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In The Matter Of:

Doll, et al. VS. *University Hospitals of Cleveland, et al., No. 297828*

Deposition of Clark H. Millikan, M.D.
November 6, 1997

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COURT OF COMMON PLEAS

CUYAHOGA COUNTY

PATTY DOLL, ET AL.,)

Plaintiffs.)

vs.) Case No. 297828

UNIVERSITY HOSPITALS OF)

CLEVELAND, ET AL.,)

Defendants.)

DEPOSITION OF CLARK H. MILLIKAN, M.D.

Thursday, November 6, 1997

Deposition of CLARK H. MILLIKAN, M.D., called by the Defendants for examination under the Ohio Rules of Civil Procedure, taken before me, the undersigned, Mary Ann Fiynn, Registered Professional Reporter, a Notary Public in and for the State of Ohio, at the offices of Becker & Mishkind Co., L.P.A., Skylight Office Tower, Suite 660, 1660 West Second Street, Cleveland, Ohio 44113, commencing at 11:10 a.m. the date and time above set forth.

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APPEARANCES:

On Behalf of the Plaintiffs:

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On Behalf of Defendant University Hospitals of Cleveland:

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On Behalf of Defendants Michael T. Gyves, M.D. and Partners in Women's Healthcare, Inc.:

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CLARK H. MILLIKAN, M.D.
called by the Defendants for examination under the Ohio Rules of Civil Procedure, after having been first duly sworn, as hereinafter certified, was examined and testified as follows:
MR. MOSCARINO: The record should reflect this is discovery deposition of Dr. Clark H. Millikan who has been identified as an expert witness in the case of Doll versus University Hospitals of Cleveland.

(Defendant's Exhibits A and B were marked for identification.)

EXAMINATION
BY MR. MOSCARINO:

Q: Dr. Millikan, we met just a second ago. My name is George Moscarino and I'm the attorney for University Hospitals of Cleveland, and I'm here just to ask you some questions about your opinions in this case and the reasons why you're saying what you're saying, fair enough?
A: Yes, sir.
Q: Every once in a while I drop off or I don't talk quite as loud as I should or I talk a little too fast.

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Let me know if you don't understand my question, all right?
A: Yes.
Q: You issued a report dated June 13, 1997 which I've marked as Exhibit B; is that right?
A: Yes, sir.
Q: Is that your only report in this case?
A: Yes.
Q: Do you have any drafts of that report?
A: Nothing other than this.
Q: Okay. Exhibit A which I've marked is a CV that I believe you provided for us this morning?
A: Yes, sir.
Q: Is that current?
A: Not quite.
Q: Tell me what needs to be on there.
A: I'm no longer at the Medical College of Ohio. I am now in Salt Lake City, Utah and I'm director of academic affairs for the Inter Mountain Society for Stroke Research. Inter Mountain Foundation for Stroke Research.
Q: When did you move from Ohio to Utah?
A: September 1997.
Q: So it's a recent move, right?
A: Yes, sir.

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Q: And give me the title of your current job again?
A: I am director of academic affairs for the Inter Mountain Stroke Research Foundation.
Q: And what are your duties in that job?
A: My duties are to see patients in the outpatient department of the foundation, to see patients principally in Cottonwood Hospital as inpatients, mainly with stroke but with other neurologic conditions, to respond to calls from the emergency rooms of Cottonwood Hospital, LDS Hospital and Alta Vue Hospitals in Salt Lake City, to construct a program of education for nurses, physicians, physicians' assistants on stroke in these hospitals and throughout the Inter Mountain Health Care System of 21 hospitals.
Q: So this Inter Mountain term is a hospital system?
A: Yes, sir.
Q: Are you, then, an employee of the Inter Mountain Hospital System?
A: No, sir.
Q: Who are you an employee of?
A: I'm an employee of the Inter Mountain Stroke Research Foundation. We have a contractual relationship to Inter Mountain Health Care System.

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Q: Doctor, how much of your time is spent seeing patients now that you're out in Utah?
A: Between 60 and 65 percent.
Q: And what is the balance of the time spent on?
A: It is spent in the teaching activities and the construction of the teaching programs. I do editorial work for the Journal of Stroke and the Journal of Stroke and Cerebral Vascular Disease and review papers for other journals such as New England Journal of Medicine and Annals of Internal Medicine and Neurology and journals of that category.
Q: Are all of the opinions that you have about the case involving Mrs. Doll and University Hospitals and the other doctors contained in this Exhibit B, your report of June 13?
A: Yes, sir.
Q: You haven't changed any of the opinions that have been set forth in that letter to Mr. Mishkind?
A: Correct.
Q: Now, since the time that you reviewed the materials that are set forth in that first paragraph, have you been furnished with some additional material regarding this case?
A: Yes, sir.
Q: Why don't you just tell me, for the record, what

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additional materials you've been furnished.
A: A report from Lawrence Wechsler, a report from Jeffrey King, a report from Thomas R. Price, the deposition is on the list but I have got a new copy, a deposition of Patty Doll, the deposition of John Nemunaitis, a deposition of Alan J. Lerner, the deposition of George Dewey Doll, a report of a neuropsychologic examination signed by Barry Layton, a report on a speech and language evaluation signed by Cloe Glasson and a letter to Mr. Mishkind dated October 14, 1997 signed by Alan J. Lerner.
MR. MISHKIND: I think there is one other item in there, Dr. Riggs' report also, I'm not sure he mentioned that.
A: A letter of August 6, 1997 signed by Dr. Jack Riggs.
Q: Can I see that big pile of materials, please?
A: Sure.
Q: I take it from your answer to my previous question that the review of these additional materials didn't change or alter any of the opinions that you set forth in writing on Exhibit B?
A: Yes, sir.
Q: And this big black binder here, is this your copy of the records?

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A: Yes, sir.
Q: According to your report, you reviewed the labor, delivery and post partum records from University Hospitals and the St. Luke's records in their entirety, right?
A: The records furnished to me, yes, sir.
Q: Have you ever looked at the records from Meridia Huron Hospital or rehabilitation facility, which I will represent to you is the place where Mrs. Doll went from St. Luke's?
A: No, sir.
MR. MISHKIND: You don't mean Huron Road.
MR. MOSCARINO: What do I mean?
MR. MISHKIND: Euclid General.
Q: Meridia Euclid. I'm sorry.
MR. MISHKIND: That's okay. I knew what you were talking about.
Q: The answer is the same, right?
A: Correct, sir.
Q: Thanks.
MR. MISHKIND: We like to do that every once in a while, Doctor. You can disregard us.
Q: What portion of these materials did you review

in prepamtion for today's proceedings?
A: Close to all of them.
Q: Did you look at the films again?
A: Yes, sir.
Q: When did you look at the films?
A: This morning.
Q: Which films did you look at?
A: I looked at CT scans of the 16th, 19th, 21st, MRI done in 1996. MRA done in 1996. I think those are the ones.
Q: Doctor, is there an increased risk of stroke for women who are in the post partum period?
A: Yes. The chance of stroke in the postpartum period is approximately one out of 12,000. If we define "post partum period" as six weeks following parturition, that is a bit higher than though there had not been parturition.
Q: What was that last part? If there had not been, what, pregnancy?
A: Pregnancy and delivery.
Q: So what is the risk of stroke of someone who is a female of Patty Doll's age who is not in the post partum state?
A: In the same period of time, about one in 100,000.

Q: If I ask you to tell me how many more times likely a women who is in the post partum state is to have a stroke than someone who is not in the post partum state, what is your answer?
A: The answer is, the relationship is between one out of 12,000 and one out of 100,000, so that's about eight to one.
Q: Why is there an increased risk to women who are in the post partum state for stroke?
A: I don't know.
Q: Does anybody know?
A: I don't think so.
Q: It's your conclusion in this case that Mrs. Doll was septicemic?
A: Yes, sir.
Q: What does that term mean?
A: Means an infection in the blood.
Q: Is septicemia the same thing as bacteriemic?
A: Not necessarily.
Q: Bacteriemia means a bacterial infection in the blood?
A: Yes.
Q: Septicemia means what
A: Inf ction which can include a virus.
Q: Do you have an opinior. as to whether she was

bacteriemic?
A: She had a positive blood culture which identified that she was bacteriemic.
Q: It's your opinion in this case that – you tell me when I'm wrong. I read your report. If understand you correctly, it's your opinion that this lady had an embolus?
A: Yes, sir.
Q: And I take it from your report that you basically have two alternative theories as to the source of the embolus; am I right?
A: There are more places than that. There are two questions involved. One is, what was the mechanism which produced the embolus, and, secondly, where did the embolus come from, and the embolus could come from a numb er of places. The mechanism remains uncertain.
Q On page two of your report you set forth two equally reasonable explanations for the stroke; am I right?
A: Yes, sir.
Q: Both of those explanations are premised on the fact that Mrs. Doll was septicemic, correct?
A: Not necessarily, no.
Q: Let me point you to –
A: She may have platlet aggregation and clot

formation without being septicemic.
Q: Okay. I'm just going to quote from your report and tell me where I'm wrong. You said, "Two equally reasonable explanations for this stroke exists, both directly related to her septicemia," correct?
A: Yes, sir.
Q: And my question to you was, are both of those explanations premised on the fact that she was septicemic?
A: No, sir.
Q: Why not?
A: In her instance, there was septicemia but there can be a platlet aggregation, the formation of clot, the development of embolus or emboli from the clot, without there being septicemia.
Q: It's your opinion, though, in this report that the stroke was related to the septicemia?
A: Yes, there was a relationship, I think.
Q: Is it your opinion that, at the time of the stroke, Mrs. Doll was dehydrated?
A: Yes, to some degree.
Q: Is it your opinion that the stroke is related to or linked to the dehydrated state?
A: The dehydrated state is one of several factors.
Q: What are the other factors?

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A: The matter of the inflammatory reaction in general including the septicemia. When the operation was performed and the foreign body removed, it was noted that there was damage to the wall of the bowel, and this produces a chemical reaction and inflammatory responses.

There was evidence in the white blood count, which went up to about 18,000. There was some decrease, a bit of a decrease, in the hemoglobin and hematocrit, which are changes that are produced in this fashion. There was a blood test called the D-Dimer, which is abnormal, which suggested that there is pathology in the fibrin fibrinogen complex.

So these were all things that were abnormal and produced a modified disseminated intravascular coagulation state which is associated with clotting.

Q: Getting back to this post partum state, is the post partum state itself a recognized cause of stroke?

A: It is recognized that there is an increased incidence or frequency of stroke. The actual cause of the strokes during that period of time is generally not known.

Q: I just want to make sure that I understand the way you're using some of the terms.

A: Yes, sir.

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Q: "Mechanism of the stroke" means what?

A: Means the actual cause of the occlusion of the artery which produced the stroke.

Q: So what are examples of actual causes of the occlusion of the artery which produced the stroke?

A: The basic causes -

MR. MISHKIND: Are you talking in general or are you talking about with specifics to this case?

MR. MOSCARINO: No, I was trying to find out in general what examples are.

MR. MISHKIND: Okay. Fine.

A: Yes, sir. The basic cause of infarct, which is a stroke produced by a decrease in blood supply, the basic causes are occlusion of a vessel, commonly by thrombus or embolus: maybe a decrease in arterial profusion pressure secondary to such things as trauma with shock: heart attacks with impaired cardiac output; maybe an inflammation of the blood vessel or blood vessels which stimulates the forming of a clot, which, in turn, occludes the vessel.

Such inflammation may be in the form of a vasculitis. It may be secondary to an overt infection. It may be associated with something like meningitis. There is a disorder called lupus which is

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associated with this kind of change.

These are the actual ways in which the blood vessel gets occluded. I get back to the one we call a hemodynamic mechanism in which there is a marked drop in blood pressure and the person goes into shock and there is a narrowed vessel in the brain. There may then be a decrease in focal blood flow distal to that narrowing so that there is a stroke. Those are the mechanisms of an ischemic stroke.

The other big type of stroke is bleeding, and that is due to customarily a break in the blood vessel or for some reason there is seeping of blood quickly out of the vessel and there is a hemorrhage, like one can bleed from a broken vessel in the skin, et cetera. Those are the two big categories of stroke.

Q: Just so I'm clear, the two big categories are ischemic or, what, hemorrhagic stroke?

A: Hemorrhagic, yes, sir.

Q: And what did Mrs. Doll have, in your opinion?

A: She had hemorrhagic transformation of a cerebral infarct.

Q: Where does that fit in, hemorrhagic or ischemic stroke or neither?

A: It fits basically into ischemic stroke.

Q: What does it mean to have hemorrhagic

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transformation of a cerebral infarct?

A: It means that as the tissue dies, there is still some blood getting into the area, although a small amount, and as the tissue dies, the little blood vessels die, they seep blood and the appearance of that blood in the infarct then is called a hemorrhagic transformation.

Q: And in what vessel did Mrs. Doll have this stroke?

A: The general distribution of the middle cerebral artery on the left.

Q: Are you able to tell me in which vessel the stroke originated?

A: No, sir.

Q: Why not?

A: I simply don't know, sir.

Q: How does one, whether you're a neurologist or a neuroradiologist or whomever, go back and make a determination as to which vessel the stroke originated in?

A: Well, if you -

MR. MISHKIND: Let me just object only because you said in which vessel the stroke. You mean in which vessel are you talking about the clot originated?

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MR. MOSCARINO: If he doesn't understand me –

MR. MISHKIND: Okay. I'm just objecting because I'm not sure –

MR. MOSCARINO: Okay. That's fine.

MR. MISHKIND: – what your question is.

MR. MOSCARINO: You're allowed to object.

MR. MISHKIND: Thanks. Every once in a while I do that.

Go ahead, Doctor.

A You asked about neuroradiologists. Neuroradiologists never make such a determination.

Q: Who does make the determination, if anybody?

A That determination is customarily made by a neurologist, general internist, family physician, et cetera.

Q: And what tests do those doctors who practice in those disciplines use to make the determination as to where the stroke originated from?

A: The testing begins with the physical examination, and one of the common sites of trouble is the heart, and so there may be the detection of

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cardiac murmurs, of a change in the size of the heart or a change in the rhythm of the heart, a common change in the latter being auricular fibrillation, which, in turn, is associated with clot formation in the heart. So that the piece of material which becomes an embolus comes from the heart.

We listen to the neck and we are listening for bruit or noises, which may indicate that there is some narrowing there, and the narrowing may be associated with clot formation. Many of us look in the eye and we search for tiny emboli, which are little pieces of material, and if we find such emboli, we recognize that statistically those emboli have come from a lesion, a clotting lesion, in the carotid artery or in the aorta.

So we kind of start with this physical examination matter. We have a variety of tests that we do. We make a distinction between hemorrhage and infarct by doing a CT scan. Do you want me to proceed with the –

Q: Sure.

A: We have a variety of tests that we do. We do a Doppler flow study in the neck to find out whether there appears to be some alteration in the flow patterns there. We do transcranial Doppler, and we

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are now hunting for emboli with embolus-detection testing in the neck.

We look at the contents of the blood. We know that people, for instance, with too many red blood cells may get clotting in various parts of the body or decrease in blood flow. So we look at the red blood count. We look at the white blood count as evidence of possible infection. We look at the hemoglobin because it may decrease the capacity of the blood to carry oxygen to the brain. We look at hematocrit. These are all a series of things that we do.

Then we get into testing for coagulation mechanisms, and this testing can be extensive. We are hunting for evidence that the patient may have a hypercoagulable state. Now, that will not necessarily tell us, if we find same, where the embolus started, but it will tell us that there is a propensity for clotting, and, therefore, for embolus formation.

We look at Factor-C. We look at Factor-S and we look at 3-A, 3-B. We look at phospholipid antibodies. We look for D-Dimer. We test fibrinogen, for instance. We go through a battery of items, including Factor 2, which is prothrombin, and we do plasma determinations to see whether there is any change in antithrombin 3 and a whole variety of things to see

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whether there is too much of a tendency or an abnormal tendency for the person to develop clotting.

So these are some of the things that we do as far as blood examination is concerned. We look for diabetes. We look at the lipid profile because we know that hyperlipidemia constitutes a risk factor for stroke.

We go to things like the chest X-ray to see whether there is a change in cardiac outline. We get an EKG immediately in the ER to see whether there is a change in rhythm or there is any evidence of a previous heart attack, myocardial infarction, because if there is an idiodynamic segment in the heart, this is a source of clotting and embolus formation.

We look for such things as pericarditis. We do a sedimentation rate to see whether there is any evidence, for instance, of periarteritis nodosa, which is a disorder of the blood vessel system, which can cause a stroke.

In the last couple of decades, we often in the ER do a tox screen because ingesting of certain agents such as cocaine, heroin and so forth can be associated with blood vessel changes, which, in turn, can be associated with an increased tendency to clot. We look at all of those things.

In the history, we get into the background of whether an individual has had X number of strokes or heart attacks, in other words, vessel disease of various kinds. We, of course, measure the blood pressure to see whether the individual is hypertensive or not.

We look at renal function, the function of the kidneys, to find out whether there has been any alteration there, which may indicate a background of vascular disease. We do a similar thing as far as the lung is concerned in our chest X-ray profile. We are looking for items such as sarcoidosis, for instance, which can turn up in the chest and can be associated with stroke production. These are a variety of items that we look at.

We do the CT scan, as I mentioned, to distinguish between infarct and hemorrhage. There may be instances where subsequently arteriography is done. There are two general fashions in which that's performed. One is called MRA and the other is a so-called traditional arteriogram, and that's done, however, in a variety of ways and may be done in certain circumstances, particularly if we hear a noise in the neck or there is a change in the intracranial digital subtraction, et cetera.

So there are a whole variety of things that we do in an attempt to find out the mechanism and also the possible source, and in a fair number of instances, probably a third or more, we do not find the actual source and sometimes not the mechanism of the clot embolus formation.

Q: You gave me a pretty long answer there on the variety and types of tests that you as a neurologist perform to try and find both the mechanism and the source of the stroke, right?

A: *Yes*, sir.

Q: In your report you state on page two, the first paragraph there, "She underwent multiple tests following the stroke to determine the etiology of same," correct?

A: Yes, sir.

Q: Your next sentence says, "According to Dr. Lerner, a definitive explanation for Ms. Doll's stroke could not be determined," correct?

A: Correct.

Q: And your source for that statement is what?

A: His deposition.

Q: What do you mean by the term "definitive explanation"?

A: The word "definitive" means highly likely, high

probability.

Q: Of the tests that you recited for me in that long answer, a great majority of those were performed at the ordering of Dr. Lerner; is that correct?

A: Yes, sir.

Q: And none of those tests gave an answer as to what the cause of the stroke was?

A: They gave no answer as to the source of the embolus. There were abnormalities.

Q: Was it Dr. Lerner's conclusion at the time of the hospitalization that there was an embolus, if you know?

A: I believe he made a diagnosis of an embolic infarct with hemorrhagic transformation.

Q: And even looking at this case afterward in retrospect, you're not able to tell me where this embolism came from, true?

A: Correct, sir.

Q: What is your reason for concluding that it was an embolus as opposed to a thrombus?

A: The relative suddenness of the neurologic onset abnormality together with the nature of the first CT scan.

MR. MOSCARINO: Can you repeat that answer for me?

MR. MISHKIND: Your question was why he's saying it's an embolus as opposed to a thrombus?

MR. MOSCARINO: Right, that's what I asked him.

MR. MISHKIND: Just wanted to make sure that's what you meant to ask him.

A: Excuse me. I didn't hear the word "thrombus" in the question.

MR. MISHKIND: That's why I raised it because I know what you're asking him but I think you are not stating it properly to get the answer that I think you want from him. I'm not going to touch it any further. I'm just going to leave it at that.

Q: Do you want to add something to that answer, Doctor, after that discourse by Mr. Mishkind?

A: No, sir.

Q: Just to break it down so nobody's confused, you believe that there was an embolus here that traveled from some undetermined, unknown site to Mrs. Doll's brain, correct?

A: Yes, sir.

Q: And you believe that that embolus, although we don't know where it came from, lodged somewhere in the blood vessels or undetermined blood vessels of the brain, right?

A: Yes, sir. Middle cerebral artery territory on the left.

Q: When you say "middle cerebral artery territory," that's the same thing as you told me before, general distribution of the middle cerebral artery?

A: Yes, sir.

Q: Is it your opinion that it actually lodged in the middle cerebral artery?

A: Probably. High probability. 90/10.

Q: And your reason for saying that is what?

A: The extent of the damage to the brain anatomically.

Q: Is there a test that you looked at in the form of some type of scan that lets you as a neurologist look back in time and say, "There it is in the middle cerebral artery," or is that your conclusion based on the reasons that you just told me?

A: It is my conclusion based on the physical signs or neurologic abnormalities coupled with the first CT and subsequent CT scans.

Q: Are there strokes that are caused by a thrombus as opposed to an embolus?

A: *Yes,* sir. Recall, if you will, that most emboli are made up of thrombus.

Q: And excuse my lack of knowledge of medicine, but are there strokes that are caused by formation of clot in the actual artery or vein where the stroke happens as opposed to having that piece of blood clot, emboli or whatever travel from a more distal location?

A: Yes, sir.

Q: And my original question here was, what is your reason for saying that this was a stroke of what I'll call embolic cause as opposed to a clot that was caused by a thrombus in that vessel?

A: I repeat, Number one, the severity and suddenness of onset of the neurologic abnormality. Number two, the nature of the changes in the CT scans, sir.

Q: And specifically what nature, what changes?

A: This was a picture in the CT scan that, by autopsy study in other patients down through the years, is characteristic of an infarct which has little tiny islands of blood in it, which we refer to as hemorrhagic transformation, and in experimental animal work as well as in autopsy in humans, that is characteristic of an embolus.

Q: I take it you're telling me this was an arterial

stroke?

A: Yes, sir.

Q: Are there such things as venous strokes?

A: Yes, sir.

Q: Is it your opinion that this was not a venous stroke?

A: Yes, sir.

Q: And your reasons for saying that are what?

A: The venous stroke has a different distribution in the vascular system and it also has a different method of onset, and the CT scan shows a different pattern of abnormality.

Q: When you talk about the CT scans in answer to my last few questions regarding venous strokes and this being in the middle cerebral artery, are you speaking of the first CT scan done on 11/16?

A: And subsequent CT scans.

Q And why is it that you can't tell us where this embolus came from?

A: Simply because I don't know, sir.

Q: Why do you conclude that the carotid artery had focal narrowing?

A Because of what I saw later on in the films in the MRA.

Q: What tests were performed during the

hospitalizations that give any insight regarding the status of the carotid artery?

A: Doppler examination.

Q: And what was the result of that test?

A: It was said to be normal.

Q: Is the Doppler test something that's done by sound?

A: Yes, sir, ultrasound.

Q: Were there films then taken of the carotid artery?

A: There is a type of film which is ordinarily made, yes, sir.

Q: Does that film give insight as to the status of the carotid artery, whether it's open or whether it's stenosed?

A: Yes, sir.

Q: Did you review that film?

A: No, sir.

Q: And which film was it that led you to conclude that there was a focal narrowing of the carotid artery, the MRI or MRA?

A: MRA.

Q: "A" you said?

A: *Yes,* sir.

Q: What did you see in the MRA that led you to that

conclusion?
A: There is some narrowing of the pattern in the internal carotid artery. This was in 1996, however.
Q: And it's your opinion that that Same narrowing was, therefore, present two years before?
A: It's possible, sir. I think it's more likely than not, in other words, 75/25.
Q: Okay, In response to that question, you used the word "possible." Then you used the term "75."
A: Yes, sir.
Q: Is it your opinion that it's more likely than not that Mrs. Doll had a focal narrowing of the carotid artery back in 1994 when she had the stroke?
A: Yes, sir.
Q: And the reason for your opinion is what you just told me about with respect to the MRA?
A: Yes, sir.
Q: Is it your opinion that Mrs. Doll was in a hypercoagulable state at the time of the stroke?
A: Yes, sir.
Q: What's your basis for that conclusion?
A: The existence of the D-Dimer; the altered profile, for instance, of the white blood count, with so many blood cells; slightly low fibrinogen, and this is a DIC kind of stroke, disseminated intravascular

coagulation.
Q: Is it your opinion she suffered from DIC?
A: A distant form of it, yes.
Q: What do you mean by that?
A: DIC has a number of subdivisions or split-offs, like some other disorders, and I think she had an element of DIC present, not flagrant or full-blown DIC.
Q: What are the tests that are normally done to confirm the presence of DIC?
A: Well, D-Dimer is one of the principal ones –
Q: What else?
A: – that's been done in the last few years. We look at antithrombin-C. We look at S. We look at platlet aggregability. Those are other tests that are done.
Q: Were those other tests in addition to the D-Dimer performed in this case?
A: I don't think so. I don't think so. C, S and antithrombin-3 were done. I may be wrong about that, sir. I don't remember seeing them.
MR. MISHKIND: If you want, he can look through the record and confirm that.
MR. MOSCARINO: If you want to, you can. If not, it's fine with me.

A: Yes, sir.
Q: How many?
A: I don't know.
Q: Not trying to split hairs, but when you do a blood culture, does that mean, when she had one positive, that there was more than one culture positive? Did they do those in sets or should that sentence read "A blood culture was positive"?
A: A blood culture was positive.
Q: Do you know what the opinion was of the infectious disease consultants at St. Luke's with respect to the significance?
A: I don't remember.
Q: What is the incidence of contaminant with respect to strep viridans and positive blood cultures?
A: I don't know.
Q: Have you cared for a women in the postpartum period who has suffered a stroke?
A: Yes, sir.

Q: How many?
A: Probably ten in the last 45 years. Ischemic stroke. I have cared for 40 or 50 with bleeding.
Q: So total 50 to 60 women who have suffered strokes in the post partum period in your career?
A: Yes, sir.
Q: Have you cared for individuals who have suffered strokes subsequent to a retained foreign body in the abdomen?
A: Yes, sir.
Q: How many?
A: One.
Q: Can you tell me about that case?
A: That was a man who was injured in a lumber mill accident in 1958 and had a piece of wood driven into his abdomen and that was not removed and healed. Then they got into trouble with his intestine and infection, had to, of course, have an operation, and in the course of these events, had a stroke.
Q: Was that an embolic or thrombic event?
A: It appeared to us to be embolic secondary to thrombus formation.
Q: Did you identify the site of the thrombus formation in that case?
A: We were uncertain about it.

Q: Did Mrs. Doll's post partum state play a causative role in the stroke that she suffered subsequent to the removal of the laparotomy pad?
A: I need further definition of the phrase "post partum state."
Q: The fact that she was two weeks post-delivery, did that in and of itself play a causal role in the stroke that she suffered post-surgery?
A: To me, that is a matter of relativity. Her course from the 6th until the 15th, except for the day of the 14th, was associated with general malaise, that is, feeling pretty lousy, with some nausea, abdominal discomfort. In other words, she wasn't well at all.
Then on the 14th there she had a good day and on the 15th she had a return and exacerbation of the symptoms that she had been having between the 6th and the 14th. All of these things indicated that there was something significantly wrong with her, and she then appeared at St. Luke's Hospital and the diagnosis of a foreign body was made and the operation was performed.
So there was an abnormal post partum state existing with the exception of one day between the 6th and the 15th.
Q: Do you know a Dr. Sheldon Margulies?

A: No, sir.
Q: Have you read his report in the case?
A: No, sir.
Q: He says in his report and he told us yesterday that there are several possible causes of Mrs. Doll's stroke, one of which is her post partum state. Do you agree with that?
A: Well, I have tried to straightforwardly define what I mean by post partum state, and I'm not sure what Dr. Margulies means by that same phrase. I think her post partum state was caused by the presence of the foreign body, post partum state referring to her medical condition during the time between, let's say, the 2nd and 3rd and the 15th.
Q: Well, these 50 to 60 patients that you have treated that have suffered strokes in the postpartum period, have you been able to determine a mechanism or etiology or cause of all of those strokes?
A: Not all of them, but most of them, yes.
Q: And when you determined the cause of those strokes, is one of the causative mechanisms the fact that they are in this post partum period, or do you just conclude that that's coincide?
A: In some instances, both. For instance, several of the patients have had auricular fibrillation, and

this was years ago when we weren't paying quite as much attention to auricular fibrillation as we are now. Only one of those good many patients had the stroke following a cesarean section, which is another category.
Q: Have you done research on the issue of strokes in the postpartum state?
A: No, sir.
Q: Are you familiar with the medical literature on the subject?
A: Somewhat familiar with it, sir.
Q: What articles would I look to to review this issue, what journals?
MR. MISHKIND: Let me show an objection to the question. But you can go ahead and answer it.
A: The textbook by Henry Barnett from Toronto has material about post partum state. Jim Toole's textbook has material about post partum state. My textbook has a little material about the post partum state. I forgot the name of my friend in England whose book has material about the post partum state and the occurrence of stroke.
Q: How about, are there any leading journal articles on this topic?

MR. MISHKIND: Objection.
Go ahead.
A: There was an article in the New England Journal last year about post partum state stroke.
Q: When I questioned Dr. Margulies on this topic yesterday, he directed me to the Kittner article in the New England Journal of Medicine.
A: That was in September 1996.
Q: Is that the article you're referring to?
A: Yes, sir.
Q: He also mentioned some other article that concerns some type of similar study by a group of doctors in France.
A: Yes.
Q: What is the name of that article?
A: I don't know.
Q: Did you review the Kittner article at all in preparation for your deposition today?
A: Not in preparation for the deposition, but I have seen it.
Q: Did you conduct any medical research as part of your engagement by Mr. Mishkind in this case?
A: No, sir.
Q: What was the source of your statistics when I asked you at the beginning of the deposition of the

increased risk of stroke in the post partum period?
A: The Kittner article.
Q: Is the Kittner article the leading article on the discussion of the incidence of stroke in post partum women?
MR. MISHKIND: Objection.
A: I don't know.
Q: Do you hold yourself out as an expert in the incidence of stroke in post partum women?
A: Only in my experience.
Q: Do you know any of the other experts who have been identified in this lawsuit?
A: Yes.
Q: Which ones do you know, or which one?
A: I know Dr. Wechsler just a bit and I know Dr. Price very, very well.
Q: How about Dr. Riggs? Do you know him?
A: No.
Q: How do you know Dr. Wechsler a bit?
A: Via contacts in neurology and at stroke meetings and at the American Academy of Neurology and American Neurologic Association.
Q: And how do you know Dr. Thomas Price?
A: I know him through work in stroke going back 30 years and we have served on committees together, on

NIH study section. We have worked on the nomenclature committee of stroke which I chaired and I've just seen a great deal of him in stroke meetings and one thing or another in the last 25 years.
Q: I see. Is he a recognized or respected neurologist within the subspecialty of stroke?
MR. MISHKIND: Objection.
A: Yes, sir.
THE WITNESS: Excuse me.
MR. MISHKIND: That's okay. You can still answer the question even though my objection is stated.
Q: You respect his opinion on matters concerning stroke?
MR. MISHKIND: Objection.
A: Yes.
Q: Do you know if he was involved at all in the work that is summarized in the Kittner article?
A: I think he was mentioned but not listed as an author. I think he was by-lined or something. I'm sorry. It's been a long time since I've seen that, but I believe his name was – but I don't believe he was a co-author.
Q: What do you have to do to be a co-author on one of these journal articles like appear in the New

England Journal of Medicine and other peer-reviewed journals?
A: Take some part in the accumulation of the data.
Q: Did you say you read the deposition of George Doll, Mrs. Doll's husband?
A: *Yes*, sir.
Q: Do you agree that a woman can have a stroke for no other reason than being in the post partum state and the related changes that occur to a woman's body in that time period?
THE WITNESS: Would you read that question back?
(Record read.)
MR. MISHKIND: Let me just show an objection before the doctor answers just to the question as put in terms of "Can," but certainly the doctor can answer the question.
A: No, I don't agree.
Q: And the reason that you disagree with that statement is what?
A: The matter of, most of the patients who have been studied carefully at our place, we find a cause other than the bearing of a child, causes, for instance, such as atrial fibrillation, cardiac

myopathy, lesions in the carotid artery, dissection, lupus, erythematosis, some kind of a mechanism other than, quote, "post partum period," close quote.

Q: And were there patients, in your experience, who suffered strokes in the post partum period where you were not able to find a definitive explanation?

A: Yes, sir.

Q: And what, then, was your conclusion with respect to those patients who suffered those strokes of undetermined origin in the post partum state?

A: Exactly the same as it is in the stroke population in general. Where in some 30 percent we find no literal mechanism for the stroke, we simply have to answer that we do not know.

Q: And in those cases, if those patients were in the post partum state, you would not tell those patients that one of the reasons or a reason for their stroke was the fact that they were post partum?

A: Correct. The inquiry, in my experience, has come up on a number of occasions should they have another child, and several of them have gone on to have another child and had no more trouble and we never found out what the mechanism was for the stroke.

Q: Are there any studies on that issue, that being the risk of second stroke for a woman who has suffered

one stroke in the post partum period?

A: I don't remember any.

Q: You are not going to be giving opinions at the trial of this case regarding the issue of the standard of care as it relates to either the hospital personnel or the OB/GYN; am I right?

A: Correct, sir.

Q: Are you or have you been asked to express any opinions regarding the extent or permanency of Mrs. Doll's injuries from the stroke?

A: Yes, sir.

Q: Is that contained in your report?

A: Yes, sir.

Q: Where is that contained?

A: "Ms. Doll has suffered extensive damage to her brain as demonstrated by the studies which you submitted to me."

Q: And are you going to be giving opinions other than that sentence, that she has extensive damage to her brain?

MR. MISHKIND: Let me object.

I'm going to ask him questions for him to explain the substance of that. He's not going to be limited to just saying that sentence, and if you want to ask him

questions about the nature of that extensive damage and the significance of that, that's the purpose of that sentence.

MR. MOSCARINO: Yes, I hear that.

As the lawyer for the hospital, I just want the record to be clear that he has gone through a two-page explanation of whatever his opinions are regarding the etiology of the stroke. I don't know that that one line is good enough but –

MR. MISHKIND: Well, let me just state to you that the case law is very clear that a report doesn't have to outline the entire substance of an expert's opinion as long as it identifies the subject matters, and one of the subject matters is the nature of the damage. We can deal with that.

MR. FARCHIONE: To cut to the chase from my standpoint, you've got Layton coming in, Nemunaitis, Lerner, Lystad, all coming in, treating individuals, to talk about damages. Is he going to be getting into the specifics of her current condition and that or are you talking just in general

based on the films there is damage to this area and that can lead to those types of things, then the other people come in and talk about the specifics of her damage?

MR. MISHKIND: Generally your statement is accurate.

MR. FARCHIONE: That's what I wanted to know.

MR. MISHKIND: He's not going to be testifying from a clinical standpoint how she is doing. He will testify based upon the pathology, what significance that is as demonstrated, and he has had a chance to review some of the reports. So if you want to ask him questions, I don't think it's going to take that long for him to tell you the extent of what he is comfortable testlfjring to and to the extent he's not comfortable testifying.

Q: Have you examined Mrs Doll?

A: No, sir.

Q: Have you met her?

A: No, sir.

Q: Are you familiar with what the state of her recovery is from the stroke that was suffered in

November of 1994?
A: I am familiar to the extent of reviewing the testing done and reading the deposition of her husband and those things contained in the description of her behavior, her work situation, et cetera.
Q: Will you agree with me that she has made a tremendous recovery?
A: She has made a remarkable recovery, yes, sir.
Q: I take it you're not going to be giving any opinions regarding her future course of events or prognosis?
A: I have an opinion, yes.
MR. MOSCARINO: And that one of the opinions you're going to be eliciting from him?
MR. MISHKIND: *Yes.*
MR. MOSCARINO: Well, I object to that.
Q: But since we are in a discovery deposition, go ahead and tell me what that is.
MR. FARCHIONE: I will enter an objection also.
A: My opinion is that she has permanent, lifelong brain damage and that she will not return to normal.
Q: Are you going to be giving any opinion as to

whether she is going to continue to improve?
A: Yes, sir.
Q: What is your opinion on that?
MR. MOSCARINO: Same objection, but I'm here for his discovery deposition.
A: We are now three years out, and, for instance, her homonymous hemianopsia, her visual defect, will not improve. Her aphasia at this point in time will, in general, not improve.
Q: What is aphasia?
A: Aphasia is a defect in language reception and language production produced by a focal brain lesion.
Q: Are you aware of the fact that she is back at the same job that she had before?
A: Yes, sir.
Q: Are you aware of the fact that she has received at least, I believe, two pay increases and positive job reviews?
A: Yes, sir.
Q: Are you surprised by that?
A: No, sir.
Q: Do you have any reason to doubt that she will continue to perform in her job?
A: No, sir.
Q: Do you have any reason to doubt that she **may** not

receive a promotion?
A: No, sir.
Q: Do you have any opinions that she shouldn't be rearing children?
A: No, sir.
Q: Do you know that she can balance her checkbook?
A: I've been told that.
Q: Does that surprise you?
A: Yes, sir.
Q: Why?
A: Because of the nature of the brain lesions as displayed in the CT and MRI examinations.
Q: Specifically what?
A: The evidence of brain damage, focal brain damage. It is possible that she has ability on the non-dominant side, because there are some people who do, and that may be an explanation for her ability to work with the checkbook.
Now, I don't know whether that ability is predicated on simply using a computer to add, subtract, et cetera, or whether she can literally do those things like we do them as normal people. I don't know the answer to that because I haven't seen her. I haven't examined her.
Q: You mean computer or calculator?

A: Calculator.
Q: As a neurologist, do you look at these scans and then make predictions as to future prognosis based upon the, quote, unquote, "Damage to the brain" that you see on the film?
A: I inter-relate what I see in the film with the examination of the patient. The examination of the patient is the number one issue in all of this kind of work. Number **two** has to do with the films. As I just mentioned, there are some individuals who have some cross-over, what we call dominant lobe phenomenon into the other side, and that can't be determined by the CT or MRI. The actual ability must be determined by testing the patient.
Q: And do some patients just simply do better than you, as a neurologist, predict they would do given your review of the scans and even your examination?
A: Yes, sir.
Q: You're not ruling out that Mrs. Doll will not continue to improve with respect to her job performance and her aphasia –
MR. MISHKIND: Objection.
Q: – as the years go on?
MR. MISHKIND: Objection. Go ahead.

A: I'm not ruling it out. I think the odds are 95/5 that she has reached her summit of improvement as far as formal testing is concerned which identifies the severity of the cognitive defect.

Q: Given what you told me about the importance of the examination, do you feel that you need to actually examine her and confer with her and make a personal judgment on her before issuing opinions regarding her extent of injuries and future prognosis?

MR. MISHKIND: Objection.

A: I feel comfortable with the quality of the reports that I have read and the films, but particularly with the quality of the neuropsychological testing and the testing for aphasia.

Q: So the answer is, no, you don't think you need to examine her?

A: Right.

MR. MOSCARINO: I need to take a two-minute break.

MR. MISHKIND: That's fine.

(Recess taken.)

Q: To what degree was the carotid artery narrowed?

A: To what degree?

Q: Yes, sir.

A: 20 percent.

Q: And how did you come to that conclusion?

A: By looking at it.

Q: Just by visualization?

A: Yes.

Q: Is there any kind of test that somebody performs that gives you that calculation?

A: No, sir.

Q: So it was 20 percent in 1986?

A: '96, sir.

Q: '96. I'm sorry. What was your opinion, then, as to what it was in 1994?

A: Probably similar, More than about 75 percent likelihood.

Q: About 75 percent likelihood that it was 20 percent in '94?

A: Yes, sir.

Q: You talk about an embolic event from the pelvic region on page two of your report.

A: Yes, sir.

Q: You go on to state, "Even though the tests performed did not produce evidence of same."

A: Sir?

Q: You also go on to state in that report, "Even

though the tests performed did not produce evidence of same." Am I right?

A: Yes, sir.

Q: What tests are you talking about?

A: I believe there is an examination by a vascular surgeon who found no evidence of that trouble.

Q: Was it your opinion that there was an embolus from the pelvic area?

A: I don't know, sir. It's possible.

Q: Is that an opinion you hold to a reasonable degree of medical probability?

A: Yes, sir.

MR. MISHKIND: That it's possible?

A: That it's possible.

Q: No. Do you believe to a reasonable degree of medical probability that Mrs. Doll had an embolic event from the pelvic region or are you just stating that as a possibility?

A: I'm stating it as a possibility, sir.

Q: So that the record is clear, when we go to trial in this case, you will not be testifying to a reasonable degree of medical probability that Mrs. Doll had an embolic event from the pelvic region?

A: Correct, sir.

Q: Is your delineation of possibility and

probability the same when it comes to the comment that you have in that same paragraph regarding the carotid artery?

A: No, sir.

Q: Tell me why it's different.

A: In the instance of the abnormality in the pelvis, the pathway is to the heart and then through a patent foramen ovale, and that's the right side of the heart and then into the left side of the heart and thence to the cerebral circulation.

On TEE there was no demonstration of a patent foramen ovale. However, the foramen ovale may not have opened up at the time of the TEE. This lack of opening of the foramen ovale has been well-demonstrated in people who ultimately proved to have such a defect.

In contrast, the sources of emboli to the brain are much more likely to be intracardiac or carotid system than from a pelvic lesion where there is no demonstrable way for the emboli to cross from right heart to left heart.

Q: Dr. Margulies told us yesterday, in view of the TEE test result, it was impossible for a pelvic embolus to travel to Mrs. Doll's brain. Do you agree with that?

A: I do not agree that the TEE absolutely rules out a possible cross-over.
Q: Mrs. Doll's treating physicians back in 1994 ruled this cause out, correct?
A: I understand. Yes, sir, correct.
Q: Basically you're agreeing with them?
A: I do not agree that a negative TEE absolutely rules out the possibility of a patency between the two sides of the heart.
Q: You agree –
A: Although the statistics of that probability are less than five percent.
Q: Would you agree with me that it's highly unlikely that in this case an embolus from the pelvic region traveled through Mrs. Doll's heart and caused the stroke?
A: *Yes*, sir.
Q: Now, what about the other explanation that you pose in this paragraph, that being the carotid artery? Do you agree that's also highly unlikely in this case?
A: No, I don't.
Q: Is it your opinion to a reasonable degree of medical probability that there was a clot that formed in the carotid artery that traveled to Mrs. Doll's brain?

A: I don't know where the clot formed, as I have mentioned. I think the most likely site was someplace in the carotid circulation, probably internal carotid circulation.
Q: Is this speculation on your behalf?
MR. MISHKIND: Objection.
A: No, it's not speculation, definitely not speculation. This is a result of **45** years of experience, of study and activity in 'trying to find out about such cases.
Q: Okay. And I'm just trying to uncover your opinions as the lawyer for the hospital.
A: Yes, sir.
Q: You have no opinion to a reasonable degree of medical probability as to the source of the embolus?
MR. MISHKIND: Objection. Asked and answered about five times. But go ahead and answer a sixth time.
A: *You* are correct, sir.
Q: By the way, before we took this break, we had started to talk about your opinions regarding the extensive damage to her brain. Did I receive all your opinions regarding that issue?
A: I believe so.
Q: Have you asked for any additional information

regarding this case that you have yet to be provided with?
A: No, sir.
Q: Have you read Dr. Price's report?
A: Yes, sir.
Q: Do you disagree with that or do you have any comments regarding it?
A: I disagree with the opinion concerning the cause of her stroke.
Q: I take it by your prior answers to questions that you agree with me that Dr. Price is qualified to opine on the issues that are at hand in this case?
A: Yes, sir.
Q: Just as though you would tell me. I take it, based on your CV and experience, that you are qualified to opine on the issues that are at hand in this case?
A: Yes, sir.
Q: How commonplace is it that experts in the area of a specialty like neurology will differ on the interpretation of medical records –
MR. MISHKIND: Objection.
Q: – and things of this nature?
MR. MISHKIND: Objection.
A: In my experience, it's fairly common. Dr. Price

and I have disagreed about nomenclature extensively as committee members and continue to regard each other highly.
MR. MOSCARINO: I'm going to stop my questioning at this point in time and defer to Mr. Farchione with the reservation that I may have some additional questions. Fair enough?
MR. MISHKIND: Uh-huh.

EXAMINATION
BY MR. FARCHIONE:

Q: Doctor, my name is Joe Farchione. I represent Dr. Gyves in this lawsuit. I want to follow up on where Mr. Moscarino left off with regard to Dr. Price. You've indicated that you're read his report and are familiar with his opinions, correct?
A: Yes, sir.
Q: Are you here today to rule out 100 percent Dr. Price's opinion or is this just simply a difference of opinion between two experts in the area of stroke?
MR. MISHKIND: Objection.
A: The former.
Q: The former?
A: (Nods affirmatively.)

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Q: How is it that you can rule out Dr. Price's opinion 100 percent?
A: I believe that his opinion did not include the fact that there was a cesarean section, that there was a retained foreign body and a series of days during which there was abdominal discomfort with nausea and marked worsening on the 15th, and that he has not put all of those items into the formulation of his statement that the, quote, "Cause of her stroke was her post partum state," close quote.
Q: Let me see if I understand what you just said. If I'm wrong, please correct me.
It's your belief that Dr. Price did not consider the cesarean section, the retained foreign body, the abdominal discomfort, the increase on the 15th. He did not evaluate that properly in his opinion?
A: In my opinion, correct, sir.
Q: I guess what I'm getting back to is, assuming Dr. Price had all the records that you had in this particular case, and I understand what your opinion is and you understand what his opinion is, is this just a difference of opinion between two experts?
MR. MISHKIND: Objection.
Go ahead, Doctor.

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A: It is certainly a difference of opinion between two experts. I am trying to identify, in response to your inquiry, what I think is the background reason for his opinion being so markedly different than mine.
Q: Dr. Lerner's workup of this patient following the stroke, do you have any criticism of that at all?
A: No, sir.
Q: Would you consider that to be a complete workup of the situation?
A: When we get to the technicalities of such a workup, one can get into the issue of searching with modern equipment for embolus detection. I don't think that would have added anything to this workup. I don't think that Compound S, Compound C, antithrombin-3, frequent determinations would have really added anything. I am not critical of his workup, sir.
Q: And anything additional that could have been performed, it's your belief that it wouldn't have added anything to the conclusions reached by Dr. Lerner at the time?
A: Correct, sir.
Q: Was there any way to predict when this patient was rehospitalized, hospitalized for the removal of the sponge, that she would suffer a stroke?

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A: No, sir.
Q: Was there any way that it could have been prevented once she was hospitalized for the removal of the sponge?
MR. MISHKIND: Are you talking about deferring the surgery?
MR. FARCHIONE: Any way.
A: From the time of the hospitalization on the 15th until it happened on the 16th?
Q: Correct.
A: I don't believe so, sir.
Q: At what point between the time of her cesarean section and the time of the stroke did it become more likely than not that she was going to suffer a stroke?
A: I don't know, sir.
Q: Could it have been just as likely within a few hours of the cesarean section as it would be a few hours before the rehospitalization, or you can't tell?
A: I don't think so, but I cannot tell.
Q: To a probability you could not tell which end of the spectrum would be more likely?
A: I think over half. We would say toward the end of that period of time because of the inflammatory changes that were taking place around the foreign body and into the wall of the intestine.

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Q: But for the two items that you just mentioned, would the stroke have been avoided to a probability?
MR. MISHKIND: I'm not sure I understand your question, Joe, the two items being the inflammatory process into the –
MR. FARCHIONE: The bowel.
Q: Maybe you're putting those two together. The answer that you just gave me, the inflammatory process, what exactly were you referring to?
A: I'm referring to the fact that there was alteration in the white blood count and there was a change, a bit of change, in fibrinogen and D-Dimer at the time of the operative procedure. There was a tissue reaction including adherence of material to the wall of the intestine so that that material had to be dissected away, and I believe another surgeon was called in to look at this and assist a bit with it.
All of these phenomena indicate a change in what we call the immune response to the introduction, in this instance, of a foreign body into the patient.
Q: Let me ask it to you this way. Maybe that will be clearer. If she had the sponge removed 24 hours after the cesarean section, do you have an opinion to a probability whether she would have suffered the

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stroke?
A: Yes, I do.
Q: And what is that opinion?
A: She would have been much less likely, significantly less likely, to have the stroke.
Q: Does that mean to a probability she would not have had the stroke?
A: Yes, sir.
Q: What about 48 hours after the cesarean section?
A: Same answer.
Q: 72?
A: The inflammation, of course, is now beginning to happen as far as the tissue is concerned. I think the answer is still the same. Where in that spectrum it changes, crosses over the line, I'm not sure.
Q: Well, that's what I want to try and narrow it down as to where does it get to the point where you don't know. So far you have given me three days after the section, if the sponge had been removed, to a probability she would not have suffered the stroke. Let's try day four.
A: I don't know. From this point in time out I don't know, sir.
Q: I think you mentioned that there were ten patients you had in the post partum period who had

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suffered a stroke, correct?
A: Correct, sir.
Q: Of those ten, how many were you able to determine a precise cause? And I believe atrial fibrillation is one of the causes you –
A: Is I recall, about eight. None of these were following cesarean section.
Q: Would the rate of stroke in a post partum period be higher in a woman who has undergone a cesarean section as opposed to a vaginal delivery?
A: I don't know data on that separately.
Q: The two women who suffered the stroke for whom you could not find a cause, what role did you play specifically with each of those two patients?
A: I was the neurologist involved.
Q: When were you called into the case?
A: Immediately.
Q: Were you involved with the hospitalization from that point forward?
A: *Yes*, sir.
Q: Was it a similar type of stroke to what we have in this particular case?
A: Not as severe, sir.
Q: How long ago was your experience with those two?
A: This is 25 years ago.

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Q: Women two weeks following a cesarean birth, can you tell me what range one would expect for the white blood cell count?
A: No, sir, I can't.
Q: Can you tell me what the range would be for the hematocrit or hemoglobin in the two weeks following a cesarean birth?
A: No, sir.
Q: If a D-Dimer test had been run on a post partum, post-section patient within two weeks of that section, can you tell me what range you would expect for that time of a patient?
A: I would expect it to be negative.
Q: The two patients that you were involved with 25 years ago, do you recall what their D-Dimer was?
A: We didn't have the test.
Q: Did you have a test that was similar to that at that time?
A: No.
Q: Were you able to complete *25* years ago any type of coagulation study, PT, PTT?
A: Those were done, yes, sir.
Q: Do you remember what those were?
A: The platlet agglutinations were done. Those were all normal in those two persons.

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Q: How does inflammation affect the clotting?
A: Inflammation, particularly when it gets into the wall of the blood vessel and affects the endothelium of the blood vessel, decreases the ability of the endothelium to form intrinsic TPA, which is anticlotting, and the inflammation then produces a situation where platelets may adhere to the vessel wall, and when the platelets adhere to the vessel wall, they cast out chemicals which may induce other platelets to stick to them without sticking to the wall, and aggregation of platelets then begins and this is the initiation of the clotting process.
Now, all of this is a dynamic, highly dynamic, kind of process. This is going on all of the time, but when a vessel gets inflamed, it changes the likelihood of such things happening.
Q: If the source of the embolic stroke, as you've opined in this case, if it was in the carotid, which was one of the two possibilities you've given earlier, how did the inflammation affect the carotid?
A: The inflammation can be a reaction, of course, that goes on in the blood stream or is induced through the blood.
Q: From the septicemia?
A: Through the business of septicemia and the

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changes in the chemistry of the blood produced by infection.

Q: So if this patient was not, in your opinion, septic, did not have septicemia, then that would rule out the carotid source?

A: Not necessarily. We have patients who get inflammatory reactions as in cranial periarteritis and periarteritis nodosa and lupus without inflammatory reactions in vessels secondary to an infection that is localized elsewhere from the body without literally producing any septicemia.

Q: Why did she get better on Monday?

A: I don't know, sir.

Q: Did you find that unusual, that she was able to get up and go out to McDonald's and eat?

A: Yes.

Q: Why?

A: I don't know. I literally don't know why she got so much better.

Q: Women in the post partum period who suffer strokes when there's no known source found, are those more often than not arterial strokes or venous strokes?

A: Arterial.

Q: What do you base that on, the Kittner article?

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A: Well, in my experience, see, if we look at the question of stroke, in my experience, more than half of the patients I have seen have had ruptured intracranial aneurysms.

Q: Well, then, a source for a stroke would be the aneurysm?

A: The mechanism.

Q: Correct. I'm talking about, for instance, the two patients who you had which you could not find a source for. Under those circumstances, is it more arterial or is it more venous?

A: More arterial, sir.

Q: And the reason for that?

A: I don't know, other than if we look at all strokes, the weighting is significantly towards arterial pathology in contrast to venous pathology.

Q: What was the cause for this narrowing that you noted, the 20 percent narrowing of the carotid?

A: I don't know, other than a constriction like this is produced by fragments of fibromuscular dysplasia or a bit of erythematous change. We literally don't know without tissue examination because it happens.

Q: This evaluation, the 20 percent that you reached, that was from an MRA in 1996?

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A: Yes, sir.

Q: Could that have been spasm of the carotid as opposed to an actual narrowing?

A: It is possible. I don't think it's likely but it's possible.

Q: Why don't you think it is likely that it was a spasm?

A: It was bilateral and it had a contour of a lesion in the wall of the artery rather than a constriction of the muscles.

Q: Did you mention that you reviewed articles for the New England Journal of Medicine?

A: I have, yes.

Q: Were you asked to review the Kittner article?

A: No, sir.

Q: Do you have any criticism of the Kittner article?

MR. MISHKIND: Objection.

A: No, sir.

Q: Any disagreements with the Kittner article?

MR. MISHKIND: Objection.

MR. MISHKIND: Do you understand what he means when he says "disagreement"?

THE WITNESS: No.

Q: You and Dr. Price disagree on your opinions in

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this case. That's disagreement.

A: Yes, sir.

Q: Okay. Is there anything that stood out in the Kittner article that you disagreed with?

MR. MISHKIND: Objection. Go ahead.

A: No, sir.

Q: Either the methodology used or the conclusions that were reached?

MR. MISHKIND: Same objection. Goahead.

A: Well, I think the methodology was sloppy. Now, based on that methodology, I have no reason to disagree with their statistical analysis of the data they produced in their tables and so forth.

Q: When you say "sloppy," what do you mean?

A: Well, they simply went to 45 hospitals, I think, most of them in Maryland, and went to the record rooms and got the records of individuals who had had stroke following parturition and also some individuals who were in the same age category, female, and didn't have stroke following the birth of a baby.

Having chaired record committees and looked at statistical data with some epidemiologists, I know how varied in accuracy and completeness these records from

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changes in the chemistry of the blood produced by infection.
Q: So if this patient was not, in your opinion, septic, did not have septicemia, then that would rule out the carotid source?
A: Not necessarily. We have patients who get inflammatory reactions as in cranial periarteritis and periarteritis nodosa and lupus without inflammatory reactions in vessels secondary to an infection that is localized elsewhere from the body without literally producing any septicemia.
Q: Why did she get better on Monday?
A: I don't know, sir.
Q: Did you find that unusual, that she was able to get up and go out to McDonald's and eat?
A: Yes.
Q: Why?
A: I don't know. I literally don't know why she got so much better.
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45 hospitals are going to be about the nature of the stroke, whether the CTs were done and when they were done, how the patients were worked up, how many of them had TEEs, et cetera, et cetera.

I've been through this matter of epidemiologic studies, particularly in drug trials, that is, treatment trials, and can simply say that, from my experience with such kinds of compilations of material, **we** just get kind of an overall shotgun opinion of how many this is and that is.

For instance, I didn't see anything in there about stroke following cesarean section, which is the situation we are dealing with in the patient that we are discussing. **So** that immediately raises the question how extrapable is the statistical analysis of these patients from 40 plus different hospitals to the one patient that we are discussing today.

Q: Have you seen the protocols that were used for the study in terms of which patients would be included, which patients would be excluded?

A: No, I have not seen the protocols.

Q: Discuss that with Dr. Price at all?

A: Have I?

Q: Yes.

A: No, sir.

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Q: Your criticism of the study, have you verbalized that criticism or written that criticism other than what you've just said here today?

A: No, sir.

Q: You said that the patient was dehydrated when she presented to the hospital. Was she any more dehydrated than a patient, any normal patient, two weeks post-cesarean section, a week actually?

A: I don't know.

MR. MISHKIND: It's actually two weeks.

MR. FARCHIONE: Two?

MR. MISHKIND: Yes. November 2 to 15.

MR. FARCHIONE: Okay.

A: I don't know.

MR. MISHKIND: 13 days.

Q: You don't know?

A: No.

Q: The dehydration that you see in this patient, is that in and of itself enough to have a patient hospitalized?

A: No, sir.

Q: Do you agree it was mild dehydration at best?

A: Yes, sir.

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Q: But for the dehydration, would the outcome have been different?

THE WITNESS: Would you read that, please?

(Record read.)

MR. MISHKIND: Before you answer the question, you mean everything else stays as is, just take the dehydration away?

MR. FARCHIONE: Yes.

MR. MISHKIND: Okay.

A: I don't believe so.

Q: You don't believe the outcome would have been different?

A: Correct.

Q: What are the signs of septicemia? And symptoms. Put them both together.

A: Variable. One is malaise, that is, feeling badly; fever of various degrees; sometimes chills; interference with appetite; sometimes actual shivering; blotchiness of the skin sometimes, depending on the site of the cause; nausea; vomiting.

Q: But for the septicemia in this case, would the outcome have been different?

A: I think the septicemia played a significant role

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in producing the hypercoaguabiliy.

Q: Let me take that to the next step. If the patient was not septic, did not have septicemia, would it be fair to state, then, to a probability the stroke wouldn't have occurred?

A: I don't think so. I think the stroke would have occurred.

Q: Why do you think the stroke would have occurred absent the septicemia?

A: I think there were phenomena going on in this complex coagulation-lysis system that were triggered by the chemical phenomena produced by the inflammatory reaction around and adjacent to the foreign body.

I do believe that there was interaction of a number of factors, including the existence of the septicemia, but there can be, as I mentioned earlier, an inflammation, particularly of blood vessel walls, without having septicemia, meaning bacteriemia or viremia, et cetera.

Q: You mentioned some textbooks, one of them being Toole's text. Is that T-0-0-L'S?

A: T-O-O-L-E.

Q: And what's the textbook entitled?

A: Cerebral Vascular Disease.

Q: Cerebral Vascular Disease?

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A: Yes.
Q: Barnett is spelled how?
A: B-A-R-N-E-T-T.
Q: And his text is entitled what?
A: Stroke.
Q: And your friend in England, has that name come back to you, or perhaps the name of his textbook?
A: Cerebral Vascular Disease.
Q: Same title as Dr. Toole's book?
A: Yes, sir.
Q: And the name of your textbook?
A: Stroke.
Q: Any other writings, publications that you have in your curriculum vitae that you feel would be applicable to this particular case?
A: Yes, sir.
Q: Which ones would those be? Do you have your CV numbered by page? If you can just give me the page number with the number of the article or book, that would be sufficient.
MR. MOSCARINO: Off the record.
(Discussion had off the record.)
A: Page 15, item 92; page 16, item 99; page 18, item 137; page 19, item 145; page 19, item 153; page 21, item 183; page 22, item 199; page 22, item 207;

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page 22, item 209. Conclusion.
Off the record? I thought of the name of the author of that book.
Q: Let's put it on the record.
A: The name of the Englishman authoring a book on Cerebral Vascular Disease is Ross Russell.
Q: When this patient was admitted to remove the sponge, if she was not dehydrated and if she did not have septicemia, would the outcome to a probability have been different?
MR. MISHKIND: Objection. Asked and answered.
MR. FARCHIONE: I asked it individually. Just so it's clear, I asked individually if there was no dehydrated; individually if there is no septicemia.
Q: Just so it's clear, Doctor, if there was no dehydration and no septicemia when she was admitted, all else being equal, would the stroke have probably occurred?
A: Yes, sir.
Q: And it comes down to the inflammatory response from the retained foreign body?
A: Yes, sir.
MR. FARCHIONE: That's all I have.

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FURTHER EXAMINATION
BY MR. MOSCARINO:

Q: Doctor, how much time do you spend in reviewing cases, medical-legal matters?
A: Oh, probably less than two percent of my time maybe, Well, less than two percent of my time.
Q: Have you ever worked with Mr. Mishkind before?
A: No, sir.
Q: Ever work with his law firm before?
A: No, sir.
Q: Tell me if you agree with this statement. The extremely high relative risk of stroke during the post partum period suggests a causal role for the large decrease in blood volume or the rapid changes in hormonal status that follows a live birth or still birth.
A: I do not agree with that statement.
Q: What part of that statement do you disagree with?
A: First part.
Q: The part that says there is an extremely high relative risk of stroke during the post partum period?
A: Yes, sir.
Q: Because you just don't believe there is such a

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risk?
A: Well, the risk of stroke in the post partum period is one out of about 12,000. I do not think that's a high risk.
Q: Is the risk for the women who are in that post partum state as opposed to women who are not in the post partum state high in relation to that? Do you understand my question?
A: Yes, sir. The risk in the post partum state, as I just mentioned, is about one in 12,000. For the same age woman not in the post partum state, it's about one in 100,000.
Q: So are those two risks when compared, or stated another way, when you compare the non-post partum to the post partum women, do you have, then, an extremely high relative risk of stroke?
MR. MISHKIND: Objection.
A: It depends on the definition of "extremely high." If one looks at a difference between one in 12,000 and one in 100,000 why, that's approximately eight to one. I think that a risk of one in 12,000 is a very, very slight risk.
Q: Well, then, do you agree that that risk, whether slight or extremely high, suggests a causal role for the large decrease in blood volume or the rapid

changes in hormonal status that follows a live birth or still birth?

MR. MISHKIND: Objection.

A: Go ahead.

A: There is possibly a relationship. I don't know technically, and we are not talking about post-cesarean section, of course.

Q: That's your opinion?

A: The numbers that I gave are not post-cesarean. They are just post partum, normal deliveries.

Q: So your assumption is that the Kittner articles deal solely with natural deliveries?

A: Yes, sir.

MR. MOSCARINO: That's all I have.

MR. MISHKIND: The doctor will read it. I will take a copy.

(Deposition concluded at 1:27 p.m.)

Clark H. Millikan, M.D.

The State of Ohio,)
) SS: CERTIFICATE
County of Cuyahoga.)

I, Mary Ann Fiynn, Notary Public within and for the State of Ohio, duly commissioned and qualified, do hereby certify that the within-named CLARK H. MILLIKAN, M.D. was by me first duiy sworn to testify the truth, the whole truth, and nothing but the truth in the cause aforesaid; that the testimony then given by him/her was by me reduced to stenotypy in the presence of said witness, afterwards transcribed upon a computer, and that the foregoing is a true and correct transcript of the testimony so given by him/her as aforesaid.

I do further certify that this deposition was taken at *the* time and place in the foregoing caption specified and was completed without adjournment.

I do further certify that I am not a relative, counsel or attorney of either party or otherwise inlerested in the event of this action.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at Cleveland, Ohio on this 7th day of November, 1997.

Mary Ann Flynn

Mary Ann Flynn, Notary Public
in and for the State of Ohio.
My commission expires 10-21-01.

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ERRATA SHEET

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