will respond to bright lights that are focused on the mother's abdomen. There are other experiments that have looked at the chemosensory changes, so that these are the receptors for taste and smell. For example, if you inject a small amount of saccharin or a sweet tasting substance into the amniotic fluid, then the fetus starts swallowing the amniotic fluid at a much greater rate. If instead you inject a particular type of oil that has a bitter taste, then the fetus stops all swallowing activity. So that suggests there are chemosensory cues available. There was also an experiment done where pregnant women were given capsules of cumin. Cumin is one of the herbs. These were

tasteless and odorless capsules. They were asked to swallow one capsule with each meal. And when their babies were born, they had a very specific orienting response to the smell of cumin, as opposed to a citric smell or something else. So it shows that there is -- not only the sensations are present, but there is some form of memory and learning based on these sensations.

Q. Doctor, now I would like to turn to the physiological indicators for pain you mentioned. What does physiological indicators mean?

A. These are changes in the physiology of the infant, as a result of being exposed to painful stimuli.

Q. What are the physiological responses to pain that the fetus has exhibited?

A. The fetal research in this area has mainly looked at changes in heart rate or changes in blood flow, as a response to pain. These physiological indicators also include the secretion of various stress hormones, in response to painful stimuli.

Q. When have these responses appeared in the fetus?

A. The earliest responses have been noted from about 16 weeks of gestation, and I'm talking specifically about the hormonal responses. These are hormones like adrenalin that are released during stress. Adrenalin, cortisol type hormones. And this has been documented as early as 16 weeks

gestation. Changes in heart rate have also been documented between 16 and 18 weeks of gestation in response to painful stimuli.

Q. Could you briefly describe the studies that have exhibited the stress hormone response in the fetus?

A. Certainly. There is most of these studies were performed at -- I believe, Imperial College, London, but there have been other groups that have reported on this area. And they have noted, following painful stimulation, there is the release of cortisol or beta endorphin. In fact, six-fold increase in beta endorphin will occur. Two or three-fold increases in cortisol and other stress hormones will occur. Two-fold in the catecholamine, adrenalin or noradrenaline, following painful stimuli. The stimuli that were examined in these experiments were mainly a needle puncture of the fetal body, in order to give a blood transfusion through the intrahepatic vein or a vein that is located within the liver.

Q. Could you briefly describe the studies performed on the circulatory responses to pain?

A. Certainly. There has been numerous articles and multiple researchers have noted that when a fetus is subjected to a painful stimulus, there is a rapid change in heart rate. And people have even looked at blood flow to the brain using Doppler, you know, the colored Doppler

probes. And they have found that when a fetus is subjected to a painful stimulus, there is a decrease in the pulsatility index, which means the amount of blood vessel that distends during the pulse. And this is associated with an opening up of the circulation to the brain, so that the brain gets more circulation, as a result of the painful stimulus. What they have also noted is that this occurs very rapidly, within 70 seconds of the painful stimulus. And some of the hormonal responses have also noted that the magnitude of the response is related to the duration of painful stimulation, as well as the degree of painful. So it's -- these physiological responses have been very clearly studied in the fetus.

Q. Doctor, aren't there other factors, besides pain, that did cause a change in the stress hormones and a change in the circulatory responses?

A. Certainly, there are. These are nonspecific responses but they are associated in temporal sequence. They follow just after a painful stimulus, and that's why we equate them with a response to pain.

Q. Have these studies also used anesthesia?

A. Yes. There was a paper which was actually listed in my expert report published in the journal called Anesthesiology in 2001, by Norman Fisk and colleagues. And what they found was in baby -- in fetuses that were requiring multiple blood

transfusions, they were randomly assigned to receiving the blood transfusion through the intrahepatic vein with or without a anesthetic drug. The drug they used was Fentanyl. And this was given in a dose of 12.5 micrograms per kilogram of the fetus's body weight, and it was directed directly into the bloodstream of the fetus. So they found that using the same fetus as its own control, if the blood transfusion was done without the anesthetic, there was a robust and massive response. But if the anesthetic was given and then the blood transfusion occurred, then this response was completely eliminated or oblated.

Q. Doctor, are these physiological studies direct evidence that the fetus experiences pain?

A. Like I said before, the fetus cannot talk, so this is the best evidence that we can get that the fetus is responding to these painful stimuli.

Q. Doctor, what is a scientific inference?

A. A scientific inference is simply what I said, using these different sources of information, given the current state of our technology that allows us to study the human fetus, to infer from these data, to infer from these responses and functional changes as to the fact that fetuses are capable of pain perception.

Q. Is inference a widely accepted tool in a scientific community to draw conclusions?

A. Certainly, it is very much integral to the scientific method.

Q. Is an inference the same thing as an extrapolation?

A. No, it's not. The inference is within a certain experimental paradigm, you infer from the pattern of the data as to what this data is meaning. Extrapolation is where you take data from a different experimental paradigm and apply it to say that it applies to a different situation or different set of experiments.

Q. Doctor, is an extrapolation a widely accepted tool for drawing conclusions in the scientific community?

A. Yes, it is. Less strong evidence as inference but, nevertheless, it is a tool that we use regularly.

Q. Is your opinion, in this case, based on extrapolation?

A. To some extent, it is. Because we know the pattern of physiological responses to pain from children or adults who have been subjected to painful stimulation, and who have reported that they feel a certain intensity of pain. And if those same stimuli result in similar types of responses in the fetus, then we can extrapolate that those stimuli are causing pain to the fetus.

Q. Doctor, could you explain how scientific inference has been used in this case, for your opinion?

A. I have based my opinion on multiple lines of evidence, taking from the anatomical structures and their connectivity

and their functionality and inferring that the pain system is developed. And taking from the physiological responses and inferring that these responses follow from the integration of painful information following a painful stimulus in the fetus.

Q. Doctor, can you extrapolate your findings on fetal pain to fetuses with anomalies?

A. It depends on where the anomalies are. If a fetus has anomalies that involve the brain, or the spinal cord, or the sensory nerves, then it would be difficult to extrapolate findings from a normal fetus to that of a fetus with an abnormal nervous system. Fetuses also with certain chromosomal abnormalities like Trisomy 13, or Trisomy 18, have very abnormal structures of the central nervous system. So it would be difficult to extrapolate to those fetuses.

Q. Can you conclude, with a reasonable degree of medical certainty, these fetuses with certain neurological anomalies cannot feel pain when subject to a painful stimulus?

A. That's a very difficult question, really. The evidence against pain perception is flimsy at best. And so I think one has to weigh the evidence for and against, and come up with a conclusion. Certainly, one can study these abnormal fetuses with abnormal central nervous system anomalies. There is also some well documented cases where an anacephalic fetus was delivered, and based on the parents

request, was cared for in an ICU. And that fetus or newborn was noted to be responding to the painful stimuli associated with its care.

Q. Doctor, now I would like to turn back to the definition of pain and apply it to the fetus. Does the fetus at 20 weeks gestation have a sensory experience of pain?

A. Yes, it does. We can judge that from the sensation of pain. We can judge that from the somatosensory evoked potentials which are changes in the electrical activity of the brain, following a painful stimulus. So it does respond to a painful stimulus, the sensory component of pain.

Q. Does the fetus at 20 weeks gestation have an emotional experience of pain?

A. That is far more difficult to define. We would have to infer that from particular types of fetal behavior. For example, fetuses who are subjected to intrauterine procedures will have a facial expression suggestive that they are of pain and that has been characterized. There are very highly specific -- eight different movements in the face that occur, across the different age groups and across different species as well, associated with pain. And some of those facial expressions have been noted in fetuses who were subjected to painful stimuli. There is also data suggesting that even though fetuses are in utero, when they are exposed to a painful stimulus like the intrahepatic

needle puncture going through their abdominal wall into their abdominal cavity, piercing through the cavity of the liver, etc.; they have what seems like crying activity. So they have the deep inspiration and expiration noted from ultrasound studies of the diaphragm. So from these indirect pieces of evidence, one can infer that there is an emotional experience of pain.

Q. Does the fetus also possess certain anatomical structures that process emotional experience at 20 weeks gestation?

A. Yes. Like I mentioned before, the Amygdala, the Limbic system, the Hippocampus, all of these structures are developed to different degrees of maturity and are functional in the fetus at 20 weeks.

Q. Doctor, is the fetus's experience of pain at 20 weeks subjective?

A. Very difficult to answer. I really can't -- one can assume that it is subjective, but until the fetus is able to report to us, we don't know what it is experiencing.

Q. Would you base your conclusion on also the surrogate markers you have described?

A. Yes, certainly. I think the pattern of responses is typical of the responses to pain noted in older children or adults who are able to report that they have pain.

Q. Doctor, would you say that there is a medical consensus

that the fetus feels pain at 20 weeks gestation?
A. It depends on who you're talking to. For the medical community that is familiar with this area of research and has read through this series of research papers on fetal responses, beyond a shadow of doubt, there is -- the vast majority do believe that the fetus has the capability of pain perception. For people who are unaware of this area of research, there is controversy. They are certainly not informed as well.
Q. Dr. Anand, do you have an opinion as to whether the fetus can feel pain more intensely at certain periods of gestation?
A. What we have noted from studies in premature infants is that they have a much lower threshold for pain, meaning they are more sensitive to pain than the full term infant. In fact, some types of pain are three times greater sensitivity in the pre-term baby as compared to the full term neonate. And the full term neonate is more sensitive to pain than the two-year-old child, and the two-year-old child is more sensitive to pain than the six years old or 8eight , 10-year-old child. So there is a much greater sensitivity to pain earlier in development and there are clear developmental reasons for that.
Q. Are there any anatomical structures in the fetus that would explain this phenomenon?

A. Yes. Basically, when the nervous system is developing, what we find is that there is an earlier and robust development of the excitatory mechanisms within the nervous systems. So that the nerve fibers that are stimulated by pain, the chemicals that are released by painful stimuli, etc., all these develop very early in gestation. And the reason is that these sensory inputs are required for the normal development of the brain and the subcortical structures associated. So, on the other hand, the inhibitory mechanisms are much more delayed in their development. They first appear at about 32 to 34 weeks of gestation and, you know, may not even develop until much after full term birth, like six to eight weeks after birth.

Q. What are the inhibitory mechanisms?

A. Well, these are descending inhibitory fibers that have their origin in some of the thalamic nuclei, the mid line thalamic nuclei or some of the centers in the brain stem. And these fibers grow down and establish connections with the cells in the Dorsal Horn. And their primary function is to block the incoming painful stimuli or to modulate. So these are descending inhibitory fibers. It's very interesting that when we practice in the neonatal ICU, and we have, say, a premature infant who is 33 or 34 weeks, they have a higher threshold to pain in their hands and a lower threshold to pain in their legs simply resulting from the

fact that the descending inhibitory fibers have made connections with the upper part of the spinal cord, and have still not -- sort of are still growing down to the lower part of the spinal cord. So that's a clinical, very obvious clinical measure of this descending inhibitory system.

Q. So what period of gestation would you say the fetus is most sensitive to pain?

A. I would say between 20 and 30 weeks of gestation is the greatest sensitivity to pain. This is based on multiple lines of evidence. Not just the lack of descending inhibitory fibers, but also the number of receptors in the skin, the level of expression of various chemicals, neuro transmitters, receptors, and things like that.

Q. Is there medical consensus that the fetus feels pain to a greater sensitivity at that gestational period?

A. Yes, there is.

Q. Doctor, do you have an opinion as to whether the fetus is conscious of pain?

A. I believe that the fetus is conscious. And consciousness, as such, is very difficult to measure simply. So there are various aspects of fetal behavior which suggest that the fetus is conscious.

Q. At what gestational age would you say that the fetus becomes conscious of pain?

A. I believe there is intense controversy in this area. I

must sort of preface my opinion. But I do believe that the fetus is conscious around the time that the pain system is completely developed. So about 20 weeks of gestation.

Q. How can we tell that? Are there scientific indicators that lead you to that conclusion?

A. Let me explain with an example. Consciousness is very difficult to measure because consciousness is beyond thought. So before the expression occurs, first a thought or an emotion must occur. So consciousness is extremely difficult to measure as such. It's like how do you measure silence? It cannot be measured. It can be experienced. Similarly, consciousness can be experienced. It cannot be measured. However, when you look at the fetus and examine all of the modalities of responses to sound, and touch, and light and taste, etc., the responses to pain -- all of these features suggest that the fetus is responding consciously to the stimuli from its environment. But it has consciousness separate from that of the mother is, again, substantiated by -- for example, the fetus having a startled response. The mother didn't have the start would responses. It was the fetus that startled in response to the loud noise. So all of these are -- all of these behaviors are suggestive of fetal consciousness. You can also do fetal EEG, which is, you know, electrical brain wave activity in the fetus in different states of sleeping and wakefulness. Intrauterine

states of -- so that, again, is suggestive of consciousness. All the experiments -- and a huge number of papers have been published in this area showing memory and learning off the intrauterine experiences. And, again, that memory and learning cannot occur without consciousness. So that is, as well, evidence in favor of consciousness occurring in utero. I can also say from my clinical practice that we have cared for premature babies as early as 22 weeks of gestation and those premature babies, right at the time of birth, are conscious. So there is no way consciousness could have been injected into the baby. It was present in utero, and I believe, is present from about 20 weeks of gestation. So I take all of this and sort of put this evidence on the one hand, and try to search for evidence which suggests the fetus is unconscious. And there is very little in comparison. So I do believe the fetus is conscious, but because it can't be measured, there is -- there are extreme positions that people have taken. There is a huge controversy about this.

Q. Could you describe some of these extreme positions?

A. We can argue about it the entire day. I'll just give an example.

THE COURT: No, we can't.

THE WITNESS: There was a British Commission into fetal sentient that was set up by the British Parliament in

'96, I believe. And they concluded that a fetus is conscious or sentient by six weeks of gestation. On the other hand, the Royal College of Obstetrics and Gynecology put a working party together. And they concluded that a fetus is not sentient until 26 weeks of gestation. There are many of my pediatric colleagues will believe that consciousness appears at conception, whereas other pediatricians say consciousness appears only in the full term baby when they are born. So there are extreme positions that can be -- having looked at the area of fetal responses very carefully, I feel the earliest manifestations of fetal consciousness are probably around 20 weeks

BY MS. NORONHA:

Q. Doctor, do you believe it's possible for the fetus to feel pain before 20 weeks gestation?

A. It is possible that the fetus may have some perception of pain prior to 20 weeks. That is particularly based on a very radical and new approach to the phenomenon of pain. This was as recently as June of last year. A very famous scientist, by the name of Bud Craig, published a new view of pain as a homeostatic emotion. And he postulated that there are numerous phenomena associated with pain that cannot be explained by the fact that pain is a sensation, which is similar to the touch sensation and things like that. And he said that the cortical representation of pain appears to be

a myth that is generated from incomplete data. Because in adult patients who have a stroke or who have a tumor or whatever, and their entire somatosensory cortex is removed, they are still capable of feeling pain and responding to pain, and characterizing the intensity of pain and, you know, whether it's throbbing or pricking or burning type of pain, etc. On the other hand, if you place electrodes in the somatosensory cortex and stimulate that area, it does not lead to the expression of pain in conscious adult patients. So the fact that pain is a cortical sensation has been challenged, and the new view of pain suggests that it is more of a thalamic perception that occurs. Because you can inject, say, local anesthetic into a very specific area of the Thalamus and block all incoming painful stimuli. You can put electrodes in that area, and even with a very small current to stimulate the Thalamus will result in ex suppressions of severe pain by the subject. So this new view of pain suggests pain occurs at the thalamic level. And the Thalamus does develop much earlier than the sensory cortex. So I believe there is the possibility that pain may occur as early as 16 weeks of gestation.

Q. Have there been studies to test Dr. Craig's theory?

A. What he has done is synthesized a wide variety of multiple lines of evidence that are suggestive of this new view of pain. And he has, on the basis of this new

construct, been able to explain other previously inexplicable data related to phantom limb pain or other types of pain. If you are asking are there studies directly testing this new construct of pain in early life, no. Those studies have not been done.

Q. So is this theory widely accepted in the medical community currently?

A. There was an uproar when this paper was first published in June of last year, but over the past several months, more and more people are realizing that this is perhaps a better representation of pain processing within the central nervous system than the models that we had previously.

Q. Doctor, now I would like to turn to the partial-birth abortion procedure. What is your understanding of the partial birth abortion procedure?

A. Very rudimentary, I must say.

Q. Could you describe your understanding of the procedure?

A. Yes. I'm not an obstetrician, so all I can learn about this procedure is from various reports and websites and things like that. I think the procedure consists of the patient receiving some medications to soften the cervix. At the time of the procedure, the cervix is dilated. And using some kind of instrument, the surgeon reaches inside to grasp the lower extremity of the fetus, delivers the fetus, the lower half of the body of the fetus up until the time where

the neck is exposed, and then there is an incision made, I believe, at the back of the neck, and a trocar is inserted through the skin and the neck muscles into the occipital bone piercing into the skull. And when suction is applied, the brain is sucked out and then the fetus is delivered. So that's my understanding of the partial birth abortion procedure.

Q. Doctor, you mentioned you not an obstetrician. Have you ever performed this procedure or any abortion procedures?

A. No, I have not. I have trained in obstetrics during my medical school and internship but not -- that was more than 20 years ago.

Q. You support a woman's right to an abortion?

A. I certainly do. I feel women have an inalienable right to having an abortion, with the caveat that it should not result in pain to the fetus.

Q. So, Doctor, do you have an opinion as to whether the partial-birth abortion procedure causes pain to the fetus?

A. If the fetus is beyond 20 weeks of gestation, I would assume that there will be pain caused to the fetus. And I believe it will be severe and excruciating pain caused to the fetus.

Q. What do you mean by severe and excruciating pain?

A. You see, the threshold for pain is very low. The fetus is very likely extremely sensitive to pain during the

gestation of 20 to 30 weeks. And so the procedures associated with the partial-birth abortion that I just described would be likely to cause severe pain, right from the time the fetus is being manipulated and being handled to the time that the incision is made, and the brain or the contents, intracranial contents, are sucked out.

Q. Doctor, if an instrument is not used to remove the fetus but a physician's hand would be used, would that also be painful to the fetus?

A. I don't understand how using the surgeon's hand -- how a puncture could be made in the occipital area.

Q. I think you misunderstood. Just bringing the fetus out from the uterine cavity with the hand as opposed to using the forceps, would that manipulation of the fetus be painful?

A. Yes, it would, unless the cervix is completely dilated and, you know, it would be painful to the fetus.

Q. What about instead of a puncture and suction? There was solely a puncture and then removal of the fetal body. Would that also be painful?

A. Yeah. Simply the tissue injury that is caused will produce pain.

Q. Say, for example, there is no puncture and suction and there is just a crushing of the fetal head with forceps. Would that also be painful to the fetus?

A. I'm sorry. It is gruesome, but, yes, it would be extremely painful.

Q. Doctor, do you have an opinion as to whether an abortion procedure in which the fetal body is dismembered, as it is being removed from the uterus, would also cause pain to the fetus?

A. If the fetus is beyond 20 weeks of gestation, then certainly the dismembering will cause severe pain to the fetus.

Q. Do you have an opinion as to whether cutting the umbilical cord will cause pain to the fetus, while it is in utero?

A. The umbilical cord is not innervated. Just the umbilical arteries and the umbilical vein have nerve fibers that may have some sensory component. So I believe cutting the umbilical cord would not be painful or, at most, would result in very mild pain.

Q. Do you have an opinion as to whether an injection of Digoxin or potassium chloride into the fetal body will cause pain to the fetus?

A. Yes, certainly, it will.

Q. Do you have an opinion as to whether an induction by administration of Prostaglandin's will cause pain to the fetus?

A. The Prostaglandins, I assume, would be leading to the

onset of labor, and, thereby, result in the delivery of the fetus. Prostaglandins themselves are a class of chemicals that are released in response to pain. So if you -- for example, if you have a cut on your skin and in that area of tissue where a cut occurs, if you do sensitive assays, you will find that Prostaglandins have been released in that area, more so with inflammatory pain. But with the tissue injury, Prostaglandins are released. So it's possible inserting Prostaglandins into the amniotic fluid, I believe, you're saying that it could possibly cause pain. I'm not certain about that.

Q. Do you have an opinion as to whether vaginal childbirth at full term will cause pain to the fetus?

A. You bring up an important question. The normal physiology of parturition, or the process of birth, results in a number of hormonal changes which protect the fetus from the sensory components of the birth process. For example, if you take the umbilical blood from a freshly delivered newborn infant, the umbilical cord blood has a very high level of endorphins. In fact, the beta endorphin levels are about 1,000-fold higher than the highest levels ever recorded in the adult human bloodstream. So the release of beta endorphin or other dynorphins, metenkephalin, leuenkephalin, other chemicals that block the painful stimuli would protect the newborn infant at full term.

These mechanisms don't develop until fairly late in gestation. They start developing at about 32 to 34 weeks of gestation, and by full term, they are fairly well developed.

Q. Do you have an opinion as to whether a cesarean section will cause pain to the fetus?

A. I believe a cesarean section where there is enough of a uterine incision to deliver the baby will not cause pain to the full term infant.

MS. NORONHA: Your Honor, I have one more section that should take about five minutes. We can break now or I would be happy to continue.

THE COURT: Why don't we complete the doctor's examination, if it's going to just take five minutes or so, and then we can take our break.

MS. NORONHA: Okay.

BY MS. NORONHA:

Q. Doctor, now I would like to turn to the question of anesthesia administered to the mother. Could you generally describe how anesthesia administered to the mother would reach the fetus?

A. Well, it depends on what kind of anesthesia is being given. But simply injecting an anesthetic drug to the mother, the anesthetic would have to avoid being metabolized by the liver, would circulate in the bloodstream of the mother, then would have to cross the placental barrier,

because the mother's blood and the baby's blood don't mix. They are separated by the placental membrane. So the anesthetic has to get across that placental barrier, then be present in sufficient concentrations in the baby's or the fetus's blood, and then have to cross the blood/brain barrier within the fetus, in order to act on the cells producing anesthesia in the fetus.

Q. Dr. Anand, do you have an opinion as to whether anesthesia administered to the mother prevents the fetus from feeling pain?

A. I do. I feel that the fetus has minimal effects of the anesthesia given to the mother, and it just depends on the types of anesthesia that is being used; the mode of administration, etc.

Q. What are the various types of anesthesia that can be used?

A. The type of anesthesias, at least as far as I know, commonly used is either a pudendal nerve block, which is a block of the nerves that supply the cervix or an epidural anesthetic blocking the nerves from the lower part of the spinal cord. So those are local or regional anesthetic techniques. And they certainly will not have any effect in protecting the fetus from feeling pain. Systemic anesthetics can be used either injected intravenously or by inhalation -- the gas anesthetics. And although these will

get across the placenta, but will not achieve sufficient concentrations in the fetal circulation, in order to block the painful stimulation.

Q. So in order to block the painful stimulation in the fetus, how much anesthesia should be given to the mother?

A. It's my opinion that it would require toxic amounts of anesthesia in the -- given to the mother in order to achieve a significant state of fetal anesthesia. And I can do a simple calculation, you know, for some of the commonly used systemic anesthetic drugs to illustrate that.

Q. Okay. Great. Would you like to use the chalk board? I believe you can write on it.

A. Okay. So for example, there is a woman of say body weight of 60 kilograms. Okay. Could you erase that?

Q. Could you clear that, please?

A. The average dose of an aesthetic that I would give to this -- say I'm using a drug called Fentanyl. The average dose which would be therapeutic for the mother would be, say, about 200 micrograms of Fentanyl. This would lead to a certain concentration within the mother, so that would be sort of -- that would be about say three micrograms -- actually, this 200 micrograms would be distributed in the mother's blood volume of about five liters. So you divide that by sort of 5,000, and you have an average set of concentration of about .4 micrograms per CCs. Let me see if

that's correct. 04. I was off by a factor of 10. So this would be the concentration in the maternal circulation. Now, Fentanyl is a drug that is rapidly metabolized by the liver, and it has a hepatic extraction ratio of one, meaning that every molecule of Fentanyl that goes through the liver gets metabolized. So by the time the injection is over, these concentrations, you know, will have dropped to almost half of what was, you know, from a simple calculation. Now, there is studies showing that whatever the concentration in the mother, only 30% of that concentration is achieved in the fetus. So the concentration in the fetus would be. 006. And, again, I'm giving the benefit of the doubt. Because these studies are done in the full term fetus, and at full term, the placental barrier is much thinner. There is much more efficient transmission of drugs through the placenta. So let's say -- but in mid gestation, say, in the second trimester or the first trimester, placenta barrier is much thicker, but let's say that it's as efficient in transferring. So that's the concentration available in the fetal circulation. This will be metabolized to some extent by the fetal liver. But about half of that would get across the blood/brain barrier to produce its effect of anesthetic or analgesia in the fetus. On the other hand, Norman Fisk and colleagues, in their studies -- can you wipe that off -- have used a dose of 12.5 micrograms per kilogram of the

fetal weight, which leads to a much higher concentration, about, say, if we take, you know, the entire range, it would be anywhere from three to 50-fold higher concentrations that would reach the brain cells to produce the anesthetic effect. So if we are to guarantee that the fetus has adequate anesthesia, we have to give three to 50 times the normal therapeutic dose of Fentanyl, in order to produce fetal anesthesia. We give three to 50 times the dose used for the mother, in order to produce fetal anesthesia. So I think I can go through this calculation for different drugs, Propofol or Midazolam, etc., but I believe these drugs would cause sufficient toxicity in the mother in order to guarantee that there is a state of fetal anesthesia.

Q. Doctor, are you aware of any anesthetic drug, that when safely administered to the mother, would provide complete pain relief to the fetus?

A. No, I don't.

MS. NORONHA: Your Honor, may I have a moment?

THE COURT: Sure.

MS. NORONHA: Thank you, Your Honor. I have no further questions at this time.

THE COURT: All right. Shall we take our break now?

MS. CREPPS: Yes. Thank you.

THE COURT: We'll stand in recess for 15 minutes.

Doctor, you may step down, sir.

(Recess from 10:39 to 11:00 a.m.; all parties present).

THE COURT: Doctor, if you would come forward, please.

(Dr. Anand resumed the witness stand).

THE COURT: Counsel, you may inquire.

CROSS-EXAMINATION

BY MS. CREPPS:

Q. Thank you. Good morning.

A. Good morning.

Q. I would like to just clarify a couple of things in terms of the work that you've done. Let me start, you are the -- the doctoral thesis that you described, that involved premature infants as early as 25 weeks but not fetuses; is that correct?

A. That is correct.

THE COURT: Ms. Crepps, could I trouble you to pull the microphone about even with your mouth.

MS. CREPPS: Is that better?

THE COURT: Slightly. You're speaking at sort of an angle, so to the degree to which you can speak directly into the microphone, we'll be able to hear you a little better. Thank you.

MS. CREPPS: Remind me if I fade out again, Your Honor. I'm bad for that.

BY MS. CREPPS:

Q. And the research that you have personally conducted has focused on the effects of drugs on newborn infants; is that right?

A. That is correct.

Q. And you had only limited participation in the studies that you described that were happening while you were in Oxford on fetuses; is that right?

A. That is correct.

Q. And you haven't conducted any studies measuring the effects of anesthesia on fetuses, have you?

A. No, I have not.

Q. And all of the articles that you're currently working on are looking at pain in newborns and neonates; is that correct?

A. Yes, premature and full term neonates.

Q. And so to the extent that you would be relying on that work to support your opinions in this case, that would be extrapolation from your research on neonates including premature infants?

A. Yes. It would extrapolate to fetuses with the same neurological maturity of the premature infants that I have done the research on.

Q. And you've never participated or conducted any studies on any methods of abortion; is that correct?

A. That is correct.
Q. And you would estimate that 99% of your time is spent in work with the Department of Pediatrics; is that right, and then 1% of your time in the remaining departments that you listed?
A. Well, I do -- that is correct. Although, I would like to explain that.
Q. That's fine.
A. I do have an adjunct appointment in the Department of Anesthesia, and help with the teaching and research that is carried out in anesthesia, but my salary comes entirely from the Department of Pediatrics. However, these are two departments within the same medical school, and we have a considerable degree of overlap. In so much the work that I do for the Department of Pediatrics also contributes to the functions within the Department of Anesthesia, and vice versa.
Q. Thank you, Doctor. In the expert report that you submitted in this case, you cited 27 articles that you reviewed and relied on in forming your opinions; is that correct?
A. Yes, that is correct.
Q. Let me clarify that. There were articles and some were chapters and some were editorials that had appeared in peer reviewed journals; is that more accurate?

A. Yes, and there was also one document from the website for the International Association for Study of Pain.
Q. And these are all reliable sources that you looked at in forming your opinions?
A. Certainly, yes.
Q. Doctor, you do not believe that fetuses perceive pain prior to 20 weeks; is that correct?
A. There is a much greater likelihood that they would perceive pain at or after 20 weeks. Much lower likelihood that they would perceive pain before 20 weeks.
Q. You do not hold the view, to a reasonable degree medical certainty, that fetuses prior to 20 weeks experience pain; do you?
A. At this point of time, I agree with you, yes. Although, with accumulating evidence, particularly considering this new constructive pain that has been advanced, that may change.
Q. The new construct of pain that you were just referring to is based on the article by Dr. Craig; is that right?
A. That is correct.
Q. You would describe that as a novel view of pain; isn't that correct?
A. Yes, it is.
Q. And that article only came out in 2003; is that right?
A. In June of 2003.

Q. And I believe you've testified that none of the evidence that Dr. Craig relied on in setting out this hypothesis was based on studies looking at fetuses; is that correct?
A. Yes, that is correct.
Q. Doctor, it's not possible to directly measure whether a fetus experiences pain; is that right?
A. Yes, that is correct.
Q. And, therefore, you look at surrogate markers, and from that, you infer that the fetus is experiencing pain?
A. Absolutely right.
Q. Now, some of the surrogate markers that you mentioned are hormonal or hemodynamic changes in response to noxious stimuli; is that correct?
A. That is correct. Yeah.
Q. Would you agree, Doctor, that none of these surrogate markers are yet suitable for assessing pain in fetuses?
A. They are biological responses to painful stimulation, and in that sense, they can be used for assessing pain in the fetus. The magnitude of the response is related to the duration or the intensity of the painful stimulation. So in that sense, these are markers that can be used for assessment of fetal pain.
Q. Doctor, one of the sources that you cited in your report is an article by Vonhatalo entitled Fetal Pain; is that correct?

A. That's correct.
Q. I would like to have you take that and have a look at that and that's going to be Defendant's Exhibit 633. I don't know which of those four notebooks it's in. It should be in one of those. I can help you.
THE COURT: Counsel, why don't you help the doctor find it?
THE WITNESS: It's here.
BY MS. CREPPS:
Q. Have you located the right notebook?
A. Yes. 633, you said?
Q. Yes.
A. Yes, I have it in front of me.
Q. This was one of the articles you cited in your expert report; is that correct?
A. Yes, it is.
Q. This was published in the year 2000; is that right?
A. In the journal of Brain and Development, yes.
Q. Doctor, I would like to have you look at the first page of that article; the last paragraph on the first page and going over to the second page.
A. Yes.
Q. And if you would just take a moment to review that. And here -- I'm sorry. Let me know when you're finished.
A. Yes.

Q. And here the authors list some of the surrogate markers that you've discussed today as for clinically assessing fetal pain; is that right?

A. Yes.

Q. And the authors state as to those markers, they are still being developed. None is yet suitable for assessing pain in fetuses. That's the conclusion of these authors; is that right?

A. That is correct.

Q. Now, you have indicated pain involves both a sensory perception and an emotional experience; is that right?

A. Yes, it is.

Q. That comes from the IASP definition you discussed on your direct examination?

A. Yes.

Q. Is it your opinion, Doctor, there is a consensus in the medical community that the physical structures are in place at 20 weeks that allow a fetus to experience pain?

A. In the medical community that is familiar with this area of research the anatomical development, there is consensus regarding the anatomical development at 20 weeks of gestation.

Q. But there are some in the medical community, in the relevant medical community, who believe that fetuses do not have the mechanisms in place to transmit painful stimuli and

perceive pain at 20 weeks; is that correct?
A. There are a few, yes.
Q. In fact, some of the articles you have cited in your expert report conclude that the fetus does not have those necessary mechanisms to experience pain until after 20 weeks; is that right?
A. That is correct. I would like to explain that. In preparing this expert report, I felt the need for due diligence in terms of citing both the evidence in favor of and against the opinion that I was reaching. And that's why this paper on Vonhatalo, and other papers published by people who are contradict, would contradict my opinion. Those were included and listed in my expert report.
Q. So, for example, the article that you were just discussing that we just had an excerpt out of, that author concludes that while the fetal nervous system is capable of mounting protective responses to noxious stimuli, that cortical processes and the first sensory experiences only become possible when the thalamocortical connections grow during the 26th week of gestation; isn't that correct?
A. Yes, that is their opinion.
Q. Again, I would like to have you now look at Exhibit 625, which might be in that same notebook or you might have to get a different notebook.
A. Right here. Yes.

Q. Again, this is -- I'm sorry, Doctor. Have you located that article?

A. Yes, I have.

Q. This is an article by Smith, et al., entitled Pain and Stress in the Human Fetus. And, again, this was an article that you cited in your expert report; is that correct?

A. Yes, that is correct.

Q. I would like to have you look at the first page of this article at the very bottom of the first page, the last sentence?

A. Um-hm.

Q. And there, the authors state that quote in summary, prior to 22 weeks, the fetus does not have the neuro anatomical pathways in place to feel pain. Between 22 weeks and 26 weeks, thalamocortical connections are forming and after 26 weeks, the fetus has the necessary connections to feel pain. Again, these authors don't share your opinion that the fetus has in place all of the necessary mechanisms at 20 weeks; is that correct?

A. Yes, that is correct. Could I explain?

Q. I'm just trying to establish what your sources are saying, Doctor, at this point, and certainly your counsel will have a chance to allow you to do that later.

A. Okay.

Q. And it's true that just because a fetus experiences

stress response, that does not necessarily mean that it's experiencing pain; is that right?

A. A stress response that follows a painful stimulus indicates that the fetus is experiencing pain, in my opinion.

Q. And that's an interpretation of the data that's presented in the studies in which a response following a stimulus, a noxious stimulus, is recorded; is that right?

A. That is right.

Q. And one of the studies that you're relying on for that opinion, and for the opinion that a fetus experiences pain beginning at 20 weeks, is a study that I believe you mentioned on direct by Fisk, et al. And that's going to be Exhibit 563. And I would like to have you pull that one out.

A. Yes. I have it.

Q. All right. And this is a study reported by Fisk, et al., and the title of it is Effect of Direct Fetal Opioid Analgesia on Fetal Hormonal and Hemodynamic Stress Response to Intrauterine Needling; is that correct?

A. That is correct.

Q. This study was published in October of 2001; is that right?

A. Yes.

Q. And this is one of the studies that you are relying on

for your opinion that surrogate markers can establish that the fetus is experiencing pain at 20 weeks; is that correct?

A. That is correct.

Q. Doctor, I would like to have you go to page 14 of that study, and if you see the numbers are in the top corner, 14 of 17?

A. Yes.

Q. And here the authors conclude that although the human fetus in the last half of gestation has the necessary neuroconnections for nociception, it is not known whether the human fetus experiences pain. Is that a correct statement of the authors? Am I reading that correctly?

A. That is, yes.

Q. And the very last sentence of that paragraph, again, this is the authors, says quote, because the relation between stress responses and pain is not clear, it is not possible from our data to conclude that the human fetus experiences pain in utero. That is their conclusion based on the study; is that right?

A. That is right.

Q. And you wrote an editorial that accompanies this, the publication of this study; is that right?

A. Yes.

Q. And in that editorial, you stated, quote, the hormonal stress responses seen by Fisk, et al., do not necessarily

indicate fetal pain perception, nor does Fentanyl dose (12.5 micrograms per kilogram of estimated fetal weight) administered after IHV cannulation equate with fetal analgesia or anesthesia. Is that a statement you included in your editorial?

A. I don't know where you're looking.

Q. All right. Would you turn to Exhibit 538, please?

A. I have it.

Q. Is this an editorial you wrote to a company the Fisk study?

A. That is correct.

Q. And if you look at the in the second column, the right-hand column on the first page, at the beginning of the second paragraph?

A. Yes.

Q. Do you see the sentence that I just read?

A. Yes, I see it. That's right.

Q. In the Fisk study, the authors compared responses of the fetuses undergoing transfusion where some of the fetuses received the transfusion intraabdominally, that is the injection through the fetus, and some received the transfusion through the umbilical cord; is that right?

A. That is correct.

Q. The youngest fetus in this study that was transfused intraabdominally was 23 weeks; is that correct?

A. Was 20 weeks.
Q. Was 20 weeks?
A. Yes.
Q. Can you go back to the Fisk study for a moment?
A. Certainly.
Q. And that was Exhibit 563.
A. Um-hm. It's on page three of 17, the first sentence of the methods section.
Q. Yes. And I believe I have got a little mistake in here, so I'll just pass over on that.
A. Okay.
Q. Instead, I would like to have you look now at Exhibit 566?
A. Okay. Yes.
Q. And this was, again, another article that was cited in your expert report; is that right?
A. That is right.
Q. And the title of this article is Fetal Plasma Cortisol and B-endorphin Response to Intrauterine Needling?
A. That is correct.
Q. This is an article you've relied on in support of your opinion that a fetus experiences pain at 20 weeks; is that correct?
A. That is correct.
Q. All right. And in this study, the youngest fetus -- let

me back up. This study also looked at transfusions of fetuses; is that correct?

A. That is correct.

Q. Using both transabdominal injections and also through the umbilical cord?

A. Yes.

Q. All right. And in this study, if you will look at page 80?

A. Yes.

Q. The youngest fetus who was transfused intraabdominally was 23 weeks, is that correct? I'm looking at the fourth paragraph down that begins with we found that?

A. Yes. Yes.

Q. All right. And 23 weeks was the youngest fetus to receive the injection?

A. That is correct.

Q. And if you will look at the last column on that page, which is page 80?

A. Um-hm.

Q. The second to the last paragraph, the authors state since the mechanisms involved in pain perception are not fully understood, it is not possible to conclude that the fetus experiences pain. A hormonal response cannot be equated with the perception of pain. And so these authors are not concluding that this study establishes that a fetus

experiences pain; isn't that correct?
A. Yes, that's what they state.
Q. Now, Doctor, on direct, you explained that pain is a combination of both an emotional, a sensory stimulation and an emotional experience; is that correct?
A. That is correct.
Q. And by emotional experience, you mean the characterization of pain as an unpleasant experience?
A. Yes, that is correct.
Q. And your opinion is that at 20 weeks, the areas of the brain necessary to process emotions are sufficiently developed to suggest the primordial forms of emotional experience resulting from tissue injury. Is that how you would characterize that?
A. Yes, I would.
Q. And your opinion that the fetus is able to have the emotional experience of pain is an extrapolation from studies done on fetuses later in pregnancy; isn't that right?
A. To some extent, yes.
Q. And the studies that you are relying on for your opinion about the fetus's ability to experience rudimentary -- have a rudimentary emotional experience are, in some ways, relying on the same surrogate markers that we have been discussing; needling and the response to needling and

hemodynamic and hormonal changes; is that right?
A. Yes, in addition to the behavioral changes that occur.
Q. As of today, the technology does not really exist to enable us to determine, with certainty, whether a fetus experiences pain; is that right?
A. It depends on what level of certainty that you desire.
Q. Well, your opinion that a fetus experiences pain at 20 weeks is not to a level of 100% certainty; isn't that right?
A. Again, it depends on what you desire as the proof of certainty. What criterion of certainty would you like to use?
Q. Well, during your deposition, Doctor, in this case, do you recall testifying that you were willing to say that there was greater than an 80% probability that a fetus at 20 weeks experiences pain?
A. That's right.
Q. And that 80% or greater than 80% was not derived as a result of any mathematical calculation, but was based on your overall assessment of the evidence; is that fair?
A. That is fair.
Q. And, again, there is disagreement in the medical community on the issue of whether fetuses, at 20 weeks and later, are able to feel pain?
A. You're correct.
Q. Doctor, I believe you testified on direct that you

believe consciousness is present in the fetus at 20 weeks. Is that correct?

A. That is correct.

Q. In your expert report, however, your opinion was that fetus -- consciousness in the fetus or the converging lines of evidence that you discussed, suggest that consciousness in the fetus occurs at about 20 to 22 weeks; is that right?

A. That is right.

Q. And you would agree that in addition to the emotional experience that we have discussed, that it's necessary for the fetus to have some level of consciousness in order to experience pain?

A. That is correct.

Q. And consciousness is not something that can be measured even in adults; is that right?

A. That is correct.

Q. One of the bases on which you formed your opinion that fetuses at 20 weeks are conscious is the presence of brain wave activity that can be measured by EEGs; is that right?

A. Yes, that is correct.

Q. And at 20 weeks, the EEG activity is only intermittent; is that correct?

A. Yes. Depending on the state of the fetus at that time.

Q. And your opinions regarding fetal consciousness are based primarily on studies of preterm neonates and fetuses

in the third trimester of gestation; is that right?
A. Yes, to some extent, yes.
Q. And you have also stated that fetal behavior in utero must be differentiated from that of premature infants, because of the possibility that the birth process and the demands of independent survival may trigger the expression of consciousness. Is that correct?
A. That is correct.
Q. And the studies that you cited during your direct testimony regarding the ability of fetuses to acquire verbal memories, those were all performed in the third trimester; isn't that right?
A. Most of them were performed in the third trimester or the late second trimester.
Q. Isn't it true that in your deposition, you agreed that all of the studies regarding the ability of fetuses to acquire verbal memories were performed in the third trimester?
A. That is correct, although, more recent data has been published since then which includes fetuses in the late second trimester and early third trimester.
Q. And those more recent studies would not include fetuses at 20 weeks, would they?
A. No, they were not.
Q. And to the extent that there is consciousness in a fetus

or that you believe there is consciousness in a fetus at 20 or 22 weeks, that would be a rudimentary form of consciousness, in your opinion; isn't that right?

A. Yes.

Q. And you would agree there is no evidence that there is any fetal consciousness prior to 20 weeks; is that right?

A. At this present time, there doesn't seem to be much evidence to support that.

Q. And, in fact, you would concede that it has not been definitively established that there is consciousness starting at 20 weeks; is that correct?

A. Within the limitations on our ability to measure consciousness, yes, that is correct.

Q. And, in fact, you have characterized your conclusions as to fetal consciousness at about 20 to 22 weeks as tentative; is that right?

A. Where do you base that statement on?

Q. Can you turn back now to Exhibit 538, which we discussed earlier? If you would look, Doctor, at page 824.

A. Yes.

Q. And I'm looking at the bottom of the left-hand column.

A. Um-hm.

Q. And at the last sentence of the second paragraph and the first sentence of the third paragraph, and let me read it to you. To us, all these lines of evidence suggest that fetal

consciousness develops from about 20 to 22 weeks of gestation. And the next paragraph begins, accumulating data may confirm or refute these tentative conclusions. And that was the statement that you made in this editorial; is that right?

A. That is correct.

Q. And again, Doctor, you would agree that there is no consensus in the medical community about when fetal consciousness occurs, if at all; is that right?

A. That is correct.

Q. Can you, in fact, some of the studies that you've relied on in your expert report, make that point; do they not?

A. They do, yes.

Q. Could you turn to Defendant's Exhibit 609, please?

A. Yes.

Q. This is an article that -- I'm sorry. It's actually a chapter that you cited in your expert report; is that correct?

A. That is correct.

Q. And the authors are Modi and Glover, and the title of the chapter is Fetal Pain and Stress. And this was published in 2000; is that correct?

A. Yes, that is correct.

Q. On page 18 of this chapter, the only paragraph in the full right-hand column, the authors state, we do not know

when, if at all, consciousness begins during fetal life; is that correct?

A. That is correct.

Q. And you've admitted or conceded that this is a very controversial issue, the question of when fetal consciousness occurs?

A. That is right.

Q. And, in fact, you, yourself, have stated that hormonal or circulatory responses are not directly indicative of the conscious perception of pain, although their absence would be more likely of sensory stimuli from invasive procedures were not reaching the Thalamus and Hyperthalamus. Is that a correct statement?

A. That is correct.

Q. In the example that you gave earlier about some of the controversy around consciousness and the fetus, you described an RCOG position and that's the Royal College of Obstetricians and Gynecologists, is that right?

A. Yes.

Q. The report that you referred to was that fetal consciousness did not occur before 26 weeks; is that right?

A. That is correct.

Q. And that group -- the purpose of the working group that put out the report was to review all of the material available at that time regarding fetal consciousness; is

that correct?
A. That is correct, yes.
Q. Are you aware that the other group that found that fetal consciousness occurs as early as six weeks was an anti-abortion organization?
A. I'm aware that it was a British Parliamentary Group or Commission. I was not aware of their affiliation.
Q. Doctor, I would like to have you look now at an article that's not in the notebook.
MS. CREPPS: Doctor, this is a new exhibit. May I approach?
THE COURT: Yes. Would you provide counsel with a copy, please?
MS. CREPPS: Would you like one, Your Honor?
THE COURT: Yes, please.
BY MS. CREPPS:
Q. Doctor, in November of 2003, you were an author on a study that was published in the Journal of the American Medical Association; is that right?
A. That is correct.
Q. And I have handed you what's been marked as Plaintiff's Exhibit 114. Is this that article?
A. That is one of the articles published, yes.
Q. And the title of this article is Routine Morphine Infusion in Preterm Newborns Who Received Ventilatory

Support; is that correct?
A. That is correct.
Q. Your hypothesis prior to the study that's reported here was that continuous Morphine infusion in preterm neonates receiving ventilatory support would reduce the pain experience; is that correct?
A. Where -- where are you reading in this article.
Q. I just asked you if you agreed, but if you would turn to 2423, under the comment section. The first sentence under that section.
A. That is correct.
Q. The conclusion of the study was, however, that there was no measurable analgesic effect of Morphine, routine Morphine infusion for fetuses receiving ventilatory support; is that correct?
A. Yes, that is correct.
Q. And the study concludes that because there was no measurable analgesic effect, that routine Morphine infusion would not be the standard of care in this situation; is that right?
A. That is correct.
Q. Doctor, you talked a little on direct about extrapolation and inference. It's correct, is it not, that your opinions in this case, and the studies that you wrote are relying on -- let me make that a better question. It's

true, is it not, that none of the studies that you're relying on directly establish fetal pain at 20 weeks, and that your opinions in this case are based on inference and extrapolation from the studies that you have looked at; is that correct?

A. That is correct.

Q. You testified on direct about the effect of maternal fetal -- of maternal anesthesia on the fetus. Is it correct, Doctor, that the effect of maternal anesthesia on second trimester fetuses is a relatively underinvestigated area?

A. Yes, it is.

Q. And there have been no conclusive studies looking at the amount of maternal anesthesia that would be needed to curb pain in a fetus; is that right?

A. That is right.

Q. We talked earlier about your opinions as to fetal pain prior to 16 weeks. It's your understanding, isn't it, Doctor, that the Act that we are here discussing can apply to abortions prior to earlier than 16 weeks; is that right?

A. That is correct.

Q. And can apply between 16 and 20 weeks also?

A. Yes.

Q. And prior to being contacted by the Government in this case, which was in November of 2003, you weren't familiar

with the details of the Partial-Birth Abortion Ban Act of 2003; is that correct?

A. No, I was not familiar apart from one news item that had been published in the Journal of the American Medical Association. That was the degree of knowledge I had about this Act.

Q. And, in fact, before talking to the Government, it was your belief that the Act applied to all or the vast majority of procedures used for abortion; isn't that right?

A. That is correct.

Q. So your current understanding of the Act that it applies to the procedure that you described involving an incision or puncture in the skull of the fetus and removal of the contents, that's based on explanations that you've received from the Government's attorneys; is that right?

A. No, that is not right.

Q. The other sources that you've looked at for that would be websites?

A. That's right.

Q. And you would describe your understanding of the Act as rudimentary; is that correct?

A. The understanding of the procedure described in the Act, yes. My understanding is rudimentary about that.

Q. Doctor, do you make a distinction between the procedures that you believe are covered by the Act and D & E abortion

procedures?
A. Could you explain what you mean by the D & E abortion procedure?
Q. Well, maybe that's really my question. Can you distinguish for me the procedures that you believe are covered by the Act and D & E abortion procedures?
A. No, not being an expert in this area, I have little knowledge about the nuances of and the different acronyms used for procedures in this area.
Q. Would you support legislation requiring that all abortions performed at 20 weeks or later proceed in a manner that does not result in pain to the fetus?
A. Given my research and clinical background, I would feel that the fetus should be protected from the pain that occurs during procedures that are performed after 20 weeks of gestation.
Q. And that would include not just abortions, then, but other procedures that might be painful?
A. Certainly, fetal surgery and other procedures would and should include that consideration.
Q. And it's your opinion that a fetus may experience pain during an induction abortion procedure; is that correct?
A. That is a tentative conclusion, simply based on the fact that Prostaglandins are mediators of pain as well.
Q. That's correct. But the Prostaglandins don't alleviate

the pain completely for a woman undergoing an induction procedure; is that correct?

A. That is correct.

Q. And the -- I believe you talked about the protective response that fetuses mount at the time of birth, and that those mechanisms don't develop until around, I believe you said, the 30 or 32nd week; is that correct?

A. 32 to 34 weeks. Yes, ma'am.

Q. So it's unlikely that the protective responses that a fetus would have at term delivery would occur in fetuses undergoing an abortion, say, between 16 and 24 weeks; is that right?

A. That is right.

Q. Doctor, it's your opinion that a fetus beyond 20 weeks gestational age would experience pain; is it beyond 20 weeks or at 20 weeks?

A. At and after 20 weeks.

Q. All right. And your testimony is based on gestational age; is that correct?

A. That is correct.

Q. Did you also testify, Doctor, that an abortion procedure, a surgical abortion procedure involving greater dilation would likely be less painful to a fetus because the fetus would be coming through a larger opening?

A. Yes, that is a possibility.

Q. And you were asked about whether cutting the umbilical cord would cause pain to the fetus, and I believe your testimony was probably not or very little; is that correct?
A. That is correct.
Q. Are you offering an opinion as to whether it's always possible to cut the umbilical cord prior to removal of the fetus during a surgical abortion?
A. I'm simply offering an opinion on the degree of pain that would be caused.
Q. And a fetus in that situation would, however, likely mount a stress response; is that correct?
A. If that fetus were to survive long enough, yes, there would be a stress response to the blood loss associated with cutting the umbilical cord.
Q. And I believe you also testified that a fetus would, to the extent that you believe a fetus experiences pain at 20 weeks, would experience that pain in reaction to needling for the purpose of injecting either Digoxin or KCL; is that correct?
A. Yes, that is correct.
Q. And it's your opinion, Doctor, that a fetus at 20 weeks or later undergoing a D & X procedure, as you described it, would experience intense pain; is that right?
A. That is correct.
Q. And it's also your opinion that a fetus undergoing

dismemberment during the abortion procedure would also experience severe pain?

A. That is correct.

Q. And, in fact, isn't it true that it's your opinion that a fetus undergoing a dismemberment procedure could experience greater pain as a result of the fact that there is more somatic injury?

A. That is correct, yes.

MS. CREPPS: May I have a moment, Your Honor?

THE COURT: Yes.

MS. CREPPS: No further questions.

THE COURT: Redirect?

REDIRECT EXAMINATION

BY MS. NORONHA:

Q. Doctor, Ms. Crepps took you through several articles. I would like to ask you to look at those as well. Could we start with Defendant's Exhibit 633?

A. I have it.

Q. And I believe she asked you to look at the last paragraph on the first page?

A. Yes.

Q. Do you hold a different view than the authors in this article?

A. I certainly do.

Q. In what way?

A. I believe that this article represents the state of the art or the state of the knowledge in the year 2000. And considering that it was published in one of the earliest issues of this journal in the year 2000, it's likely that it was submitted well before, so it's probably summarizing the evidence available in 1999. And there has been a remarkable amount of research that has been done in this area since then. Also, I believe that if you look at the 42 references cited at the back of the article, there is not one single reference that I could locate that was authored by these -- the authors of this article. So they simply have collated the information from various other authors available at that time. In contrast, several of my articles are referenced within, I think, five or six of my previous articles are referenced in this article. I think this is a fairly naive attempt to synthesize the information available in 1999, and has little application in 2004.

Q. Doctor, next I ask you to look at Defendant's Exhibit 625. And in this exhibit, Ms. Crepps asked you to look at the last paragraph on the first page as well. And at the bottom of that paragraph, the authors conclude that prior to 22 weeks, the fetus doesn't have the pathways in place because between 22 and 26 weeks, the thalamocortical connections are still being performed. Do you disagree with that view?

A. I do, yes.
Q. In what way?
A. Again, I feel this is a synthesis of the data that was available in the year 2000. And since then, additional evidence has been published that supports the opinions I have stated in my report. One of the authors, Dr. Glover, was -- is also a member of the Maternal Fetal Network which is funded by the National Institutes of Health. And at a meeting of this Maternal Fetal Network that was held at the University of Michigan, Ann Arbor, on March 10th to 12th of the year 2004, Dr. Glover presented additional evidence that -- that supports a much earlier development of the pain system than what is stated in this article.
Q. Next, Doctor, please look at Defendant's Exhibit 563. What role does this analysis play in regard to your data regarding fetal pain?
A. This article has significant control in forming the opinions in this case.
Q. In what way?
A. What this article shows is that not only are there significant responses to intrahepatic vein blood transfusions, or transfusions given through by inserting a needle into the fetal liver, but it also shows that in the same fetus, if a transfusion is given through the umbilical cord, there are no such responses. And if the fetus is

given a pain relieving medication, it blocks the pain responses occurred, as a result of transfusion through the hepatic vein. So this establishes the conditions that we require; the blood transfusion is the same. The fetus and all its physiology is the same. However, by giving a painful stimulus through the abdominal wall and the peritoneal membrane and the liver capsule, etc., all those painful stimuli result in a response and giving a pain medication blocks that response. So this is a very important part of evidence that has appeared after 2000, and extends the knowledge from that time.

Q. So in this article by Dr. Fisk and others entitled the Effect of Direct Fetal Opiod Analgesia on Fetal Hormonal and Hemodynamic Stress Response to Intrauterine Needling, do you then agree with the sentence on page 14 that you were directed to at the beginning of the third paragraph that states, it is not known whether the human fetus experiences pain?

A. Yes, I agree with that sentence. Although, if you read further on, you'll see the context in which this statement was made, and they say nociception is difficult but the intrauterine environment precludes study before birth of the behavioral manifestations of pain that can be observed postnatally. And so in totality, you see, this is one of the ways of scientific writing where we state the opposite

condition first, and then we try to disprove the hypothesis, which is opposite to what we want to prove, and that is the style of writing that is followed in this article, as well as in some of my previous writings as well.

Q. So, Doctor, would you please read the rest of that paragraph, so we get the full context?

A. To explore the question of fetal nociception, our group has used fetal stress responses as an indication of the trauma involved to test the null hypothesis that pain responses would seem unlikely in the absence of stress responses. This study confirms that invasive procedures produce stress responses and shows that these can be blocked by analgesia. Because the relation between stress responses and pain is not clear, it is not possible from our data to conclude the human fetus experiences pain in utero.

Q. Do you agree with that last statement?

A. Yes, to some extent. They are, because of the nature of this research, they are simply allowed to form conclusions or scientific inferences on the data that is presented in this paper. So taken in isolation, this is not sufficient evidence to conclude that a fetus feels pain. But taken in the context of anatomical development, other physiological responses, behavioral expressions, this is one additional area that adds to the evidence supporting the opinion that the fetus feels pain.

Q. Doctor, if you would please turn to defendant's Exhibit 566?
A. Yes, I have it.
Q. And this is an article entitled Fetal Plasma Cortisol and B-endorphin Responses to Intrauterine Needling. Ms. Crepps asked you to look at page 80, the second column and the second to the last paragraph?
A. Yes.
Q. Would you please read us that paragraph?
A. This article states that it is not clear whether the rise of the stress hormones --
Q. Doctor, I think we are looking at the second column, the paragraph above the last one.
A. Okay.
Q. Okay.
A. Since the mechanism, that one.
Q. Yes.
A. Since the mechanisms involved in pain perception are not fully understood, it is not possible to conclude that the fetus experiences pain; a hormonal response cannot be equated with the perception of pain. Our study shows that as with neonates, the fetus mounts a similar hormonal response to that which would be mounted by older children and adults to stimuli which they would find painful. This is of relevance to the now commonplace intrauterine needling

procedures on the fetus, such as cyst aspiration, chest and bladder drainage or tissue biopsy. Further investigation is needed into how these responses may be blunted by anesthesia or analgesia.

Q. What role does this article, and these conclusions, play in your opinion that the fetus can feel pain at 20 weeks gestation?

A. This was one of the earliest pieces of evidence to suggest that there is fetal pain. It was published about ten years ago, and really opened up the question of when is the pain system developed enough to start responding to these needling procedures.

Q. Has there been further study after this article was published on this topic?

A. Certainly, yes. Ten years of progress has been made since this article came out.

Q. Doctor, please look at Defendant's Exhibit 609.

A. Yes, I have it.

Q. On page 218 Ms. Crepps asked you to look at the second column, the paragraph that begins, we do not know?

A. Yes.

Q. Would you please read that paragraph?

A. Yeah. We do not know when, if at all, consciousness begins during fetal life. Even in the adult, the physical basis of consciousness is far from understood. Most

evidence suggests consciousness is associated with activity in the cerebral cortex. Greenfield has emphasized that one should not think of consciousness as an all or none phenomenon, but rather like a dimmer switch. This concept of evolving consciousness might well apply to the developing fetus, in whom conscious experience is both unlikely to be the same or have the same physical basis as in the adult. Frogs, for example, do not have a developed cerebral cortex, lacking layers IV to VI. If they are conscious at all, their experience may be associated with activity in a less complex neuronal network, possibly more analogous to the fetal subplate zone. Accepted correlations between structure and function may also be unreliable, particularly in the developing fetus. Decorticate adult rats are unlikely to be conscious, but still exhibit considerable pain behavior during surgery. Pain responses have also been observed in patients in persistent vegetative state and in anacephalic infants. It has been suggested that in the fetus, pain perception may be associated with electrical activity in the Thalamus rather than the cortex.

Q. So, Doctor, this article entitled Fetal Pain and Stress by Neena Modi and Vivette Glover, how does that affect your analysis of feel pain?

A. I think this is, again, a summary of the evidence that was available in the year 2000. And this also reflects some

of the future directions that these authors were thinking along, and is much more consistent with the opinions that I have stated.

Q. Doctor, next would you turn to page -- I'm sorry, Defendant's Exhibit 538. And that's an editorial that you have authored entitled Fetuses Fentanyl and The Stress Response?

A. Yes, I have it.

Q. The second column, the paragraph that begins the hormonal stress response as seen by Fisk. Would us please read that paragraph?

A. Yeah. The hormonal stress responses seen by Fisk, et al., do not necessarily indicate fetal pain perception nor does a Fentanyl dose (12.5 micrograms per kilo of estimated fetal weight) administered after IHV cannulation equate with fetal analgesia or anesthesia. These authors have adequately discussed the technical constraints, limitations in study design, and alternative explanations for their results. Nevertheless, even to the skeptics, these data provide convincing evidence for pain induced stress responses in fetuses between 20 and 35 weeks of gestation, confirming previous work by the same investigators and preliminary findings from others. For example, the pulsatility index of the middle cerebral artery decreased within 70 seconds after painful stimulation in fetuses from

as early as 16 weeks of gestation. Such robust physiologic responses would be unlikely, if fetuses were impervious to the pain induced by IHV needling.

Q. So, Doctor, is it still your opinion that the data provides convincing evidence for pain induced stress responses in fetuses between 20 and 35 weeks of gestation?

A. Yes, it does. And like I stated earlier, a style of scientific writing is to -- is to state the opposite view, and then to disprove that or examine whether it holds up in the light of the available evidence. And that's why, in this article, we took the view initially that these hormonal responses don't necessarily suggest fetal pain perception and their effects of fetal analgesia, don't, you know, necessarily support that. However, given all the other pieces of evidence in this field, we can come to that conclusion. In fact, at the end of this article, we have suggested that with this, this is on page 824, the last sentence of this editorial. With this line of investigations, Fisk, et al., have opened the door for the development of an entirely new field of fetal anesthesia, requiring the development of newer clinical skills, innovative anesthetic techniques, and perhaps novel ways of examining immediate and long-term clinical outcomes. That is the conclusion from the assessment of their data.

Q. Doctor, now I'll ask you to turn to Plaintiff's Exhibit

114, that was just provided to you. That's not in the binders.

A. Yes, I have it.

Q. Doctor, how did the conclusions in this article impact your opinions as to fetal pain?

A. This article was basically a randomized controlled clinical trial where premature babies who were on a ventilator received either a placebo infusion or a Morphine infusion. And they found that the assessment of pain in the babies who were receiving a low dose Morphine infusion did not show any differences from the babies who were not receiving the Morphine infusion. However, Morphine was still given to the babies who received placebo, because when the clinical team felt that these babies are in pain, they gave Morphine. So their conclusion is perhaps Morphine is not a very effective analgesic in the -- in this gestational age group, and I agree with that. In fact, we have even more data that is currently being evaluated by the British Medical Journal suggesting that Morphine may not actually be a pain relieving drug at this early gestational age, because of the way in which the receptors develop, and the way in which those receptors hook up with the signal transduction mechanisms or the mechanisms within the cell that produce the effect of anesthesia and analgesia.

Q. So, Doctor, do your conclusions about Morphine apply to

all anesthetic drugs?

A. No, they don't.

Q. Doctor, during your cross-examination, you agreed with Ms. Crepps that you have referred to consciousness in the fetus as a rudimentary type of consciousness. What do you mean by that?

A. I would suggest instead of going back to the metaphor that was given in terms of consciousness is not an all or none phenomenon; this was first proposed by Greenfield, but since then has been accepted by almost everyone who has considered the -- and who works clinically in this area. Consciousness is, perhaps, more like a dimmer switch, so that there are increasing degrees of consciousness that get manifest during fetal life. And that transition from being unconscious to being conscious occurs in the period of time when these connections are being made. So I would characterize that period of time as being 18 to 22 weeks or 20 to 22 weeks, as was stated in my deposition. So I think that's really what the meaning is that there are rudimentary forms of consciousness which we cannot even imagine. No amount of knowledge will allow us to experience what a snail may experience because. We don't have a snail's consciousness. Similarly, a fetal consciousness can be judged from the fetus's behaviors that are available from that age onwards.

Q. Doctor, you also agreed that the studies on the effect of maternal anesthesia on the fetus are limited. What studies do you base your opinion on, regarding maternal anesthesia's effect on the fetus?

A. The evidence that is available in the medical literature primarily is focused in two areas of practice. Most of the evidence comes from studies that were done in the third trimester where mothers were given anesthetic drugs and the umbilical cord blood was sampled. So they relate to the placental transfer that occurs in the third trimester close to the time of full term birth. The other groups of studies that have been done were performed in the first trimester, more as an experimental design, where drugs were given to the mother, and they were sampled from the fetus as well as from the maternal circulations. Using -- these maybe two opposite ends of the tunnel, but using these data to extrapolate what may be happening in the second trimester, I have based my conclusions of maternal anesthesia on that.

Q. And finally, Doctor, if an abortion procedure with greater amount of dilation was accomplished by grasping the fetus, extracting it from the uterus, and emptying the brain contents either by puncture and suction or by crushing the skull, would that be painful, in your view, notwithstanding a greater amount of cervical dilation?

A. Certainly, it would be.

MS. NORONHA: I have no further questions at this time. Thank you.

EXAMINATION

THE COURT: Thank you. Doctor, I have real brief series of questions. I understood you to say that -- I understood you to comment on fetal anatomical development. What I would like to ask you is a series of questions about length and weight at various gestational ages. Would you be comfortable talking about that or would that be out of your area of expertise?

THE WITNESS: That really would be difficult for me, because I don't have the data available to me that looks at a fetal weight and length at different gestational ages.

THE COURT: All right. Then I'll leave that alone. I understand you to say that -- well, tell me what your definition of consciousness is.

THE WITNESS: Consciousness is this mysterious and imminent force that forms the substratum to all of the experience that can occur. It is the substratum to the manifestation of the entire universe in a way. Because it is a conscious universe that we live in, and we are conscious beings within this universe, the consciousness is, if I could use a metaphor, suppose we go to the movie theater and we watch a movie and this movie has numerous characters, and they have interactions and dialogs and

events, etc., occur. And that is the -- the content of what the movie is about. Consciousness is like the screen on which the movie of nature, this three-dimensional movie of nature, is being played. In that sentence, it is beyond thought. It is and can be experienced, but it cannot be measured, and that's what my definition of consciousness is.

THE COURT: Now, is there any medically accepted definition of consciousness?

THE WITNESS: No, there is not.

THE COURT: All right. If I understood you correctly, and I in no sense mean to trivialize what we are talking about, but I understood you to stay that a frog might be conscious, just as a higher living thing might be conscious, although sort of the degree of consciousness might be very different. Is that fair?

THE WITNESS: That is correct, yes. It is -- various levels of consciousness are available in from examples in the animal kingdom. And those levels of awareness or consciousness are very specific to the organism that they are manifested through.

THE COURT: All right. I found your discussion very interesting. You began to tread on the theory of science, and it's evident you have read Carl Popper, and so I thank you very much. I'll let the lawyers follow up. First for the Government, then the plaintiffs, then the

Government.

MS. NORONHA: I have no questions. Thank you.

THE COURT: Counsel.

MS. CREPPS: I don't have any questions, Your Honor.

THE COURT: Can we excuse the doctor then?

MS. CREPPS: Yes, I was just going to move into evidence some of the exhibits that we were referring to. I neglected to do that earlier, but I would be offering them, again, for the purposes that we have discussed; not for the truth of the matter but to demonstrate the debate within the community.

THE COURT: Doctor, you can step down. We are just going to do legal stuff now and that's really boring.

THE WITNESS: Thank you, very much. Thank you, Your Honor.

THE COURT: You're welcome.

THE COURT: Give me the numbers.

MS. CREPPS: Your Honor, that would be Plaintiff's Exhibit 114.

THE COURT: Um-hm.

MS. CREPPS: And Defendant's Exhibits 633, 625, 563.

THE COURT: 563.

MS. CREPPS: Yes, 538, 566, and 609.

THE COURT: And you're offering those not for the truth of the matter asserted, or are you?

MS. CREPPS: No, Your Honor, I don't think we could overcome the learned treatise objection; hearsay objection, so I would be offering them again for the -- to demonstrate the debate within the community on the issues that Dr. Anand has been testifying about.

THE COURT: Counsel?

MS. NORONHA: Your Honor, we renew our hearsay objection for these articles, but we have yet to determine whether the basis upon which Plaintiffs are admitting them is a proper basis for admission and I believe we are still in discussions on that point.

THE COURT: All right. I'm going to -- we were talking about pain. I'm going to end your pain probably on Friday, and make a decision one way or another about these are coming in, so you all don't have to do a bunch of briefing, frankly. And I'm beginning to lean on admitting them not for the matter of the truth asserted but for the debate question. How we phrase that makes a difference to you, but we can deal with that. So one way or another, I'm going to decide that on Friday, so you all talk to one another. If you can make, come up with an agreement before then, fine. If not, I'll do it for you. So I'll withhold ruling on 114, 633, 625, 563, 538, 566 and 609. Shall we

take our lunch break now?

MS. NORONHA: Yes, Your Honor.

THE COURT: Is in agreeable? All right. Since we went a little bit late, why don't you come back at say 1:45 please. We'll stand in recess. I do have a criminal matter in here over the noon hour so you may want to push your stuff forward.

(Recess at 12:18 p.m. 1:45 p.m.; all parties present).

THE COURT: Mr. Henry?

MR. HENRY: Your Honor, defendant calls Dr. LeRoy Sprang.

DR. M. LEROY SPRANG, DEFENDANT'S WITNESS, SWORN.

THE COURT: You may inquire.

DIRECT EXAMINATION

BY MR. HENRY:

Q. Thank you. Good afternoon, Dr. Sprang. Could you tell us your profession, please?

A. I'm a practicing obstetrician gynecologist.

Q. And are you board certified in obstetrics and gynecology?

A. I'm board certified in obstetrics and gynecology.

Q. Are you licensed to practice medicine?

A. I'm licensed to practice medicine in the State of Illinois.

Q. Doctor, if you would, please, take a look at Defendant's

Exhibit 530. Is that a copy of your CV with certain home residence information redacted?

A. It does appear to be, yes.

Q. And is your CV up-to-date?

A. It does appear to be.

Q. And is it, are the items depicted therein accurate?

A. Correct.

MR. HENRY: Now, Your Honor, I move the admission of Defendant's 530.

MS. CREPPS: No objection.

THE COURT: It's received. Doctor, could I trouble you to put your elbows on that bench in front of you and that will force you into the microphone.

THE WITNESS: Thank you.

THE COURT: You're welcome. Go ahead.

BY MR. HENRY:

Q. Dr. Sprang, could you describe your medical education and training for us, please, just kind of briefly give us a rundown, if you would?

A. I graduated from Loyola Medical School, School of Medicine in 1969. Had a first one-year residency in obstetrics and gynecology at St. Francis Hospital. Went into the United States Navy for two years; was assigned to the United States Marine Corps, after which time I returned and finished the obstetric and gynecological residency from

'72 to '75.

Q. And you're currently practicing obstetrics and gynecology?

A. I'm currently in the private practice of obstetrics and gynecology at Evanston Northwestern Health Care, which is an affiliate of Northwestern University Medical School. I would break down what I'm doing now is about 60% active clinical practice in an academic setting. I also would say about 20% of my time is in teaching. I have students and residents with me on a routine basis, in the office and in the hospital, and I teach them both clinical outpatient and obstetric and gynecologic surgery. I also am very active in teaching the continuing medical education arena. I, over a 20-year period of time, have put on three to five national postgraduate courses a year, and teaching obstetrics and gynecology, gynecologic surgery, surgical infections, and have done that for about 20 years. I also, the next 20%, I had an interest in various things. I'm also very interested in professional organizations. And straight out of residency, I got involved in Chicago Medical Society and State Medical Society and the American Medical Association working up through Evanston Hospital. I served on each of the officer rotations, and was president of Evanston Northwestern Health Care, which now has 1,800 physicians on its staff, so it's a huge organization. I became very

involved in Chicago Medical Society; served as chair of many of their committees including Chairman of the Physician Review Committee. I currently am Chairman of the Ethical Relations Committee and have been for about the last 10 years. I have held all the offices at Chicago Medical Society including Chairman of the Board, and President of the Chicago Medical Society. I have done very similar things at the Illinois State Medical Society; served on a number of committees including being Chairman of the Board of Trustees, and president of that organization, which allows you to go around throughout the state and give presentations to many various physician groups and hospitals, and see what is going on in different parts of the state in different hospitals. You can have a much broader base, and been involved in the American Medical Association and have been a Delegate to the American Medical Association from Illinois for at least the last 10 or 12 years. I was an alternate delegate before that. I currently am Chairman of the Illinois Delegation to the American Medical Association, and have, because of that, have had discussions with many physicians from all over the United States on many areas including some of the areas we are going to discuss today.

Q. Doctor, could you tell us a little bit about your private practice, and what it involves, what kind of

procedures and that sort of thing?
A. I have a very large private practice. I'm in the biggest group, and probably the biggest obstetric and gynecologic group in the State of Illinois. I just put together a group of 238 obstetrician gynecologists and am president of that group. Personally, I have delivered over 3,000 babies into the world, over the last 25 or 30 years. I do the full range of obstetrics and gynecology. Normal risk and high risk obstetrics. In the beginning, before the subspecialty of high risk obstetrics existed, our group provided the high risk obstetric care. We still have a relationship with maternal fetal medicine patients that when we have a high risk patient, we get consult from them but they do send them back to us for continued care. I do all surgical procedures in any typical fashion of gynecology.
Q. Doctor, are you a fellow of ACOG?
A. I'm a fellow of the American College of Obstetricians Gynecologists, and a fellow of the American College of Surgeons. Individual I trained with was very surgically oriented and felt we should actually be able to be fellows in both those organizations.
Q. Doctor, have you published any books or articles in the medical field?
A. I have published a reasonable number of articles probably totaled about 20, some in more peer reviewed, some

in some of the organizational types of journals as well. I have written a book chapter, I have been a reviewer for the American Journal of Obstetrics and Gynecology which all the articles have been presented have come from. I have edited other pamphlets and have been Chief Editor for Chicago Medicine and a number of things like that.

Q. Okay. And are your articles, the stuff you mentioned, is that indicated on your CV?

A. It is on my CV, and the chapter of the textbook is on obstetric and gynecologic infections.

Q. Do you consider that a special interest in your practice?

A. I have had a special interest in obstetric and gynecologic infections, practically pretty much from the beginning of going into practice, and have lectured probably hundreds of times in national and local programs. I have lectured at the American College of Obstetricians and Gynecologist annual meeting; American College of Surgeons, family practice, internal medicine, and a number of major national and have been a speaker AMA leadership conferences on several occasions.

Q. Doctor, are you also involved in the risk management work?

A. I do a fair amount of that as well. One of the other boards I sit on, which I have chaired, is the Illinois State

Medical Society Insurance Company, liability insurance carrier. It's the biggest liability carrier in the State of Illinois. We have 14,000 policy holders. I chair various committees there, and have chaired the board. We review all of the cases that come forward each month. We have different review committees that go through each of the cases. So I see a lot of the types of errands that are -- errands, some of them are legitimate but some of them are not. It gives you a chance to see what's going on in gynecological surgery obstetrics and where we do or don't see lawsuits being filed. So we have a feel for the applications that occur in practice as well.

Q. Doctor, I would like to ask you some questions regarding your familiarity, if any, with methods of abortion. Let me ask you, in your practice, have you, yourself, had to remove products of conception before pregnancy reaches term?

A. I have, and they are obviously kind of medical and CDC definitions of abortion. Commonly people, when they are using a CDC definition, would mean the fetus is alive before the physician intervenes, in some fashion, and terminates the pregnancy. Medical terminology would include abortions have a much broader term for that. We would use even like spontaneous abortions, which the vernacular would be like a miscarriage. So I have actually, again, if I have delivered over 3,000 babies, approximately 15% of pregnancies end in a

miscarriage and abortion. So I have managed at least 450, 500 patients with those types of abortions. And we have also done it at each of the different stages at the first trimester, the second trimester and the third trimester.

Q. Aside from miscarriages, have you dealt with situations involving removing a fetus when it had died while in utero?

A. Yes, and at each first, second, third trimesters, yes.

Q. Can you tell us the different methods of removing fetuses?

THE COURT: Counsel, it would be helpful if -- and I'll leave it to your good judgment, but helpful for me to know if the doctor has performed and if so, when, abortions as defined by the CDC.

BY MR. HENRY:

Q. Doctor, have you performed abortions, as defined by the CDC, which I believe, Your Honor, is referring to abortions on live fetuses; is that correct?

THE COURT: The doctor gave his understanding of it and that's mine as well.

THE WITNESS: Right. The definition would be where you're starting the procedure with a live fetus and ending up with a dead fetus. And I would be in circumstances where that has occurred, yes. Has that been initial goal? Not really. And, actually, I think in my deposition, I couldn't think of a time when I have done that. There -- were

actually thinking about it in further detail. There was one time that I did. It was actually a circumstance where a patient came into the emergency room probably about 12 weeks pregnant and was bleeding into her abdomen. Naturally, the surgeon saw her and knew she needed to go to surgery, but they also did a pregnancy test before they sent her it was positive. So he called me and said you operate on her rather than he. I opened up the abdomen, which she was bleeding profusely from the uterus, and was, again, about 12 weeks pregnant, and had a mass growing out of the uterus that looked really like a tumor or cancer. I wasn't sure what it was but I took out a slice and sent it down for a frozen section. It did turn out to be the placenta. The placenta, in rare occasions, can be aggressive enough. The distinctions are the placenta can grow into the wall and be called just attached placenta accreta. Goes into the wall into the thickness and be a placenta increta, and on rare occasions, it's actually a placenta percreta. That was the case here. It had grown through the wall and the woman was actively bleeding. What I did was remove the placenta in mass, basically at that point, doing a hysterotomy and suction out the contents of the uterus with a live fetus to safe the life of the mother.

THE COURT: Thank you

BY MR. HENRY:

Q. Doctor, you mentioned a hysterotomy. Are there -- and I take it from your testimony that all the other instances where you have removed fetuses have been in situations of fetal demise; is that correct?

A. Correct.

Q. Can you just give us a brief rundown of the different types of procedures you have used in situations of fetal demise, and about how many you've done of each of those procedures? I take it -- let's start with the first trimester. If you would just walk down those briefly.

A. These are clearly estimates. I'll probably try to under estimate rather than over estimate. I think it's more appropriate that way. Again, I said there had been several hundred. Clearly most spontaneous abortions, missed abortions, incomplete abortions occur in the first 12, 13 weeks of pregnancy up to about 15%.

Q. And what type of procedures do you use?

A. What you're doing most of the time, whether you need to dilate the cervix or not, you're doing the same, essentially the same procedure, as any abortion clinic would if the fetus was alive. You're dilating the cervix. We use local anesthesia. We use a paracervical block on either side of the cervix. We also use MAC anesthesia, which is monitored anesthesia care. The anesthesiologists are there. The patient is not asleep, but they are giving them enough

medications to make them very comfortable.
Q. Is that known as conscious sedation?
A. It would be another word for it. In some of the other labs that they do it, when they do it in the GI lab, they more commonly call it conscious sedation. We call it MAC, but it's a very -- same idea. You then dilate the cervix as necessary, depending on how far along the patient is. If they are 8, 10, 12 weeks, you want to try to get about as much dilation of the cervix, so you can put in the appropriate cannula that is going to fit. And there is a correlation between the size of the cannula and the weeks. It's not one-to-one, but we kind of use that as a criteria.
Q. Have you -- I'm sorry. Have you performed procedures in the second trimester?
A. You want me to finish first trimester?
Q. Yes. Go ahead.
A. Once we dilate the cervix and we do put in suction curettage, and there is various sized cannulas, whether we use 7, 8, 9, 10, 11, 12, which, fortunately, we don't need to use that often. It's a system that works very well. There is enough suction from the machine. If you pass it, you kind of go back and forth, and I kind of go in and twist it out a couple of times. I do then take a curette, just to do by feel as well, to make sure that there is nothing left; very gently, because you don't want to leave scar tissue and

you don't want to cause other complications like an Asherman's Syndrome. If you curette too much -- because a pregnant uterus is almost always softer, more friable. If you curette too much of the endometrium out, literally when it heals, you might get scar tissue between the top wall and the bottom wall of the uterus and create some serious problems for that patient afterward. May not even have periods later, but even if they do, there will be more trouble getting pregnant and stuff, because there are adhesions inside the uterus. Now, you want to go to the second?

Q. Can we talk about the second trimester? What methods have you used during the second?

A. Up to 14 weeks, you can probably still often get away with just using suction. And some people would even say a little more, depending on -- you may need to finish it with forceps in removing some of the additional remaining products of conception. Depending on severity, you may be more likely to not just want to mechanically dilate it the way I said we did in the first trimester. Sometimes we will, depending on seeing the patient and how soft the cervix is. And, again, sometimes when the fetus is dead, it is easier because the cervix is already kind of starting to dilate and is softer and easier to do. If it's firmer, you can use laminaria in exactly the same fashion.

Q. Have you done that?
A. I have done that.
Q. And can you tell us how many times you've done it?
A. Not -- it's really guessing now, but not a tremendous number of times, half-a-dozen. And that's purely a guess. Because over the 25 years, I don't remember exactly what the numbers were.
Q. Okay.
A. Actually, we're starting to do it a little more, and I saw a patient this week from one of my partners, and she just had a D & C the next day. And I just felt it was really tired. We put one laminaria in just to kind of soften it and make it a little easier to do it the next day.
Q. And so what do you do after you do the laminaria?
A. Usually, we'll just kind of do it in the office and then jugs see the patient in the operating room the next day, and then I just remove it the operating room.
Q. When you say remove it, what method do you use to remove it?
A. Literally, just like a ring forceps -- enough of it -- leave enough of the tip out so it's easy to grab and just extract it.
Q. Would you consider that a D & E?
A. No.
Q. Okay.

THE COURT: He's talking about removal of the laminaria. You're talking about something else.

MR. HENRY: I have a little trouble hearing you.

THE WITNESS: Sorry. I'll try to stay closer to the mike.

MR. HENRY: I apologize.

THE WITNESS: No. Where do you want me to go from there?

THE COURT: You removed the laminaria and then I think what happens next.

BY MR. HENRY:

Q. What happens next?

A. Depending on how far dilatation, you may still need some mechanical dilatation. You may have achieved enough dilatation with the laminaria. And then you're going to go ahead and use your suction curettage. Often, again, like at 14 weeks, you can still get away with that. Depending on the how long the fetus has been deed, softness of the tissue, you can still get out pieces that way, and sometimes you do need to remove remaining pieces with forceps. And in that, again, we use a curette to make sure everything is gone.

Q. That procedure you just described, do you consider that a D & E where you use the forceps?

A. We consider that a D & E.

Q. Have you used any other method --
A. At that stage of pregnancy.
Q. Yes?
A. I don't believe so.
Q. Have you done any inductions in the case of fetal demise?
A. Through what we do in our hospital, and just about everybody in our hospital uses this kind of approach. They are going to have -- different individuals may have a slightly different upper limit of 16, 17, 18 weeks. Some might even go to 20. But at that point, everybody in my institution, including all the board certified maternal fetal medicine physicians, and the physicians who do D & Es at 16, 17, 18 weeks, much more commonly, at that point, everybody in my institution would go to induction, an induction method.
Q. And can you briefly describe how you do inductions that you do?
A. Depending, again, on -- we'll wait awhile sometimes and actually because it makes it a little easier if the fetus is softer. In some of the changes that take place, the human body does recognize the fetus is dead and often the cervix will be softer, and the uterus is even more responsive to medication. Depending on the anxiety of the patient too, and how quickly they want it done. Some people are not

comfort at all, and I made the diagnosis in the morning and they want it done that afternoon. We kind of try to talk them into being a little slower, a little more gentle than that, but it's anxiety producing. Depending on the cervix, again, you can use laminaria to just maybe make the job a little easier, and start to soften and start to efface the cervix. By putting the foreign body in it, you're kind of creating the process; some irritation, some dilatation. As the laminaria is absorbing moisture it is swelling. Basically, you're starting to cascade of maybe the body starts to making more Prostaglandin. Starts actually softening and effacing, making the cervix shorter as well as softer making it easier. Where you're probably going to have more likelihood of successful induction in a shorter duration. In a lot of the things we are talking about now are clearly evolving as to dosing, and what's the best way to do it. And I think it is continuing to improve and be expedited. And as we talk more, I'll sure we'll get into all kinds of other ways of doing a little bit of this, a little bit of that and a little bit of that. What we would do is more of what I said, and then the next morning just bring the patient in and start. My favorite drug for this is Misoprostol Cytotec, and I actually wrote the protocol for use of Cytotec in my institution. My experience has been very, very successful and it just -- the last one I did

I think was there eight , 10 hours. In my opinion, she's undergoing a stressful time anyway. In that setting, we are much more able to give her numerous medications. I basically, at that point, would give her whatever seems appropriate. And she needs to be more comfortable whether it's pain medication, antinausea medication. And Cytotec works in kind of actually most of the inductions -- before we used to use other Prostaglandin vaginal suppositories. They all kind of work in strange ways. By that, I mean you down know how fast they are going to work. Sometimes they work very quickly. Sometimes less responsiveness. Sometimes you can put it in, and two hours later, the fetus is in the vagina. And basically, you're making the patient comfortable. But often, you really don't know what is going on inside until all of a sudden, the patient just says I feel something in the vagina, and you go there and the fetus is sitting in the vagina. That could be two, four, six, eight, 10 hours later. But most of the time, the fetus will be sitting there. Most of the time the placenta will follow. I think the statistics overall are about 10 to 20% of the time, the placenta doesn't just follow afterwards. My experience is better than that, but go ahead.

Q. We'll talk about that.

A. You don't want me to go there. Okay.

Q. I'll tell you what. I just kind of want to get an

overview right now.

A. Sorry.

Q. So you use Misoprostol for induction?

A. Yes.

Q. And we are talking during the second trimester?

A. Throughout -- the reality is that you can do it straight through 40 weeks.

Q. So you do the same type of --

A. Yes, whether it's at 20 weeks, 25, 30, 35 or 40. I have sadly done it in each of those circumstances.

Q. The protocols you mentioned that you had a hand in developing, that was for Evanston?

A. Correct. Evanston Northwestern Health Care.

Q. To those protocols -- they apply in all contexts?

A. We have a little disagreement, and sometimes we use higher doses earlier. Because earlier in the gestational age, a weak pregnancy or uterus at 20 weeks may not be as responsive as a uterus at 38 weeks. The maturing process does do more things to the uterus as well to make it more responsive.

Q. And, Doctor, have you studied medical literature regarding termination of pregnancy after the first trimester?

A. I have, yes.

Q. And how did you come to engage in that study?

A. They are -- basically about in '95 or '96, when this specific procedure -- I was not involved in the abortion issue. I did not have any strong feelings or involvement whatsoever, until this issue came to the forefront.

Q. When you say this issue, what do you mean?

A. Partial intact D & X using ACOG's terminology. And what happened first, it became much more common in the media and people, physicians, the public, were all talking about it, I'm sure, across the United States including in Chicago and in Illinois. Some of the -- a lot of the states started looking at whether they were going to pass laws to ban intact D & X. Illinois did some surveys among its physicians where 90% of the physicians in Illinois supported a ban on intact D & X. The Illinois State Medical Society started looking at whether they wanted to introduce a resolution. And the board of trustees both introduced a resolution to the AMA and to the Illinois State Medical Society to introduce a resolution to ban partial -- let me be consistent, intact D & X in Illinois.

Q. And what was your position at that time?

A. At that point, I was chairman of the board.

Q. Of the Illinois --

A. State Medical Society.

Q. Okay?

A. And cause of that, and because I was the only

obstetrician gynecologist on the board, obviously they looked -- a lot of the questions were expected to be answered by me. So I had to make sure I had a better understanding, and better data, and better information on it. Also, because of the three to five national post graduate courses I would put on annually, I had a lot of interaction with many other physicians from all over the United States and foreign countries. And I have put on high risk obstetric courses. When you're doing things like that, some of the discussions, you give case examples and say how would you handle a patient who came into the hospital at 22 weeks with ruptured membranes. And the idea is just to generate discussion, and what are various ideas. Some maternal fetal medicine specialists say you might give steroids and try to -- at least if you are at 22 weeks, you may try to hold off to 25 weeks. Because at 22 weeks, it's virtually a 1% chance of survival. And at 25 weeks, in my institution, it's an 80% chance for survival. Some of the people in the audience might say -- getting much more aggressive and to say why take the risk of infection, just go in and do a D & E. So you end up having a lot of conversations with a lot of different people in those situations. And I did have the opportunity to speak to some of them, and because I was more interested in the topic, started asking them more of what they do, how they do it,

when they do it. And that's part of how I found out some of that information.

Q. And this was all part and parcel of your service that you do?

A. Part and parcel of putting on courses in high risk obstetrics and management of complicated obstetrical situations.

Q. Let's go back to the Illinois State Medical Society. You were a delegate from that society to the AMA?

A. Right. We did two things. We both introduced a resolution in the Illinois House, and the Illinois House, again, which had never supported any abortion legislation whatsoever in the past, after hearing about the description of this procedure and the details of this, voted overwhelmingly to cast a resolution in Illinois that the Illinois State Medical Society supported a ban on intact D & X. Again, because that was also introduced at the American Medical Association, and as a delegate to the American Medical Association, I spoke to that issue, because I was the only obstetrician on our delegation from Illinois.

Q. And with respect to the AMA, did your interest or work in this area continue?

A. What happened is the House of Delegates, again, because they had never taken a position on an abortion issue, because the goal is to try to maintain a consensus. You

have got a wide variety of physicians from all over. You're always trying to be neutral. You're trying to say, you know, we will take a hands off position because, again, this issue had said -- had such widespread public disapproval, physician disapproval, they set up -- established a committee to review it at the interim meeting in December of '96, and bring that committee report back to the June meeting, the annual meeting in '97.

Q. And were you involved in that?

A. What they did is the board of trustees established that committee. They picked people from various councils. Representatives from the American Academy of Pediatrics, representatives from the American College of Obstetricians and Gynecologists, so there would be wide representation. They also felt because two states had introduced resolutions, Illinois and Pennsylvania, that they wanted a representative from each of those states. And so I was selected as the representative from Illinois to serve on the AMA's committee to review this issue.

Q. And so can you tell us a little more about what the result of the committee's work was?

A. Again, a very, obviously, controversial subject. And the committee was made up, as I said, of representatives from the council, Council on Scientific Affairs, Ethical Relations Committee, ACOG, and the Chairman of the Board of

the AMA. And we had a lot of background information and research information reviewed. Then we met, actually, at the airport for a day and went over a lot of the different ideas. Tried to come to a consensus, opinions, and then went back to the different councils and committees. Additional changes continued to be made. By phone, by fax, by back and forth, we came up with a 26-page board report that included some of the legal background, the medical background, and they went into a great length or not great length, significant length on the ethical aspects of this. Because medicine is a profession wouldn't exist without ethics. And the ethics of this issue, we felt to be a significant part of it. So the Ethical Relations Committee were involved as well and presented a series of positions. Got deeply into the ethics of abortion, but then specifically, intact D & X, and how it differs from any other abortion, and why they came to a different conclusion on this procedure, because the ethics are different.

Q. And so you're involvement in this committee had a hand in -- you continuing to research the literature regarding abortion?

A. Very, very much so, because, again, you can't sit on a committee like that and talk intelligently with a group of intelligent physicians, unless you know the background and do the home work. I reviewed articles, read medical issues,

medical journals, talked to physicians, again, that I met at my meetings, because there is a lot of opportunity to meet at meetings.

Q. Okay. And have you co-authored an article concerning late term abortion?

A. Following that position, and then it did go to the AMA, and the AMA, surprisingly, went to Congress in Washington. And there was enough concern about the procedure that they said if they could make some tweaks in the bill, if they could feel more comfortable that it really just involved intact D & X, that the physician would have the opportunity to go before a his own disciplinary board first and make some tweaks that they felt make it more palatable to physicians, they actually supported HR 1122, which is the first time in history the American Medical Association supported a ban on an abortion procedure.

Q. What time frame was that?

A. It was about May of '97.

Q. And HR 1122, you understand it was a prior version of the Partial-Birth Abortion Ban Act at issue in this case?

A. Yeah. Worded differently, isn't it?

Q. Excuse me?

A. Worded differently? A little bit or I don't know, but yes, it is another rendition of that bill.

Q. Yes. It's true or is it true that the AMA, to your

knowledge, does not support the Partial-Birth Abortion Ban Act of 2003?

A. What happened is what I said, because of the consensus building, with the changes they made --

MS. CREPPS: Your Honor, I'm going to object at this point to lack of foundation.

THE COURT: What foundation is lacking?

MS. CREPPS: How he would -- saying what happened here. I don't think that he has laid any foundation for his knowledge as to what happened with the AMA, as far as the Partial-Birth Abortion Ban Act of 2003.

THE COURT: That will be sustained. If you want to lay some foundation about, for example, is the doctor currently a delegate to the house, if so, is he aware of their change in position.

BY MR. HENRY:

Q. Doctor, are you currently a delegate to the AMA?

A. I'm currently Chairman of the Illinois Delegation and was Chairman to the Delegation Coalition, which is a coalition of seven states and 96 delegates. Yes, sir.

Q. And are you aware of the AMA's position concerning the Partial-Birth Abortion Ban Act of 2003, and, if so, can you tell us how you know?

A. Well, I have been very active in that organization, and I just happened to be in a position that I'm on a first name

basis with the president, the president-elect, the chairman of the board, the chairman-elect of the board, and all the officers of the AMA and the board. Clearly, they are not -- they have not come out supporting this particular law.

Q. Do you know why?

A. Yes. I'm, again, trying to get a consensus. For consensus building, the reasons among physicians, American College of OB/GYN has 30 --

MS. CREPPS: Excuse me. I'm going to continue my objection to lack of foundation.

THE COURT: Well, that will be sustained. I don't think that one delegate to a body as large as the AMA can know institutionally why it is that body did or did not do something, and so if you have a 30(b)(6) designee from the AMA, perhaps they could express that. But what I'm worried about is, to my way of thinking, there is a difference between why something was done and what was done.

MR. HENRY: Yes.

THE COURT: I think this witness can tell us what was done. Why it was done, I suspect is a different question.

MR. HENRY: I would like to ask that question.

BY MR. HENRY:

Q. Can you just tell us without elaboration what was done with respect to the AMA's position?

A. The AMA's position, as I understand it, because the bill includes a criminal aspect, is taking a position which they traditionally take is that if a bill has -- criminalizes, potentially can criminalize the physician, they never support a bill that has that as part of it. And that is -- that's their public statement.

Q. Okay. Doctor, if we could, let's try to get back to the question I asked a minute ago. Did you co-author an article concerning late term abortion?

A. Shortly after that debate and, again, it became a very hot topic. And so there were other articles that had been written to JAMA, the Journal of the American Medical Association, on this issue and they were, now, taking an opposing position that they didn't believe there should be a ban, because they wanted to put it in a controversy section of JAMA. They were looking for an author who also would write an opposing position. Because I had supported the first position of the AMA, and they knew that. The editors from JAMA asked me if I would be interested in writing an article supporting the AMA position.

Q. Okay. Could you take a look at Defendant's Exhibit 626?

A. The next book.

Q. You have it, Doctor. Is that the article that the JAMA folks asked you to write?

A. It's so small that I think it is.

Q. Okay. You mean yes?

A. Yes.

THE COURT: Well, in all seriousness, that machine will, if you need to question the doctor about specific portions, that machine can be focused to give you a little bit better magnification, but I leave that to you.

MR. HENRY: Okay. Actually, Your Honor, I just would like to ask the doctor very briefly to tell us what the article is about if you would.

THE WITNESS: Specifically, the article is talking about abortions later in pregnancy. And by that, the definition they used were 20 to 27 weeks. So it's actually the later portion of the second trimester. We have broken it into two portions. One specifically related to intact D & X, which was the subject that initiated this, and I had the most interest in. But for the sake of completion, they wanted the entire area addressed. So I did exactly that. I divided it into two sections. One specifically on intact D & X, and then talked about maternal considerations, the fetal considerations, the ethical considerations, and the work that was going on in the public and the professional legislative arenas. Then I did the same thing for just looking at other -- just any abortions after 20 weeks.

BY MR. HENRY:

Q. Okay. And was that article peer reviewed?

A. In an issue this controversial, I'm sure it was double peer reviewed.

Q. And could you describe the research into the medical literature otherwise that you did, if any, with respect to that article?

A. Let's say using -- first of all for simplicity, education, training, experience being an obstetrician gynecologist, teaching gyne-surgical techniques and treating complications of abortion in my office, and patients in my office who have had abortions and come back for care. All those kind of things. So my personal experience as well. But I also did review the literature. Did, again, I had talked with another physicians who performed some of the different procedures. So it was a compilation of general education, training, specific review of the literature, and internet searches looking for literature in this country and others.

Q. Doctor, have you testified in court regarding abortion methods?

A. In Ohio, in the Ohio case, I was an expert.

Q. Would that be Womens Medical Professional Corps versus Taft?

A. Correct.

Q. And that was in the Southern District of Ohio?

A. Correct.

Q. When did you testify in that case?
A. I think it was 2000.
Q. Okay.
A. Or early 2001.
Q. On what subjects did you testify?
A. We actually covered all the same areas, and they did go into detail. On that, it was obviously specifically limited to intact D & X, and we covered everything essentially that it covered in my paper; looking at the medical aspects, the maternal aspects, the health risk of the maternal well being, the fetal considerations, and talked about pain, and then went through the ethical considerations related to this procedure. And used the different ethical arguments that the AMA emphasis had used, and then went through the general, the public perceptions, the media, the politicians and the entire things that are in this article.
Q. You would say you were testifying as an expert witness?
A. Correct.
Q. All right. And did that service as an expert witness in that case -- did that affect your familiarity with abortion?
A. Again, significantly, because there had been some time between my writing this article and testifying in Ohio, so, again, I had to do a literature search and review a number of additional articles, and try to get as much information as I could.

Q. Doctor, can you tell the Court why you don't perform abortion procedures on live fetuses?

A. The reality is, I went into medicine because I wanted to try to preserve life. I'm a very positive person. I very much enjoy doing obstetrics. And in talking with women in positive situations. Obviously, sometimes you have things happen, and you have to talk to them when they lose a child and have a miscarriage, or have breast cancer and those things as well. But to actually cause a fetal death would not make me feel comfortable. In my office, patients are referred. They go have the abortion, they come back and see me. None of them want to go back to the abortion clinic for their two-week checkup. They come back and see me.

MS. CREPPS: Your Honor, I'm going to object at this point this answer is nonresponsive.

THE COURT: I think the answer is concluded, and I think as it's concluded, it's enough responsive that I'll let it stand. Go ahead and ask another question

BY MR. HENRY:

Q. Doctor, have you ever been actively involved in supporting other restrictions on abortion, aside from the partial-birth abortion issue?

A. I have not.

Q. Doctor, I want to ask you some questions about some of the methods of second trimester abortions that you have

mentioned. First induction. You previously described you have performed inductions for pregnancy terminations, I think. Let me ask you this: Do you have an opinion concerning the safety of induction as a termination method? And I'm talking specifically during the second trimester.

A. Specifically during the second trimester, yes.

Q. Are you talking from your experience?

A. Talking from my experience, talking from the experience at the hospital where I'm very actively involved and have done quality control committees there as well. In my reading the literature and various textbooks, and some of the current textbooks, the ones we talked about, as far as clinicians, management to surgical and medical abortions, and chapters and various books that I've read who all refer to inductions as being, at least, comparable to D & E after 20 weeks.

Q. Okay. And how would you compare the preparation of the cervix for an induction termination situation with preparation of the cervix, with regard to childbirth or full term delivery?

A. We do some similar things. We usually don't -- at term, we usually wouldn't use laminaria, but we actually do things that are in some ways similar. If you are actually trying to do somebody at 38 weeks, we actually have something called an EZ. You put a Foley catheter into the cervix and

run normal saline through it so you're EZ is extra amniotic saline infusion. You're kind of irritating the end of the cervix with normal saline, which, in a way, kind of stimulates the cervix and starts the effacement process, and in many ways, is doing things very similar to laminaria. And often we'll start those, especially if we need to induce somebody for a medical reason, and the cervix is not ripe, it's not ready for induction. So we'll -- by doing that, you can soften and make it more readily available. Sometimes we use Cytotec. Sometimes we start Pitocin. Depending how long and thick the cervix is, but you're doing an induction.

Q. When you are talking about sometimes there, you're talking about at term deliveries?

A. Correct. The definition of term is beyond 37 weeks.

Q. So when you're doing induction termination during the second trimester, I believe you testified earlier that you would use laminaria and/or Misoprostol; is that correct?

A. Correct. Depending, again, on the cervix, sometimes we use laminaria to just make it easier. If it seems like it's soft and partially effaced, we may just go right to the Cytotec. Cytotec is just one of the Prostaglandins. It's newer and it just is extremely effective. And the beauty of this, a lot of the other things you have to give my injection or they are much more expensive, you have to keep

them in the refrigerator. Cytotec costs 50 cents, a dollar a pill. You break it into pieces to use it, so you don't even use a whole pill. It's out there. It's available. It's not what it's on the market for. It's highly effective for that reason. Part of the reason I wrote the protocol for it because another article had come about questioning whether it should ever been used in obstetrics and that, and the OB community tried to respond, along with ACOG, and did get Searoe who makes it to kind of back down and allow us to use it.

Q. Doctor, you previously commented on the comparison of the safety of induction versus D & E. Did you run through that comparison, as far as your opinion on the safety issues with respect to -- let's start at 14 weeks and maybe take two week jumps. And just let us know for each two-week period what you think the relative safety of induction D & E is?

A. As I said, probably most people would still feel pretty comfortable just doing a suction and curettage after 14 weeks.

Q. Okay.

A. I know some people are a little bold and go further and might use a larger suction cannula do it all the way up to 16 weeks, recognizing they still may have some additional products in there that they need to withdraw. But 14 is the

average kind of time you do that. Going beyond that, probably -- actually for years, the kind of gray zone was the 14, 15. People weren't quite sure what to do there. A lot of them sometimes wouldn't do it. They would do it before or after. But D & E, probably for most of the literature, probably D & Es between 14, and probably even say 20 weeks, what do you think? Between 14 and 20 weeks they are probably -- okay. I'm sorry. I shouldn't have done that.

Q. Thank you.

A. There is probably more safety data on those than inductions. Many of the book chapters, many of the articles I have read all say that beyond 20 weeks -- at best, most would say they are comparable. There is not a strong preference for one or the other. My preference, my argument is that induction -- it's just more physiologic. You're basically doing what the body was going to do anyway. And I feel, theoretically anyway, and there is some data I could kind of show -- and we'll see -- you want to get back to weeks by weeks. But it's just more physiologic. If it's a more physiologic thing, it's like a woman normally being in labor. You should be doing less trauma to the cervix, you end up with less, overall, problems.

Q. Doctor, are you familiar with a study by a Dr. Autry and others comparing induction to other methods of abortion

during the second trimester?
A. Yes, I am.
Q. Would you please turn to Defendant's Exhibit 545. And for the Court's reference, I believe this is also Plaintiff's Exhibit 19. Doctor, is this a study by Dr. Autry that compares induction to other methods of abortion during the second trimester?
A. Correct.
Q. Okay. Could you, just very briefly, summarize what the study says?
A. What they did, they took -- it's a retrospective study of 297 women who underwent either D & E or medical abortion, and they compared the two. The range here was 14 to 24 weeks, and I already said at 14 to 20, probably I would say D & E is preferable too, and I'm more looking at the 20 and beyond.
Q. Let me ask you, is this study different from prior medical literature comparing D & E and induction during the second trimester?
A. Because it covers a broader base, it's covering a wider portion of the second trimester.
Q. Did the prior literature involve inductions using -- well let me ask you this: The induction methods or method that is used in this study, did it involve the use of Misoprostol?

A. Two things. In one, they did use Misoprostol in the majority of them, but not in all of them. And I actually was kind of pleased to point out that even though they had -- I'll talk about their complication rate in a minute. But when they used Misoprostol, they had much fewer complications. In fact, in the complications they had, even though the nonMisoprostol inductions made a very small percentage of the inductions, a large percent of the inductions were all in that small percent. So I think you kind of look at it in today's -- what we do today, you should kind have excluded those ones that weren't done with Misoprostol. It kind of skews the data, because it increased the complications by not using the Misoprostol.

Q. I asked you, the fact there are inductions involved in this study that use Misoprostol, does that distinguish it from the prior medical literature?

A. Yes. Because, again, it's a newer medication. In some of the old medication things -- when they talked about inductions in the old data, and especially in the '75 to '81, in '81, in fact, they were talking about instilling saline into the uterus, instilling urea into the. Uterus hopefully nobody does that any more. There is risks and complications to that, and I don't believe that would be a modern way of doing it.

Q. Can you tell the Court when Misoprostol came into use

for labor induction?

A. I will say about five or six years. In that range. Maybe a little before that.

Q. Okay. With regard to this study, Doctor, are you aware of any shortcomings or limitations with regard to the study? Let's talk about its methodology.

A. Okay. When I was trained, again, I think I had a very good mentor. We didn't just look at the summary, the beginning, and the conclusions at the end. That really doesn't tell you anything about the study. If you really want to evaluate a study intelligently, you look at the materials and methods. You look at what patients they included, which ones they didn't. How did they actually do it? Because it's the only way you really know. You should have faith in the study.

Q. Have you looked at the methodology of the study as reflected?

A. A couple of concerns I had, one, as I said, they were inconsistent in the types of inductions they used. But in general, the inductions are done in hospital based patients. In the hospital, much better record documentation, the doctors and nurses and everybody are there. Much better follow-up because you have a relationship with those physicians and nurses, and you're going to know the complications. The D & Es were mostly done in clinics. And

a lot of those patients were referred in, and then they leave and they are never seen again anyway. In both -- I'll go to the Ohio case. The physician there who -- they actually -- one of the questions they asked him was I know you try to get follow-up on your patients. What percent of patients that you do these procedures on do you get follow up on, and the answer was 36%. Two-thirds, they don't know about.

Q. Doctor, if we could kind of stay on the study?

A. Sorry. I'm just trying to point out that when you do something in the clinic, you don't have the same follow up. My point is that your complication data may not be as good, because you just didn't get the follow up on those patients. And, again, in my experience that's the same case. Patients have a procedure done at an abortion clinic and then come to me for follow up. So I don't think it's as accurate. That's why I'm saying it's a short coming in the study.

Q. You're saying, that in the study, the D & E abortions; is that correct?

A. Correct.

Q. It's your understanding that they were done on -- did you say an outpatient basis?

A. Yes. With lesser follow up, and the study points that out. The study says one of the shortcomings of the study is we didn't have follow up, the same follow up on the

patients. Another major concern I had, and it's certainly up for debate, is how do you define your complications. Because that's going to be a huge issue in the percentages you're going to get in one or the other.

Q. Doctor, could I ask you, how did this study define complications?

A. They just define complications as any of the following events were reported as complications: Field medical induction, if it didn't respond, they went and did a D & E. And so actually turned it from a medical induction to a D & E. Hemorrhage requiring transfusion. Nobody would argue with that. Infection that required antibiotics. Nobody would argue with that. Retained products of conception that required a D & C. It's a known part of medical abortions that 5 to 10% of the time, the placenta won't follow immediately afterwards. I'm not sure that's a complication. It's a known part of the procedure.

Q. Doctor, can I ask you a point about that?

A. Sure.

Q. You said it's a known part of medical abortions. Are you talking about medical abortions being inductions, correct?

A. Correct. That's how I'm using that medical inductions. Actually, the way I was trained, we do them -- if you put, say put Cytotec in a small dose, 25 micrograms every four

hours. If the last dose was three hours ago and the patient passes the fetus, and you wait 15, 20 minutes and it's nothing is happening, some people would go ahead and do a D & C. I would put another Cytotec suppository in there and probably within the next half hour, have the placenta. So I have a very low situation where I have to go and get the placenta. Even when I have had to do that, that's not very often, often right there in the delivery room, you can just grab a ring forceps and kind of tease it out. Sometimes you can tease its out with your fingers, and so you're just kind of finishing assisting the process. I really wouldn't call that a complication. The reason I'm making such a big deal out of it, that accounts for 75% of their complications. So if you don't count that, the numbers would look totally, totally different. And, again, taking that into account, taking into account that they were looking from 14 to 24 weeks, I don't think this study tells you in any way, shape, or form that D & Es are better or safer method after 20 weeks than induction. I just think there are too many flaws there that you can't use this study to say that D & Es are better than induction after 20 weeks.

Q. Doctor, you expressed your view that you don't consider a retained placenta in an induction abortion situation to be a complication. Do you know, is your view unique in the medical profession?

A. I know it's not unique, but it's also not universal. Certainly open for interpretation, and the authors would be able to say that's what they wanted to use as a complication. Again, if you actually use CDC complications for abortion, you have to have severe hemorrhage where you need transfusion. You need to have a temperature of 103. You need to be hospitalized for 11 days or have a major surgical operation. I don't think that fits in any of those. So it's a soft thing, and the reason it's so important is because it was far and away the major complication. If you didn't count it and if you looked at just after 20 weeks, I think you would have a totally different outcome to the study.

Q. Doctor, just by way of clarification, do you know in the study what the two competing complication rates were?

A. I will have to look it up. They were dramatic but for the reasons I said. They were very dramatic. They have 4% versus 29%.

Q. That 4% being with respect to D & Es?

A. Yes. Those numbers tell you there is something. Because nobody has ever said the distinction is that great.

Q. Doctor, I would like to ask you about intact dilation and extraction or intact D & X?

A. You want me to put this away?

Q. Yeah.

THE COURT: I think the lawyers ought to, when they are asking a witness questions from these big books, they ought to be required to hold the big books themselves. And then that will remind them that handling these things is a little bit like lifting weights.

THE WITNESS: That's a very good idea.

THE COURT: Go ahead.

BY MR. HENRY:

Q. Doctor, are you familiar with a method of abortion that has been referred to as intact D & Xs?

A. Yes, I am.

Q. Is it sometimes referred to or is it similar to a procedure known as intact D & E, to your knowledge?

A. Yes. There are several different people who use different means, and whether it's McMahon or Haskell, or I will call it intact D & X, because that's what the American College of Obstetricians and Gynecologists wish to call it. And that's what the American Medical Association has said is the appropriate term, and they have defined it.

Q. And how did you become familiar with this particular technique?

A. For the reasons we said before, sitting on the AMA committee. And I'm also strongly involved in American College of Obstetricians and Gynecologists, and talk to the President of ACOG, at the time that they formed that

definition.
Q. And when you're talking about that definition with respect to ACOG, are you talking about the statement on intact dilation and extraction?
A. Correct.
Q. Dated approximately 1997; is that correct?
A. I can look it up. '96, '97, yes.
Q. Did you take a look at Defendant's Exhibit 651? Is that the ACOG statement you're referring to?
A. It appears to be.
Q. Could you also take a look at Defendant's Exhibit 580?
A. 580.
Q. I believe earlier you had mentioned Dr. Haskell. Defendant's 580 is a paper entitled Dilation and Extraction for Late Second Trimester Abortions by Dr. Haskell. Have you read that paper before?
A. I definitely saw his presentation National Abortion Federation, and I'm not 100% sure this is the same one. I would have to look at it a little bit.
Q. Is there any other way you made yourself familiar with the procedure known as intact D & X?
A. Again, speaking with different physicians who do it and, again, speaking with physicians at the AMA. Again, in that room, there were probably a thousand physicians from all over the United States in all specialties. And the American

College of OB/GYN had their delegation there too. So I frequently speak with them.

Q. Based on what you have learned, could you describe to us the X of the intact D & X procedure as you understand it?

A. Again, there are multiple definitions, so I'll use ACOG's, because it's an organization that I belong to, along with some of the others. Their definition is a gradual dilation of a cervix, usually over days, usually over two or three days. Once there is completed dilatation, there is instrumental inversion, what we a podalic, an internal podalic inversion of the fetus from a vertex presentation to a breech presentation. You reach in -- usually they reach in with an instrument, try to grab a foot. They rarely can get both, and forcefully turn the fetus in the uterine cavity to make it do a somersault so the feet present. The third is then basically doing a total breech extraction. As a resident, I probably did 50 of those and probably done 100 in my career, and that's what they are doing. They are doing a total breech extraction on a fetus, typically between 20 and 26 weeks. That's the most common time Haskell says he uses it, and it's a twisting, turning motion with a certain amount of traction. And depending on cervical dilatation and potential trauma to the cervix, pulling it through the cervix. And depending on how much dilatation and size of the fetus, sometimes it will come

down as far as the head, and then it will stop there because in most babies, the head is the largest part. What he then describes, you dilate the cervix, turn the fetus, do a breech extraction to the head, then Haskell's description and basically what ACOG's -- mechanically he puts his hand on, kind of pushing the shoulders down with a couple of fingers, tries to push the fingers up with a couple other fingers, which sounds pretty hard to do, and tries to get in between, so you can just place the scissors inside the fetal skull, pierce the skull. And then he takes a suction cannula and removes the intracranial contents, which then collapses the skull, and then basically, as ACOG says, the partial evacuation utero contents, and then to affect the vaginal delivery of a dead, but otherwise intact fetus.

Q. Doctor, do you know, do all physicians who perform the intact D & X procedure perform all the aspects that you have just described?

A. Speaking to physicians who have done it in reading declarations and depositions in the Ohio case, and in this case, no, they do not.

Q. So there are some variations. Is that what you're saying?

A. Correct. Correct.

Q. Would one of the variations be crushing the skull instead of suctioning the brain?

A. Some crush the skull. I heard one who just kind of puts their finger in the skull, pierces through it, then just kind of breaks up the brain, but I'm not sure how you do that.

Q. And I believe you mentioned earlier, when you were talking, that it's typically done in a 20 to 26-week time frame; is that correct?

A. Everything I have read, people I have talked to, Haskell's initial report, which is basically is a -- in'92 when he presented that to the National Abortion Federation, I would consider it it's a cookbook. I don't mean that in a negative term. He specifically says you do, this, this, this, and this. It's a recipe. So he very specifically says how he does it and what he does.

Q. Okay. So on the gestational age question?

A. In that cookbook recipe, he says this is useful to 20 to 26 weeks.

Q. Do you have an opinion, or do you know whether the technique would be useful, prior to that time?

A. From, again, numerous readings and both articles and book chapters, and depositions, and declarations, it seems I'm sure some people could use it at 18, 19, 20 weeks, but it seems the majority would say, and some have actually said in their declarations, before 20 weeks, it's harder. Less likely, you are going to get an intact fetus because the

friability does change as the fetus matures and actually in one of the -- and I won't mention names.

Q. Doctor, let me ask you, what does friability mean?

A. How easy does something break apart. If you are trying to extract a fetus at 14, 15 weeks, it's much softer much more cartilage, soft tissue. If you grasp it, you're probably just going to pull off whatever you grasp. As you pull on it it's not going to stay intact. It's not going to come down in one piece, because it is too soft to do that. It's cartilage, not bone. It's just more friable tissue.

Q. Doctor, are there features that you consider specifically distinguish the intact D & E and D & X procedure from, say a traditional disarticulation D & E?

A. No. There are several, I mean and there may be nuances, there may be -- I'll give the several things that are appearing to me. They may not all be 100%. As you go through the definitions. In general, you are putting laminaria in, which do carry some risks, by putting them in multiple times carry some risk. But you're trying to get a greater dilatation of the cervix. To do the E, you needless dilatation, because you're crushing the parts or the parts you're bringing through the cervical os are smaller. For intact D & X, you need, at least according to Haskell, at least five or centimeters of dilation. To do that, you're usually putting laminaria in and putting more laminaria in.

The first day, Haskell says he puts in half-a-dozen, so the process is a three-day process. The first day, he puts in about, first mechanically dilates the cervix. Puts in about a half-a-dozen laminaria. The patient goes back to -- if she's from out of town, back to a motel. Is having cramping and discomfort, and hopefully, she has a friend or somebody with her. The laminaria are expanding, dilating and dilating the cervix over that 24-hour period. The next day, he sees her in the office again, removes those laminaria, and puts in, by his definition, 20 to 25 laminaria. That's a lot of laminaria. And you're forcing them in to get maximum expansion of the cervix. Patient goes wherever she goes again for another 24 hours, and then comes back to his clinic again. And on the third day, he pulls out the laminaria and sees how much dilation he has. And, hopefully, he has enough that he feels he can do the procedure. At that point, then she goes into the operating room, and anesthesia, and prep, and then he breaks the bag and uses suctions. Gets out the fluid, and then does then what we described as the intact D & X. How much detail do you want?

Q. That's fine. So you mention the kind of multi-day aspect of the process?

A. Yeah, and the amount of cervical dilatation.

Q. Right. Anything else?

A. The actual procedure. You're doing an internal podalic version, which, as I have said in my paper, Williams Textbook of Obstetrics says there is seldom, if any, indication for doing this procedure, other than maybe for the second twin. He does go on to say that there is risk of rupturing the uterus by doing that procedure and he actually says it's the most common cause of traumatic rupture of the uterus. It is true, the whole process is smaller here, but if you are still doing it at 25 weeks, you do it in twins at 30 weeks, that's getting pretty close to the same thing.

Q. Doctor, you mentioned Williams Obstetrics. Do you know the current version of Williams Obstetrics as the assertion that you talked about?

A. What they have done, because that procedure is done less and less in obstetrics, again, being an editor an reviewer for textbooks as well. As new information comes out, now external versions are much more common than internal versions, and you only have so much space in the book. And you only have so many pages. So they have expanded the section on external version, which is now much more common obstetrics, and you have a much smaller paragraph on internal versions.

Q. Okay. Doctor, if I could, I wanted to ask you, based on your training, experience as an OB/GYN, your knowledge of medical literature, do you have an opinion as to whether the

intact D & X procedure presents significant risk to the woman?

A. I believe it does.

Q. Could you just briefly list kind of what those risks are?

A. My concerns with the procedure are several things that distinguish it from the traditional D & E. The fact that it -- more commonly for D & E, you can dilate the cervix over one day. There may be exceptions. But in general, more commonly one day. More commonly for a D & X, you're dilating it over two days.

Q. Does that present a risk?

A. Presents several problems. Laminaria are these little seaweed sticks that you're placing in the uterus, and they have to cover the entire length of the cervix. They have to be from the outside to the inside to make sure the entire cervix dilates evenly. Again, infectious disease is my area of expertise. You put a foreign body that's sitting in the vagina and inside the uterus, that vagina normally has five to nine different types of bacteria in huge, huge quantities, ten to the nine. Bacteria have a better chance moving along the laminaria and getting inside the endocervical os and running a risk of infection, because they are in contact with the vagina, and up against the amniotic sack. That's the issue. There is a certain amount

of trauma in just the fact there's a foreign body. There is a risk. By doing that two days, it's just there longer. There is more risk. In the descriptions I have read on occasion, including Haskell, he says sometimes when you go back the second day, the bag breaks. But he still puts his laminaria in, and still waits for the next day. Well, once the bag breaks and you have a foreign body sitting there and the bacteria are getting from the vagina to the uterus, that's a recipe for disaster. They use prophylactic antibiotics during all this, so they are trying to do something to protect against that too. Again, it's different from D & X because the duration is longer.

Q. You're talking about the risk of infection?

A. Correct, and trauma to the cervix. If you are dilating the cervix to a greater degree, some of it is mechanical. You mechanically dilate first before he puts the first laminaria in. I have been told by some -- the people, some or at least one of the people who does that, that they force as many laminaria in as possible on the second day because they want the greatest amount of dilatation as possible because that will make the delivery process easier. So it's not just slow dilation from laminaria taking in fluid, there is some mechanical aspects to it too. And that, I think, does more risk to the cervix. And, clearly, at least theoretically, that risk --

Q. What kind of rise to the cervix are you talking to?
A. You traumatize the cervix. And there is information on earlier ones, which even dilate mechanically now, dilate the cervix either from 10 millimeters to 11 millimeters, it increases the risk of an incompetent cervix later. The cervix not being able to maintain a pregnancy or maybe just weak enough you have more preterm deliveries. And preterm deliveries are the single greatest medical obstetrical problem in the United States today.
Q. So are you saying preterm deliveries are caused by the incompetent cervix?
A. By weakness of the cervix.
Q. Okay. Are there any other aspects of the D & X procedure that contribute to --
A. The next thing that is unique, is that you are doing the internal podalic version, and we talked about that. Yes, it is smaller, but so is the uterus smaller. So, relatively, the uterus, and the placenta, and the fetus are more comparable. And, again, you're doing them later, so the uterus is already starting to soften more, and there is greater risk of trauma in uterine rupture. By mechanically doing that, this is not easy. We are physically, forcefully pulling this. And I don't think people have any idea -- when we gently deliver a baby with low forceps, sometimes your feet are on the thing, you're going like this. The

things we do are mechanically forceful.

Q. So have you done one of these podalic versions?

A. I have done numerous podalic versions.

Q. At term?

A. At second twin, where you're all of a sudden heart tones look bad, one twin is out, one twin is in. You have either got to get that twin out of there or do a crash cesarean section. In that environment and doing the internal podalic version, I trained at a time when those were more common and more acceptable, and today, probably more people would just do a C section. They wouldn't even do it. But in doing that, the risk of ruptures there, first off, these are rare things. Pulmonary embolus -- we do 500 or a thousand before you see one. But it's there. When you separate and you are doing that much force, if the placenta separates, the maternal blood vascular supply is then exposed. And some amniotic fluid or some of the vernix from the baby are particles and go along, and you have a pulmonary embolism and amniotic fluid embolism, which is serious, potentially half of them dies. Potentially life threatening. Assuming that doesn't happen, you finish, you do the breech extraction, which is, again, doing what we used to do just to deliver the babies vaginally, when they are breech, but again, stopping at the neck, not all the time, some of the time, and concerns me, if it doesn't stop at the neck. What

do they do? Just deliver it but we won't go there. It just that does happen.

MS. CREPPS: Excuse me. I couldn't understand the last part of that answer. Could I ask --

THE COURT: The answer was.

MS. CREPPS: I'm having a very hard time hearing.

THE COURT: Pardon me?

THE WITNESS: Didn't hear you.

THE COURT: Well, I will tell you the last part of the answer was something to do with if the head doesn't hang up at the cervix, and it's delivered, it concerns him what do they do then? And he says we won't go there. And then he was about to go on with his answer when you stood up and you said something. And I think it was in the form of an objection, that the answer was becoming narrative.

MS. CREPPS: Well, that would have been my objection, Your Honor, but I can't understand. I couldn't understand what the doctor was saying is really my problem. His voice was fading. He was still talking, but I couldn't understand what he was saying.

THE COURT: All right. Well, let's put another question to the witness and we'll ask him to speak into the microphone again. Thank you, Doctor

BY MR. HENRY:

Q. Doctor, are you aware that some abortion providers use

Misoprostol either alone or in combination with laminaria, when performing an intact D & X procedure?

A. You're changing the subject, but, yes.

Q. Okay. My question is, does that, in any way, impact the potential risk, in your opinion, of this procedure?

A. Yes. Reading different declarations and depositions, this process is clearly continually changing. And I don't know where it's going to end up. But the reality, again, of Cytotec is as effective as I believe it is, and I believe the literature says it is, and may have -- it's very hard to control. Because you don't know when to use it, how much dilation you're going to get how fast. Clearly, it can soften the cervix. Clearly it can dilate the cervix. I'll give you an example of a lady I was inducing at term and I had three people in labor. I just delivered one and the other one had Cytotec. And I checked her myself. She was not even close. Nothing was going on. It was two in the morning. I told the nurses, I'll go home. Call me if anything happens. They called me two hours later, this is a lady having her first baby. It was closed, and she was complete and the baby's head was on the peritoneum. So the Cytotec change things that fast. My concern is that you don't have any control. I think some physicians use it. Some are afraid to use it because of that. You may end up just giving it, and two or three hours later, you're

delivering the fetus. Then what do you do?

Q. Does it affect any risk, with respect to the D & X procedure, in your opinion?

A. If -- it may. It serves some advantage, if you really actually can use it effectively to dilate the cervix, and the cervix is more and more out of the way, there is probably going to be less trauma to the cervix.

Q. Doctor, do you believe there is any risk associated with this procedure when -- with regard to the aspect of this procedure, when it's used of piercing the skull and suctioning the cranium contents?

A. My theory in that, as I pointed out, the way Dr. Haskell describes it you're trying to pull down on the head all with the same hand, and with the other two fingers of the same hand, push the cervix up out of the way, so you can see the lower portion of the head, if it's trapped there. And then trying to slide in the scissors and pierce the skull. In most of the other D & Es, they are not using, at least I know they cut off portions of the baby sometimes, the fetus or partially delivered child, whatever word you want to use. But this is going into the skull, into the cervix somewhat blindly, depending on how far down it is. You're in the cervical area. It is quite effaced. Very vascular area. The pregnant uterus has a tremendous blood supply. The uterine arteries come in a little above that at the level of

the internal os. Theoretically, using sharp instruments there poses a risk of cervical laceration. And I'm not going to say it's a tremendously high risk, but you're using sharp instruments blindly in a very vascular area.

Q. Doctor, we have talked about some of the risk. I would like to talk about some of the possible or arguable advantages of an intact D & X procedure. Would, if the intact D & X procedure, you know, where the fetus is removed intact up to some level, would it present any significant advantage, with respect to other abortion methods, with regard to leaving fetal parts or fetal pieces in the uterus?

A. Clearly, if you have everything intact, that concern would be significantly less. At the same time, with most D & Es, it's not that many parts. You can both -- if you have all the parts out, put them back together and see if the fetus is all there. You can feel with your fingers, and I'm going to say is the golden standard, I believe you should have an ultrasound sitting right next to you all the time. And I think that any question, you should be using the ultrasound as well. There is numerous articles on just using ultrasound, even just to do the procedure dramatically makes it safer both in grasping and in telling you whether there is anything still there.

Q. That was my question. So you are using the ultrasound to determine if there is any fetal part left?

A. And you use your fingers, and you can take the parts out; you have them, and look at them, and you're still going to go back in and suction and make sure you have the placenta, and you have all the tissue.

Q. And you mentioned the grasping aspect of it. Are you saying ultrasound affects any risks that would be posed by that?

A. Significantly decreases the risk, and there is a study again in the Clinical Guide to Surgical and Obstetrical Abortions, and that using ultrasound decreased the risk from like 1.4% to .2%. There is actually a beautiful picture in there that I like, because the metal instruments reflect the ultrasound very, very well, they can see these two beautiful clear, white grasping things. You can see the skull there. You can see it. Picked it up nicely and more carefully slide out. It gives you better control. It's like you want to do something with the lights turned on in the room or whether you want to do something with the lights turned off in the room.

Q. So you're saying the use of ultrasound would reduce the potential for --

A. Both trauma and leaving any fetal parts in there.

Q. And trauma, that would be from any instruments you're using?

A. The risk and, again, it's the experience of the

physician makes a huge difference. I have done 500 D & Cs or something, and I have never perforated the uterus, and that's in pregnancy and not pregnancy. It's just finesse and skill and your ability to do it. If somebody doesn't have any finesse, then they are much more likely going to go through the uterus, because they don't know where they are.

Q. Doctor, are you aware of any published studies comparing the safety and risk of intact D & X with dismemberment D & E? I'm talking about published things.

A. I'm not aware of any published studies.

Q. During the course of this case, were you made aware of a study that had been submitted for publication that compares complications or safety of intact D & X versus disarticulation D & E?

A. I did see that study.

Q. Could you turn to Plaintiff's Exhibit 27? Okay. Doctor, have you reviewed the study that's reproduced at Plaintiff's 27?

A. I have.

Q. Can you briefly tell us what the study is, and just give us a quick summary?

A. Basically, it's a study of 383 patients comparing D & E, traditional D & E, and their definition of D & X. I have not seen a definition like this, because it certainly doesn't follow ACOG's, or Haskell, or McMahon's definitions

of the intact D & X. Seems to me, they kind of made up their own.

Q. Do you know how many studies were involved in each group?

A. Out of the 383 patients, they had what they called intact dilatation extraction in 120 cases, and 263 cases of D & E.

Q. Can you tell us what the results of the study were?

A. What they said is they looked at the complications. They said the overt complication rates were essentially the same. There were no second trimester miscarriages. They did say, and seems very relevant to me, even though they said it wasn't. They said there were two of owe 17 or 11.8% of those 12% of the patients who had a D & X at preterm labor. Only 4.4 %, almost a three-to-one ratio of patients with D & E had a preterm labor. Because the numbers are so slow and one of the weaknesses --

Q. Well, let's talk about some of the weaknesses. Could you just kind of catalog what you think any of the weaknesses are?

A. Because some of the large weakness, still the numbers were so small and the number of complications were small enough that they didn't have any power. They didn't have any meaning where you could say they were statistically significant, because there is so few cases that something

would have to happen one and two, for it to even show anything. When things don't happen as often, you need many more patients to look at for the statisticians to tell you, this have a chance or enough power to actually distinguish a change -- a difference between the two. But even though the power was very minimal, there is no significance, statistical significance; a difference between 12% and 4% certainly would indicate a trend. And, certainly, if anything from the trend from that would clearly say D & Es are the better of the two. They have less preterm labor.

Q. Can you tell for sure anything from a trend, when you have statistically insignificant numbers?

A. You look at it and say maybe this deserves further studies. You certainly can't say they are dissimilar and just blow it off, when it's one is three-to-one. They also said that the complication rates were kind of similar and when you look at the complication rate for lacerations, which is what we are talking about, our concern about doing an intact D & X is that it's just bigger. If you bring something bigger through the cervix, the vagina, the peritoneum, you're going to do more trauma. I looked at these numbers myself, and I have to kind of come off the top of my head. The lacerations for D & X were like 3 1/2 %. The lacerations for D & E were 1 1/2% to, again, it was like two-to-one.

Q. Is that another trend?
A. It's clearly a trend. Numbers are so small that I can't say that's a statistically significant difference, but that's a fault of the study. The study has so few cases that you can't say anything is statistically significant. They conclude that the two are comparable. There is certainly nothing there that says D & X is superior in any way, and I would say the trends for both of those, which are major issues that I talked about in my paper, trauma to the cervix, preterm labor, those kinds of things defend-- would support that D & X has more risk than D & E.
Q. Are there any other concerns that you have with the study, methodology and your conclusions?
A. They have very small follow-up. They started out with that number of patients, but then for deliveries afterward, they looked at -- they only looked at those patients that subsequently delivered in their institution. So they excluded a great many of the patients. And you exclude them, you don't know whether that's -- how meaningful that is or not. They looked at 62 subsequent pregnancies which, again, the numbers are too small to be meaningful.
Q. Does the fact --
THE COURT: Hold on just a minute, please. The court reporter needs to change his paper. Go ahead.
BY MR. HENRY:

Q. Dr. Sprang, does the status of the study, as being in a prepublication status, as I understand it, does that concern you in any way?

A. The fact that it's not even published yet -- really haven't had any ability for the medical community to respond and make any comments. Sometimes, especially on controversial issues and issues like this, they will be discussed at journal clubs or at different hospital departments. Sometimes at various meetings, sometimes you'll even get letters to the editor kind of saying, why did you publish a study with such low numbers that nothing statistically significant or pointing out the trends were actually greater, and they had clearly more studies needed to be done. And when they came to conclusions that they did, it just didn't seem to me that their data is substantiated by the numbers they have. They concluded that, again, an abortion after 20 weeks with intact D & X appears to have similar rates as D & E. That -- certainly, the trend doesn't say that. They observe complication rates in subsequent obstetric outcomes appear comparable. I don't senior three-to-one in favor of the D & E comparable. And then all he did was gave ACOG's policy statement, so that it was not -- it wasn't consistent. It didn't meet with the data.

Q. Tell us what. I'm done with that. Doctor, have you

ever performed an intact D & X procedure?
A. I have not.
Q. In your practice, have you ever seen the need for it?
A. I have not.
Q. Your practice involves high risk obstetrics; is that correct?
A. Full range including high risk obstetrics and, again, I'm now president of a group of like 27, 28 OB providers. So I have seen a great number of circumstances. With our issues, they do clearly present them to me and I have never seen that.
Q. Would that be true even of situations involving serious maternal health conditions?
A. I have never seen a situation where a D & X would be the safest, the best, or the only procedure to use to protect the health of the mother.
Q. And that would be even in emergency situations where the pregnancy needs to be terminated and very quickly?
A. I have never seen a situation where intact D & X would be required, or the best procedure to do. In reading all the other declarations and stuff, I haven't seen a single physician who provides it do that. The AMA committee that I sat on could -- and there were several different obstetricians and Counsel on Scientific Affairs. Nobody could come up with a situation where the intact D & X would

be necessary to preserve the health of the mother. In ACOG, when they had their panel, could not come up with -- they couldn't come up with a single example where it would be, you know, the best, most appropriate alternative to save the health of the mother or to have a beneficial effect on the health of the mother.

Q. Doctor, have you ever performed a hysterotomies?

A. We perform them all the time. That's what a cesarean section is.

Q. How about hysterectomies?

A. All the time.

Q. Are you familiar with the risks that are involved with those procedures?

A. Clearly, any major surgery in that arena, both from the anesthesia, from the risk of bleeding, from the risk of -- anything we do, the risk of bleeding, hemorrhage, infection, trauma to surrounding tissue -- that's what we tell every patient every time, because that's what is true.

Q. Doctor, let me ask you to assume that a situation would arise in your practice in which a patient suffered from a serious health condition, and the physician had the option of either performing a hysterectomy, hysterotomy, I think on the one hand or an intact D & X on the other. Would it, ever be appropriate, in those circumstances, to utilize the hysterotomy or hysterectomy?

A. The circumstance I gave you where the patient was before me, and was actively bleeding intraabdominally, and I was in her abdomen, that clearly was -- the hysterotomy was the appropriate thing to do. Depending on the specific circumstances and cervical dilation and things, if somebody felt they could safely do a D & E, that would be a very unusual set of circumstances. But if that arose, I have people in our hospital who would do a D & E. I don't have any indications I could possibly think of where a D & X would be the thing to do.

Q. Dr. Sprang, is it ever necessary to perform an intact D and X on a living fetus during the second trimester, in your opinion?

A. No.

Q. Why is that?

A. Because there is both induction and D & E. And if somebody could describe for me some situation where, and I can't think of one, and nobody else can think of one, but say somebody came up with one, I would simply say at this point in time, there is so much information either trying to get the cord first, which the people in our hospital always do first, is try to cut the cord. And, obviously, the baby would exsanguinate or intrafetal Digoxin, or potassium chloride. It is becoming more and more common in the medical community and, in fact, in my institution, within

the last couple of weeks. Before, they used to just offer it to a patient if they wanted or kind of asked for it. Now it's the policy, at least at Northwestern Health Care, that every patient who under goes a D & E, has an injection and they use potassium chloride. They could have chosen Digoxin as well. The beauty of potassium chloride is you can easily -- and they are very good at what they do. They can easily see the heart. You inject a 20 gauge, 18, 20, 22 gauge needle directly into where the chambers of the heart. You can inject two and three C Cs, a couple of drops of potassium chloride, and there is immediate cessation of the heart. You don't wait, you don't do anything with the needle in there. You're watching the heart beat with the ultrasound, and it stops. So you have immediate death. You take out the needle and do what you need to do, and in that case, you're always doing it on a dead fetus, so you are never doing an intact D & X. Because intact D & X is on a live fetus. Another clear distinction, which I should have said before, major distinction, and from ethical points of view, a major distinction which I hope you get to, if you kill the fetus in the uterus, none of these issues are there. You know, it's within the body of the mother. The mother has the rate of her own body. She can control it. When the fetus is killed outside the body, in the delivery process, that ethical questions are raised. And the Supreme

Court has said, you know, it's different if it's during the delivery process, and there is a lot of arguments to get into there but I'll stop there.

Q. The techniques or the procedure you talked about just now for inducing fetal demise through an injection of potassium chloride, or I think you also said you could use Digoxin?

A. Digoxin.

Q. Is that similar in any way to an amniocentesis?

A. Yes and no. We are all, again, basically trained to do amniocentesis. And it is just placing a long, but it's very slender needle, through the abdomen. Again, I have done well over 100, and never had a problem and never, most of the patients say that was no big deal. And we do it under ultrasound guidance, so it's done well.

Q. What are you trying to do --

A. In an amniocentesis a couple of things. Most of the time, we are doing it about 16 weeks to remove fluid for genetic studies, for chromosomal studies. Sometimes, we are doing them at 27 weeks where we kind want to induce her, we didn't have a strong reason to do, it but to make sure the fetus is mature, you just take some of the fluid and send it to the lab, and they can tell you if the LS ratio, whether the lungs are mature or not. And so those kinds of things. Sometimes you use it for different medical reasons and

sometimes they use it, they can actually inject a needle, draw blood from the fetus and some hemologic conditions, actually make diagnoses directly on whether the baby has a blood problem or not. They can give transfusions right through that, through the sack. So it has some very useful things. And where I described the risk and complications to mother and, again, I'm aware of over a thousand just in our group. We say there is about half of 1% chance we may cause a miscarriage. It can break the bag and you may go into labor, and that, for a wanted pregnancy, is obviously a very serious situation. There is a very rare, small risk of infection. Any time you do anything, there's a risk of infection.

Q. Do you have an opinion as to whether the risk you just talked about with respect to an amnio would also apply with respect to the injection of KCL or Digoxin?

A. Yes and no. Obviously, the half percent risk of causing a miscarriage clearly there, but that is no longer a complication because that's the goal of the procedure. So you know it might expedite it in some way, but that's what you're trying to do anyway, so that complication is no longer relevant. The small theoretic risk of infection is still a little relevant, but nowhere near as much. When you're using it in an abortion procedure, you routinely are using prophylactic antibiotics as well, because they don't

do the injection until they have already put the laminaria in. So, you know, you're on the way to the do the abortion. More important, again, infectious disease is my area of expertise. The best treatment for anything if you think there is infection is to remove the infected material. If you are doing it for genetic studies, the mother goes home and nothing happens. If you are doing it to do an abortion, you're going to remove the products of conception. If by any tiny, tiny remote chance there is a risk of infection, you've removed the infection by delivering the products of infection, so the risks are just negligible.

Q. Doctor, are you aware of side effects from the use of injection of KCL or Digoxin?

A. For potassium chloride, because it is such a tiny dose and you're injecting it directly into the heart or at least into the thorax of the fetus, it's not going to get absorbed. Actually, if you inject it into the bloodstream, we would just be giving a little more potassium to the mother. That would be fine, because the doses are all such -- it's fatal for the fetus. It would be just a little more potassium for the mother. For Digoxin, similar. Digoxin is used to treat heart conditions. If you are in congestive heart failure, Digoxin may help you along. We have measured Digoxin levels in mothers who received Digoxin. If they get any, it's a very therapeutic dose. It's nothing bad. There

is some significant studies out there. I'm doing all these things. In one of the chapters, they about talk -- study again as presented actually at National Abortion Federation, where they successfully did 5,000 consecutive injections of Digoxin. They didn't even use ultrasound. They just stuck it in the amniotic sack, and it worked and they had no serious complications. I think they had a couple of times with maternal heartbeat went down a little bit, but went right back up. Sometimes they injected in the wrong spot. They put it in the uterus, they put it in blood vessels and still didn't do any damage. There is another, in the same chapter, talking about another 10,000 cases. So just that one thing. It's talking about 15,000 times they have used it. There is other papers out there with 150 cases and 400 cases. Part of the data that convinced my institution, my maternal fetal medicine physicians as group, to routinely use potassium chloride, is they had already been doing it in what's called selective reduction. And this is really, obviously, you have got a mother who has triplets, quads, quintuplets. And the concern is if you don't do something early, that her chance of actually having any babies is very low, because she's going to deliver at 20 weeks or something. So they actually -- I'm not sure exactly how they pick which ones. Actually they pick the ones that are closest and easiest to get. They actually inject two or

three CCs of potassium chloride. If there are five babies there, they may inject two of them. So they are using potassium chloride in a mother who is 13, 14, 15, 16 weeks pregnant, killing two of the fetuses in hopes that they'll just fade away and she'll go on and carry the other three. So they think it's safe enough to give to a pregnant woman, where there is another fetus sitting right next door. It's going to be alive and hopefully deliver healthy. And they have done it, and there is national published data over 400 consecutive cases where 100% of the time, they were successful in the injections. No mothers suffered any complications and so it's -- it's safe. And if you did that, the whole issue of what we are talking about goes away because there are no intact D & Xs. Because an intact D & X is on a live fetus that's killed outside the uterus. In this case, the fetus is killed inside the uterus.

Q. Doctor, can I ask you the question -- you mentioned earlier that you said OB/GYNs are trained in doing amnios. Given your experience and relationship with Northwestern University are OB/GYN residents today taught how to do amnios?

A. Across the board, I believe every resident who is trained at Northwestern is trained to do amniocentesis. I will say putting that needle just in the heart probably takes a little more practice, a little more experience, but

I would also say if somebody is doing these procedures, we are talking about procedures only done after 20 weeks. It's a relatively small number. It's a relatively small number of people doing them. If they can do those and are taking care of women in those circumstances, they should acquire the skills necessary to do it in the best fashion.

Q. Doctor, could I ask you --

THE COURT: Mr. Henry, just for your help, two things. It would be helpful for me to know if they are doing the interfetal injections prior to 20 weeks, and the D & Es. And, if so, under what circumstances? And then give me a sense of how much longer you'll be with this witness.

MR. HENRY: Actually, probably five more minutes at most.

THE COURT: All right. Go ahead.

MR. WARDEN: Your Honor, when you said they are doing it prior to 20 weeks, do you mean at Dr. Sprang's hospital?

THE COURT: Yes.

BY MR. HENRY:

Q. Dr. Sprang, could you address that question, please?

A. Yes. Yes, sir, they are. The comfort level -- part of the things we haven't said -- they have been doing D & Es at 15, 16, 17 weeks. Everybody is more comfortable if it's a dead fetus. By that, I mean in both in our hospital and in

other institutions, I have talked with physicians that are doing that. The patients are greatly relieved that we talked about fetal pain before. Here is a solution where there is fetal demise, and you don't have to talk about some of the other things whether it's D & E or any other procedure. So, yes, they are, and they think it's better for the patient. It's better for the physicians because everybody is more comfortable. It's better for the nurses that are in the room, because everybody is uneasy if it's a live fetus coming out of the uterus. So, yes, sir, they are.

Q. Doctor, could I ask?

A. I think, Dr. Carhart, in his testimony.

MS. CREPPS: I object in that the answer is no longer responsive.

THE COURT: That will be sustained. Go ahead.

THE WITNESS: I can't do that. Okay.

BY MR. HENRY:

Q. Dr. Sprang, just listen to the question.

A. Be focused. Okay.

Q. Based on your experience as an OB/GYN, can you tell the Court at what gestational age, in your opinion, a fetus becomes viable?

A. I talk about kind of peri-viability. I will answer your question directly. What do I mean by peri-viability. Just

like we talked about peri-menopause, around the time viability is likely. As modern medicine advances, the number keeps going down. But to directly answer your question, I'll say 23 weeks right now. And significant pieces of published literature and in my institution, a 23-week fetus has about a 15% chance of survival. A 24-week has anywhere from a 55 to an 80% chance of survival, in my institution. At 25 weeks, it's 80, and it just goes on from there. And different people would use different arguments. But I would say if somebody had cancer and they were told bone marrow will give you a 5% chance of living, I think most of us would pick, go ahead and have the bone marrow. 15% clearly is a reasonable number. You start talking about 22 weeks and maybe 1%. So I would say viability now, in most people, would say is around 23 weeks. Many people would say that you should use a cutoff that ultimately elective abortions have to have some end point where viability has to be taken into account in both the American College of Obstetricians and Gynecologists, and AMA have physicians that they are opposed to abortions and a healthy mother with a healthy fetus that's reached viability. So it becomes very important as a cutoff. A couple of years from now, maybe it will be 20 weeks. I don't know. But right now, I would say 23.

MR. HENRY: I have no further questions at this

time.

THE COURT: Shall we take our break now and come back in about 15 minutes?

MS. CREPPS: That would be fine.

THE COURT: Doctor, you may step down. We are going to take a 15-minute break.

THE WITNESS: Thank you.

(Recess from 3:41 to 4:00 p.m., all parties present)

THE COURT: Doctor, if you will retake the witness stand, please.

(Dr. Sprang resumed the witness stand)

THE COURT: Ms. Crepps?

CROSS-EXAMINATION

BY MS. CREPPS:

Q. Thank you, Your Honor. Doctor, the Evanston Hospital where you perform or where you practice is one of two teaching hospitals affiliated with Northwestern University; is that correct?

A. Correct.

Q. And what's the other hospital?

A. Prentice. Northwestern Memorial. The OB section is Prentice.

Q. Prentice, P-r-e-n-t-i-c-e?

A. Right.

Q. And you practice exclusively in the Evanston hospital;

is that correct, or you don't practice at Prentice?
A. I go there occasionally maybe to lecture students and things like that, but I don't actually practice there.
Q. All right. Are you acquainted with Dr. Cassing Hammond?
A. I know the name.
Q. And he is an obstetrician and gynecologist who also, he practices at Prentice, the other teaching hospital; is that correct?
A. That's correct.
Q. Is Dr. Hammond a well regarded obstetrician and gynecologist?
A. I'm not sure how I can answer that.
Q. Do you consider him to be a competent and a competent obstetrician and gynecologist?
A. I don't know him well enough to answer that.
Q. Are you acquainted with Dr. Marilyn Frederiksen?
A. Correct.
Q. And she also practices at Prentice; is that correct?
A. Correct.
Q. She's an obstetrician and gynecologist?
A. Correct.
Q. Do you know Dr. Frederiksen well enough or by reputation to have an opinion as to whether she's a well regarded obstetrician/gynecologist?
A. I do not.

Q. Are you aware that Dr. Hammond and Dr. Frederiksen are plaintiffs in other lawsuits challenging the Federal Partial-Birth Abortion Ban Act of 2003?

A. I did see that.

Q. Are you aware that both Dr. Hammond and Dr. Frederiksen do D & E procedures through the end of the 23rd week LMP?

A. Correct.

Q. Are you aware that both Dr. Hammond and Dr. Frederiksen perform abortions that they believe are covered by the Act?

A. I'm not sure of that.

Q. Doctor, you have done approximately 20 D & E procedures over the course of your career, all in cases of fetal demise; is that correct?

A. More or less. I'm sure I have actually done more, and it depends on whether you count the 14 weeks, or when I said that I was actually trying to go to ones that were more, 15, 16, 17, if you count 14s, I'm sure the number is higher.

Q. Okay. Well, I won't hold you to exact numbers, Doctor.

A. That's an approximation.

Q. And you estimate that the latest you've performed a D & E procedure is approximately 17 weeks?

A. That's correct.

Q. And you've done approximately 20 inductions for purposes of removing a dead fetus; is that correct?

A. I'm sure I've done more. It was just kind of a low

estimate so I couldn't be accused of saying I did more than I did.

Q. Okay. And that was the estimate you gave at your deposition?

A. Yes. Yes.

Q. You acknowledged it was only an estimate?

A. Correct.

Q. And most of the induction procedures that you've performed for the purpose of removing a dead fetus have been at 20 weeks or later but a few at 18 or 19 weeks; is that right?

A. Correct. Correct.

Q. And I believe you stated this on direct examination, but you have never performed with the one exception that you described, you have never performed a procedure on a live fetus, a termination of pregnancy on a live fetus?

A. With intent of killing the fetus, no. There are people who come into the emergency room at 15 and 16 weeks in labor with infection and stuff and half the baby is in, and half the baby is out. I have been there and I have taken care of them. It was a live fetus, but obviously, it's going to die because it's 15 or 16 weeks.

Q. And the situation that you just described with an inevitable abortion, is that the right term for that circumstance?

A. Yes.
Q. And in those situations, you have actually had women present for treatment where the fetus has begun to come through the cervix and is still alive; is that correct?
A. Correct.
Q. Now Doctor, to state the obvious, because you have only done abortions on fetuses that are already dead, you yourself have never induced fetal demise prior to beginning an abortion procedure; is that correct?
A. Correct.
Q. And you don't give formal lectures on abortions to medical students or residents, formal lectures?
A. Using the definition of formal, I have had discussions with them on D & X.
Q. But not in the formal, not where you would set out to do a formal prepared lecture on abortion?
A. I'm just quibbling because at lunch time conferences, I have, you know, their presentations. How formal that is, I'm just hung up on the word formal. I have done it in part, but I'm not sure formal fits the definition.
Q. All right. And it's your testimony that you did not become involved with the issue of abortion until the partial birth abortion debate began; is that correct?
A. To the best of my recollection.
Q. Doctor, throughout your testimony today, you referred to

conversations that you have had with physicians who performed -- Sorry about that chair. It really isn't going to move. But you have had, you have discussed conversations that you have had with physicians who perform what you've described as an intact D & X procedure; is that correct?

A. Correct.

Q. But you cannot recall the names or locations or dates involved with any of those conversations; is that correct?

A. I'm sorry. I do not.

Q. Dr. Sprang, when you perform a D & C, you use mechanical dilators; is that correct?

A. Correct, sometimes, and sometimes use laminaria.

Q. Okay. And also for procedures where you are removing a dead fetus in the first trimester, you might also use mechanical dilators; is that correct?

A. Probably, sometimes yes, and sometimes laminaria.

Q. And in those cases, you may use the mechanical dilators to dilate the cervix up to nine or ten millimeters; is that correct?

A. Correct.

Q. And in some cases when you're doing procedures beyond ten weeks, you may use mechanical dilators up to as much as 12 millimeters; is that correct?

A. I don't think, thinking back on it, I think usually the sets we have on the table, they do have bigger ones, but

usually the sets I have on the table, usually I go to ten.
Q. That's usually, but occasionally, you will go past ten; is that correct?
A. I'm going to have to say maybe because I don't remember for sure.
Q. You don't recall testifying about that at your deposition?
A. I remember saying it, but as I thought about it, I'm not 100% sure. I'm trying to think we have had bigger dilators on there, but I don't remember if we had to use them.
Q. And for mid trimester induction procedures, you use Misoprostol; is that correct?
A. Say that again.
Q. For second trimester induction procedures, you use Misoprostol?
A. That is my primary drug now. Obviously, I have been doing this a long time long before Misoprostol was around.
Q. All right. I'll confine my questions to your current practice unless I make it clear to you that I'm talking about another time. All right?
A. Yes.
Q. Thank you. Now, in some circumstances you will put in laminaria the day before you administer the Misoprostol and allow the patient to go home; is that right?
A. Correct.

Q. She comes back the next day to the hospital, and Misoprostol is administered at that time?
A. Correct.
Q. And you estimate that you personally use laminaria, I think you said, maybe half-a-dozen times. Is that an estimate?
A. Again, it's a guesstimate, yes.
Q. You also used mechanical dilators in some circumstances prior to the insertion of laminaria just in order to make enough space to get some, at least a laminaria in; is that correct?
A. Right.
Q. And when you insert the laminaria, you put in as many as you can reasonably fit, obviously depending on the size of the cervix, when you start out; is that correct?
A. Depending on, literally, I was involved in one this week, and it's unusual because I don't do that many. But it's actually for my partner whose patient had a missed AB. She wanted to induce her, do a D & C the next morning, and it really looked like a tight, firm cervix, and just rather than be too forceful the next day, we just put in a small laminaria in the office. It was a medium and just said you may have some cramping and stuff, and the hope's that tomorrow, the next day, I'm thinking what day it was, she'll come in as an outpatient D & C, and it will just be easier

to dilate the cervix because there is some risk involved in mechanically forcing. You open it, it may cause laceration.

Q. And so you have to take each patient as she comes and decide at that point how many laminaria you can reasonably put in; is that right?

A. Correct.

Q. And you have not personally done serial laminaria, and by that, what I mean is that the patient has laminaria inserted, goes home, comes back the next day and has additional laminaria inserted?

A. We talked about that at the deposition, too. I wasn't sure. It does seem to me that one time one of the residents asked me to do that, so I wasn't involved, but as a routine, no.

Q. But you have supervised residents who have done that?

A. Correct.

Q. And you mention that you are part of a large or maybe the president of a large practice or partnership practice?

A. Correct.

Q. And some of your partners will do serial laminaria; is that correct?

A. Correct.

Q. And the risk of laminaria, let me just list and see if you agree these are some of the risks associated with laminaria. Infection, well, infection and trauma to the

cervix?
A. Yes.
Q. And those risks are present when there is a single insertion of laminaria; is that correct?
A. Correct.
Q. And I think you mentioned that you can reduce the risk somewhat by the use of prophylactic antibiotics; is that correct?
A. Reduce the risk of infection, yes.
Q. And those risks, the risks of infection or trauma to the cervix are present whenever laminaria are inserted regardless of whether the laminaria insertion is for purposes of a D & E or an induction; is that correct?
A. Correct. A different distinction would be, obviously, the number you're going to use. You're probably going to use much less if you are just going to minimally prepare the cervix or make it a little expeditious the next day than if you are trying to dilate it five centimeters.
Q. If a woman comes in prior to the induction and the physician puts in an amount that he feels is reasonably, can reasonably fit and the physician doing a D & E, would do the same thing, those risks could be the same thing; is that correct?
A. I think so.
Q. And some of the side effects from laminaria are cramps

and pain; is that right?
A. Correct.
Q. Doctor, is it true the causes of cervical incompetence have been studied but aren't well understood?
A. That's a fair statement.
Q. Doctor, are you -- Let me ask a different question first. What's the shortest amount of time that you have seen an induction for in the mid trimester, an induction abortion completed using Misoprostol?
A. I mentioned a term delivery in two hours. Probably four to six hours.
Q. Are there any randomized controlled studies looking at whether completion of an induction abortion within four hours could lead to cervical incompetence?
A. Not that I'm aware of.
Q. Are you aware of any studies looking at the effect of laminaria dilation during the second trimester and cervical incompetence?
A. I might be out there. I'm not thinking of one.
Q. And there is no studies that you're aware of looking at laminaria and Misoprostol use together and cervical incompetence; is that correct?
A. People are reporting the results. I'm not sure if you're specifically looking at blood loss, infections, time, I'm not sure they are looking at an incompetent cervix.

It's a much more difficult thing to look at. You need to follow up. Those women need to get pregnant again. It needs to take several years, and you need a population that's going to stay in your area and be able to do that. That's why it's a difficult thing to study.

Q. Okay. Doctor, I believe you testified on direct that when a physician removes the products of conception, removes the fetus during a D & E, that he might use a twisting motion to facilitate disarticulation. Is that your testimony?

A. I believe I said that.

Q. And that's based on your personal experience?

A. Correct.

Q. And is it your opinion, Doctor, that dilation and evacuation can only be used until approximately 22 weeks because after that, the fetus is too difficult to disarticulate?

A. From both the physician's and my hospital and numerous declarations, depositions that I have read, it seems to be much more difficult, and I'll go specifically to a deposition in the Ohio case where one of the physicians who assist Dr. Haskell said he's really not much concerned about it at 20, 21 weeks. He knows he can get it done. Twenty-two weeks, he knows it's much more difficult procedure to do.

Q. So this isn't based on your personal experience?
A. No. No.
Q. And the fetal development is on a continuum; isn't that correct, and so there is nothing magic about 22 weeks?
A. Pretty magic because we grow at certain rates, and by 22 weeks, there is just the ligaments, the joints are much stronger. The cartilage start getting replaced more by bone, and you have a much stronger fetus than you had at 18 weeks.
Q. But not a much of stronger fetus than you would have, say, at 21.5 weeks; is that correct?
A. If you are going to go from day-to-day, you're right.
Q. And there are physicians who regularly, who routinely do perform D & E abortions at 22 weeks and later; is that correct?
A. Correct.
Q. Doctor, I believe it's your opinion that fetal demise can always be safely effected either by the use of Digoxin or cutting the umbilical cord prior to removing the fetus; is that correct?
A. Or potassium chloride. Always is a very strong word.
Q. I'm sorry. I didn't hear that.
A. Always is a very strong word.
Q. Your expert report, let me read what you said in your expert report and see if you agree with this. Fetal demise

can be safely -- can safely be effected either by the use of a chemical agent or by cutting the umbilical cord before removing the fetus. Neither of these methods presents significant risk to the life or health of the mother. Is that your opinion, Doctor?

A. Talking about significant risks being obviously either in frequency, if something, there maybe some we talk about occasionally infection, but extremely, extremely rarely, and to my knowledge and everybody that I know that does amniocentesis specifically. That's usually the way it will be presented as far as using risk benefits.

Q. At the time of your deposition, which I believe was in February, Evanston hospital did not routinely induce fetal demise for D & E procedures; is that correct?

A. At that point they offered them. They do not do them routinely.

Q. So then it was the patient's choice as to whether or not she wanted to have IUFD; is that correct?

A. Correct.

Q. And the policy that you describe, was this at your urging?

A. Not at all.

Q. And that policy applies to all D & E procedures; is that correct?

A. That is my understanding.

Q. It does not apply to induction procedures at similar gestational age?
A. I'm not clear on that.
Q. That's because you don't know or the policy hasn't been decided?
A. My understanding is they haven't completely decided what they are going to do on those.
Q. And what are the exceptions to the policy?
A. I haven't seen a written policy. This is obviously verbal at this point. I do know the department of maternal fetal medicine met, decided this would be their policy. Whether they are going to continue to talk about it as far as making exceptions or stuff, I think, remains to be seen.
Q. So you don't know at this point whether there would be an exception made if the woman was particularly obese?
A. Clearly obesity would make the procedure more difficult but clearly not impossible.
Q. Do you know if there will be an exception made if the woman simply declines?
A. I'm not sure if they are making it mandatory. They may actually make it, this is the way they do it, and if you want them to do it, that's what you'll do, and if you want, you don't want them to do it, you can have it done someplace else.
Q. And was this policy change instituted because of the law

at issue in this case?
A. I think there is just a lot of discussion; again, a lot of publicity in this issue, and as they continue to talk about it, I'm sure more organizations, more hospitals are doing it, and as I was reading different reports from different places, I was surprised at how many are doing it.
Q. However, Prentice Hospital, the other teaching hospital for Northwestern, does not have this policy; isn't that correct?
A. Today or tomorrow or the next day?
Q. Right now.
A. To my knowledge, today, they do not have that.
Q. And so you don't know, Doctor, for sure whether the change of policy at your hospital was due because of the potential enforcement of the statute that we are here discussing today; is that right?
A. Do I have a specific answer for that? No, obviously there has been a lot of discussion on this because of that Bill, and when things come more into the media, there is more discussion.
Q. Dr. Sprang, have you considered the testimony of Dr. Bowes that intrauterine fetal demise is quite difficult and that it's quite difficult? Have you considered or been apprised of his testimony?
A. I haven't seen that, and that's not consistent with

anybody I know who does it. They actually say it's very easy.

Q. And are you aware that he also testified that for some women, it might be impossible to perform because of extreme obesity?

A. Again, that's his opinion, not the opinion of the people that I talk to who do it.

Q. And have you, would it be your opinion that it would be more difficult to induce IUFD in a woman with uterine fibroids?

A. Depending on location and mapping positions and just the people that I work with are exceedingly good. I have seen them put the needle in from the side, from the back, from the top. They will just overcome what they need to overcome and get it done.

Q. Doctor, at this point, you have not performed this procedure yourself. Would you feel comfortable attempting it in extremely obese woman?

A. I wouldn't have any reason to do it.

Q. I understand that, Doctor. I'm just asking you hypothetically.

A. There clearly are people in my institution who have more experience, and they literally, as we have talked about, you don't even need to do the heart. You can just thread the umbilical cord whichever is easier. You don't need to get

to the heart. If you inject it into the umbilical cord, you accomplish the same thing. What they do they look and see what's the most direct route, what's the easiest way to approach it and do it. Because I have not done many of those, it would be foolish for me to do it. If I was in a position where I was doing those procedures commonly, I would acquire that skill and do it. Because I don't, I let subspecialist people who have that skill do it.

Q. And these residents, the OB/GYN residents at your hospital are not doing injections for selective reduction; are they?

A. I don't know that. If somebody had an interest in it and were a senior or beginning resident and internal fetal medicine physicians were doing it, they may very well let that resident do it.

Q. You don't know for sure; is that correct?

A. I know the way we teach at Evanston Hospital. I do know that's what would happen.

Q. Doctor, are you familiar with a recent case report about two maternal deaths from amniocentesis in Israel?

A. Explain that report to me again.

Q. Pardon me?

A. Please explain that report to me again.

Q. I just wondered if you had seen a recently published case report about two maternal deaths as a result of

amniocentesis in Israel?
A. These are case reports? Do you know where they were published?
Q. I'm just wondering, Doctor, if you have seen the study.
A. I'm aware of a study like that, but I wasn't sure whether it was published or any of the details.
Q. Okay. Would you refuse a woman obstetric care if she refused to undergo an amniocentesis because she did not wish to bear the risks or discomfort?
A. I routinely make that information available and totally do whatever the patient chooses.
Q. Doctor, I believe you testified that there can be some medical benefits with IUFD if enough time passes to have an effect on the fetus; is that correct?
A. Correct.
Q. And you understand that some women have one-day second trimester abortion procedures from starting at 16 weeks?
A. Correct.
Q. When they come in the morning and they are finished in the afternoon; is that correct?
A. Correct.
Q. And for those women, injections which can cause IUFD would not provide any of the benefits that would come from the passage of time of having the fetus, of causing demise in the fetus; is that correct?

A. I would not agree to that.
Q. You would not?
A. I would not. I do think you can get -- multiple different aspects of looking at it. Even in a few hours, you start getting some softening of the tissue and in some ways make it easier. If it's easier, if it's softer, maybe there is less risk of trauma to the cervix. That can exclude the benefits, again, to the psychological well being of the mother. Abortion is a traumatic experience for everybody in the room, the mother, the providers, and in both at Northwestern, I know Dr. Frederiksen, and I know how at Evanston, they provide that information to the patients. Most of the patients are relieved that that can be done that way. As some of the reports that I have read, most of the time if you explain it in a positive fashion, patients will most likely go along with what you're suggesting if they have faith and trust in you. It's better for mother, it's better psychologically, maybe physically, it's better for the health care team, so there are benefits.
Q. I think you may have --
A. I thought I answered your question.
Q. You answered my question, but I think you answered more than what I was asking. So let me just make sure that I got the right -- I heard the answer to the question I was asking which was medical benefits caused by softening of the fetus,

it's your opinion those can occur in as little as a few hours?

A. Correct, and I do consider psychological benefits medical benefits.

Q. So the psychological well being of the patient is an important factor for you in the process of abortion; is that correct?

A. I think it should be an important issue for everybody.

Q. Doctor, do you have, since you have no personal experience with IUFD, do you have a study?

A. Say that again.

Q. You have no personal experience causing fetal demise prior to --

A. I treat a lot of IUFDs.

Q. I thought your testimony was that you have never posited uterine fetal demise.

A. I treat patients with IUFD.

Q. Okay. Let me clarify my question then. You have no personal experience causing intrauterine fetal demise by means of an injection or cutting the umbilical cord; is that correct?

A. True.

Q. So your opinion that the benefits of that can occur in as little as three hours, is that based on your experience removing dead fetuses?

A. Correct.
Q. And how do you know for certain that the length of time that the fetus has been dead before removal in the 20 cases that you have had where you've removed a dead fetus in a D & E?
A. There has actually been more than 20, but when did the patient feel the fetus last? I have seen patients come in, said they felt the fetus that morning, and I have listened to heart tones and there are no heart tones.
Q. And you have no study though to support that; is that right?
A. Experience.
Q. Doctor, I believe that you testified that your opinions about the safety of intrauterine fetal demise were based in part on information that you read in a book entitled A Clinician's Guide to Medical and Surgical Abortion; is that correct?
A. It's only one of the sources. I had multiple sources for the safety other papers, papers specifically on selective reduction which we talked about, and a couple of -- one with 400 cases, one with 150 cases, other talking to other physicians, reading other depositions, numerous sources of information.
Q. And none of those sources, other than the source I just mentioned the Clinician's Guide were mentioned as a source

in your expert report; is that correct?
A. I told you at the time of the deposition, I would continue to look into it.
Q. That's right, and you haven't disclosed the names of any of the studies that you just mentioned about the 400 cases, the 150 cases in your testimony today, in your deposition or to me through the Department of Justice; is that correct?
A. I believe I told you about them last night.
Q. You didn't provide me with the name or cites to any of those studies; did you, Doctor?
A. Not that I recall.
Q. All right. I would like to have you pull out Defendant's Exhibit 549, if you would.
A. Maybe.
MS. CREPPS: I can assist you to find that. May I approach, Your Honor?
THE COURT: Sure.
THE WITNESS: I don't know if I have the right book.
BY MS. CREPPS.
Q. I know. I'll see if I can find the binder.
A. Here it is. I just didn't see it.
Q. Doctor, have you had a chance to find Exhibit 549?
A. Chapter 11, Abortion by Labor Induction.
Q. Yes. And this is in a Clinician's Guide to Medical and

Surgical Abortions; is that correct?

A. Correct, I believe.

Q. And this is one of the sources that you were discussing about for the safety of procedures to cause intrauterine fetal demise; is that correct?

A. Actually, this is one I thought we were just talking about in the different methods of choosing labor induction, and I thought it was good in that it said after about 18 weeks, D & Es and inductions had the same complication rate I was using this.

Q. I wasn't asking you --

A. That's how I was using this. Isn't that what you said? Did I misunderstand you?

Q. Let me ask the question again.

A. Sure.

Q. In your previous testimony earlier this afternoon, you testified about reports of 5,000 and 10,000 patients.

A. Right. I don't believe they are in this chapter.

Q. Well, let me finish my question. All right?

A. Sorry.

Q. You testified about reports of 5,000 and 10,000 patients in which intrauterine fetal demise was safely accomplished; correct?

A. Correct.

Q. My understanding at the time of your testimony was that

you listed this as one of the references for that, and I would like to have you look at page 131. Are you able to find that page, Doctor?

A. No, because this isn't the chapter.

Q. It does not -- It's not chapter 10?

A. No.

Q. All right.

MS. SMITH: Your Honor, I have the book here and -- Just one second. We need to move to a different exhibit. Our exhibit also has that book.

BY MS. CREPPS:

Q. I would have you look instead, Doctor, at Plaintiff's Exhibit 70. I'm sorry for the mix up. I thought that --

A. 70?

Q. 70. Plaintiff's Exhibit 70. I'm going to come up and get the binder. All right, Doctor. Can you turn to -- and this is also the Clinician's Guide to Medical and Surgical Abortions with different excerpts; is that correct?

A. Say that again.

Q. This is also excerpts from the Clinician's Guide to Surgical Abortions?

A. A chapter, yes.

Q. Can you go to chapter 10, and once you get to that chapter, would you go to page 131, please?

A. I'm there.

Q. There is a section here entitled Feticidal Techniques; is that right?
A. Correct.
Q. And looking at the second paragraph, does this refresh your recollection that this is one of the sources that you were relying on?
A. I knew it was a source all along. You gave me the wrong chapter.
Q. I'm sorry.
A. I knew it was the source all along. You were referencing the wrong chapter.
Q. And here in these paragraphs are the discussion of five and 10 thousand case series that you referred to earlier; is that right?
A. Correct.
Q. And the 5,000 case series, that was presented not as a peer-reviewed article but at a NAF conference; is that correct?
A. Correct.
Q. And the 10,000 case series, that information is reported as a personal communication from G. R. Tiller; is that right?
A. Correct.
Q. Doctor, would you agree that amniotic fluid embolus with DIC is a serious complication that can occur during a D & E

procedure?
A. Correct.
Q. And sepsis with pulmonary embolus is also a serious complication that can occur?
A. Correct.
Q. And uterine perforation is also a serious complication that can occur?
A. Nowhere as near as serious as the other two, but yes.
Q. Not as serious?
A. Correct.
Q. It's still a possibility; is that right?
A. Probably one of the most common possibilities.
Q. I'm sorry?
A. Probably one of the most -- Sorry. Probably one of the most common serious complications.
Q. And one of the reasons that you believe an induction is safer than a D & E after 20 or 22 weeks is that it does not necessarily involve the introduction of instruments into the uterus; is that correct?
A. I believe it's somewhere in the natural process.
Q. I'm sorry, Doctor. I'm really having a hard time hearing you. Can you just repeat that answer and I'll try and listen.
A. I believe because it's a more natural process. I like natural things.

Q. Doctor, is it correct that in your expert report, you made the statement that one of the reasons that you believe that induction is safer than D & E after 20 or 22 weeks is that it does not necessarily involve the introduction of instruments into the uterus? Do you recall?
A. When you phrase it that way, it sounds reasonable.
Q. You don't recall whether you made that statement in your expert report?
A. Yes, I do.
Q. And so you acknowledge that introduction of instruments into the uterus is a risk?
A. Depending on how it's done.
Q. That's right, and one of the factors that can influence that is the skill of the physician; is that correct?
A. Correct.
Q. And I believe you testified about some studies that you had looked at where the use of ultrasonography reduced the risk of uterine perforation; is that true? Is that correct?
A. That's correct. If you go to page 133 of your same chapter, you'll see that.
Q. And that's 133 in --
A. Same chapter, chapter 10.
Q. In the exhibit that we were just discussing?
A. Correct.
Q. While we are in this exhibit, Doctor, can you go back to

page 131 where we were discussing the text on feticidal techniques?

A. Yes, ma'am.

Q. Let me just make clear for the record here, the title of this chapter is Surgical Abortion after the First Trimester; is that correct?

A. Correct.

Q. And in the discussion of feticidal techniques, according to this text, noticeable cortical softening begins to occur as soon as 16 to 24 hours after fetal demise; is that correct, as stated in the first paragraph under feticidal techniques?

A. It does say that. Doesn't say it doesn't happen earlier.

Q. I understand that, Doctor, but you couldn't rely on this text for your opinion that this, that feticide would cause softening prior to that; isn't that correct?

A. Wasn't trying to.

Q. Now, one of the studies I believe you mentioned about ultrasound was the Darney study; is that correct?

A. I had mentioned it in passing. I don't believe I mentioned it today.

Q. Is that one of the studies that you have relied on in forming your opinion that the use of ultrasound can reduce the risk of uterine perforation?

A. It is one of the studies.
Q. Isn't it correct, Doctor, that in that study, the physicians who were being studied were all residents?
A. Often the easiest way to show distinctions because your ability is going to be more enhanced. You would still be able to clearly help others. It just may not be as easy to demonstrate it.
Q. And none of the studies that you've reviewed show that the risk of uterine perforation is reduced to zero; is that correct?
A. I'm sure for some of the people who are doing it, it was zero.
Q. Are you aware of any study on the use of ultrasound for second trimester abortions that shows a risk reduced to zero of uterine perforation?
A. Am I aware of the study? No. My point was, depending on, again, the initial skill of the individual and adding the extra skill of the ultrasound, we could discern a zero.
Q. It's possible, isn't it, Dr. Sprang, that some very serious physicians who do not use ultrasound could have a rate of zero complications from uterine perforation?
A. I'm one of them.
Q. If you're performing a D & E procedure for the purposes of removing a dead fetus, do you advise the woman that there is a risk of uterine perforation?

A. I do.
Q. And you would use ultrasound for that procedure; is that correct?
A. Depends on the circumstances. If I thought it was going to go very easily, not necessarily. If I was concerned at all, I would have an ultrasound tech or resident in the room with me so I could be doing what I want to do, they could be doing that at the same time and expediting it together.
Q. Doctor, is it your testimony that you believe that the amount of dilation necessary to perform an intact D & X as you have described it could increase the risk of cervical incompetence?
A. That is correct.
Q. Can you be specific, quantify for the Court by how much you think that risk is increased?
A. The risk has never been quantified. There is numerous articles going both back into time and more current things that will all acknowledge there seems to be some correlation between the subsequent cervical competence and the dilatation. Some of those wrote studies and some others were more related to mechanical. The question now, theoretically, if it's more done with things like Misoprostol and it's more natural intuitively, you would hope that would be safer, and I would probably say that's a reasonable intuitive assumption. My concern is that you are

also somewhat doing it mechanically, you're doing it mechanically when you're reinserting the laminaria the second day, and I have talked to at least one physician who said when they do it, they put 25, 30, and they just force in as many as you can. Some of that dilatation is mechanical. My concern, also, in depending on gestation, you take a 24 week fetus, 50% biparietal diameter is six centimeters, if you get it dilated to five centimeters or where the trochanter, the pelvis, the abdomen may all be a little bigger than the placenta, correction, than the cervix, and so you're really kind of somewhat mechanically dilating the cervix, too, in the delivery process in doing a breech extraction.

Q. But, Doctor, wouldn't that be an extrapolation from what you have read in terms of that there might be additional mechanical dilation?

A. No. It's because both again reading some of the things that I have seen, it does happen, and again in the Chasen study, there were more cervical vaginal lacerations with intact D & Xs than there were with D & Es, so it's very, very logical.

Q. But the Chasen authors don't ascribe the cervical lacerations to mechanical dilation caused by bringing the fetus out; isn't that right?

A. What do they ascribe it to.

Q. I don't believe they do, Doctor. I think you have testified as to what you are interpreting the study to mean?
A. Doesn't it have to be from something.
Q. Yes, Doctor. It would have to be either from an instrument or from another cause but the study itself does not make that clear; isn't that right?
A. It just simply says demonstrates, the numbers demonstrate there is greater risk in D & Xs which is just all I'm saying.
Q. And, Doctor, the conversation that you just related about a physician saying that they were forcing laminaria in, that, again, is conversation with somebody who you cannot name, cannot provide a date for and cannot describe the circumstances of the conversation; is that right?
A. I apologize for being in practice for 30 years and talking to thousands and thousands of physicians.
Q. Doctor, if physicians testified that when they take actions to reduce the size of the skull by inserting either an instrument or their finger into the calvarium, if their testimony was that they can either visualize that or visualize that by ultrasound, would that reduce your concerns about that aspect of the procedure?
A. It certainly could make it safer if my concern -- and actually one of the letters to the editors after our JAMA article was by one of the medical students.

Q. I'm sorry, Doctor. I just want to know your opinion, not the opinion of a medical student?
A. Quite right. Where I'm going, I think it will fit. I think I'm answering your question, maybe. If you see too much of it, then where have you really delivered the head? Is it still inside? That starts raising other questions.
Q. But you have no personal experience with this; isn't that correct?
A. Personal experience, I have read probably more things on it than certainly most people.
Q. Doctor, it's your opinion, is it not, that the available data indicates that prior to 20 weeks, the morbidity and mortality associated with D & E and induction are very similar?
A. Prior to 20 weeks. Probably the data is a little better for D & E.
Q. Okay. But it's your opinion, and now I'm quoting out of your expert report so that I get it exactly right, there is reason to believe, and I have concluded that induction is, in general, the safest method of abortion for the pregnant woman beyond approximately 20 to 22 weeks given the chemical agents used for induction to prepare the cervix and the uterus for delivery and that induction, unlike other methods, does not necessarily involve introduction of instruments into the uterus. Is that your opinion, Doctor?

A. Correct.
Q. And you don't have any hard data to support that opinion; isn't that correct?
A. Well, there again, the chapters in books, various descriptions, I think Stubblefield, and it says anything, there is, I think chapter 6 in here where it's saying select, the procedure selection does say after 18, 20 weeks, they are at least comparable, and again, depending on the individuals and the expertise of the individuals, in most settings in the United States, there is no question in my mind that induction would be safer and better for the mother.
Q. And that's based, then, on comparable data that's reported in journals and texts and your opinion that given operator skill, induction is more likely to be safer; is that right?
A. Correct.
Q. And when I asked you at your deposition about this, you did state that you did not have hard data to support your opinion; isn't that correct?
A. After reading more chapters, I think I just -- the things I just said, obviously it's a more difficult skill to learn, and there are few physicians, a small minority of physicians in the United States who would have the skills to do that after 20 weeks, and for the majority of patients, of

women in this country, it would be safer for them to have an induction.

Q. Isn't it true, Doctor, though, that the vast majority of D & Es performed at 20 weeks and later, of abortions performed in this country after 20 weeks are performed by D & Es?

A. I'm not sure of that.

Q. You're not aware of statistics that show that 86% of the abortions performed at 20 weeks and later in this country are performed by D & Es?

A. I think probably the distinction there, I'm not sure if they are talking about more elective.

Q. I'm really just asking if you are aware of the statistics?

A. I saw those numbers, but I think they were looking at more elective than medically indicated.

Q. Doctor, there would be no reason to apply a different safety standard for women obtaining elective abortions than women obtaining nonelective abortions at 20 weeks or later; would there?

A. Please repeat the question.

Q. Well, you just indicated that the statistics that you were thinking of were for elective abortions, and I just wanted to clarify that you don't think there should be a different safety standard for women obtaining elective

abortions than women obtaining nonelective abortions?
A. Of course not.
Q. Acknowledging that your personal safety record is better than this, you have seen statistics indicating that the incidents of instrumental removal of retained placenta following abortions ranges from 10 to 20%; is that correct?
A. Correct.
Q. And if the placenta does not deliver, you would be willing to wait one to three hours prior to an intervention; is that correct?
A. Usually more about an hour. And again, my success rate is that they do come out within that period of time. If it doesn't, in our circumstance, again, I don't think it's a big deal. You go in, as I said, and just kind of tease it out, tweeze it out with your fingers and sometimes grasping it with the ring forceps or a curette. All those are done right in labor and delivery. If the patient is uncomfortable, if they don't have an epidural, if they are uncomfortable or something, you can just give some Versed and make them quite comfortable. It's just a continuation of the process that didn't quit finish itself in a reasonable fashion.
Q. And so it's your opinion, Doctor, that it's no big deal for the woman to have additional medications and instrumentation in the uterus in order to remove the

placenta; is that your testimony?
A. If you tell the patient again for induction, they have acknowledged this, that about 10 to 20% of the time, it doesn't pass spontaneously. I told you about adding extra Prostaglandins or Misaprostol which does increase the chance of it passing spontaneously. If it still doesn't most of the time, it's no big deal.
Q. So am I correct, it's your opinion that retained placenta requiring instrumental removal is not a complication of induction abortion?
A. I would consider it if you want -- it's a soft definition, a very soft application. I would consider it more likely just a part of the process.
Q. And you acknowledge that not all physicians hold that view; is that right?
A. We went into that before, and I just said it's certainly nowhere near the CDC guideline for complications which are much more stringent.
Q. And, Doctor, one of the risk of an induction procedure is uterine rupture, and we are not talking about an induction procedure. Let me be clear. We are talking about an induction procedure for purposes of an abortion. One of the risks is --
A. Why do you distinguish?
Q. I didn't want you to think I was referring to inductions

in term just to make the record clear. One of the risks of induction is uterine rupture; is that correct?

A. Correct.

Q. And one of the risks is infection; is that correct?

A. Minimal.

Q. But still a risk?

A. Everything we do has a risk of hemorrhage, infection and trauma to the tissue.

Q. Good. You just answered two more of my questions.

A. Those are the standard risk of everything we do.

Q. And would you agree, Doctor, and I think your testimony supports this, that the protocols for Misoprostol have evolved over time?

A. And are continuing to evolve.

Q. And, Doctor, isn't it correct that if you have a patient with fetal demise at 20 weeks or later, you do not even inform her of the option of having D & E; isn't that correct?

A. Whether I have actually said there are different ways of doing it, I may have. It's just, again, as other people have pointed out, in most situations when the patient has a good relationship with her physician, you can inform them of three or four or five approaches. They are going to ask you which one you think makes the best sense, and then they are going to pick that one.

Q. So, Doctor, is it your testimony that you do inform women of the option of a D & E after 20 weeks in cases of fetal demise?

A. Did I sit here and say that in -- whenever that circumstance has come up, have I absolutely remembered whether I have said the options, or I said you want to do it what we most commonly do?

Q. All right. Doctor, I'm going to have you take a look at your deposition and see if it refreshes your recollection on this issue?

A. Um-hm.

Q. Doctor, would you turn to page 98 in your deposition?

A. Um-hm.

Q. And my question, beginning on line 2 was that is, though -- and I'm referring to D & Es, that is, though, one of the options you discuss, a D & E instead of an induction, and your answer is at 20 weeks, I probably wouldn't even bring that up because I think there is, in my belief, induction is safer process for the patient at 20 weeks.

A. That probably wouldn't bring it up, so maybe I would and maybe I wouldn't, but more commonly, I will stick with what I said, that I do think it's safer, and all the physicians in my hospital do that. They think it's safer.

Q. And so in that situation, you wouldn't offer the woman, typically, the option of going over to Prentice Hospital and

having a D & E procedure performed by Dr. Hammond or Dr. Frederiksen; is that right?

A. Probably I wouldn't offer her a procedure that I feel may be more risky for her. I always try to do what's best for my patient.

Q. But, Doctor, I believe you testified earlier about the importance of a patient's comfort during an abortion procedure; is that right?

A. Absolutely.

Q. Given that the published data on inductions and D & Es at 20 weeks and later shows comparable safety, you don't consider it important to give the woman the option of having a surgical D & E procedure rather than induction procedure?

A. In my belief, I have said this repeatedly, I think the induction is safer. I would encourage my patient to do what I think is safer, and I know I can make her totally comfortable because she gets to labor and delivery, she's going to get anything she wants.

Q. That would include whatever pain medication, to whatever level she desired; is that correct?

A. Absolutely.

Q. You're not aware of any randomized controlled studies comparing D & Es and Misoprostol inductions other than the one study. Well, are you aware of any?

A. Please repeat the question.

Q. Are you aware of any randomized controlled studies comparing D & Es and Misoprostol inductions?
A. At specifically 20 weeks?
Q. Twenty weeks or later.
A. Sitting here, I can't think of any.
Q. And if someone were to undertake such a study, would you recommend that your patients participate, given your views on induction and D & E?
A. I might not be opposed if it was a good controlled study and I knew the people who were doing it, and I really trusted them, and again, don't forget, a study in medicine proves very little. In medicine, you want multiple studies and well-designed studies that when you look at it, you think the conclusions are coming to are logical. If we changed what we did with every study that happened, with everything that is published in the hundreds of medical journals, we would be doing something different every day, good or bad.
Q. I think you misunderstood my question, though, Doctor. My question was, are your concerns about the risk of induction compared to D & E such that you would not recommend to your patient that she participate in a randomized controlled study comparing the safety of D & E abortions and Misoprostol inductions at 20 weeks or later?
A. Recommend her to participate is too strong. I usually

don't do that with any studies. I make the patient aware of the study, and I would also use my judgment as to whether I think it's beneficial, and both arms are reasonably comparable, and I have dozens of patients in various breast cancer studies and still other studies and everything else.

Q. What about this particular type of study, Doctor?

A. I think I answered that. Depends on the details.

Q. Isn't it true, Doctor, that your opinion about the relative safety of induction compare to D & Es is based primarily on your intuitive knowledge, education and experience?

A. All the above, and that's what all physicians in my hospital do, and it's a major teaching hospital of Evanston, Northwestern Health Care at Northwestern.

Q. And isn't it also true, Dr. Sprang, that any attempt to quantify the difference in risk between D & E at 20 weeks and induction at 20 weeks or later would just be speculation on your part?

A. You already asked me if there is a quantified study out there. I think we are getting repetitive here, but I can't quantify it, no.

Q. Doctor, you had some testimony earlier about the Chasen study, and I wanted to ask you a few questions about that.

THE COURT: Counsel, it's now slightly after 5:00 o'clock. I'm perfectly willing to go as long as you all

want to go until my court reporter begins to squeal, and he will, but give me a sense of how much longer you want to go.

MS. CREPPS: Your Honor, I would estimate that I have probably 30 minutes or more or less left in my cross-examination.

THE COURT: Give me a sense, counsel, about your redirect.

MR. HENRY: I expect my redirect to be very short at this point, Your Honor. I would point out that the witness does have travel arrangements, but if we go another 30, 40 minutes, we should be able to accommodate that.

THE COURT: What time does his plane leave?

THE WITNESS: 6:15.

THE COURT: Out of Lincoln?

MR. HENRY: Yes, sir.

THE COURT: Even out of Lincoln.

MR. HENRY: I think I can make it in ten minutes.

THE COURT: You're with the Government. When I give them my Government -- This is the truth. I gave them my Judge's ID, and the gal looked at it and said that's real nice, but it doesn't have an expiration date, and I said, well, I'm confirmed for life. They don't put those on there. She said, give me your license, so I gave her the license. Anyway, good luck trying to make it at 6:15. Let's go. Let's see if we can't get this done. Go ahead.

MS. CREPPS: All right. Thank you, Your Honor.
BY MS. CREPPS.
Q. Before I ask you about the Chasen study, let me just clarify something that you alluded to earlier in your testimony. The use of Misoprostol for inductions, that's an off label use; is that correct?
A. Correct.
Q. Now, one of the issues that you raised in connection with the Chasen study is that the definition used by the authors of the procedure that they are describing as an intact D & E differed from ACOG, and if you would like to pull that study out and have a look, Doctor, that's fine. I believe that's Exhibit 27. Plaintiffs 27.
THE COURT: Would you help the witness?
THE WITNESS: Just ask me.
BY MS. CREPPS:
Q. Why don't we see if I can get through the questions. If you need it, you can let me know.
A. That's fine.
Q. Well, first, my question is, is there -- Let me help you with that.
A. Don't worry about it, please.
Q. Are you sure?
A. I'm positive.
Q. All right. Is there definition of intact D & E

materially different in your opinion than the ACOG definition?

A. No. It sounds like the definition that's in the law that was just passed. It doesn't sound like any other definition I have read anyplace else.

Q. Doctor, I think you're going to have the to pull the study out, if you don't mind?

A. It's saying if it's head first, if the head is just delivered if the fetus is delivered to the umbilicus, it doesn't talk about the podalic version, it talks about vertex being delivered just to the head. That's what it reminds me of.

Q. I'm sorry, Doctor. Are you talking about the law or the Chasen study that description you just gave me?

A. That description is the Chasen study. Forget I said that. Go ahead.

Q. Pardon me?

A. Forget I said that.

Q. No, Doctor. I think it's appropriate at this point to pull out the Chasen study unless you feel that that criticism is --

A. It wasn't a criticism. You said what did it sound like to you.

Q. I must have misunderstood your testimony. I thought that one of your criticisms under the -- of the methodology

of the study was the definition that Dr. Chasen used in describing his procedure. Was I incorrect in that?

A. I didn't say it was different than ACOG's.

Q. You didn't intend that to be a criticism of the study?

A. No, just different.

Q. It would, in fact, make sense for Dr. Chasen to describe his procedure so that people who are reading the study can make a determination as to what he -- what at least he felt he was studying; isn't that right?

A. It was an arbitrary description of it. Yes, that's what he was studying, yes.

Q. Well, Doctor, I will move on. And are you aware that he wrote the study guidelines prior to 2000, prior to reviewing medical charts in 2000?

A. The number 2000?

Q. I'm just asking if you recall that from your review of the study.

A. Remind me again when it was published.

Q. The study hasn't been published yet?

A. Accepted for publication.

Q. Accepted for publication. My question to you is, are you aware that Dr. Chasen wrote the study guidelines prior to reviewing medical charts in the year 2000?

A. When was the study actually finished? Wasn't it August of 2 --

Q. I guess, Doctor, can you answer my question, which is are you aware?

A. How do you know he wrote the study guidelines?

THE COURT: Counsel, or pardon me. Doctor?

THE WITNESS: I'm sorry.

THE COURT: Within reason, I'll permit an interchange.

THE WITNESS: Backlog.

THE COURT: But I tend to be fairly mean with the lawyers and if they don't treat witnesses with respect, and when I know when I get put in the position when I used to do this a long time ago and a witness would ask me a question, I would almost invariably want to give him some smart remark because, you know, you're juices get flowing. It puts them in an awkward position when you ask them questions because they are not supposed to answer. They are supposed to only ask questions, so to the degree you can, you can ask for clarification, but to the degree you can, try to get along without that. Now, let's start over.

MS. CREPPS: Your Honor, actually, I think I'll just move on.

THE COURT: Okay.

BY MS. CREPPS:

Q. Doctor, it's correct, is it not, that you received the Chasen article from the Government's attorneys; is that

correct?
A. Correct.
Q. And you received it approximately a week or two weeks ago?
A. Correct.
Q. Doctor, do you believe that study would help a physician design a prospective randomized controlled trial?
A. Yeah. I guess any study may give somebody else the idea. Once you see one program, you may go forward with it, yes.
Q. And your main criticism of the Chasen study is that it had too few patients; is that right?
A. It is, you know, there are probably three main ones. It had too few patients, it doesn't have enough power to really distinguish, and the conclusions they came to didn't seem consistent to me with the data.
Q. And isn't one of the purposes of peer review to ensure that a study that's published is going to be useful in the field?
A. You want -- I'm sure the reviewers are doing that. That's certainly part of what's in their mind.
Q. And do you consider the American Journal of Obstetrics and Gynecology to be a reputable journal?
A. I do.
Q. Can you tell me, Doctor, how many patients you would

want to have seen in this study in order to allay your concern?

A. Well, I think it says right in the study the major flaw in it didn't have enough patients in it to have any power. What you do in academics, they have a statistician that works for them, too, and if you are depending on what you think the risk of the complication, what it is, then they'll tell you how many patients you have to have in each arm for them likely to be able to significantly show a change or how many differences you would need in each arm for it to show a change, so they can give you that information depending on the frequency of what you're looking for is.

Q. But if the authors are willing to acknowledge that the results don't rise to the level of statistical significance, you could still obtain useful information from the study; is that right?

A. That's why I looked at the trends and I considered it useful, and the trends were what I said.

Q. So you find the study supportive of your opinions; is that correct?

A. Correct.

Q. In spite of its flaws?

A. Correct.

Q. Now, Doctor, one of the things that you pointed out about the study is that there were four cases of genital

tract lacerations in the D & X group and four cases of lacerations in the D & E group, and that because there were fewer people in the D & X group, that means they had a higher rate; is that correct?

A. That is mathematics, that percentage. It's a fraction.

Q. It's also true, Doctor, that there were 11 other reported complications in the study, and two of those were in the D & X group and nine of those were in the D & E group; isn't that correct?

A. I will take your word for it if it's what it says.

Q. And the genital tract lacerations in both groups, they were noted and repaired at the time of surgery; isn't that correct?

A. Correct.

Q. But the more significant complications which were amniotic fluid embolus with DIC, uterine perforation and sepsis with pulmonary embolus, those all occurred in the D & E group; isn't that correct?

A. Correct.

Q. You testified that you were concerned about the trend towards spontaneous pre-term birth in the intact D & X study; is that right?

A. Correct.

Q. And spontaneous pre-term birth occurred in two of the 17 subsequent births in the intact group that were followed,

and two of 45 in the nonintact group; is that correct, if you recall?

A. Say those numbers again.

Q. Two of 17 in the intact group, two of 45 in the nonintact group?

A. Pre-term.

Q. Yes, spontaneous pre-term birth.

A. What are the percentages it gave for spontaneous pre-term birth? I'm sorry. I shouldn't ask the question. I should have the chart in front of me so I can look at it. What numbers -- Let's do it right.

Q. All right. Would you please turn to Plaintiff's Exhibit 27? Is that the right binder? I can come around and get it for you.

A. This one starts with 46 to 75.

Q. My question, Doctor, just to refresh your recollection while you're looking through the study, is the number of women who experienced spontaneous pre-term birth following either the intact or nonintact procedure. Do you see those results?

A. 11.8% for the intact group for 24% for the D & E group so about three to one.

Q. Okay. And that was not statistically significant; is that right?

A. The numbers are so small, it can't be statistically

significant, but there is an obvious trend.
Q. And the same is true with the cervical lacerations. That difference was not statistically significant; correct?
A. But an obvious trend.
Q. Isn't it true, Doctor, that two women in the intact group who had spontaneous pre-term birth had abortions in the earlier pregnancy because they were already experiencing spontaneous pre-term birth or advanced cervical dilation?
A. I believe it says that.
Q. And both of those conditions are strong risk factors for recurrence in subsequent pregnancy; isn't that right?
A. Risk factors.
Q. And, in fact, it was the same two women who had that, those conditions, when they got the abortions that subsequently had them after the intact D & E -- X; isn't that correct?
A. That I don't recall.
Q. Doctor, again, to state the obvious, you're familiar with the Partial-Birth Abortion Ban Act of 2003; isn't that correct?
A. I have read it.
Q. And you believe that intact dilation and extraction, as you have described it, is a separate procedure from D & E; is that correct?
A. Correct.

Q. And you believe that intact dilation and extraction is covered by the Act, but D & E is not. Is that correct?
A. Correct.
Q. And you believe that a physician who performs the intact D & X procedure described by ACOG that you referred to earlier would violate the Act; isn't that correct?
A. Correct.
Q. If a physician used only Cytotec and didn't dilate the cervix over a sequence of days but otherwise performed the three ACOG steps, do you think that physician is violating the Act?
A. If I'm understanding your question, if they still do an internal podalic version, deliver the child, partially born child to the head, and then suction out the brain, yes. I don't think they care how the cervix is dilated.
Q. If the physician does not convert the fetus to a footling breech but performs the other three steps of the description, do you believe that the physician is violating the Act?
THE COURT: But delivers it footling?
MS. CREPPS: Yes, delivers it footling, but does not take the step of the internal podalic version.
THE WITNESS: Interpreting, I'm not a lawyer. You know that, but my interpretation of it is if they deliver the fetus sufficiently outside the uterus and kill the fetus

outside the uterus, intentionally, purposefully, all those kinds of things, and it's not to save the life of the mother, then it probably would be covered, but I think there is a lot of caveats in there and a lot of protections in there for the physician.

BY MS. CREPPS:

Q. So do you think if a physician performed only the last two steps of the ACOG definition, they could still be violating the Act?

A. Specifically, intentionally did an abortion on the fetus, delivered it to the head and then suctioned out the brain, all with that intention in mind, and intention is important, it could easily be, but I'm not a lawyer.

MS. CREPPS: Just a moment, Your Honor.

BY MS. CREPPS:

Q. Dr. Sprang, if a physician uses the same dilation procedure for all D & Es performed between 16 and 20 weeks, and in 10% of those cases is able to remove the fetus intact except for the head, would he be violating the Act?

A. I'm not sure you're giving me enough information, but again, if they intentionally deliver the fetus or most of the fetus is outside the mother's body, and the distinction is obvious, where is it when it's killed, and that's just -- they would be violating the Act, I would think. If they intentionally kill the fetus outside the mother's body, and

that's the principle the AMA is having problems with is that it's no longer killing the fetus inside the body. You're killing it outside the body.

Q. All right. So if a physician -- Let me give you a hypothetical. If a physician performing abortions between 16 and 20 weeks used laminaria inserted one day and had the woman return the next day, removed the laminaria and administered Cytotec, and a few hours later removed the fetus and in 10% of the cases in which that process was followed, the fetus delivered intact except for the head, and the physician then took a step to reduce the size of the cranium, do you believe the physician is violating the Act in every case in which he follows that procedure?

A. Depends on the specifics of the case. Intention, was the fetus killed outside of the mother's body? I think you're in a better position to answer those than I, as a lawyer, to actually interpret it. I would have to have the law in front of me, and my recollection, a lot of it depends on the intention and the sequence of events, and so it depends on the circumstances.

Q. All right. If a physician's intent is always to deliver a fetus as intact as possible, do you think, then, in those circumstances I described that the physician is violating the Act?

A. I think I may need to know more details. You may even

need a legal opinion.
Q. Dr. Sprang, would you support the Act if it were interpreted to cover all D & E abortions?
A. I think that is what they are trying to do, so that's why I'm supporting the Act.
THE COURT: Doctor, I think she asked --
THE WITNESS: A different question.
THE COURT: Yeah. Listen more carefully.
THE WITNESS: Thank you.
MS. CREPPS: I'll try and speak up, Doctor. I'm sorry. It's getting towards the end of the day. Let me just go back, and I'll ask that question again.
BY MS. CREPPS:
Q. So sitting here as a physician with a hypothetical that I have given you, you're not sure based on the hypotheticals that I have given you what the Act would include or not include; is that correct?
A. Where is the Act?
Q. If you would go to Plaintiff's Exhibit 69, we can take a look. Oh, I think I have to get that from the clerk.
THE COURT: You do.
MR. HENRY: Your Honor, I'm going to object. I believe the question mischaracterizes the witness's prior testimony.
THE COURT: Well, first of all, there is no pending

question. I'll ask counsel to put a pending question, and then you can perhaps lodge your objection. Go ahead.

BY MS. CREPPS:

Q. All right. Thank you. Dr. Sprang, have you had a chance to review the Act for a moment to refresh your recollection?

A. For a moment.

Q. Would you like additional time?

A. Go with it. I'll try to read it while you're talking.

Q. I don't want to put you in an awkward, position, Doctor. If you are comfortable with that, I'll go ahead and ask my question. If you want more time to read the Act, that's fine. Shall I proceed?

A. Sure.

THE COURT: Are you going to be talking about the definitional sections?

MS. CREPPS: Yes. I'm sorry.

THE COURT: Doctor, if you would look, counsel will now direct you to the definitional sections, and I think she's going to get into some questions regarding definition and the applicability of the Act to a variety of factual circumstances, so if you would direct your attention to those definitional circumstances.

THE WITNESS: The last part where it actually says what they are talking about?

MS. CREPPS: Yes, I believe you can find that on page S 6 with the numbers at the top.

THE WITNESS: Um-hm.

BY MS. CREPPS:

Q. You'll see towards the bottom of that page section 1531 and that's the prohibition in the Act. Do you see that language?

A. Um-hm.

Q. All right. With that language in mind, Dr. Sprang, let me ask my question again which is this: If a physician, if a physician's intent is always to bring the fetus out as intact as possible and the physician is able to accomplish that in 10% of the D & E procedures he performs, would those abortion procedures violate the Act in your opinion as a physician reading the language of the Act?

A. That's what it says, knowingly performs a partial-birth abortion and thereby kills a human fetus shall be fined, blah, blah, blah, does not apply if partial-birth abortion is necessary to save the life of the mother. Partial-birth abortion means an abortion which the person performing the abortion deliberately and intentionally vaginally delivers a living fetus, so in the case of head first, the entire fetal head is outside the body, or in the case of a breech presentation, any part of the fetal trunk past the navel is outside the body for the purpose of performing an overt act

that the person knows will kill the partially-living fetus, and performs the overt act other than completion of delivery that kills the partially delivered living fetus. If you are doing all those things, then yes, that's what you're doing.

Q. Just to be clear, Doctor -- Well, let me say this. I'm not sure what your answer to my hypothetical was then. Would the physician in the circumstances that I described be violating the Act in your opinion?

A. Did you give me enough information as to knowingly performs a partial-birth, deliberately and intentionally vaginally delivers a living fetus in the case of head first, if all those things were met, yes. If they were not met, no, so I'm not sure I understood enough of your question to answer it.

Q. All right. Let me restate the hypothetical, and you can tell me which information, what additional information you would need in order to answer my question if you can. The hypothetical is this: A physician performs, routinely performs D & E procedures between 16 and 20 weeks. His dilation process for that is to insert laminaria on day one and have the patient return on day two, remove the laminaria and go ahead with the procedure. The physician's intent is always to remove the fetus as intact as possible. In 10% of the cases in which the physician follows this procedure, he's able to remove the fetus intact but for the head

through the cervix. In your opinion, in that circumstance, would the physician be violating the Act?

MR. HENRY: Your Honor, I'm going to object. The question is exceedingly complex. It calls for a legal conclusion, and the witness has testified, I think, several times that he's not a lawyer qualified to interpret the Act.

THE COURT: That will be overruled. You may answer.

THE WITNESS: Thank you. Yes, the key, deliberately and intentionally deliver the living fetus, and to that point with the intention for the purpose of performing an overt act that the person knows will kill the partially-delivered living fetus, and if he did that, yes. If he didn't do that, no, so I'm not sure. Are you telling me he did that or he didn't do that?

BY MS. CREPPS:

Q. Let me just ask the question?

A. That's the only way I know how to answer the question.

Q. That's fine. Thank you, Doctor. I'll move on then. And the reason you can't answer the question, Doctor, is because you don't know what the answer is; is that right?

A. No, I don't know. You haven't given me enough information.

Q. What additional information would you like, Doctor?

A. Specifically, did he deliberately and intentionally

vaginally deliver the fetus with the intent of performing an overt act to kill the fetus? If it's yes, then I would say that --

THE COURT: Doctor, let me interject here.

THE WITNESS: Please.

THE COURT: What the lawyer wants you to do is to take the facts as she gives it to you, understanding that they may not be in the precise words of the statute, and using your skill as a physician and a surgeon who does comparable procedures, ask you to take those facts, understanding you aren't a lawyer, and answer what is a pretty simple question. Do you think, understanding you aren't a lawyer, that doing this violates what your understanding of the Act is, or does it not, so questions about overt meaning of legal meaning of overt act or legal meaning of intentional, all of that sort of stuff, she realizes you can't answer that. Ultimately, that would be for a judge and perhaps a jury, but she wants you to put yourself in the position of a physician, accept those facts as accurate, and then accepting them as accurate, apply your lay understanding of that Act and answer do you violate the Act or did you not. Now, counsel, put the question to the Doctor again.

BY MS. CREPPS:

Q. All right. Thank you, Your Honor. Dr. Sprang, having

the language of the Act in mind, my hypothetical for you is as follows: A physician performing D & E procedures, routinely performing D & E procedures between 16 and 20 weeks follows the process of dilation whereby the physician inserts laminaria and has the woman return the next day, at which time the physician removes the laminaria and completes the procedure, it is always the physician's intent to bring the fetus out as intact as possible. In 10% of the cases in which the physician follows this procedure, he's able to remove the fetus by breech delivery intact but for the head, at which point the physician takes an act to reduce the size of the calvarium and then thereafter removes the fetus. In your opinion, Doctor, would that physician be violating the Act in those circumstances?

A. It sounds close enough to the Act to me that we have the possibility of being charged, but then as Justice described, it would depend on whether people arguing whether it was intentional or not, and it would depend on the outcome of the judge and jury whether he was found guilty, but there may be enough evidence there to charge that physician if someone wished to.

Q. So the physician in that situation would need to be concerned prior to 100% of his abortion procedures that he might subsequently be charged with violating the Act because he wouldn't know ahead of time which 10% could result in

that circumstance?
A. See, and we have done this in the deposition. I don't think the physician, if I was the physician, I just wouldn't put myself in that position. I would use the feticide so it would be a nonissue, and what I would also do, if I didn't do that, then as soon as I saw that it was going to come out more readily, I would cut the cord and with suction, it's a common thing that comes down first. You put the suction cannula in, the cord is going to come down, you cut the cord, and they are not in violation, and I would be smart enough physician and practitioner to know what it says, and I'm quite sure that I could overcome the obstacles that this would create. I truly believe that if this was upheld, it should not stop a single abortion. All you have to do is be smart enough to work within the rules of the law.
Q. And being smart enough, in your opinion, Doctor, would be requiring physicians to perform IUFD procedures even if they thought those procedures posed risks to their patients?
A. It would be one way. The other way would be, you know, quickly get into the cord and severing the cord so that the act you're perform that kills the fetus is still inside, and that is the distinction I understand, as I understand this law trying to make. They are trying to draw a line between killing the fetus and killing a baby, and if we erase that line, then it's a whole different issue dealing, you know,

society is dealing with, and they are just trying to maintain that line, and that seems like a reasonably sound, appropriate, ethical public policy.

MS. CREPPS: Well, Your Honor, sorry. Doctor, we are going to talk about ethics in just a minute, but let me ask you one more question. I'm sorry. I understand I have gone longer.

THE WITNESS: I'm just going to miss my plane which is going to create a real problem for me.

MS. CREPPS: I apologize for that, Dr. Sprang. I'm trying to move through this as quickly as possible.

BY MS. CREPPS.

Q. You have no experience cutting the cord in order to bring about fetal demise; is that correct?

A. I have all kinds of experience in cutting cords. I have done it over 3,000 times. I just don't do it for that reason.

Q. You don't do it prior to beginning the removal of a fetus for purposes of abortion; isn't that correct?

A. I do it prior to delivery. Sometimes the cord is around the neck, all kinds of things. I cut cords all the time.

Q. But you have no personal experience cutting the cord as part of an abortion process in order to cause fetal demise; is that correct, Doctor?

A. Yes.

Q. And is it your opinion that that can be accomplished 100% of the time prior to bringing any part of the fetus out through the cervix?

A. Clearly, again in speaking with physicians in my hospital, before they make their decision to do potassium chloride injections, that is what they routinely did, and did it successfully. I don't know if it was 100% but a very high percent.

Q. Dr. Sprang, if they were able to do it 100% of the time, there would be no need to have a policy for KCL injections; isn't that correct?

A. It -- They may actually feel its even just a smarter act.

Q. Doctor, you testified on direct about viability; is that correct?

A. That is correct.

Q. And I believe your testimony was that you believe that viability occurs at 23 weeks; is that right?

A. Yes, that is what I said, and that's what I believe.

Q. Let me clarify. Is that 23.0 LMP?

A. We did this before 23.0.

Q. And --

A. And maybe 25.6 or 22.6. It is a graduating scale.

Q. Let me ask you about that. That was going to be my next question. It's your opinion that at 23.0 weeks, there is a

15% chance of survival?
A. Of survival, correct.
Q. Of survival. All right. And so you have selected 15% as the cut off or the distinction where you're going to say viability has been achieved; is that right?
A. Correct.
Q. And that's not uniform 15%. That's not uniform in the medical --
A. That's the information, you know, in the literature.
Q. I understand that, that 15% is in the medical journal. My question to you, Doctor, is do all physicians believe that viability occurs when the fetus has obtained a 15% chance of survival?
A. I don't know what all physicians think.
Q. Doctor, you've testified about a little bit about fetal pain, and we have heard quite a bit about that today, so I'm not going to ask you a lot of questions about that, but I just want to ask you a couple of questions. It's your opinion that a partial-birth abortion would be excruciatingly painful for a fetus; is that correct?
A. Correct.
Q. And it's also your opinion that a D & E procedure performed at the same gestational age would also be excruciatingly painful; is that correct?
A. Correct.

Q. Doctor, on direct examination, you referred to an AMA committee on which -- of which you were a member that looked at late term pregnancy techniques; is that right?
A. Right.
Q. I would like to have you pull out one last exhibit, and that's Plaintiff's Exhibit 13. Is that in the binders that are handy to you?
A. Should be.
Q. And I lied. I'm going to have one more exhibit after that. I'm sorry, Your Honor. I seem to be taking much longer than I anticipated.
THE COURT: Well, speed it up so that we can get the doctor back to Chicago.
MS. CREPPS: All right. Thank you.
BY MS. CREPPS:
Q. Is this the report you were referring to? The first page, I realize, is a cover letter, but subsequent to that, is that the report that you were referring to?
A. It's in a different format, and I can't really --
Q. If you could not look at the first page but look at the second page.
A. It appears to be.
Q. All right. And you testified that the committee that put this report together gave thorough consideration to the ethical issues raised by partial-birth abortion and late-

term abortion; is that correct?

A. Correct.

Q. And that information appears in an appendix at the back of the report beginning on page 205, as they are numbered at the top, and that appendix B, and it's entitled Medical Ethics Regarding Abortion; is that correct?

A. Correct.

Q. And the appendix summarizes various ethical arguments in the context of intact D & X; is that right?

A. Correct.

Q. And the document lists three possible policy options based on ethical considerations, and I'm referring you now to page 208 if you wish to refresh your recollection.

A. Um-hm, yes.

Q. The three options are restrictions on the procedure, keeping the decision exclusively in the medical realm, and abandonment of the procedures; is that correct?

A. Correct.

Q. And the conclusion of the document, again reading from page 208, is although these types of arguments, types of circumstances and types of policy options may help clarify discussion, they do not lead to one clearly preferred ethical justification if the relevant principles are invoked. Is that correct, that that's the statement in the report?

A. I don't see it, but I'll buy it.
Q. Well, Doctor, isn't it true that the ethical consideration given by the committee did not result in a clearly preferred ethical position? I'm talking just about the committee now on partial-birth abortion.
A. There was significant discussion on it, not a consensus, even if there was a majority, and because again, the chairman of the board was chairing the committee, it was further discussed at the board, and the board obviously decided to support HR 1122.
Q. That's correct, but as far as the report issued by the committee on which you were a member, there was -- The report did not find that there was one clearly preferred ethical position?
A. We did, in effect, but the chairman's position was because there wasn't a consensus, even if there was a majority, that she would prefer to have the board look at it as well.
Q. All right. Now, I would like to have you look at what is the final exhibit that I would like to use, although, Your Honor, I would at this point point out that the exhibit that the Doctor is looking at is part of the Congressional Record, so I don't know that I need to move it in separately, but I would like the Court to consider it not for the truth of the matter asserted but to establish the

debate on the ethical issue.

THE COURT: What is the exhibit?

MS. CREPPS: That would be Exhibit 12. No. I'm sorry. Exhibit 13.

THE COURT: Well, I have read, yeah, and the Booz-Allen Report, is that part of this exhibit or not?

THE WITNESS: I'm not sure that it is. I don't believe I made that part of this exhibit, Your Honor.

THE COURT: All right. So you offered Exhibit 12, not for the truth of the matter asserted but to describe the debate. I reserve ruling.

MS. CREPPS: I think I misspoke, Your Honor. I believe it's 13.

THE COURT: You've offered Exhibit 13 for that purpose, and I have reserved ruling.

BY MS. CREPPS:

Q. All right, Dr. Sprang. One final exhibit that I would like to have you review is Plaintiff's Exhibit 45 which I believe is in the same notebook. Dr. Sprang, have you had a chance to look at that article, at least to see what the article is?

A. The one that says Continuing Need for Late Abortions from Dave Grimes.

Q. Yes. Have you seen that before?

A. When the article first came out, not since, but go

ahead.
Q. And this article was published in the same issue of JAMA as the article that you authored; is that correct?
A. Correct.
Q. Both of these articles appeared in the controversy section; is that right?
A. Correct.
Q. And the reason the articles were published together was to present different views on a very controversial issue; is that correct?
A. Correct.
Q. And isn't it correct, Doctor, that Dr. Grimes' opinion is that the ethics, medical ethics would favor allowing intact D & X to remain legal?
A. I do not know that.
Q. Pardon me?
A. I do not know that.
Q. You don't know that from the article? I thought you might be familiar with it, Doctor, because it came out as part of the same --
A. I do not know that.
Q. Okay. Could you turn, then, to page 750 of the article? Your Honor, I think rather than have the Doctor go and read out loud this part of the article, if I could just move this article in on the foundation I have laid for the purposes of

establishing or demonstrating the debate on ethical issues, I would just do that and be finished.

THE COURT: And the number again?

MS. CREPPS: That's Plaintiff's Exhibit 45.

THE COURT: All right. 45 is offered for the debate. I would withhold ruling.

MS. CREPPS: In that case, Your Honor, I have no further questions.

THE COURT: Counsel?

MR. HENRY: Just very briefly, like one minute.

REDIRECT EXAMINATION

BY MR. HENRY:

Q. Doctor, I have three questions for you.

A. Can I comment at all on what she just showed me that I'm reading now?

THE COURT: Huh-uh, not unless you want to miss your plane.

THE WITNESS: Go ahead.

BY MR. HENRY:

Q. Let's just answer these questions.

A. Okay.

Q. Doctor, do you know of any deaths in the United States that have resulted in the use of injection of KCL or Digoxin for purposes of fetal demise?

A. I do not.

Q. Do you know of any deaths in the United States that have resulted from the use of amniocentesis?

A. I do not.

Q. Doctor, counsel for the plaintiffs gave you a hypothetical scenario that I believe involved a physician performing D & Es at 16 to 20 weeks who regularly dilated via laminaria and have had the patient return the next day for removal of the fetus, and I believe the hypothetical included the concept that it was always the physician's intent to bring about intact removal of the fetus as much as possible, and in 10% of the cases, the physician was able to remove it up to the head intact. Are those facts sufficient for you to give your opinion as to whether that physician would be in violation of the Act?

A. I really would want a legal opinion and ask more questions.

Q. Doctor, one final question. Is the measure of gestational age, which I think is usually via from last menstrual period or whatever, is that an exact measurement?

A. They are inexact because some women have their periods every 28 days, some every 40, some every three months, so it really doesn't tell you, but it's the only thing that we really have to go on because we don't know the date of ovulation, conception, so that's why it's usually picked, but if it's clearly not consistent with that, you have an

early ultrasound, but those are the dates you would use.
Q. So does that mean the point when viability starts is somewhat fuzzy?
A. Depending if the uterus was inconsistent with the size, you would do an early ultrasound. Then we would use that date.

MR. HENRY: Thank you.

THE COURT: Thank you, Doctor. You may stand down and are excused, and you may leave immediately.

THE WITNESS: Thank you, sir.

THE COURT: I hope you catch your plane. If somebody calls the airport, they are likely to hold the plane for them if you tell them it's a physician who needs to get back to Chicago.

MR. HENRY: Yes, sir. We have had somebody trying to take care of that. Thank you.

THE COURT: Just don't threaten them with Homeland Security or something. All right. Tell me about tomorrow.

MR. HENRY: Tomorrow the only witness on tap is Dr. Curtis Cook.

THE COURT: Dr. Cook?

MR. HENRY: Yes.

THE COURT: And you think he'll take all day.

MR. HENRY: He may take most of the day. I would be surprised if he took all day.

THE COURT: Okay. And then, so you will have one person on tomorrow and then what is it?

MR. HENRY: On Thursday is also one doctor, Dr. Elizabeth Shadigian, and probably the same situation with her. I would be surprised if she took all day.

THE COURT: Then Friday?

MR. HENRY: Friday is Dr. Lockwood, Charles Lockwood, and I would be surprised if he took all day, although I think plaintiff's counsel is planning an extensive cross-examination from what I have heard.

THE COURT: You're a mind reader. Well, so you think you would be done on Friday?

MR. HENRY: Yes.

THE COURT: Okay. All right. All right. Be working on that agreement on those articles and see if you can come to something. I'm not trying to hide the ball. I'm likely to admit it, but my only real concern is if there is some goof ball article in there that really needs, that you really have a legitimate argument about whether that is a fair facet of the debate, then I want to know about that. I suppose you could publish something in the Journal of Siberian Medical School and -- but absent something like that, let's see what the debate is and the contours of it, and you all can, you all know the articles much better than I. My concern is at the margins, so to the extent that you

can resolve it, I would appreciate it. All right. We'll start again at 9:00 o'clock in the morning. We stand in recess.

(Recess at 5:51 p.m.)

C E R T I F I C A T E

I, David C. Francis, certify that the foregoing is an accurate transcription of the record of proceedings made in the above-entitled matter.

/S/ David C. Francis Date: April 6, 2004

Official Court Reporter (Ret)

INDEX

EXHIBITS:		Offered	Received
13.	Report	1244	Withheld
114.	Article	1096	Withheld
538.	Editorial	1096	Withheld
563.	Fisk study	1096	Withheld
566.	Article	1096	Withheld
609.	Cited chapter	1096	Withheld
625.	Article	1096	Withheld

633. Article 1096 Withheld