State of Ohio,)
)
County of Ashtabula.)

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IN THE COURT OF COMMON PLEAS

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MATTHEW LAYMAN, et al.,)
)
Plaintiffs,)
) Case No. 93 CV 00672
vs.)
)
C.K. WOO, et al.,)
)
Defendants.)

- - -

DEPOSITION OF SAMUEL J. HORWITZ, M.D.
Friday, March 3, 1995

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The deposition of SAMUEL J. HORWITZ, M.D., a witness, called for examination by the Defendant, Dr. Woo, under the Ohio Rules of Civil Procedure, taken before me, Diane M. Stevenson, a Registered Professional Reporter and Notary Public in and for the state of Ohio, by agreement of counsel, at University Hospitals of Cleveland, 11100 Euclid Avenue, Cleveland, Ohio, commencing at 4:00 p.m., the day and date above set forth.

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APPEARANCES:

On behalf of the Plaintiffs:

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and

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On behalf of the Defendant, Dr. Woo:

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SAMUEL J. HORWITZ, M.D.

A witness, called for examination by the Defendant, Dr. Woo, under the Rules, having been first duly sworn, as hereinafter certified, was examined and testified as follows:

CROSS-EXAMINATION

BY MR. KALUR:

Q. Please state your name for the record.
A. My name is Samuel J. Honvitz.
Q. Dr. Horwitz, what type of cerebral palsy does the Layman child have?
A. He has a spastic quadriparesis.
Q. Is there any athetotic element?
A. No.
Q. You mentioned in one of your letters to the treating physicians that the child exhibited arching of the back. Has that been a regular finding?
A. To some extent he has arching, which would be sort of straight back, but he also curves to one side. More of it is now the curvature than the arching.
Q. You use the term "arching." Is there arching of the back? You used it in one of your reports.
A. When I last saw him, I would say it was insignificant arch. It was mainly curvature.
Q. Did the child exhibit any extrapyramidal movements?
A. No.
Q. Have you met with Mr. Becker before this deposition today about this case?
A. Yes.
Q. On how many occasions have you met with him?
A. Well, I met with him today and, to the best of my recollection, I think once before this.
Q. When was the prior meeting?
A. I am trying to think because there is another case that I have got that I am the treating physician. Well, he met with me last week, but I am trying to think if there was one prior to that, and I don't remember one on this case.
Q. Have you met with any other lawyers from his office or any other lawyers working on the Layman case, plaintiff or defendant?
A. He came in with one of his associates, I don't know if she was a lawyer, it was a woman.
Q. Have you met with anyone from his office alone on a prior occasion?
A. No.
Q. He has a co-counsel in this case. You never met with his co-counsel?
A. Never met with him until today.
Q. Any telephone conversation with Mr. Becker about this case?
A. Well, when I was first contacted and then asked for the records, and I think he called me and I explained to him that I was not going to be an expert on this case, I was a treating physician, and would answer the questions I was asked, but I didn't want it to extend beyond that point.
Q. The report that you have written in this case, was that written after your first meeting with Mr. Becker a few months ago?
A. Yes, that was a meeting then, right. As I recall, it was a very brief meeting, in fact.
Q. Today's meeting, approximately how long did that last?
A. With interruptions, about 20 minutes.
Q. What topics were discussed?
A. The topics that were discussed were the life care plan, the cause of the child's brain damage, the clinical picture.
Q. Anything else today in your discussion with Mr. Becker?
A. There was one brief discussion about seizures

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and, again, he asked me about the contents of the letter that I wrote about the diagnosis and prognosis.
Q. Have we now fully covered what you recall from today's meeting with Mr. Becker?
A. Yes.
Q. With respect to your discussion of the clinical picture with Mr. Becker today, can you be a little more specific as to what aspects of the clinical picture were discussed?
A. The aspects discussed were the multi-organ involvement, the seizures, the grading of the severity of his hypoxic ischemic encephalopathy picture.
Q. Anything else under clinical picture?
A. That is all I recall discussed today.
Q. Under seizures, what was discussed today?
A. What was discussed today was the jerking movements that occurred with attempted intubation.
Q. Jerking movements when with attempted intubation?
A. There was a note in the consultation note alluding to seizures following attempted intubation.
Q. That was at R,B & C?

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A. Right.
Q. Somewhere between 1:30 p.m. and 2:30 p.m. on 8/20?
A. I don't remember the times, but I accept that.
Q. I just want to make sure we are talking roughly the same episode.
A. Right.
Q. What were you asked about the jerking movements with the attempted intubation sometime in the early afternoon of 8/20?
A. Whether there was a seizure.
Q. What was your view on that?
A. Probably not. It is a few jerking movements that are very common if there is a sudden drop in oxygen supply or perfusion, you see that quite frequently. I suppose you can call it a seizure-like movement in the widest sense.
Q. Where did the term jerking movements come from as having application to something recorded in the records in the early afternoon of 8/20 at R,B & C?
A. I just recall that that episode occurred and there was some jerking described or seizure-like movements, I don't recall the *term*.
Q. But, whatever the movements were, whether they

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are described as jerky-like or some other type of description, you didn't feel that they represented actual seizures?
A. Well, there is a real problem with the word -- let me just make the point I didn't think they represented epileptic seizures. Let's put it like that.
Q. What did you think the movements represented, or what do you think they represent?
A. There are a lot of movements that occur in newborns, particularly, but can occur in other people, as well, with hypoxia that are seizure-like, they are jerking, various kinds of postures. For want of a better term you call them a release movement.
Q. Go ahead, go ahead.
A. Those are usually not accompanied by electrical evidence of epileptiform activity.
Q. The movements that you have just had reference to, are they generally after a hypoxic situation, or are they precursors to actual seizure-like activity?
A. No, they are just after hypoxic episode.
Q. How long is "just after"?
A. Let me give you an analogy. You can say somebody

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is standing on a very hot day in church and feels dizzy and falls down and faints and is down on the floor 20 seconds and has six or eight rhythmic jerks, that is a very common thing, so within a half minute or a minute. Elderly people do it, children do it.
Q. So you are saying that these were movements that occurred within a minute to a minute and a half after some event took place at R,B & C?
A. That was what I understood from the record.
Q. Have you been shown -- as part of your meetings, either the prior one with Mr. Becker or the one just before this deposition, have you gone over with him the CAT scans that were taken in the neonatal period?
A. Yes.
Q. Was that done today or before?
A. No, that was done before.
Q. Can you recall the substance of the discussion at the time several months ago when you reviewed the CAT scans with Mr. Beckcr, what you were asked about them and what you said?
A. I didn't review them several months ago, as I recall. These were the ones -- as I said, he was here a week or so ago.

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Q. All right. I may have gotten confused.
MR. BECKER: Well, let me just enter an objection because 1 don't think it is appropriate for you to inquire of my conversations with Dr. Horwitz, even though he is not, per se. a liability expert.
He is a subsequent treating physician and has written a very limited report, and I just think it is inappropriate to inquire about our conversations, just as I wouldn't inquire of your Dr. Zimmerman your personal conversations with him. I think it is inappropriate.
Q. How many conversations have there been?
A. Well, as I told you, there was today --
Q. Yes.
A. -- and then I mentioned that he was here last week and there was a woman with him. Then I recall there was something some months ago when he came in very briefly and talked with me about the prognosis. We met for maybe a few minutes. And then I wrote that short report.
Q. So presumably a few days before or reasonably close to December 12 there was a first meeting?
A. Yes.
Q. And then a week ago with an associate there was a

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meeting?
A. Right.
Q. And then today there was a meeting?
A. Yes.
Q. Now, when were the CAT scans gone over?
A. Lastweek.
Q. That was when he had an associate here with him, a woman lawyer?
A. Right.
MR. BECKER: A nurse.
MR. KALUR: Nurse, okay.
Q. (Continuing.) Now, what subjects were covered about those CAT scans last week?
A. The appearance of the scan, the question of edema on the scan, and that was about the extent of the findings on the scan.
Q. Were you asked how long it takes for edema to develop after a hypoxic incident?
A. It was discussed, yes.
Q. Was that brought up by Mr. Becker, or did you volunteer that?
A. He brought it up.
Q. What was the question, as best you can recall?
A. The best I can recall, the question was: When do you see edema on the CAT scan after a hypoxic

Page

episode?
Q. What was your answer, and what is your answer?
A. Well, my answer is I honestly don't know for sure, and I defer that to a radiologist. I know what I have seen, but I don't really know that that specifies the onset. I don't know for sure, and 1 don't know the literature is accurate, so I am not sure of the answer to that.
Q. What have you seen, in your experience, from the time between hypoxic event which insults the brain to the first time at which it may be visible on a CAT scan by edema?
A. Well, most of the CAT scans that I have seen -- and this is purely from memory. Most of the CAT scans I have seen are taken 24, 48 hours after the baby has been admitted. That is pretty standard. And I have seen edema not seen at 24 hours, I have seen it seen at the 24 hours. I have seen it appear for the first time at 48 hours.
Have I seen it under 24? I really can't remember. I may or may have not. There are so few that we have taken at that point that it doesn't -- I really don't know. I can't answer that. In general --

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MR. BECKER: Let me just enter an objection here. Go ahead, Doctor.
Q. Go ahead.
A. In general, when we have ordered them, we have asked for them after 24 hours.
Q. So as you sit here now, you can't recall seeing edema on a **CAT** scan before 24 hours after a hypoxic event which may have caused insult to the brain; is that fair?
A. Mr. Kalur, let me just qualify, I am talking about 24 hours after the baby is -- 24 hours of age. So when is the hypoxic event? I mean, that is the difficult determination, specifically when that occurred, how many hours before birth or immediately at birth, et cetera.
But, in general, we have seen them, most of the **CAT** scans I have seen have been taken beyond 24 hours of birth. I have very few that have been taken earlier, so I don't know, I don't remember.
Q. So when you arc referring to 24 hours, you are talking about from the time of birth?
A. Yes,
Q. After the injury may have occurred?
A. Right.

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Q. So would it be fair to say that you have not seen swelling on a CAT scan --
MR. BECKER: Well, I am going to object. He said he may or may not have, he doesn't recall.
A. I don't know. I mean, I would have to pull all the scans and see --
Q. I want to know what it is you don't recall. I just want to be specific.
A. I just don't recall having seen it or not seeing it.
Q. "It" being edema?
A. Right.
Q. Within 24 hours of birth?
A. Right. I don't recall it.
Q. Would you say you looked at thousands of CAT scans of newborns?
A. Oh, not thousands, no.
Q. 500?
A. Much less than that.
Q. 400?
A. That I have actually seen patients here that I have looked at?
Q. Yes.
A. I suppose probably 100 or 200. Maybe 200,

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something like that.
Q. How about in lawsuits where you have examined CAT scans where the issue is hypoxic ischemic encephalopathy, would you say swelling existed in what, 100 CAT scans?
A. Oh, not 100. 50, maybe.
Q. How long does it take for swelling to reach its maximal level in the brain after a hypoxic ischemic incident?
MR. BECKER: Objection. If you know.
A. I don't know for sure. I mean, I have always assumed it takes 24 to 48 hours. Probably closer to 48, that has been my assumption.
Q. Would you disagree with 72 hours to maximal from event?
A. I wouldn't disagree because I don't know the data. I think my understanding -- we have never measured that. Let me make it clear, much of my understanding is in talking with radiologists. I defer to them.
The issue is that nobody has done a three- or six-hour sequential study that gives you an absolute controlled measure, but I have accepted from them it is around 48 hours. That has been

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my understanding. If you said 72, I wouldn't argue the point.
Q. So maximal swelling would be around 48 hours is your understanding?
A. That was always my belief and what they told me.
Q. So we are clear on the record, around 48 hours is from event to maximal swelling?
A. I am trying to think scientifically. We have always said that is 48 hours. We usually take that at 48 hours of age. But I am not sure they always time the event. I don't know.
It is fine to accept this from event. I am not going to argue that, because I really don't know.
Q. What organ involvement did you discuss with Mr. Becker? You said you discussed multi-organ involvement. What organ involvement did you discuss?
A. Kidney, liver, heart, muscle.
Q. Any others?
A. Oh, brain.
Q. Was that a discussion today, or is that one of the --
A. No.
Q. When did that discussion occur?

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A. Last week.
Q. At that time last week, did you look through the medical records to -- let's focus for right now on kidney function, Did you look through the records for the lab results, for example, related to kidney function?
A. Last week I did not have the medical records. I had not gone through them, and, in fact, I had no intention of going through them.
When these issues were raised, I said, "If those questions are going to be asked, I will look at the medical records shown to me." And I was shown a summary of the medical records which, if correct, would have shown involvement of other organs.
Q. The *summary* you were shown was something taken from the records?
A. Yes, not part of the official records, a summary created, I assume, by Mr. Becker or someone.
Q. Have you ever, yourself, even when you were treating this child, gone through the records and looked at the serum creatinine or the BUN levels and recorded them in some way so you could determine whether they were going up, down, staying the same?

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A. I absolutely did not record those. When I was taking care of this child originally, I was a consultant, and officially put one note in, as I recall.

We went back several times to see how the child was doing in a sort of unofficial, off-the-cuff way without putting in a note. But I don't recall ever even looking in the charts to determine that.

Q. "That" being kidney results?

A. Right.

Q. I will make the same question for the liver enzyme reports. Have you ever done that?

A. All of that would apply. I am sure I would have been told them at the time because I asked the residents how was the baby doing, and the attending.

But specific levels and looking at the chart, I did not look at any other organ involvement in my role as caretaker.

Q. When you saw this chart last week that was extracted from the records, presumably, what conclusion did you reach as to kidney function?

A. Well, from what was shown to me, there was reduced urine output for a while, there was 1+

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protein on one sample, there was transient elevation of creatinine, BUN.

Q. When you say transient creatinine elevation and then BUN, BUN right after that, I take it you mean both of them were transiently elevated?

A. Right.

Q. How transiently?

A. I would have to look at the record, a couple of records. Two, three days.

Q. Two or three days after birth?

A. Yes, and then they were corrected. Maybe four days. I don't know, I would have to go back and look over those.

Q. Did you make a determination of whether the elevation of the BUN and the serum creatinine levels were mild, moderate, or severe?

A. As I recalled from looking at them, they were mild.

Q. The same thing with the liver enzymes, mildly elevated?

A. Right.

Q. Is there any relationship between the status of the organ, such as the kidney and liver, as to their degree of involvement, in other words, their being mild with respect to the degree of

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asphyxial insult to the brain?

A. I don't think there is a direct correlation. You just know there is an involvement.

Q. Let me try to phrase it a little more clearly.

In other words, let's say you had a severe involvement of the kidneys. Would it be more likely then or more probable then that you are going to have a severe neurological injury to the child as opposed to a mild or moderate injury?

A. I don't know. If there is a study on that, I don't know it. From what I have seen, all variations on the theme. I have seen them both severely involved. I have seen the brain horrendously involved and the kidney mild. I have seen the brain be moderately, kidneys severe.

There may be studies of a correlation. I don't know.

Q. In those cases where you have seen mild kidney involvement and mild liver enzyme involvement bu the child turns out to have severe neurological sequelae, would you entertain one hypothesis that perhaps the asphyxia near birth which caused the kidney and liver involvement was not the asphyxia which caused the brain damage?

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MR. BECKER: objection.

THE WITNESS: May I hear that again?

(Record read.)

A. I have no way of answering it. I have not the remotest idea of how to answer that question. I have always assumed that one asphyxial episode is enough to damage both organs. It is quite variable and unpredictable which one will get hit harder. It certainly applies at all ages.

Q. Well, if there is an intrapartum event which causes brain damage, hypoxic ischemic event, and the BUN is taken within the first five hours of life, what would you expect it to reflect, normal or abnormal values?

A. If, let's say, the intrapartum event occurred an hour before birth, two hours?

Q. That's fine.

A. And then at five hours I would expect the BUN to be normal.

Q. Why is that?

A. Well, you have got to have a period for stuff to accumulate, and you have in the first two -- you know, prior to that the mother has been assisting and getting rid of by-products, so it is going to

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take a while to accumulate.
Q. The mother has been assisting because the placenta performs the kidney function before birth?
A. Yes.
Q. So it is going to -- in fact. whether the child is damaged or undamaged, you are going to have normal kidney functions in the first five hours as reflected by BUN?
A. Yes. Again, I don't know five or seven, when it goes up, I don't know.
Q. We will just say in the immediate period after. Would you agree with that?
A. Yes, I will agree with that.
Q. If there has been an event within an hour or two of birth which has caused brain damage, hypoxic ischemic event, when the BUN and creatinine levels do go up, in this case you said there was a mild level of it, do you expect them to rise gradually first and then decline, or some other event, some other sequence?
A. I am not sure I understand.
Q. Well, do you expect the BUN -- let's use actual values. Would you expect, for example, the initial BUN to be 25 and then rise to 35 and 45

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and then decline over a number of days?
MR. BECKER: I think he has already answered the question in terms of --
A. I think that -- I am s o ~ .
MR. BECKER: I think he has indicated to you already that it is extremely variable.
A. It doesn't just suddenly shoot up. I mean, stuff accumulates. It is going to go up, but then it will depend on how soon -- how hydrated the baby is what the renal output is for clearance.
I don't know how you can make the generalization. It is going to vary from child to child depending on how much damage the kidney actually got, what the perfusion pressures were immediately afterwards, how successful the ventilation is afterwards, because there will be redirection of blood flow. There are so many variables.
Q. You wouldn't expect the BUN and serum creatinine to peak a certain number of days following a hypoxic event and then decline?
A. I think what will usually happen is that if you have enough kidney impairment to elevate the BUN and the creatinine, that you will find them going up, and that once they peak, then when kidney

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function restores they should go down, providing everything goes smoothly, that you don't -- and no other ringer is thrown in along the way of the course.
Q. Would you expect the same type of sequential bell curve with liver enzymes?
A. Yes, you usually see the same thing with liver enzymes. Liver enzymes make up a lot quicker. It is a different --
Q. If they go up much more quickly, how long would you expect them to stay elevated before beginning to drop?
A. Liver enzymes often go up because of leakage of enzyme. They can also drop very, very quickly if you reperfuse them. I have seen them up sky high one day and almost normal the next, and by the next gone. They can be very transient.
Q. You said you also discussed heart and muscle. Brain we will defer. But what did you discuss about heart?
A. Nothing specific. It was pointed out to me there was a murmur, and I sort of shrugged. It was a transient murmur. It may mean something.
Q. You shrugged because that is not significant?
A. It is not that it is not significant, I mean, you

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are going through a child and circulation is changing, it may have indicated some heart abnormality, dilatation, might have been just a closing of the ductus, wasn't quite there. I wouldn't do much either way. I wouldn't disregard and wouldn't regard it. It is a transient thing that could happen in a normal baby. I just don't pay attention to it.
Q. Do you expect or have you seen on a regular basis enlargement of a heart of a newborn in an acute period of a hypoxic ischemic injury?
A. I have seen it reported and certainly been told there is poor contractility and the heart is dilated. Again, I don't go in each case and ask it specifically. It happens. How commonly, I don't know.
Q. Did you see any evidence in this case of enlarged heart by x-ray or any other study?
A. No. From my quick look through the records, I think there was one allusion to the cardiac size being borderline. But it would depend on how well the inspiration film was done. One thing like that doesn't mean anything to me.
Q. What about palpability of the liver or kidneys after a hypoxic ischemic episode in the immediate

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days after, is that a common finding after severe hypoxia?
A. Occasionally you will see -- I mean, I don't know the frequency, but I have seen an enlarged liver due to disruption of the liver, or the fact that the heart is failing, so the liver will enlarge.
Palpable kidneys I can't answer because they are often palpable anyway. So being impressively more palpable, I don't know.
Q. Any evidence of liver enlargement in any way in this case?
A. I didn't look specifically through the records that clearly, but I don't recall any major problem with that.
Q. You mentioned muscle being discussed at the meeting last week. What discussion was there concerning muscle?
A. The discussion was that I saw the CPK was elevated and said, "Oh, the CPK was elevated, probably transient muscle involvement."
Q. Does that have any significance to you in this case?
A. It shouldn't be there. That elevation, it just means it is abnormal for one or other reasons. It could be due to hypoxia, it does affect

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muscle.
If, mechanically, this was a delivery in which the shoulders and limbs were pretty bruised through delivery, that could certainly elevate that.
Q. With the head being bruised during delivery, could that elevate the CPK?
A. If brain tissue is very damaged, you could get some elevation. You would have to see what fraction it is.
Q. Could anything else raise CPK in a newborn this way?
A. Those are the major ones.
Q. Does the CPK elevation in this case tell you anything as to the time of an asphyxial incident?
A. Not to me.
Q. Have you been able to study the records in this case?
A. I looked at -- I was given -- I tried to get the records from the hospital at the beginning of the week, because I didn't want to rely on any summaries. I figured when asked I might as well look. And they could not find the records.
Q. Very good.
A. So I told that to Mr. Becker and said I wouldn't

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discuss the records unless I saw them. So he had them sent to me last night, and I looked at them for about two hours, probably less than that, an hour and a half.
Q. Did you have an opportunity to review the records in this case before you wrote your report of December 12, 1994?
A. I have my own office chart, but I didn't review the hospital records again, no.
Q. So you were able to reach a conclusion that there was hypoxic ischemic encephalopathy as a result of perinatal asphyxia based on what you could recall about this particular case and based on your own office file?
A. I recall this case fairly well. I also have a copy of my consult note in my office file.
Q. So the record is clear, your office record is a very miniature version of the hospital record; is it not?
A. My office file contains only my one page consultation note from the hospital record. It is otherwise independent of that hospital record.
Q. You don't have the lab reports in there, for example?
A. No, not the lab reports from the hospital.

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Q. You might have the discharge *summary?*
A. I don't have the discharge *summary,* I don't think so.
Q. Did you ever look at the discharge summary in this case, by the way --
A. I looked at it last night.
Q. -- from R,B & C?
Did you see a few errors in there?
A. I did.
Q. Maybe due to some late dictation there. Did you notice how late it was dictated after the discharge?
A. I didn't even look at the date, and that would be speculating.
Q. As head of pediatrics here, would it be a good example for your doctors to go back and read the charts before they dictate a discharge *summary?*
A. Do you want me to answer the question, Mr. Kalur?
Q. Yes.
A. In the best of all circumstances, your answer is absolutely correct, that before you dictate a discharge summary you should review the record, and I agree with the statement.
I have one caveat. If you want to get into

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the real world and all of us read that chart through before dictating, you wouldn't have one second of your life to take care of a patient. You have to be realistic.

Q. Very true, and I understand just what you are saying. And presumably very often doctors are rushed and they don't have time to sift through a record.

But wouldn't you agree that if we were to rely -- "we," being fact finders now or a jury later, as fact finders, have to rely on something, relying on that discharge summary in this case wouldn't be such a good source?

A. Well, let me put it to you this way, that the discharge summary -- I would agree with that statement. But the discharge summary is not the reason that most of us went to medical school, and it is probably one of the chores most people despise most. It is done late at night or Sunday when you should have been with your family.

You asked the question, and I am giving you the answer.

Q. And I agree.

A. All medical people realize it is a summary and only a guide. If you want the specifics, get the

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chart. Because it was never designed for -- it is designed for the benefit of the patient. To have a few inaccuracies like that, it is not going to affect your subsequent treatment or outcome.

I would be very concerned if it was a discharge drug and the wrong dose was given, that would really concern me.

Q. What concerns me is someone relying on the discharge summary to help them decide this case, and I think you might agree that that contains some rather gross inaccuracies, wouldn't you, for that purpose?

A. I, as a physician, if I really had to worry about the details of a case, would never look at the discharge summary as true fact. It has a basis for the *summary* sort of close to accurate, but it is -- I am not sure that I have ever seen a discharge summary that is totally accurate.

Q. What information have you gotten at any point in time about the antepartum course beforc labor?

A. Nothing.

Q. Have you ever seen rccords of Dr. Woo, for example?

A. I don't even know the doctor's name.

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Q. To go back a second to something I just forgot a moment ago, on your December 12 letter which you dictated on your recollection of this incident and then on your consult note, you said that "The HIE in this case was as a result of perinatal asphyxia," quote, unquote.

What do you mean by "perinatal" there with respect to time?

A. What I talked of perinatal is the time just prior to or around or immediately after birth. I am sort of talking a couple of days before labor, during labor, or during the actual delivery of the child. I am using that term a little loosely.

Q. And a couple of days, so there is no confusion later on when we are here next week, that is the regular 24-hour day we are talking about, right?

A. Yes.

Q. You weren't shown any monitor strips, I take it?

A. I don't even know whether they were done or not.

Q. Were you given any reports from Mr. Becker or his assistant at any time about the labor course?

A. No.

Q. If I told you there were two late decelerations within the first five minutes of monitoring in

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this case, followed within another 10 or 15 minutes by a bradycardia of approximately seven minutes down to about 90, would that be of significance to you in considering when this perinatal asphyctic event may have been?

MR. BECKER: objection. The doctor is not an expert on timing. I have never represented him as an expert on timing.

MR. KALUR: It says perinatal asphyxia. Here that means time. He has got time here.

MR. BASHEIN: which has been defined.

A. That there were late decelerations and a long period of bradycardia means to me at that moment what was being recorded -- at that moment it was recorded there was some evidence of distress.

Q. Would it be mean looking back before the disstress started, a risk factor where something was going on before the strip was started?

MR. BECKER: Objection.

A. That is certainly likely, but it would depend on a lot of factors.

MR. BECKER: Incidental, Jerry.

There are not four minutes missing, as you

suggested.
Q. If the brain were already damaged, is that something you might see at the beginning of a strip?
MR. BECKER: objection.
A. In a general sense, if a child's brain is already damaged, they may not tolerate labor well, so when you start your strip you may start seeing decelerations.
Q. What if you were told, in addition to the facts that I have given you to assume here about the beginning of the strip, that there was no fundal growth for four weeks prior to the time of the starting of the labor --
MR. BECKER: objection.
Q. -- that there was no change in sonogram, ultrasounds as to the size of the baby for four weeks before the labor started, would those factors be of any significance to you in timing the event of asphyxia which led to brain damage?
A. If I knew that, if I was told that there was no growth of the fundus and the sonogram showed no change, I would assume that for one reason or another the baby is not growing, and that there is, well, failure to grow of the baby during that

time.
Q. Is that a **risk** factor for brain damage, failure to grow in the last four weeks?
MR. BECKER: objection.
A. It is a **risk** factor.
Q. Why is it a risk factor?
A. Well, you need to know what the underlying cause is. I mean, it could be a serious disease of the baby that could result in that, it could be a disease of the mother, it could be placental insufficiency, a number of factors that could do that.
Q. Could you give me sort of a global answer as to what a pediatric neurologist's historical role, as you understand it as a pediatric neurologist, has been in the diagnosis and treatment of HIE injuries in newborns? What do you do?
A. I am not sure --
Q. What do you do, as a pediatric neurologist, when you are called in as a consult with suspected PIE? what is your general role?
MR. BECKER: You meant HIE. That was --
MR. KALUR: It was a Freudian slip. HIE. We tend to think in tracks. I guess

I got on the wrong track.
A. And I was thinking of HIV.
What is my role when I am called in?
Q. A baby born with low Apgar scores and some indicia of injury, and you are called in as a pediatric consult, what is your role and function as a pediatric neurologist?
A. I may be called because they made that diagnosis and they are sure of it but there are complications I am being called for. For example, I could be called on the complications part of the issue of seizures and maybe they want some help with the management. That may be one role that I would be addressing.
Q. Treatment recommendation?
A. It would be treatment recommendations.
I might be called for prognosis recommendations. I might be called in on a baby who is not doing well to make a diagnosis as to whether this is HIE or not; is that the diagnosis?
Well, those would be the usual reasons why I would be called.
Q. When you have been called upon over the years by lawyers to look at cases where children are suspected to have HIE damage, what has been the

generalized role that you have played in giving opinions in those cases?
A. Well, what I have done in those cases is, first of all, to look at the clinical picture that the records show, the sequence of -- let's start with the baby at birth.
What does the baby show from birth and thereafter, is that consistent with the diagnosis of HIE or not? And then I have often been asked when did I think the HIE started, when did the events start? What was the reason for it? Could I find anything from the record that would indicate why this happened?
I have been asked about timing.
Q. When did the event happen --
A. Right.
Q. -- that caused the brain damage?
A. Right.
Q. Is that on a fairly regular basis that you are consulted in these cases that that question comes up about timing?
A. Consulted by a lawyer or by physicians?
Q. Lawyers.
A. Yes.
Q. Would it be fair to say that the doctors are less

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interested in the time on that issue than the lawyers are?
A. That would be the understatement.
Q. You have perinatologists sometimes known as maternal-fetal medicine people here on the staff at UH?
A. Yes.
Q. Have you ever seen them called in as a consult in any of these cases to answer any of the questions that you answer for physicians?
MR. BECKER: objection. I don't understand the question.
MR. BECKER: could I have that back.
(Record read.)
A. At the time that I am taking care of the chart, the infant in the acute phase, of consulting on the acute phase, I have never seen a perinatologist called.
Has the family been referred to them subsequently and reviewed what happens in future pregnancies? Yes, that has happened.
Q. Who reads cerebral ultrasounds on newborns here, radiologists?
A. Yes.

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Q. *Are* you aware of whether any of the maternal-fetal medicine people are called downstairs at any time to read those ultrasounds, cerebral ultrasounds?
A. On newborn babies?
Q. Yes.
A. To the best of my knowledge, no.
Q. Does the same go for **CAT** scans, they are not called down to read CAT scans, either? "They" being maternal-fetal medicine physicians.
A. I would say as close as I can get to 100 percent, no, they are not. Radiologists read those.
Q. Did you ever discuss the timing of the brain injury to the Layman child with his parents?
A. I recall a conversation where -- this was very early on, it was in the hospital. I recall a conversation with the parents when they asked me what happened here.
I said, "Well, it looks like there was a period when the baby didn't get sufficient supply of oxygen and circulation." And they started asking when, and I said, "I don't **know.** I have never reviewed the records. I haven't addressed the issue." **And** I avoided discussing it any further with them.

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I remember them also asking me did I think there was anything wrong with the manufacture of the baby. I said no, I thought this **was** a normal baby until whatever event happened occurred.
Q. *You* said you had a pretty good memory of this particular baby and the treatment of the baby. In the records, in the radiology interpretations, and I think it is for the 8/22 **CAT** scan, there is a notation by Dr. Kaufman that he spoke to you about that film.
Do you have a recall of that conversation with Dr. Kaufman?
A. Yes.
Q. What did he say to you?
A. Well, what I recall, I recall going --
Q. Not what did he say. What was the meeting about, tell me that.
MR. BECKER: objection. You can answer.
A. The original CAT scan was read as normal, **as** I recall, or questionable.
Q. By Dr. Lanzieri?
A. Yes. When we had looked at it -- we had raised the question when I looked at it originally that the ventricles seemed a little bit small, and we

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thought we might be seeing some edema, we weren't sure.
We were told it was normal, and I remember talking to the resident, "I am not sure about this, but let's get one the next day and see what the follow-up shows. It is really important to see what it shows."
In fact, I recall quite clearly that day saying I would not have done this CAT scan that day, "If I were on this case, I wouldn't have done it."
Q. So we are clear, on 8/20?
A. On **8/20.**
Q. You said you wouldn't have done it that day?
A. Right.
Q. Go ahead.
A. I remember talking to Dr. Watts and saying, "Why did you do it today?" More often than not we get it the second day.
And she said, "Well, it was a difficult -- from the history I got, it was a very difficult delivery. I wanted to make sure there was no bleeding internally."
And I said, "That was a good thought, it is probably good to do it today, but you could have

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done it by ultrasound."
Q. Why do you usually wait until the second day to get the CAT scan?
A. Well, the reason we have usually waited until the second day is twofold. First of all, the babies are unstable, so you don't want to move them down there. It is a big undertaking to move that baby down there.
So the question has been: Why even think about the logistics and any potential for jeopardizing the baby if you can get the same answers you want by simpler means?
Your interest is in managing the baby, that is all you are interested in, and you can do that by ultrasound if you are worried about hemorrhage.
Q. You said "one of the reasons" --
A. The other reason is the general belief that the peak of edema tends to be more around 48 hours. So that if you found it normal early on, you would be doing another one in a day or two. You don't want to have the baby go through several CAT scans.
With the belief that most edema is 24, 48 hours, you might as well defer it.

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Q. I interrupted the whole train with an aside, but we were on the subject of leading up to your discussion with Dr. Kaufman concerning the second CAT scan. Would you continue your answer?
A. Well, the second CAT scan went on and said that this was now normal. And I remember saying, "Let's go back on that first one and make very clear what happened here because I want to be sure on this because it is going to be a matter of record, and I don't want this after the fact tell me."
So we looked at them both and I was absolutely right, it was changed, and it clearly was edema on the first one, because I had expressed my concern.
What happened is the residents had gone down and looked at the second scan and said it was normal. And the first one was read as normal, and I went down and read that and said, "That isn't the same." And I think he just put my name down as sort of a gracious way of saying the man came and bugged me so I put his name on the report.
Q. When you say "he put my name," you are talking about Dr. Kaufman?

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A. Right, because I bugged him on the interpretations.
Q. You sort of gave me a stream of consciousness there. I want to know about some more details there.
You saw the first CAT scan and you thought the ventricles were small and, therefore, there was edema. Am I right that far?
A. No. The ventricles were small which, of itself, could be normal. But we had some question about the gray-white differentiation. We just weren't sure where that was early, but it had been read as normal.
Q. It could be read as normal; is that what you said?
A. Well, in the report they said it is probably normal. It was one of those that said it could be normal but it could be this, maybe a little suggestion of that, but the basic premise was that it was normal. Kind of a hedgy report.
Q. You didn't agree with that when you saw the CAT scan, that it was normal? Yes or no.
A. Well, I questioned it. But, again, the guy who reads it is the official thing says the report. But I questioned it. Again, these are very

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difficult to interpret at that age, so I am going to defer. I didn't think he was wrong or right.
Q. After the second scan came out and said normal-sized ventricles, what did it tell you about the first scan?
A. That the first scan, clearly I was right. It was edema on the first scan, there was evidence of swelling.
Q. And that swelling had gone away by the time of the second scan?
A. It certainly had improved.
Q. You said it was normal, I assumed it went away. Is that wrong?
A. You would want to do a third, fourth and fifth to see it is 100 percent. They read normal when there is still a little.
Q. There could be a little there but read normal?
A. It is improved, but it is read as normal.
(Thereupon, a short recess was taken.)
BY MR. KALUR:
Q. After a significant hypoxic event intrapartum within an hour or two of birth, and the child is then born and you get white blood cell counts, do you expect to see them be elevated?
A. They are often elevated after severe attack of

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hypoxia, severe distress. I certainly know they occur on the first day. How many hours it takes before they come up, I am not sure.
Q. The bands. will they also be elevated as a result of the same hypoxic distress?
A. As far as I know.
Q. 31,000 is not elevated on a newborn?
A. 31,000 is elevated on a newborn, as far as I recall.
Q. Really? Are there norms here distributed for newborns at University Hospitals?
A. There are norms. I would have to look up what they give as the norm for day one.
Q. Perhaps you could look at those before next week before I depose you.
A. Okay.
Q. 17 bands, would that be elevated?
A. It would be elevated for a child. Again, on day one I would have to look up the norms for what they are on day one.
Q. What about NRBCs in such a child, the same thing I just gave you, nucleated red blood cells, do you expect them to be elevated?
A. There are a certain amount of NRBC normally.
Q. Elevated above normal?

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A. That is a very good question.
Q. It only took me an hour.
A. It is a very good question. And I have searched that particular issue very carefully to find out how long it takes after a hypoxic episode for the nucleated red cells to go up, and I have asked a lot of people.

If you can find a decent study that shows it that it is very clearly done, I would appreciate you show me because I haven't been able to find it.

As best I can get, I have been told it takes 24 to 48 hours, And when I asked for the data, nobody can show it to me, it has been their opinion. And others told me it is shorter. I don't know. As far as I know, it takes a while.
Q. Were the NRBCs elevated in this case; do you recall that?
A. I don't recall.
Q. Did you say to me you don't know how long it takes for WBCs to become elevated aftcr a hypoxic event?
A. I don't recall that. No, I don't know.
Q. Or how long they would stay elevated?
A. I don't know a specific study, there may bc one.

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I have never really looked it up. I have seen it elevated, but if you ask me when it starts down when it comes in, I don't know that.

Can I just add one other comment? NRBCs are often expressed in their ratio to white cells as opposed to the absolute count, which is horrendously confusing. And I don't know if your white cell count is up at the time how it reflects on the NRBC ratio. There is some calculation in there. Again, you have to look at both. I don't know why they do it that way.
Q. The autonomic nervous system that controls variability of the fetal heart rate, what portion of the brain controlled the variability?
A. Well, you have got both sympathetic and parasympathetic, so you have outflow from the hypothalamus, vagal nuclei in the brain stem. The whole lymbic system impinges on that.
Q. The vagal --
A. The vagal nuclei in the brain stem.
Q. In the brain stem. You have the brain stem, the hypothalamus. Where else?
A. Those are the major areas, those are the main controlling areas. But you certainly have connections from elsewhere that impinge on those.

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Q. Can you have intact autonomic nervous system and have cortical damage at the same time?
A. Yes.
Q. Translated, one could exhibit normal variability but have damage in the cortical area of the brain?
MR. BECKER: objection.
A. Wait a minute. You asked me on the first question if you could have intact autonomic nervous system and have damage to the brain?
Q. Yes, to the cortical areas.
A. It depends when you are talking about, the time of damage or extent of it. I mean, as a general statement, you can have cortical damage and have normal autonomic function. I can have a stroke now and be paralyzed --
Q. And still very good variability?
A. Sure. Well, I am not a fetus. Children have strokes.
Q. For example, children that have cerebral palsy caused by a hypoxic ischemic event long before labor, can they exhibit an intact autonomic nervous system during labor as determined by variability?
MR. BECKER: Objection.

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A. As I understand the question, if a child has had in utero brain damage well prior to labor --
Q. Yes.
A. -- and already has the brain damage and is going to have cerebral palsy labor, and that child goes through labor, can it show normal autonomic function?
Q. You got it exactly.
A. And the answer is absolutely yes, you can have normal autonomic function.
Q. And the reason is what, because portions of the brain damaged for cerebral palsy are different than the portions that control the autonomic nervous system?
A. That is why.
Q. Can head compression in the second stage of labor -- let's assume you have a baby that is in an occipitoposterior position and the head doesn't rotate, it is against the perineum for an extended period of time, can the force of pushing over an extended period of time in that position increase intracranial pressure?
A. Every time you squeeze on the head, you obviously are increasing the pressure on the brain. But I can't see how you would have elevated intracran-

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ial pressure just because you are posterior. I mean, I can't think that through.
Q. I suppose what I am saying is because there is a prolonged failure to rotate out of the posterior position and be delivered, and the head remains in the posterior occiput position, is it subject to compression?
A. No, because if you are going to get raised intracranial compression from pressure, you have to have a mechanism for raised intracranial pressure, either swelled contents to increase the pressure, or you have to have impairment of the vascular flow, venous flow that you back up, or you have to have expansion of the cerebrospinal fluid.
Q. Can't you have an increased intracranial pressure from prolonged head compression?
A. If you are pressing here, you will bulge there, the pressure just transfers. It is a mechanical distortion, but it is not going to change anything. You have a release elsewhere.
Q. Did the parents ever tell you in your conversations with them that, to quote one of them, "The child looked almost as if he had two heads because there was so much cephalohematoma"?

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A. I don't recall that at all.
Q. I wouldn't expect them to use the word "cephalo-hematoma," but molding, or anything like that?
A. I don't remember them saying it specifically. But let me just say that when a baby is acutely ill, we hear a lot of things in the nursery, and most of the time you don't take that stuff away because often it is very distorted. I make no memory of those things in their moment of anguish.
Q. Is there an association between an already damaged brain and a failure of normal fetal rotation during labor?
A. Ask me that again.
Q. Is there any association between an already damaged brain that affects muscle tone and the failure of a baby to rotate and be delivered?
A. Yes. If a baby is damaged and doesn't have the normal muscle movements, it may not undergo the normal rotation.
Q. In the children that you have seen and investigated for HIE injury over the years, has there been an association between meconium passage by history in those children?
A. Yes.

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Q. Have you been able to reach any conclusions as to the percentage or degree of association of meconium passage?
A. There is certainly a significant number of babies who have asphyxia in utero who pass meconium at the time of their fetal distress, sometime during the period of asphyxiation.

And I know there are figures on the number that show meconium staining, and I am trying to think of the number to have seen it, not only meconium staining, that have passed it earlier.
Q. I am trying to get if you have formed any approximation in the percentage of time you have seen it in the times you have concluded there is HIE intrapartum, for example?
A. I don't have an example, I am giving you an impression. At least half the time I have seen it, if not more than that. It must be at least half or more that they have passed meconium.
Q. What does an Apgar score tell you if it is low as to the time the hypoxia and acidosis, if acidosis existed, as to how long they existed before birth?
A. Apgar score just tells you that the baby is depressed.

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Q. Let's assume that hypoxia is a cause of depression, does it tell you how long the hypoxia had been going on if it is low?
A. We are talking beyond the five-minute Apgar, not the one?
Q. The one or the five or the ten.
A. Well, the five is much more meaningful, and the ten is even more meaningful. But if those are severely impaired, then it tells you that that hypoxia has been there a minimum of 30 minutes, more likely closer to around an hour, probably.
Q. On what basis do you reach that opinion that a low Apgar score at five minutes would mean a half hour to hour of hypoxia?
A. You can reach that conclusion because it is basically a sort of an extrapolation from experimental studies of incomplete asphyxia -- partial, not incomplete, asphyxia which shows you you have to render an animal at least that duration of partial asphyxia to get this degree of depression.
So the extrapolations have been made on humans in that way. It is very hard to know because you have no 100 percent accurate measure of when the asphyxia starts. How can you tell?

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Q. That is an extrapolation from Meyers' monkey studies?
A. Yes, and I think it is generally. Most people have accepted a half hour of severe partial asphyxia is probably necessary to get severe enough depression that leads to damage, a minimum of a half hour.
Q. To damage, but to damage the brain?
A. Yes.
Q. But Meyers never correlated timing of severe partial asphyxia with **Apgar** scores in the monkeys, did he?
A. No. You are just taking a lot of license on all of those.
Q. Nobody has correlated in animal studies or human studies Apgar score with length of hypoxia and degree, have they?
A. There is no way you could do it. There is no way you could do it.
Q. In fact, the Meyers' monkey studies found were dealing with 80 to 90 percent cutdown in normal oxygen supply to the fetus before brain damage occurred, weren't they?
A. That's correct, more **like** *90.*
Q. 90 or over?

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A. Yes.
Q. For at least half an hour to an hour before brain damage resulted?
A. And from that people have done that extrapolation. It takes that long on the Apgar being lower, assuming it is not drugs or some other thing, that kind of inference has been made. We all know Apgar score, per se, can't be the only measure.
Q. Who can you think of that has actually made some timing correlation with partial asphyxia and Apgar score timing as to the timing of the event?
A. I don't know anybody that has tried to. I don't see how you could do it accurately.
Q. Would the same go for timing acidosis before birth?
A. Yes. I mean, let's say how can you -- if you knew even the most acute event like an abruption, the moment of pain and the moment of hemorrhage is the moment you would have to start timing there, but when you have asphyxia through the more usual courses, by the time the first deceleration occurred, that isn't the moment the asphyxia started, there has been a while to stress the baby and exhaust the air and **get**

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the autonomic changes. So how can you measure it? I can't think of any way that you could do it morally, let alone technically.
Q. Is there any relationship between the time at which seizure activity begins in a newborn and the timing of an HIE event that is really the cause of the seizure?
A. Wow. Most term babies who have HIE and seize, with a qualification, will start seizing between 12 and 24 hours, but the figure that is often given is 6 to 12 hours. There is a serious qualification, that is from the time of birth, from the time of birth. Now, that is -- can I just finish that?
Q. Sure, go ahead.
A. My understanding of that is this is a baby who has the other manifestations of HIE, acute HIE, leukemia, very depressed, needed resuscitation.
Q. This baby, the Layman baby?
A. The Layman baby.
Q. Is that what you are talking about?
A. I **am** talking in general, a baby.
Q. **All** right.
A. That a baby who is born with all the other evidence of asphyxia, in other words, very

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depressed, low Apgar scores, acidosis, then resuscitated, will seize probably 12 to 24 hours, probably some 6 to 12 hours.

That is very different from a baby who might have had an asphyxial event five days before for whatever reason, recovers, then is born not particularly depressed and might start seizing on minute three. This is a whole different kettle of fish.

Q. Did you reach any conclusions when the Layman child first started to seize?

A. No, I really didn't, for very good reason.

Q. #at is that?

A. Because I didn't -- the Layman child seized. One of the problems we had with this is we often have this defining what was a seizure here. And at the time we were taking care of the Layman child, and even reviewing it, I am not sure what was a seizure here and what wasn't.

There was a lot of debate going on at the time whether what was being seen was seizure, and when large doses of anticonvulsants were given, whether there was seizure or not. I am not criticizing the use of it. It is appropriate when you are not sure in most of these cases to

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treat.

But there was a lot of concern about whether everything we were seeing was seizure or not.

Q. So can I conclude that from what we have discussed that you have no opinions with respect to seizures in this case and correlating that is to as to when brain damage occurred?

MR. BECKER: YOU can safely conclude that, and you can safely conclude that he is not represented as an expert on timing of insult. We have gone over this before.

MR. KALUR: I am going to accept Dr. Honvitz as an expert in the whole area of pediatric neurology in this case. That is what happens in Ohio, you open it up to examination.

A. What was the question for me?

Q. It was answered for you, but I would like your answer.

May I assume that you hold no opinions in this case that can correlate the time of injury, HIE injury, with any onset of seizures in this case?

A. That's correct.

Q. In children who have suffered at some point in either labor or in a week or two before labor a

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hypoxic ischemic injury of a nature that they wilt go on to exhibit CP and retardation and the other indicia of the problem, have you seen in the first hours of life, first 24 hours, 48 hours of life of those children, descriptions of their movements as a fencing type motion?

A. Yes.

Q. Could you explain what that observation is like now for us?

A. A fencing type would be where they would look like a fencer with their body like the thrust type movement, posture, all sorts of nice descriptions.

Q. What is that a manifestations of in these children under those circumstances?

A. Good question. Fencing and other movements, suc as bicycling, grimacing, arching of the back, have been interpreted as seizures, subtle seizures, subtle seizures.

Can I give you a long answer?

Q. sure.

A. The word "seizure" has usually been defined as an abnormality of movement and/or impairment of consciousness associated with an electrical discharge of the brain occurring at that time.

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All of these movements that we were describing were interpreted as seizures, which would be synonymous with what was called epileptic seizures for the brain discharge. Until a couple of years ago it was easy because you assumed they were all epileptic discharge.

I think many of us became aware that there are some very obvious seizures like repetitive jerking, a typical seizure that we can all see, but we were seeing a lot of other movements that weren't responding to drugs, some of these that are called fencing, and so on.

And now recent studies show that many of these movements, fencing, bicycling, occur in the absence of any EEG change, any EEG electrical discharge during the movement. So now they are being classified, unfortunately, as seizures that are nonepileptiform seizures.

Now, that kind of confuses the whole issue and makes the reading and the interpretation of the literature even more complex, because they are meaning different things than they did a couple years ago. What it really implies, we know some seizures occur whether there is clearly electrical discharge of the brain, but wc arc

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seeing a lot of other movements being called seizures in which there is no discharge from the brain. And some of these nondischarge things in hypoxic situations can be seen very close to the approximate event.

So it is not clear any more what we are talking about with seizure. It has horrendously complicated my life, and made it even more complex when you talk about diagnosing the seizure and giving medication, because even if you ran a monitor **strip** now of the brain and you said okay, that is having a movement and it has electrical discharge, that is a seizure and I feel comfortable in treating, but if you saw the same movement and no electrical discharge, can you then say I shouldn't treat and this is just a phenomenon and not a seizure? And to quote a medical term, the jury is still out on that one.

In general, we will use the same sorts of treatment, assume that they are all variations of the theme, but it is really muddy now.

Q. So these subtle seizure motions now are thought by the more recent research to be something called nonepileptiform seizures? Is that a non sequitur, nonepileptiform seizure?

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A. That is a good question. Welt, what they are saying is we all know that some epileptics may have a seizure without seeing an EEG because the way you are recording it doesn't show what is at the bottom end of the brain, so I honestly don't know any more. It is a real problem.

Q. So I guess the bottom line, or what you are saying to me is these type of fencing, arching of the back, trembling of the jaw movements are maybe seizures, maybe not?

A. Trembling of the jaw generally is not. Mouthing can be.

Q. Trembling of the jaw is what, a seizure or not seizure-like?

A. In my book, not a seizure.

Q. But fencing and arching of the back are in that zone that could be seizures and could not be seizures?

A. That's correct.

Q. As you said, the jury is still out. So am I correct to say that if those type of activities were noted in the early period of the Layman child's life, fencing and arching of the back, **that** no conclusions can be drawn as to the timing of the hypoxic ischemic event?

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A. That would be correct. There was also, just so -- maybe I wasn't asked, but there was also jittery, trembling movements in this baby, which are very common following hypoxia. Those, we are all aware, frequently are confused with seizures. Those are absolutely not seizure are, they are a debility.

And even in the description in the chart they came across one where they were treated for seizure but clearly it was a trembling, jittery movement. So there is a lot of confusion on seizures. I don't know, I just don't know.

Q. Now, on your neuro. consult sheet here, on the neuro. consult sheet you have some of your writing; is that correct?

A. Yes.

Q. When did you place your writing on there in relationship to when the person doing the consult wrote it up?

A. The person who wrote up the note was a neurology resident. He saw the baby, wrote up his note, presented the baby to me, presented the case.

I examined the baby, We looked at the scan EEG, and then I add my piece to the note. It would have been done the same day.

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Q. That was on 8/20?

A. Yes. Oh, yes.

Q. Maybe you could have your consult in front of you and that will save a little time.

The nursing notes indicate that the neurology consult was at 3:40 p.m. on 8/20. Would you have any reason to disagree with that timing?

A. It depends. I don't know whether that was the neurology resident or when I got there.

Q. Had the neurology resident completed -- is it his or her, he or she?

A. His, he.

Q. Had he finished his evaluation and written this first part of this neurology consult before you arrived on the scene?

A. Yes, he had that written before I saw the baby. Then I added my notes on later.

Q. And the notes you wrote are "Moderately severe clinically after HIE"?

A. Yes.

Q. And "No definite seizure, suggest repeat EEG --" what is that next word?

A. Today.

Q. "-- today. CAT tomorrow. Continue phenobarbital

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for sedation."
A. Yes.
Q. Those are the only words that you wrote in this chart at any time?
A. Yes.
Q. What was the baby's on-board medication at the time you saw the child?
A. As I recall, the baby had had some morphine sulfate.
Q. How much?
A. I don't remember the dosage.
Q. How long before you saw the child was the morphine administered, the last morphine?
A. I can't remember now. I don't remember at all.
Q. Why was morphine administered, do you know?
A. I am trying to remember. I think the baby was agitated. At the time I can't remember if they were trying to do a procedure or they gave it just to calm the baby down.
Frequently when they ventilate they give the babies morphine to calm them.
Q. The baby was described as combative?
A. I don't recall, but maybe you could show me that.
Q. The baby had stridor, breathing over 100 a minute with rales?

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A. Yes.
Q. That would cause combativeness in a child, lack of oxygen from stridor?
A. Stridor doesn't necessarily imply lack of oxygen.
Q. If the baby is breathing 100 times a minute, that would imply a lack of oxygen, and turning blue?
A. If it is turning blue, right.
Q. It is recorded in his chart, isn't it, Doctor?
A. Yes.
Q. And with saturation levels in the 30s, that is recorded in the chart in this time period, isn't it?
A. Right.
Q. With the heart rate down?
A. Right.
Q. There is a Dr. Hook who did that intubation?
A. Right.
Q. Did you talk to Dr. Hook when you were there during your consult?
A. I don't recall talking to Dr. Hook. I remember talking to Dr. Watts.
Q. Dr. Wise was there present?
MR. BECKER: He said Watts.
A. Watts.
Q. He was there present?

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A. When I did the consult?
Q. Yes.
A. No, she wouldn't have been there. I talked to her afterwards. I mean, if she was around, she might have been in the nursery. I don't recall.
Q. Do you know who wrote the entry, "Only fellows tc intubate" after this incident in the chart?
A. No. I would have to see the signature. I don't even recall seeing it. Can you show it to me?
Q. It is in asterisks on the operative note at the top of the page.
A. Dr. Hooks was a fellow, by the way.
Q. While I am looking for that, who was the resident who did the neurology consult?
A. Kuntz, Andrew Kuntz.
Q. Could you spell that?
A. K U N T Z.
Q. Is that a pediatric neurology resident, or was that somebody rotating through as a pediatric resident doing a turn in neurology?
A. No, he was a neurology resident doing a turn in pediatric neurology.
Q. What year was that resident?
A. Oh, I can't remember what he was at that time. Probably a second year, but I can't be sure.

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Q. Tell me what your understanding of the baby's first 12 hours of life were as of the time you did your examination on the 20th?
A. Wait a minute. I don't understand the question.
Q. I would like to know what your understanding was of the course of the baby's first 12 hours of life at the time you wrote your statement of "moderately severe clinically"?
A. Okay. The understanding that we had from the chart was that this was a baby born from a difficult delivery, that the baby was depressed at birth with low Apgar scores, required resuscitation, and it had numerous intubations that had not been successful, was finally intubated, and that the heart rate had recovered, it had never been too severely depressed. I think it was always over 100, as I recall.
And then the baby has stridor, required reintubation, that there was the episode where the baby turned blue, it had morphine. And they were questioning seizures. That was one of the reasons they called us so quickly.
Q. What was your understanding as to the muscle tone of the baby from the time of birth until Dr. Hook began her efforts at intubation?

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A. That *the* muscle tone had been variably increased and decreased.
Q. Really? Where had you gotten that information?
A. As far as I remember reading it from the -- I think it was from the intern admission note.
Q. What had the baby's muscle tone been from the time of admission. about 8:50 in the morning, until about 1:30 in the afternoon? What was your understanding?
A. It was increased.
Q. That is what your understanding was?
A. Right.
Q. I don't find that, Doctor. I can't find that now, but it is here, Doctor. In fact, I think it is in two places. I am looking at the upper right comer.
A. Was it in an order sheet or a progress note?
Q. Maybe it is in an order sheet because I have looked through the progress notes and I didn't see it. I know it is in here.
MR. BECKER: Off the record.
(Thereupon, a discussion was had off the record and Craig Bashein, Esq. leaves the conference room.)
A. I don't remember the question.

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Q. I don't think we have one out now. We are back on the consult sheet.
A. Yes.
Q. The information you got about the child's first 12 hours, from whence did you receive it when you arrived on the scene there with your neurology resident already there?
A. From him and from talking with Dr. Watts.
Q. You didn't personally review the record?
A. No.
Q. You said Dr. Watts you saw later, though, so Dr. Watts wasn't a part of your information for what you wrote on here?
A. I don't remember if she talked to me before or not. But afterwards I talked with her, I know that.
Q. So what you had as a basis for reviewing your consultant's note was your examination of the baby yourself!
A. And the history he gave me.
Q. And what your resident gave you as the history?
A. *Yes.*
Q. And that is all?
A. *Yes.*
Q. Here it says, "Eyes closed, hyperirritable after

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two doses of morphine sulfate." Did you know how long ago those two doses had been given, the last of them?
A. I am sure I asked about the dose and when it was given at that time. It certainly is not recorded there.
Q. Would it make any difference if, in fact, there were three doses given?
A. It would depend on the dose and time.
Q. What if it were 15 minutes before the exam?
A. It would depend on the dose that would be important.
Q. What if it was .6?
A. I would have to look at it on a weight basis and look at the book, I can't tell you what that means.
Q. You would have to look at the kilograms and dosage?
A. Yes.
Q. So my just giving you numbers wouldn't make any difference?
A. No.
Q. It wouldn't be surprising here that the child would have little spontaneous movement at the time of the resident's examination after three

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shots of morphine in less than an hour, would it?
A. It would depend on the dose. But usually if the dose is fairly heavy, then there will be reduction in spontaneous movements if he is really sedated, yes.
Q. But the child was found by the resident to move all extremities when stimulated.
A. Right.
Q. Despite the morphine.
A. Right.
Q. Did you find that, also?
A. Yes.
Q. "Appendicular tone increased," what does that mean?
A. It is talking about the limb tone.
Q. He is talking about the limbs?
A. Right.
Q. Was he talking -- what about the tone of the trunk?
A. He didn't address that.
Q. Did you?
A. I examined him, but I don't recall now.
Q. DTR, should that be DTRs?
A. *Yes.*
Q. Present?

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A. Yes.
Q. What is the significance of deep tendon reflexes present?
A. They are there.
Q. Is it a good thing to see or a bad thing? Let me put it this way: Is it normal to have deep tendon reflexes --
A. Yes.
Q. -- or abnormal?
A. Well, you usually have deep tendon reflexes. If you have them, it doesn't mean you are not.
Q. Something noted of not having?
A. Or being very excessive.
Q. They weren't found to be excessive here?
A. No.
Q. The plantar's extensor, what does that mean?
A. That is normal for a baby.
Q. "Withdraws to noxious stimuli," that is what you would expect to see in an infant? That is normal?
A. Right.
Q. "The eyes conjugate," what does that mean?
A. That the eyes are not moving in different directions, that they move in the same direction, together.

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Q. That is a normal finding?
A. Yes.
Q. Positive suck, *gag* and Moro?
A. Yes.
Q. All normal findings?
A. Yes.
Q. Significant in a baby who is supposed to have recent brain damage, aren't they?
A. Let me just say that these are positive says they are there, not normal. But they are not marked otherwise.
Q. It was his job to mark them if they were abnormal?
A. He or I should have if they were abnormal.
Q. And you didn't?
A. No.
Q. Neither of you?
A. No.
Q. In a child who has just had brain damage 8 or 10 or 12 hours before, often one sees absent suck, deprcsscd gag and absent Moro; is that correct?
A. That's correct.
Q. What had been the baby's history as you learned it from your resident concerning gag, suck and Moro testing in the prior 12 hours by other

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observers?
A. Oh, I don't recall that at all. I can't tell you that.
Q. EEG birth suppression, when was the EEG done?
A. It was done before I saw the child.
Q. How long before?
A. I mean, I don't know the exact time I was there. I would have to see the time that it was done. It was during the afternoon, presumably.
Q. I saw something about EEG leads being put on during the efforts to intubate this child. Would you say that was good judgment if that happened?
A. That EEG leads were placed?
Q. EEG leads being placed while this child is being intubated, thrashing around, and given morphine because it is combative.
A. There is nothing wrong with it. Frequently we take very sick babies and, as long as you are not in the way, you can stick on the leads. You are just putting paste on.
Q. What if you are a resident and said, "We saw birth suppression on this EEG, Dr. Honvitz, and I know from that when this child sustained hypoxic brain damage, I can tell you down to an hour or two," would you accept this as a scientific

Page 7'

conclusion?
A. From my resident?
Q. Yes. I don't want to limit it to a resident. Let's say another qualified pediatric neurologist came to you with that, and you had to rely on your experience, and you are trying to reply to that and accept that kind of concept, what would you do?
A. I would want to know all of the circumstances before I accepted that. I know that after an episode it may take X amount of time before you see these patterns there. There are some data to show when they occur.
One of the problems you have is as soon as you have any drug on board, you change a lot of things, it makes it very difficult.
Q. This child already had some drugs on board?
A. That's correct, had some morphine.
Q. The CAT scan we have already discussed as to the so-called normal reading?
A. Right.
Q. Have you ever had any reason to question radiographic readings on newborns or young infants by Dr. Lanzicri?
MK. BECKER: I am sorry, can I

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have the question again?
Q. Have you ever had reason to question radiographic readings on MRIs or GAT scans done by Dr. Lanzieri?
A. Sure, I have, certainly.
Q. Has he made errors in your opinion in the past in reading such films on newborns or young children?
A. I would prefer not to answer that question.
Q. Well, I know you would prefer not to, but I have to insist on an answer in this case, Doctor. It may be important as to judging Dr. Lanzieri's abilities, and he has been posed as an expert witness in this case.
I would like you to answer that question.
THE WITNESS: what was the question again?
(Record read.)
A. Yes.
Q. Why did you suggest a repeat EEG, because there were medications on board and they might distort the results, or other reasons?
A. Several reasons. One is medication on board. Second, this issue of seizures or not, I wanted to see if another one would show improvement in EEG, and also if some of these movements might be

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timed and actually show epileptiform activity. Then we might have a better handle on whether -- how to do the medication.
If you look at my note, it was very specific, it says, "Use phenobarbital for sedation." What I was saying is it is fine to keep this baby quiet with phenobarbital, but I don't want you to interpret that we are now treating epileptiform seizures. That was the reason for writing it that way.
Q. I want you to assume that the infant developed stridor and rales, as noted by observation, early in the afternoon on the 20th, and that the respiratory levels went up significantly above normal levels, the baby was on room air; that it was determined that the child should be intubated, and Dr. Hook was called to intubate and arrived on the scene somewhere between 1:30 and 1:45, intubated immediately thereafter; that she wrote a note in the chart at 2:00, timed at 2:00, indicating that that endotrachcal tube may not have been placed in the trachea, but that she had corrected the problem.
However, I want you to also assume that the radiographic records in this case show a chest

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x-ray taken at 2:15, and the interpretation indicating that the tube was not in the trachea as of 2:15, and that the resident, being Dr. Hook, had told the radiologist that after the chest x-ray the child was reintubated, not before, so that the period of the tube not being in the trachea was from about 1:40 to after 2:15.
A. I have got some of the events kind of mixed up. I have to put them on paper, I can't quite keep them all straight.
Q. I want you just to assume -- I can shorten it a bit because we have the general picture. Let's assume that sometime after 1:30 but before 1:45 the child was intubated, but the tube did not go in the trachea, that the child became blue, that the TCM was recording saturations in the 30s, that the child was combative, that the heart rate was down from normal, that the child was not reintubated, in other words, the tube that was placed to correct the stridulous condition of hypoxia remained out of the trachea from about 1:45, at least, until at least 2:15, for more than a half an hour with those conditions that I have indicated to you prevailing, and then was reintubated sometime after 2:15, and this time

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with the tube going where it is supposed to go, do you hold an opinion based on reasonable medical probability as to whether that episode caused any brain damage to this child?
A. Before I answer the question, I would like to know one other piece of information.
Q. Yes, sir, go ahead.
A. Where was the tube?
Q. Not in the trachea.
A. But where was it?
Q. You have to ask your radiologist. All his report says is it was not in the trachea.
A. Can I see that report?
Q. Sure. Dr. Comiskey. The x-ray was taken at 2:15.
A. 2:30. Am I looking at a different one? It says 1430.
Q. Well, he says that, but I think the nurses' notes say 2:15. But let's say 2:15 to 2:30. If it was 2:30 it makes the period without a trach. even longer.
A. Okay.
Q. Now, do you have an opinion as to whether that episode, to a reasonable medical probability, caused brain damage to the Layman child, given

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those facts as true?
A. Well. I don't know that the facts are true before I answer that.
Q. I am asking you to accept them as true. You know what a hypothetical is?
A. I understand the hypothetical, but there is a difference saying the tube is just somewhere. If the tube is in the right main stem bronchus, it is very different from the tube being somewhere in outer space.
Q. Or in the esophagus?
A. Or in the esophagus, that's correct. So it would make a huge difference.
Q. Well, let's assume that it is in the esophagus for that length of time. Would that be capable of causing brain damage to a reasonable medical probability under these circumstances?
A. While it would be in the esophagus, the saturations are around 30?
Q. Yes.
A. For that length of time, to a reasonable degree of probability, that would not cause brain damage.
Q. And the time we are talking about would be a half an hour to 45 minutes?

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A. That's correct.
Q. And saturations in the 30s to 40s percentiles, can we quantify that as to how much of a partial oxygen cutoff that would be?
A. Well, I think you would have to ask a neonatologist who deals with that. But I can tell you some facts about that, that there are many children who come in, infants, whose saturation is running at that level, and the decision, let's say with lung disease, no matter what you do you can't get better than that, and you have the opportunity to do ECMO, and with those kind of levels you would try and continue treating and not go to ECMO because these levels neither cause death or brain damage.
Q. There is a risk of ECMO?
A. The risk of ECMO would be extremely small in well selected cases, extremely small.
Q. Wouldn't you really want to know -- I can't give you the information because nobody got a blood gas. Wouldn't that be helpful in reaching a decision on what I just asked you to reach an opinion?
A. You are right, it would be helpful to have all the facts.

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Q. Should they have gotten a blood gas, within reasonable pediatric standards, under these circumstances?
A. No, the usual -- when you have intubated a baby and you feel confident that your tube is where it should be and the baby is not responding, the first thing you want to do is make sure that the tube is in the right place or isn't in the right place.
Q. Well, once you do that, wouldn't you get a blood gas then, see how bad off the kid's acid base was?
A. If you know the tube is in the wrong place, you want to intubate that, you want to correct the tube. And I don't know that in a NICU they always do it or always don't. You have to ask them that.

But it is very common for a baby to be intubated and still not be ventilating properly. And then they are not sure whether the tube is in the wrong place or have a pneumothorax or some other event causing that. The first thing is to get an x-ray first and see where the tube is and correct it if it is wrong.
Q. I am not here to get into the care standard for

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this situation. What I would like to know is can we agree, then, that under the facts that I have given you this child had a significant hypoxic episode?
A. In the facts you gave me, the child was hypoxic. Whether it is significant enough to require correction, if you are using the term significant to cause brain damage, per se, the answer is no.
Q. No, I am not saying that. I am saying significant hypoxic episode that certainly required what was done?
A. Yes.
Q. And knowing what was done, as I have stated it anyway, if it proves to be true, with an episode of hypoxia, with saturations in the 30s for a period of 30 to 45 minutes, that would not be sufficient in your opinion to cause brain damage?
A. That is correct.
Q. If a brain is previously damaged from a hypoxic ischemic insult, is it more likely to be damaged from a subsequent episode that in and of itself would not cause damage but because of the prior damage the brain is more susceptible to damage?
A. I can't give you any human data to support that, but intuitively I feel it makes sense.

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Q. In an infant who has in the hour or two before birth sustained a significant and severe hypoxic insult to its brain, sufficient that that child will eventually develop cerebral palsy, mental retardation. seizures, motor function disability connected with the cerebral palsy diagnosis, what condition of mental alertness do you expect that child to exhibit for the first 12 hours of life?
A. You usually find that those babies are very obtunded, stuporous, comatose. But we know that some of them shortly after resuscitation might have a period of hyperalertness, so-called hyper-movement, may even be rigid, and then crash later.

So the rule would be the majority would be the stupor or coma, so it would be flaccid. But we have certainly seen them move from being resuscitated and flaccid for a short while to hyperalert, thought everything was fine, sort of a honeymoon. I have been fooled by that on a number of occasions.
Q. Type I response you said usually in the majority of cases stuporous or comatose?
A. Yes.
Q. How far can we take those adverbs, 80 percent, 90

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percent of the time, less, more?
A. Where you are going to get permanent damage?
Q. Yes, under the circumstances I gave you where they had a significant and severe HIE insult so that they will go on to develop mental retardation, CP seizures, et cetera.
A. That they will go through the stupor, coma without everything being survived.
Q. You said a majority, and I am trying to pin that down to numerical.
A. I am going to give you my experience.
Q. That is what I am looking for.
A. I think the 75, 80 percent might be a conservative figure. It might even be a little higher. So that certainly is the rule.
Q. Now, of the 15 to 25 percent that are in category two at the hyperirritable state, describe hyperirritable for us so that we could now say we know what to look for to see a hyperirritable child under these circumstances?
A. Those babies will often have the eyes open. They will seemingly be alert, but may cry a little bit. You may get a very exaggerated Moro response. You may even find some sucking. Usually when you touch them they are very

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tremulous. They are often hypertonic, reflexes are normal or increased.

There is a variation on that where I have seen some who really seem to be quite good, they cry a little, they look, their eyes are open, they move spontaneously, perhaps a little -- you examine them and you find there is a little tremulousness, increased reflexes, but they are not irritable and really don't look hyper, they just look good over a period of time, short period.
Q. How long do they look good, maximum?
A. Maximum? Enough to make a fool out of me.
Q. I don't think they could ever do it that long.
A. Oh, believe me, that one is rough because you think everything is going to be --
Q. Before they crash is what we are talking about.
A. 24 hours, usually more likely 12, 18, but I have seen 24 and been pretty confident and then lived to rue the day that I said they would be fine.
Q. Did you find anything in these records that classified this child in the hyperirritable state in your review?
A. There was a lot of tremulousness at certain points.

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Q. Tremulousness to -- I wrote something down and can't read it. You said tremulous to what when you were giving me the list? Tremulous to touch?
A. Yes.
Q. When was it indicated in the record that the child was tremulous to touch? Do you recall?
A. There was one point where there were -- by the way, any time you say tremulous to touch, with spontaneous movements sometimes they may be equally tremulous.
Q. I just want to know who made the observation.
A. There is an observation in the record where they are seeing these movements that are suppressible by holding down. Here, it would be 8/21.
Q. 8/21?
A. Yes. "IPN day of life 2, infant with perinatal asphyxia has been agitated with questioned seizure activity, bicycling type movements of arms and legs off and on overnight. Able to stop movements by holding extremities down, but movements very repetitive. Also rhythmic shaking of the left leg."
Q. I think we were talking though about the first 12 hours. Remember I said, "What would you expect to see their condition be in the first 12 hours?"

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Is there anything hyperirritable by this child in the first 12 hours before you saw him?
A. When the child was agitated.
Q. When was the child agitated?
A. With the tube.
Q. Any time before that?
A. I don't recall.
Q. You reviewed the records last night?
A. Well, I reviewed those records very quickly. I had no intention or the time to go over them totally.
Q. Will you review them this week to see if you find any evidence of agitation of this child in the first 12 hours?
A. Right.
Q. We have talked about tremulous to touch. Did you find anything else from the limited time that you had to review these records now, or remembering back on your recollection, in the first 12 hours where the child had any of the other symptoms that you outlined or signs of hyperirritability, the type of situation that is in the 15 to 25 percent of these kids?
A. I would have to look at all of that to get it accurate.

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Q. I would like to ask you to do that between now and then, and I may have to ask for a telephone deposition in the meantime. If you come up with that kind of information, I would like to know what you are relying on ahead of time. And if you tell Mr. Becker, I would like to know that before because I can't question you about it now.
A. Right.
Q. Again, dealing with the example that I set up, a significant severe HIE that will lead to these deficits later in life that we talked about, when do you expect those children to turn hypertonic in the majority or usually, how far after birth if they have had the insult an hour or two before birth, within the hour or two before birth?
A. The majority of those babies, 70 or 80 percent, will be hypotonic, floppy.
Q. Hyper, I am talking about.
A. Well, I was talking about hypo.
Q. Go ahead. Go ahead.
A. You may get a period, day 2, day 3, day 4, it doesn't matter, particularly 48, 72 hours, they might be somewhat hypertonic. Usually, often most times that goes away and they remain floppy,

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and it usually takes several months before you start seeing the hypertonia. That is the rule.
What we see, the majority are not hypertonic for the first month except for some transient. Once in a while, and again percentage I am going to give you five, something, the baby is hypertonic from very early on, remains hypertonic, and for the rest of the time we follow them is hypertonic. It is the exception rather than the rule.
Q. With the rule cases, when do you expect to see the first transient episodes of hypertonia in such children? You understand what I mean by "such children" now?
A. Yes. I mean, you can see them transiently at 24. Usually I think we see them around 48, 72 hours.
Q. Before the first transient episodes appear?
A. For the usual ones, yes.
Q. If they are damaged within the hour or so before birth?
A. Yes. I think the other caveat you have to have is so many of them are being ventilated and being given drugs that it creates difficulty in saying exactly what your time frames are.

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Q. Does the tone of the child, whether the child is hypertonic or hypotonic, have anything to do with the existence of cerebral edema at that time?
A. You know, I have seen --
Q. Temporally, I am talking about.
A. I have seen what Volpe has written. From my perspective, I make no correlation. Even his rule when hypertonia occurs doesn't seem to correlate. It is nice when it does.
Q. I am talking much less of an authority than Dr. Volpe, one who opined to me that when you see differences in tone such as hypertonia in the child after hypotonia, that that means there is cerebral edema going on.
A. I think some of us used to believe that at one point. I don't believe that now. I don't think there is any correlation I can make. How do you tell other than your radiographic evidence at a certain point?
Q. If you have an onset of real seizures, not this never-never land type we talked about before, this uncertain type, do you have to have cerebral edema to have seizures, or is there any connection between the two?
A. The cerebral edema does not cause the seizures,

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and the seizures basically don't cause the cerebral edema.
Q. You can have seizures with edema or not with edema, they are not cause and effect related?
A. Correct.
Q. Does this child have basal ganglia damage in your review?
A. Not clinically significant.
Q. Basal ganglia damaged by CAT scan, does he have it by CAT scan?
A. I don't recall the one that we took as the follow-up showing it. I would have to look at that particular one.
Q. Well, if we can look at it.
A. I may have the report here. Well, I can give you -- I have it here.
Q. Go ahead.
A. This is of November 4, '92. It says, "Impression: Atrophy bilateral basal ganglia infarcts left frontal extra-axial collection."
Q. The last one taken on 9/4 which would be --
A. No, that is not 9/4 I am reading.
Q. Which one were you reading?
A. I was reading 11 -- make sure I have the right patient here.

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Q. Oh, that is the later one?
A. Yes.
Q. That is even better. If there is a lucency demonstrated in the basal ganglia demonstrated at that time, what is it?
A. It means there has been damage.
Q. It means calcium there?
A. No, lucency is not calcium.
Q. What is it?
A. It is a hole.
Q. A hole, all right. Caused by hypoxia in this case?
A. Well, a hole is usually --
Q. Caused by the effects of hypoxia or ischemia?
A. Usually ischemia.
Q. Does basal ganglia damage have any association with a full cutoff of oxygen?
A. Well, trying to go back to Meyers' monkeys, the way it is, basal ganglia type syndromes were thought to be superimposition of acute upon chronic, as I recall. Those famous Meyers' monkeys. I see it actually now on MRI and CAT scan all over the place.
Q. Do you still hold the view that experimentally basal ganglia damage has been shown to be the

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result of chronic hypoxia with an overlay of an acute episode?
MR. BECKER: objection.
Q. The question is: Do you still hold that view?
A. Pure basal ganglia damage, yes, probably correct.
Q. When you say "pure," in this case there is apparently other damage?
A. Yes.
Q. Where is the other damage in the brain, in your opinion, in this case besides the basal ganglia?
A. There is obviously a lot of neuronal damage here. There is probably a lot of white matter damage in addition to connecting fibers.
Q. No evidence of brain stem injury, is there?
A. There is no evidence clinically, and certainly CT scan would not be suitable in looking down there.
Q. On the scan of 9/4, Dr. Kaufman has an impression, he says there is an area of decreased attenuation seen within these paraconvexity/left centrum semiovale?
A. Semiovale.
Q. I don't know why he says "these," but that is more prominent than on the previous examination. Can you translate that? What is he talking about?

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A. White matter change, deep end.
Q. Are any of these damages in the cerebrum in the watershed areas of the brain parasagittal regions?
A. I would have to see the exact film to see, but this seems a little bit more than parasagittal.
Q. Seems more parasagittal?
A. No, I don't think it is parasagittal.
Q. Parasagittal injuries are the most common areas for HI injuries in the intrapartum period, aren't they?
A. Right.
Q. So if this child did get damage intrapartum, it doesn't have damage in the area you would see as the most common area you would see damage?
A. It is the most common area, but you certainly see a lot of variations.
Q. Can I see that? I don't have that last scan interpretation. I have seen it, but I don't have it with me today.
Were you shown by Mr. Becker or his associates Dr. Zimmerman's report or his deposition in this case?
A. Absolutely not.
Q. Were you advised that Dr. Zimmeramn had reviewed

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these films?
A. I was told he saw him.
Q. Were you told what he found?
A. No, I wasn't told what he found, I was told what his opinion might be.
Q. You did mention Volpe previously. Do you still consider Volpe to be authoritative in the field of pediatric neurology?
MR. BECKER: objection.
A. We always have trouble with the word "authoritative." He is clearly a great expert. It doesn't mean we agree with everything he says, but he is probably the person whose writings are most relied on.
Q. In the field of pediatric neurology?
A. In the field of neonatal neurology.
Q. Would you agree, Dr. Honvitz, that the majority of infants who experience intrauterine HIE insults do not exhibit overt neonatal neurological features or subsequent neurological evidence of brain injury?
A. Excuse me, can I hear that again?
Q. Would you agree that the majority of infants who experience intrauterine HIE insults do not exhibit overt neonatal neurological features or

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subsequent neurological evidence of brain injury? In other words, they can have events of hypoxic ischemia, but the majority have no detectable brain damage?
A. Give me the statement again. I want to hear that again.
MR. BECKER: Objection to the question.
Q. The majority of infants who experience intrauterine HIE insults do not exhibit overt neonatal neurological features or subsequent neurological evidence of brain injury. Do you agree with that statement?
A. I am not sure I understand that statement at all. I don't understand the statement.
Q. Do you expect to see an overt, in other words, not subtle, neurological syndrome within the first hours and days of life if there has been HIE insult that will lead to cerebral palsy and retardation within the last hour or two of labor?
A. Yes.
Q. Would you agree that most cerebral palsy observed in children is not related to intrapartum asphyxia?
A. Correct.

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Q. Would you agree that, for example, with respect to pH, cord blood pH, that as few as 12 percent of children with pH cord blood that is 4.9 to 6.99 will have cerebral palsy?
A. I would have thought it was even lower than that.
Q. Would you agree that the statistics indicate from your study of pediatric neurology that ten-minute Apgar scores of less than 3 will yield five percent or less cerebral palsy diagnosis?
A. That's correct.
Q. And, in fact, an Apgar score less than or equal to 5 at five minutes will yield only a pH below 7.10 in about 20 percent of the cases of newborns?
A. I don't know the exact figure, but it sounds right.
Can you read me that one again? I am not dumb, but this one is driving me nuts because I didn't understand the question.
Q. This is Volpe, page 315.
A. Which edition?
Q. The newest one, 1995.
A. I have got it. Can I read it? Page 315?
Q. Yes.

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A. Wait a minute, that is the wrong one.
Q. You want the one I read to you? Yes, it is page 315. It says, "It should be noted that the majority of infants who experience intrauterine HIE insults do not exhibit overt neonatal neurological features or subsequent neurological evidence of brain injury."
A. It starts, "It should be noted --"
Q. Do you have the black one, the most recent edition?
A. Yes, that is what I have. I can't find it on page 315.
Q. I will find it for you. Can you tell me if you have elevated BUN and creatinine levels in the immediate days after birth, and also liver findings at the same time with enzymes, does that mean there is brain damage as a result of the asphyctic incident which caused the rise in the kidney studies and the liver enzyme studies?
A. If you have the elevated BUN and the liver function abnormalities, without any other cause, that is compatible with a diagnosis of asphyxia to those organs.
Q. Asphyxia doesn't equal brain damage?
A. I just said to those organs, that's correct.

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Q. Do you normally espcct to see in the children who had a significant or severe insult in the hour or two before labor so as that they go on to have CP and mental retardation and they have a kidney dysfunction in the first few days, do you expect to see blood in the urine?
A. You are going to get blood in the urine in a percentage of cases. You are going to get it in somewhere like a third or so.
Q. Those are the more severe cases of asphyxia where you will get blood?
A. I don't know that there is an absolute correlation. I know the work of Perlmann, and I have seen the cases where we have had blood and the babies come out perfectly well. And I have seen cases where there is proteinuria and the baby is damaged.
Q. If you have a complete shutdown of urine in the initial days, is that an indication of severity of asphyxial incident?
A. Yes, that is more severe. That is a more severe insult of the kidney,
Q. Well, does that tell us that the asphyxial insult was more severe than an incident which leads to decreased urine output, but urine output?

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A. I suppose, in a general sense, you could say that. There are a lot of variables, but it is fair as a general statement. I am sure there are exceptions.
Q. Was there any evidence of hyponatremia to your observation?
A. I recall that the serum sodium fell a couple of days afterwards. I would have to look at the date.
Q. Did it reach hyponatremic levels?
A. Depends what is called hyponatremic.
Q. Did it reach below normal levels?
A. Yes, as far as I recall, it did. I can look at that lab data now if you want.
Q. Would the degree of drop in the sodium level be also indicative of the severity of the asphyxial incident, the more the drop the more the asphyxia?
A. I don't agree with that.
Q. I am just asking. I didn't say I was for it or not.
A. No, no, absolutely not.
Q. See, wc have great authority in this case that are telling us these things, and I have to get your view on them.

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Mow about DIC in the neonatal period for children under the circumstances I have repeatedly described?
A. Well, DIC is usually pretty close to death. It is very severe.
Q. So if you don't get DIC -- in other words, DIC is an extreme degree of asphyctic insult?
A. Yes.
Q. How long does it take hematocrit and hemoglobin to elevate if there is some type of a deprivation of oxygen to the fetus? Do you have any views as to how long it takes for hematocrit and hemoglobin to become elevated above normal levels?
A. It is going to take quite a while because you know that if you bleed out, which is hypoxia, it is going to take four or five days before you can generate anything that is going to Compensate for that. Reticulocytes take their period of time. From what you see, nucleated red cells, as far as I can make out it takes days to get there, weeks, probably.
Q. So if there were an insult four days before labor, three and a half days before labor, one would not expect to see an elevated hematocrit

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and hemoglobin as a result?
A. Absolutely not, no. I found your note.
Q. Okay. For the record, the doctor has reference to page 315 of Dr. Volpe's latest edition.
Does it make my more sense now reading it as opposed to my reading it?
A. Okay, now I understand it. You gave me half the sentence.
Q. I gave you the part I wanted to give you. Does that change?
A. No, I would agree entirely with this statement in the full context of what it is given.
Q. Give us the full context.
A. It says, "Although the particular importance of intrauterine asphyxia, intrapartum asphyxia with or without antepartum asphyxia and the genesis of clinical syndrome of neonatal hypoxic ischemic encephalopathy is apparent, it should be noted that the majority of infants who experience intrauterine hypoxic ischemic insults do not exhibit overt neonatal neurological features or subsequent neurological evidence of brain injury."
MR. BECKER: That's great. Can I quote that?

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MR. KALUR: NO, we are not going to use it at all, it is too long. That is why I didn't use the first part. Even the second part is too long, so we are not going to use it.

A. The answer is yes, I agree with that entirely.

Q. But I can't use it. Nobody could ever follow that.

In these luds that have brain damage incurred in the last hour or two of labor and then go on to have CP, mental retardation, seizures, et cetera, what do you expect to see in their blood pressure during the first five, six, seven hours of life?

A. A lot of them have difficulty maintaining their blood pressures. Others seem to be maintained fairly as well. It just depends on --

Q. Does your experience tell you that the majority of such children who go on to such damage will have hypotension in the first few hours?

A. I would have to look at that, but my immediate impression is that most of them, after they have been stabilized and resuscitated, and I am going to say the majority, upwards of 60 percent, have not had trouble maintaining their blood pressures.

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Q. But about 40 percent might, do?

A. It is a pure guesstimate.

Q. How about the children under these circumstances that I have repeatedly described, don't they usually require ventilator support for several days?

A. A lot of them do.

Q. A lot of them. The vast majority do, don't they?

A. The majority.

Q. 70 percent?

A. That is fair. It depends. A lot of them. It depends how long you are talking about.

Q. Four or five days, 70 percent of them, would you agree with that?

A. I would agree with the fact that the ones who are profoundly involved, gone four or five days, I don't think I have ever seen anybody get any kind of reasonable recovery.

Q. Does the Layman child have a profound neurological involvement?

A. Pretty bad.

Q. How long was it before the child was on room air, do you know?

A. We was doing pretty well in that regard. I don't have the figures. I would have to look that up.

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Q. Let me ask you this: If you have brain damage to a child from HIE, 24 hours before birth, 2 hours before birth, or 48 hours before birth, is the differentiation of the time of the occurrence an easy or a difficult task?

A. From my perspective?

Q. Yes.

A. It is very difficult.

Q. Why is it very difficult?

A. It is very difficult because the clinical features are so similar. I mean, if you look at the baby, HIE is going to be HIE. So if the baby is asphyxiated 48 hours out and then miraculously survived and labor went well, it would almost always be inconceivable. Most babies don't tolerate labor well.

And how are you going to say when it started and seize hours after they come out whether it is 6 or 8 or 12? It doesn't matter. They have blood in the urine, they can have elevated BUN, all of those things can still come.

Q. Still be the same. You used the wording "miraculously" there. Actually, survival after HIE sufficient to cause brain damage leading to CP and retardation, survival under those

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circumstances itself is miraculous?

A. Yes.

Q. Because most of the babies die?

A. The ones who get really severe intrauterine asphyxia at an extended period, many will die. I don't know if it is most. And then the others who are coining up might also tolerate labor very poorly.

Q. And therefore be born in a depressed state?

A. Yes. That is why I said miraculously come out without depression, but I wouldn't expect it.

Q. Because the earlier brain damage that might occur at 48 hours would make it difficult for them to hold up welt during labor?

A. That's correct.

Q. Now I am getting close to being done. I am going to give you some various items that have been suggested to me as indicating that they demonstrate that there was no injury before labor, in other words the child was without brain damage before labor, and I would like to get your opinion as a pediatric neurologist as to whether they are indicative -- whether they are methods for ruling out antepartum damage.

Do I make myself clear?

A. Yes. By antepartum we are talking about before the onset of labor?
Q. Before the onset of labor.
A. Yes.
Q. A finding of no intrauterine growth retardation, does that tell you that the damage could not have occurred 38 hours or 72 hours before birth?
A. No.
Q. A normal head circumference, does that tell you damage could not have occurred 24, 48 or 72 hours before birth?
A. No.
Q. Normal brain development such that there are no congenital anomalies, does that assist you at all?
A. No.
Q. The hematocrit, we covered that not being up. That wouldn't be significant?
A. No.
(Thereupon, a discussion was had off the record.)
BY MR. KALUR:
Q. Wow about children that have been injured 24, 48 or 72 hours before, will they not need vigorous resuscitation? I mean, if they didn't -- if they

required vigorous resuscitation, could you say now I know this baby wasn't damaged before labor?
A. I am scared to answer, you will tell me to shut up.
Q. No, no.
A. No.
Q. This child, I *think* you have opined in your report, is going to live, what did you say, into the 20s?
A. Yes.
Q. I want to make sure I use your -- early 20s, specifically early 20s. Are you saying that is the maximum?
A. I think only God would know exactly. But I am saying in my opinion that is sort of the time that would be --
Q. Are you saying if there were 100 children that were damaged in this fashion that 51 of them would live to be in their early 20s?
A. Yes.
Q. And what studies do you have to support that?
A. The studies are totally unsatisfactory. I mean, I know all about Dr. Grossman's studies.
Q. We are not going to even talk about Grossman, that is institutionalized children.

A. That is the problem.
Q. We are not talking about that.
A. A child that looks like Matthew Layman, that is nourished like Matthew Layman, that has the typee of parents who dote on Matthew Layman, who has access to health care, our experience is they do reach that age with antibiotics and reasonable health care.
Q. And Ripley has a book about things that have happened, people in Crimea that live to 120. Aree you telling me this can happen, that children can live to their 20s with this degree of disability, or are you telling me that "I have scientific studies and research either in my own experiencee or in the literature to show that 51 percent of these children will live to be in their early 20s"?
A. It is not studies in literature. It has been my experience with children that I have cared for with this degree of severity with these kind of family, that they are living well to that age. Now, when you say to me the 20s, the change in management in health care is so profound for these children --
Q. Which is it?

A. -- in the last ten years that you can anticipate the 20s. If you say how many do I have, they never got that health care 20 years ago. But I know what they are getting now, and there is every expectation it will go to the 20s.
Q. I imagine they will walk in in 100 years and regenerate brain cells.
A. No. I don't appreciate that remark.
Q. Dealing with what we do know and the state of medical science now, Doctor, what I am getting at is: Would you agree with me, so we can leave this subject, you have no studies of a group of individuals with these similar disabilities who have lived into their early 20s so that you could say that 51 out of 100 will live to this age?
A. That's correct.
Q. I just have one thing, and I will be done with my questioning. This child is G tube dependent?
A. Yes.
Q. Seizures?
A. Yes.
Q. Immobile?
A. Relatively, yes.
Q. Never will walk, in your opinion?
A. Won't.

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Q. Not responsive to visual stimuli?
A. According to the parents --
Q. I am asking about what you observed, Doctor.
A. Well, I have observed that the child will blink to threat or sudden movement in front of his eyes and will smile, but does not follow. I haven't got him to follow.
Q. Does not follow?
A. Didn't follow me. The parents say he does, but he didn't follow me.
Q. The parents tend to be somewhat hopeful about these children, don't they?
A. They tend to be hopeful. But you have to give them credit, they are with them all day. And I am with them 20 minutes. And I generally believe them.
Q. The child will always be entirely dependent on others for care?
A. Yes.
Q. Always have to be treated for seizures?
A. I think to a reasonable degree of probability, yes.
Q. Is the child able to smile, laugh, respond to verbal stimulation and make noises?
A. He smiles. I haven't heard him laugh.

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Q. Is the child able to grasp objects?
A. I haven't gotten him to grasp objects.
Q. Does the child visually fixate on an object, to your observation?
A. No, not to my observation.
Q. Does the child have any response to verbal stimuli?
A. Yes, he smiles.
Q. Smiles. Are you sure that this child really won't live to no more than 18 to 20 years of age?
A. *Am* I sure that he won't?
Q. Isn't it really your opinion that the child will live no more than 18 to 20 years?
A. There is no way to say that definitively.
Q. If I looked at a base deficit of 17.2 at 41 minutes of life in the Layman child and asked you to tell me when the child first became acidotic, could you do that to a reasonable medical probability?
A. I wouldn't even address that. No, I can't.
Q. Why wouldn't you address the issue?
A. Because I don't know how to do that. I don't know that you can do that.
Q. Have you ever seen in the medical literature where someone did that in a reliable manner, a provable manner?
A. I am not aware if it is there. I haven't heard it addressed here, I mean, in this hospital.

MR. KALUR: Lucky we have an expert that can do it in this case. I think that is all I have.

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CROSS-EXAMINATION

BY MR. SWITZER:

Q. I just have a few questions. My list isn't as long. Most of it has been asked.
A. I appreciate that.
Q. In your opinion, has Matthew received appropriate medical care since he was born?
A. Yes.
Q. I am not just talking about you, I am talking about all of the other physicians involved in his care.
A. Yes.
Q. Including his counseling and therapy provided by, I believe, the Board of Mental Retardation?
A. Yes.
Q. The percentage of children with mental retardation, say profound mental retardation, what percentage of those children have causes related to labor and delivery, less than five percent?
A. I would say less than five percent. I don't have an exact figure, but I would certainly believe it is less than five percent.
Q. Would an arterial blood gas pH in the range of, let's say, 7.0 to 7.1 cause brain damage to a newborn if that pH persisted for four and a half hours?
A. After birth we are talking about?
Q. Yes, after birth, yes.
A. I don't think the pH, per se, is the issue.
Q. Well, the results of the pH?
A. It is not the results of the pH, it is the cause of the problem.
Q. The results of the cause of the pH.
A. You would have to know what is doing it. You could certainly tolerate the pH well if you have a normal brain.

MR. SWITZER: Thank you, Doctor, very much.

(DEPOSITION CONCLUDED.)

SAMUEL J. HORWITZ, M.D.

CERTIFICATE

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

I, Diane M. Stevenson. a Registered Professional Reporte: and Notary Public in and for the State of Ohio, **duly** commissioned and qualified, do hereby certify that the within-named witness, SAMUEL 3. **HORWITZ,** M.D., **was** by me first duly sworn to testify the truth, the whcie truth and nothing but the truth in the cause aforesaid; that :he testimony then given by him was by me reduced to stenotypy in the presence of said witness, afterwards transcribed by means of computer-aided transcription, and that the foregoing is a true and correct transcript of the testimony as given **by** him 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, employee or attorney of any party, or otherwise interested 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 _____ day of _____, 1995.

Diane M. Stevenson, RPR, CM
Notary Public in and for
The State of Ohio.

My Commission expires October 31, 1995

State of Ohio,)
)
County of Ashtabula.)

- - -

IN THE COURT OF COMMON PLEAS

- - -

MATTHEW LAYMAN, et al.,)
)
Plaintiffs,)
) Case No. 93 CV 00672
vs.) Judge Mackey
)
C.K. WOO, et al.,)
)
Defendants.)

- - -

DEPOSITION OF SAMUEL J. HORWITZ, M.D.
Thursday, March 9, 1995

- - -

The deposition of SAMUEL J. HORWITZ, M.D., a witness, called for examination by the Plaintiffs, under the Ohio Rules of Civil Procedure, taken before me, Diane M. Stevenson, a Registered Professional Reporter and Notary Public in and for the state of Ohio, pursuant to notice, at University Hospitals of Cleveland, 11100 Euclid Avenue, Cleveland, Ohio, commencing at 11:33 a.m., the day and date above set forth.

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APPEARANCES:

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ALSO PRESENT:

Scott Morrison, Videographer

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MR. BECKER: Let the record reflect that this is the evidentiary deposition of Dr. Samuel Horwitz in Cleveland at Rainbow and Children's Hospital upon direct examination on behalf of the Plaintiffs.

Before we begin, may we have a stipulation by counsel that this evidentiary deposition is being taken pursuant to notice, and may we have a stipulation relative to the waiving of any filing requirements of this deposition?

MR. KALUR: Well, taking those in order, number one, clearly we are here pursuant to notice; we have a notice. But the notice that we received said that this was to be a videotape deposition, and we have proceeded on the assumption that it would be. We are now here, there is no videotape equipment, and I have ordered videotape equipment for my cross-examination.

So to the extent that we received notice, I agree. To the extent that I think it was defective notice, I also note that for the record.

The second question, we have no problem with waiving the filing requirement.

MR. SWITZER: I agree with Mr. Kalur's observations.

MR. BECKER: The record should further reflect that Dr. Horwitz is being offered strictly as a subsequent treating physician and, as such, as a fact witness, and as an expert with respect to Matthew's neurological condition, likely future problems that Matthew will encounter, and life expectancy.

The record should reflect that we are not offering him as a liability expert regarding the specific timing of any event that caused Matthew's brain damage. This doctor has not reviewed any of Matthew's records from ACMC, and has not been provided with any of the testimony from care-givers of ACMC to adequately formulate any opinion on the timing of the hypoxic ischemic encephalopathy.

If the defense, the record should reflect, intends to ask him questions about causation and, specifically, timing, the notice is given that we are going to seek, without waiving our objections thereto, to conduct cross-examination of Dr. Horwitz of any of the opinions, if any, that he chooses to give.

MR. KALUR: Well, you should be on notice right now that we don't agree in any way with your concept that there is some kind of a special designation of a treating physician who you can ask limited expert questions of. We told you that at the deposition of Dr. Horwitz last week: it is on the record. You are fully of notice on that.

You could have applied to the court if you want your novel concept of limitation of an expert ruled upon by the Judge for today.

We will object to any effort by you to cross-examine this witness. You have given us at least three different opinions that he has rendered in a report, including the term "perinatal asphyxia" which carries a temporal relationship to an event.

We consider your position to be without merit legally and will proceed as if this were a deposition of an expert who happens to be a treater, and that is exactly what we consider it to be.

MR. SWITZER: I join in Mr. Kalur's objection. And I also disagree with basically everything you said as far as the use

of Dr. Horwitz.

MR. BECKER: That's fine.

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SAMUEL J. HORWITZ, M.D.

A witness, called for examination by the Plaintiffs, under the Rules, having been first duly sworn, as hereinafter certified, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BECKER:

Q. Doctor, would you state your full name for us, please.
A. My name is Samuel J. Horwitz.
Q. What is your occupation, sir?
A. I am a pediatric neurologist.
Q. What is pediatric neurology?
A. Pediatric neurology is a medical field devoted to the diagnosis and treatment of children with disorders of the brain, spinal cord, nerves and muscles.
Q. Doctor, you are the treating pediatric neurologist for Matthew Layman; is that correct?
A. That is correct.
Q. Would you affirm for the record and for the ladies and gentlemen of the jury if you have a

desire, if any, as to what your role in this case be limited to?

MR. KALUR: objection, Move to strike any answer that may be brought from this question.

Q. Go ahead, Doctor.
A. Could I have the question again, please.
Q. Would you indicate for the record, Doctor, your desire as to what role you would act today as?

MR. SWITZER: objection. same objection.

A. My desire was and still is when I was approached about the Matthew Layman case to confine my opinions to what is wrong with Matthew Layman, what his treatment is, and what his prognosis is. That is what I understood I was going to agree to talk about, and that is all I agreed to talk about. I had no intention of doing more than that.
Q. Doctor, what is your business address?
A. Rainbow Babies & Children's Hospital, 11100 Euclid Avenue, Cleveland, Ohio, 44106.
Q. Let's talk a little bit about your educational background. First of all, where did you go to medical school?

A. I went to medical school at the University of Cape Town in South Africa.
Q. After medical school, I understand you did one year of an internship, and that was also at the University of Cape Town.
A. That is correct.
Q. After you finished that internship, and before your residency, I understand you practiced medicine; is that correct?
A. Yes.
Q. Would you explain what that practice of medicine consisted of?
A. It was general practice or what would be called family medicine.
Q. Then I understand, Doctor, you came to University Hospital here in Cleveland in May of 1962 to begin a residency in pediatrics; is that accurate?
A. Yes.
Q. Would you describe how long that residency lasted?
A. The residency in pediatrics lasted two years and two or three months, I believe.
Q. From 1964 until 1967, did you do a fellowship in pediatric neurology?

A. Yes.
Q. Would you explain to the ladies and gentlemen of the jury what a fellowship is?
A. A fellowship is advanced training in a specialty field. For me it was three years of training in the field of neurology, with special emphasis on the practice of child neurology.
Q. After you finished the fellowship, what did you then do, Doctor?
A. I joined the faculty of Case Western Reserve University School of Medicine.
Q. And that apparently was in 1967?
A. Yes.
Q. Would you bring us up-to-date chronologically from 1967 as to your professional and academic positions held?
A. In 1967 I was appointed Assistant Professor of Pediatrics and Assistant Professor of Neurology. I was subsequently promoted to Associate Professor somewhere in the mid-'70s, I don't remember the date. And about three years ago I was promoted to Professor of Pediatrics and Professor of Neurology.
Q. And you are licensed to practice medicine in Ohio, of course?

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A. Yes.
Q. Any other states?
A. New York.
Q. Arc you Board certified, Doctor?
A. I am.
Q. And you are Roard certified in what specialties?
A. In pediatrics and in neurology, with special competency in child neurology.
Q. Would you tell the ladies and gentlemen of the jury what steps you had to undertake to become so certified?
A. I had to complete the period of training required by the American Board of my specialty. I then undertook a written examination. And having passed the written examination, was then given an oral examination that applied to both the Board certifications I have.
Q. Doctor, have you lectured to other medical professionals around the country?
A. Yes, I have.
Q. Has that generally been in the field of pediatric neurology?
A. Yes.
Q. It is true that you have authored many journal articles in the field of pediatrics and/or

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pediatric neurology?
A. That is correct.
Q. Have you been a contributing author to any medical textbooks?
A. Yes.
Q. Do those also deal with pediatrics and/or pediatric neurology?
A. Yes.
Q. Doctor, are those medical journals that we have referenced, as well as the book chapters, the kind of material that is regularly relied upon by physicians to upgrade their clinical skills?
A. Yes.
Q. Doctor, we are taking this evidentiary deposition because I understand you are going to be unavailable during the week of trial in this matter. Is that correct?
A. That's correct.
Q. Would you explain to the ladies and gentlemen of the jury the basis of your unavailability?
A. During this next week we are having the accreditation of the School of Medicine. There is a commission coming in to review all of the activities of the Case Western Reserve School of Medicine.

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As acting head of the Department of Pediatrics, I am required to participate in that accreditation process, and have to meet with the various members of the commission.
Q. Doctor, before we specifically talk about Matthew Layman, I would like you, for the benefit of the ladies and gentlemen of the jury, to explain some terms that I suspect might be used throughout the balance of this evidentiary deposition.
First of all, what is cerebral palsy?
A. Cerebral palsy is a sort of general term that denotes a problem primarily involving the motor system of the brain that is nonprogressive, nonworsening, is present from before, during, or shortly after birth, early infancy, and may have additional neurological features, complications, in addition to the motor abnormality.
Q. What is epilepsy?
A. Epilepsy is a term used for recurrent seizures. It is not a disease, it is just a term used for anybody who has more than one seizure in his life.
Q. What does the concept mental retardation mean?
A. Mental retardation means mental functioning below the range of normal.

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Q. What is asphyxia?
A. Asphyxia means a lack of oxygen and circulation sufficient to produce an accumulation of acid products in the body or acidosis.
Q. What is hypoxic ischemic encephalopathy?
A. Well, encephalopathy is a disorder of the brain. "Hypoxic ischemic" means a reduction in the amount of oxygen and a reduction in the mount of circulation. So the terms put together mean a brain disorder due to reduction in supply of oxygen and circulation.
Q. All right. Doctor, let's turn to Matthew Layman. I understand your contact with him came about via a consultation request.
A. Yes.
Q. Doctor, during the course of this evidentiary deposition, I want you to know that you are more than free to review your consultation sheet and/or office records on Matthew before responding on a question.
Doctor, I also want you to know that, in case I forget to ask you through the balance of my questioning, I am asking you for your opinion within a reasonable degree of medical probability.

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A. Right.
Q. When did you first have contact with Matthew Layman?
A. My contact was on August 20. I will try to find the consultation sheet. I have it.
It is August 20, 1992.
MR. BECKER: Why don't we go off the record and I will mark this as an exhibit.
(Thereupon, Plaintiffs' Exhibit 1 was marked for identification.)
MR. BECKER: We can agree to substitute for this highlighted one. I will make a photocopy, I will do that. I will represent that I will do that.
MR. SWITZER: Sure.
BY MR. BECKER:
Q. Doctor, handing you what has been marked as Plaintiffs' Exhibit 1, would you identify that for us, please?
A. This is a copy of the consultation that was carried out by me on August 20, 1992.
Q. I don't recall if I asked you, did you tell us who specifically requested the consult, which physician?
A. It was requested by Dr. Watts, Catherine Watts.

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Q. Who is Dr. Watts?
A. Dr. Watts is a member of the Department of Pediatrics. She is in the division of neonatology.
Q. Is she an attending physician at this institution?
A. Yes.
Q. Was she, in fact, the physician in charge of Matthew Layman throughout his hospital stay here?
A. I don't think she was the attending throughout the hospital stay.
Q. Was she the attending during part of the hospital stay?
A. Yes.
Q. As a result of getting that consultation request, what, if anything, did you then do?
A. I requested that the neurology resident who is working with me carry out the review of the records that were available and do the examination, and then, when he was ready, present the case to me. And I examined the child.
Q. What did that examination consist of, Doctor?
A. The examination consisted of really looking at the baby and checking the baby's movements, eye movements, doing the reflexes. The baby was

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obviously in an incubator and would not have been removed from that site.
Q. After doing a physical examination, what then did you do?
A. I reviewed the EEG that had been taken, the CT scan, made recommendations, and added a note to the neurology resident's note.
Q. So did you concur with the impression of the resident?
A. Yes.
Q. What does the concept, at least on a consultation sheet, of "impression" mean in lay terms? Is that like a diagnosis?
A. Impression is a little bit -- diagnosis tends to mean more definitive, saying "This is what it is."
Impression is more preliminary, "This is what I think it is likely to be, or possibly." So often impression may have one item, or may have six items if the physician is at that point not sure what the specific diagnosis was.
Q. What was your impression, Doctor, at this time of the consultation?
A. That Matthew was suffering from hypoxic ischemic encephalopathy.

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Q. Did you so note that on Plaintiff's Exhibit 1?
A. I did.
Q. Did you note the severity of that?
A. I did.
Q. What severity was that?
A. Moderately severe.
Q. What did you base that on, Doctor, his --
A. I based it on, primarily, the neurological picture, and certainly influenced by the EEG, in addition.
Q. I guess I forgot to ask you to define what an EEG is.
A. Well, EEG is an abbreviation for an electroencephalogram, which is a test that measures the electrical activity emanating from the brain itself.
Q. Doctor, you described the severity as moderate to severe. Are you familiar with any studies by Sarna?
A. Yes, I am.
Q. Can you put the severity in terms of a Sarna scale for us?
A. Well, a Sarna scale has 1, 2 and 3 levels of severity, and I would have put this somewhere between a 2 and 3.

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Q. What was your suggested medical management at this point?
A. I suggested that the CT scan be repeated the next day, that the EEG be done again, and I suggested continuation of the phenobarbital that had been started to be used for, primarily, sedating the baby.
Q. Was your plan to follow this child on a daily basis?
A. My plan was to follow, not necessarily on a daily basis.
Q. At this t h e , was Dr. Watts the attending physician?
A. Yes.
Q. Doctor, can you estimate for me how many times you personally saw Matthew Layman during the balance of that hospitalization at Rainbow & Children's, approximately?
A. I can't tell you exactly. I would say I probably saw him half a dozen times in the first ten days to two **weeks.** And then maybe two or three times I went by and saw him or talked with the family when he was transferred out of the neonatal intensive care unit.
Q. Would you describe in very general terms the

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clinical course during your management of him or consultation services?
A. Well, his course, in general, was one that was unfavorable. He required a great deal of medical care. He had trouble with feeding, eventually required placement of a gastrostomy. He had very poor suck. He had seizures.
He had a long hospitalization here.
Q. Did you come to what is known as a preliminary diagnosis within a reasonable degree of medical probability?
A. I did.
Q. What was that, sir?
A. The diagnosis, the diagnosis very early on?
Q. Towards the end of the course of his hospitalization.
A. The diagnosis is that Matthew suffered from brain damage as a result of hypoxic ischemic encephalopathy.
Q. Doctor, after Matthew was discharged, I understand that you became his attending physician; is that correct?
A. It is only correct to the extent I am attending physician for his neurologic problems.
Q. How did that come about?

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A. Usually when we consult and the baby does have permanent abnormality or a possibility of a permanent abnormality, the physician who consulted will generally follow that baby for that specific purpose if it is deemed necessary.
Arrangements were made by the neonatologists with the family to follow up with me.
Q. You have continued to see Matthew Layman on an outpatient basis?
A. Yes.
Q. Physically, where does that take place when you see Matthew in an outpatient basis?
A. I see him in either of two sites. Either I see him here at University Hospitals in the ambulatory facilities, or I see him in the Rainbow Subspecialty Center at the Parkway Medical Building in Beachwood.
Q. Would you estimate for us how often you have seen Matthew since his discharge, approximately?
A. Only probably about eight times, six or eight times.
Q. Would you describe for the ladies and gentlemen of the **jury** Matthew's present physical and mental condition.
A. Matthew Layman is mentally retarded. He has

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cerebral palsy with tightness or what we call spasticity of all four extremities. He has an uncontrolled seizure disorder. He seizes every day, for practical purposes.
He is fed through a gastrostomy tube button -- gastrostomy button. He does not feed orally. He is totally dependent.
Q. Doctor, let's take them one at a time. You mentioned mental retardation. Can you quantify that in terms of mild or moderate or severe?
A. I don't have -- oh, okay, I would call this in the severe range.
Q. What is the basis of that opinion?
A. My observations of him, as well as the history from the family of what he can and cannot do.
Q. The cerebral palsy you described **as** spastic quadriplegia?
A. Quadriparesis, yes, yes.
Q. What is the difference between quadriparesis and quadriplegia?
A. "Quad" is four, four limbs. "Plegia" generally means a complete paralysis. "Paresis" means more of a weakness than a complete paralysis.
The terms are used somewhat interchangeably.
Q. And you already described the seizure disorder.

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You noted that he does not feed himself, that he is on a G tube. What is a G tube, Doctor?
A. Well, it is a gastrostomy tube. A small hole is made through the abdominal wall into the stomach, and either a tube or a button-like device is inserted in there, and feeding is done through a tube that is plugged into that opening.
Q. Why is it necessary for him to be fed through a G tube?
A. Because of the damage to his brain, his swallowing mechanism is severely impaired, so he is unable to take the food and would probably choke if we did try to feed him to any significant degree by usual oral feeding.
Q. Doctor, what is the relationship of Matthew's present condition, the profound mental retardation, the cerebral palsy, the uncontrollable seizure disorder and the dependency on a G tube, in relation to the hypoxic ischemic injury that you have earlier described?
A. The items you mentioned that affect Matthew are the direct result of the hypoxic ischemic encephalopathy.
Q. Doctor, do you have any opinion within a

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reasonable degree of medical certainty whether these conditions that you have just described are permanent in nature?
A. I do.
Q. Are they?
A. They are permanent in nature.
Q. Will Matthew have to live with them for the rest of his life?
A. That is correct.
Q. Do you have an opinion, Doctor, whether Matthew will ever walk?
A. I have an opinion.
Q. And that is?
A. He will never walk.
Q. And the basis of that opinion?
A. The basis of that opinion is an evaluation of his present neurologic condition, the severity of his cerebral palsy, and the experience with similar patients that we have had.
Q. Do you have an opinion whether he will ever talk, Doctor?
A. I have an opinion.
Q. That is?
A. He will never talk.
Q. And the basis of that opinion?

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A. The same as I gave for walking.
Q. I think you already indicated that he will never be able to live independently. Is that accurate?
A. That is absolutely accurate.
Q. And he will need lifetime care?
A. For as long as he lives, that's correct.
Q. Will the family need assistance for his lifetime care?
A. Yes.
Q. Incidentally, Doctor, you have had an opportunity to work with the Laymans and see them interact with their child. Would you describe their level of commitment to their son, from your observations?
A. From my observation, they have been a very devoted, loving, and committed family who have done the best that they could for their child.
Q. Doctor, do you have any understanding as to whether orthopedic surgery is presently scheduled for Matthew?
A. I don't know that it is immediately scheduled for him.
Q. Do you have an opinion whether or not he will likely need orthopedic surgery, first of all?
A. I have an opinion.

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Q. What is that?
A. My opinion is that he will likely need orthopedic surgery in the future.
Q. Can you be more specific as to what the need will be?
A. It is my opinion that he will require some tendon releases.
Q. What does that mean?
A. Well, what it really means is that you cut the tendons, the ends of the muscle, to loosen up the tightness. What you are really doing is a destructive operation.
Q. Why do you want to do that?
A. Because the amount of tightness is so severe that two things are going to happen. One is he is going to get contractures, which means that the limbs will be in a bent position permanently, which is very difficult to nurse. And it is more than likely that with this degree of tightness, if he doesn't have release, he will eventually dislocate his hips.
Q. Is Matthew capable of experiencing pain?
A. Yes.
Q. Now, in addition to the tendon release, any other type of orthopedic surgery that is likely?

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A. Well, he has a severe scoliosis.
Q. What does that mean?
A. Curvature of the spine. And I am not managing the scoliosis, but, from what I have seen, I think it is probable that he will have to have some surgical stabilization sometime in the future.
Q. What would be the purpose of that, based on your understanding, Doctor?
A. Well, if the curvature becomes too severe and fixed, it is not only difficult to physically handle them, but it starts compromising the lung function. You can't breathe properly because your chest is curved, so you are more likely to get pneumonias and problems with ventilation.
Q. So the surgery is to prevent that?
A. Yes.
Q. And the likely reason -- you have explained the reason for the need for the tendon release. What is the explanation, Doctor, for the development of the scoliosis in Matthew?
A. Scoliosis develops in Matthew and children like Matthew because with the abnormal degree of muscle tightness there is a stronger pull of the muscles on one side of the body than the other,

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and they are not balanced. It simply pulls the spine into a curve.
Q. Okay. Doctor, I want to turn now to my final topic, which is life expectancy of Matthew. Do you have an opinion, Doctor, based on your education, training, experience, within a reasonable degree of medical probability what the life expectancy of Matthew will be?
A. I do.
Q. What is that opinion, sir?
A. My opinion is that Matthew will probably live into the early 20s.
Q. What is the basis of that opinion, Doctor?
A. The basis of that opinion is my evaluation of Matthew's current status, his medical history, my experience with other children of similar type.
MR. BECKER: We will take a break.
(Thereupon, a short recess was taken.)
BY MR. BECKER:
Q. Doctor, relative to the G tube, do you have an opinion whether Matthew will ever be able to feed himself?
A. I have an opinion.
Q. What is that?

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A. He will never bc able to feed himself independently.
Q. And the basis of that opinion?
A. My evaluation of the severity of his neurological deficits.
Q. And, of course, will he need physical therapy after the surgeries that we have talked about?
A. Yes.
Q. Doctor, if Matthew had not sustained this hypoxic ischemic injury, do you have an opinion whether or not he would have lived a normal life?
MR. KALUR: objection. How would this Doctor -- how would he be qualified to know whether Matthew would have lived a normal life?
MR. SWITZER: objection.
Q. If you have an opinion, Doctor.
A. I have an opinion.
Q. What is it?
A. My opinion is that aside from his neurologic condition, if we took that away, Matthew appears to be a normal child. So his chance of a normal life are probably no greater or lesser than anyone else.
I couldn't answer whether he could get cancer, or anything any other person could get.

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MR. BECKER: All right. I have nothing further.
MR. KALUR: We will have to set up for the videotape portion of the deposition.
- - -
(Thereupon, Samuel Horwitz, M.D. was duly sworn for the benefit of the videotape record.)
(Thereupon, Defendants' Exhibit A was marked for identification.)
- - -
CROSS-EXAMINATION
BY MR. KALUR:
Q. Dr. Honvitz, now that the videotape equipment has arrived and we are on the videotape, I would like to show you what has been marked as Defendant's Exhibit A, Defendant Woo's Exhibit A, and ask you if you can identify that document for the jury.
A. Yes, I can.
Q. Would you tell us what that document is?
A. This is a letter from me to Mr. Michael Becker relating to Matthew Layman, and it was dated December 12, 1994.
Q. Is that an exact copy of the copy you maintained in your file after you sent the original to Mr. Becker?

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A. Yes.
Q. Docs it bear your signature, that copy?
A. Yes. I will just check my records to be sure on that. Yes.
Q. Perhaps you could look at your copy. I have a couple of questions to ask you off the copy that we marked as an exhibit here.
The letter starts out, "Dear Mr. Becker: In reply to your letter of December 2, 1994," and then it goes on to say some other things. Would you give me Mr. Becker's letter of December 2, 1994 from your file, please.
A. It should be in here; I can't locate it at the moment.
Q. Are there any other letters from Mr. Becker in there, from his office or from him?
A. There is a letter from Mr. Becker December 22, 1993 asking for a copy of my medical records.
Q. This letter that provoked your letter of December 12, his letter of December 2, 1994 is missing from your file?
A. I don't see it in here. I assume it is not in here.
Q. Are you aware of how it got out of that file?
A. No.

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Q. It was supposed to go in that file, wasn't it?
A. It should have been in that file.
Q. Well, is it fair to say that you were responding, by your letter of December 12, 1994, to questions that were raised in that missing December 2, 1994 letter?
A. That is correct.
Q. And you have three specific answers to, presumably, what you were asked in that letter?
A. That's correct.
Q. And the first two you certainly testified to on direct, the life expectancy and the degree of disability of the Layman boy; is that right?
A. That's correct.
Q. And Matthew's diagnosis in No. 3 of hypoxic ischemic encephalopathy, you also testified to that on direct?
A. Yes.
Q. But you did not testify to what is in the last sentence in your report to Mr. Becker, did you, on direct examination?
A. I did testify that Matthew suffered hypoxic ischemic encephalopathy that caused the abnormalities.
Q. But you did not say that it was a result of

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perinatal asphyxia?
A. I don't think he asked me that.
Q. Well, that's right, he didn't ask you that.
A. Right.
Q. So you couldn't answer it.
A. That's correct.
Q. But "perinatal" is a word, a medical word, that implies time parameters; does it not?
A. It implies time parameters.
Q. And time parameters in this case, as you used it, when the hypoxic ischemic injury to the brain was received by the Layman child or fetus at that time before birth?
A. It is used by me to indicate in my diagnosis that the asphyxia occurred somewhere proximate to the delivery, within a couple of days of the time of labor. I am only using it in the widest sense.
Q. Now, a couple of days before, for the record, that is 48 or more hours before birth where you are beginning that period; is it not?
A. I am beginning that period around 48 hours before birth.
Q. Dr. Horwitz, in your experience, you have been called upon by lawyers, including me, to attempt to determine and render your opinion concerning

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when hypoxic ischemic injury has been received to an unborn child or to a child after birth; have you not?
A. I have.
Q. And that isn't something that has happened once or twice, it has happened many, many times; has it not?
A. That's correct.
Q. And the lawyers that have asked you to render opinions on that subject after reviewing medical records are both lawyers who represent an injured child in the family and lawyers who are defending the doctor; isn't that true?
A. That's correct.
Q. What about your study of pediatric neurology, as a science, enables you to be able to render opinions on the timing subject of an injury like hypoxic ischemic encephalopathy?
A. We are just talking in a general sense?
Q. Yes, sir.
A. I am just asking because, as I indicated earlier, in this particular case I had no intention of addressing those issues.
My training, my knowledge of clinical picture, what my understanding of neuroimaging

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studies, all of those factors, the history of labor and delivery, everything has to be put together to enable me to give any opinion whatsoever in that context.

Q. Well, what allows you to give opinions in that context as a pediatric neurologist, as opposed to an obstetrician or a hematologist or any other specialty of medicine? That is what I am getting at.

What is unique about pediatric neurology, if anything, to determining the time of a hypoxic ischemic insult to a child?

A. I don't think there is anything unique to a pediatric neurologist. I think a neonatologist who looked at -- or perinatologist who looked at all of the facts and had the knowledge of neurologic picture and as much as we know about neuroimaging monitoring would have to look at all of those factors. You don't have to be a pediatric neurologist to do it.

Q. Well, you said that you didn't wish to become involved in this case in rendering a thing decision. Am I characterizing that properly?

A. If I said that, I didn't imply it. I implied I didn't want to be involved in this case in

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anything other than discussing what is wrong with Matthew, what caused it, and what his prognosis is. I did not at any time want to address the other issues because I did not review the medical records in total context, and I had no intention of doing so.

Q. Well, you did address it insofar as you said the injury to his brain was, quote, "the result of perinatal asphyxia," end quote, didn't you?

A. Well, I did say that.

Q. Well, so to that extent you did address the timing?

A. I only addressed the timing to the extent that I am saying it is within the framework that I gave you of 48 hours. And I don't need all that other stuff to say that.

Q. Well, you did review these records, they were made available to you in this case, the University Hospital records, weren't they?

A. The University Hospital records were made available to me specifically at my request so I could look at the first couple of days of Matthew to refresh certain items in my memory.

I have no intention of going through the whole University Hospital record, and I haven't.

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Q. Just for comparison purposes, of course, you do charge and will be charging Mr. Becker for your time today that we are taking up?

A. Right.

Q. What is your hourly charge, Dr. Horwitz?

A. I will charge Mr. Becker $300 an hour.

Q. Thank you, sir.

Would you explain for the jury -- we have used the term "perinatal asphyxia," and you have used the term "asphyxia," you have defined that, but could you explain, does asphyxia to an unborn child, a fetus, does that come in two varieties like partial and total?

A. Yes.

Q. And have you learned in your studies and your experience whether or not different portions of the fetal brain are injured by the two different types of asphyxia, partial or total?

A. Yes, that is part of the experimental evidence that I have looked at would indicate that.

Q. What portions of the brain are injured when there is total asphyxia versus what portions of the brain are injured when there is partial asphyxia?

MR. BECKER: Excuse me, Doctor. Let me just enter an objection so I don't

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continue to interrupt Mr. Kalur through this line of questioning. It is obvious to me where he intends to go and attempt to make you his witness.

To reiterate for the record, Dr. Horwitz is first and foremost Matthew's treating pediatric neurologist. He was not retained to testify as an expert on the issue of causation. He was not retained to provide specifically expert opinion on the exact timing of when the insult occurred.

Mr. Kalur's attempt to *turn* this doctor into his expert witness is inappropriate, and we object to that, we move to strike. And at this point we would ask Mr. Kalur for a continuing objection so I don't continue to interrupt your cross-examination.

MR. KALUR: Yes, we will give you a continuing objection.

Q. (Continuing.) Now, I will repeat my question, Doctor. The question was: What type of injury do you see if there is partial asphyxia to the brain versus what do you see when there has been total asphyxia of the brain in the period before birth?

A. What we are talking about is experimental model?

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Q. Yes, go ahead.
A. Okay. The total asphyxia frequently does severe damage to brain stem nuclei. It is a more selective asphyxia.
The partial asphyxia tends to cause more of a parasagittal injury affecting gray and white matter of the cerebral hemispheres.
Q. Matthew Layman's injuries, is it a partial type or a total type?
A. There is no way I can answer that question. I don't know what it is.
Q. Well, let me put it this way: Is this any clinical evidence of brain stem injury in this case?
A. There is no evidence of primary brain stem injury in this case.
Q. And, as you said, experimentally, models, brain stem injury is associated with total asphyxia?
A. Correct.
Q. And the injuries to this child's brain, I think you told us the other day, are white matter injuries, aren't they?
A. Well, they are gray matter injuries, as well.
Q. Sornegray matter, too?
A. Sure.

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Q. Would you explain for the jury, Dr. Horwitz, what level of oxygen deprivation is necessary or has been determined necessary experimentally in order to create partial asphyxial brain damage?
A. Again, we are talking theoretically here --
Q. Yes.
A. -- experimentally?
Q. Yes.
A. Experimentally, you need probably more than 90 percent reduction in oxygen supply.
Q. In other words, the fetus's normal oxygen supply, we will say in this case 100 percent -- which is normal, in other words, you are not getting pure oxygen 100 percent, but the 100 percent level that the fetus usually gets when the mother is still carrying the baby around -- has to be cut down by 90 percent or more before brain damage begins to ensue; is that right?
A. That's correct.
Q. And secondly, we just talked about the severity of oxygen deprivation. In order to cause brain injury, it also requires duration of time. In other words, a few seconds of 90 percent cutoff doesn't do the damage; it has to be over a prolonged period of time. Would you agree?

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A. That's correct.
Q. Would you agree that experimentally that has been shown to be at least a half an hour at 90 percent?
A. Are we talking about partial?
Q. Yes, partial?
A. Yes.
Q. And the experimental studies you have referenced, among others, are the Myers monkey studies, aren't they?
A. Yes.
Q. Can we agree, sir, that partial asphyxia, in other words, 90 percent or more, and lasting at least a half an hour or more, can be referred to as serious or significant asphyxia, in other words, it would put the brain at risk for injury?
A. Yes.
Q. Now, based on your experience as a physician, though, with your knowledge of what you have had to learn as a pediatrician about the labor process, the fetus even during labor is not subject to constant deprivation at 90 percent; there must be periods of alleviation. Wouldn't you agree?
A. It would depend on the circumstance.

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Q. Now, this serious or significant asphyxia, as we have just defined it, the 90 percent or more for more than a half an hour, does that cause brain damage to occur when that happens during labor alone, or does it happen -- will the brain damage occur if those circumstances exist any time before labor begins?
A. I am not sure I understand the question.
Q. Well, if there is a 90 percent or more cutoff of oxygen supply, and it lasts long enough -- I mean, this may seem obvious to you, but maybe not to us -- can you have damage to the brain whether or not labor is going on as long as those conditions exist?
A. Right. And we are talking in a general theoretical sense?
Q. Yes.
A. I am not addressing this case?
Yes, it doesn't matter when it happens, from that perspective.
Q. In fact, is it not true that most of the hypoxic ischemic brain injuries that newborns suffer are not the result of events that occur during labor?
MR. BECKER: objection.
A. Could I have that question --

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Q. Is it not accurate that most of the hypoxic injuries that are diagnosed hypoxic ischemic brain injuries to newborns did not occur during the labor period, but at some period before the labor period?
A. That's probably correct.
MR. BECKER: Move to strike.
Q. Would you agree, Doctor, that, for example, with reference to the concept of Apgar scoring, Virginia Apgar scoring, the jury will have heard that have by now, but with respect to the Apgar score, even a score of ten minutes, which is 3 or less, results in only a five percent incidence of cerebral palsy?
MR. BECKER: objection.
Q. Is that correct?
A. That is correct.
MR. BECKER: Move to strike.
Q. In this case, of course, you are aware that the Layman child's five-minute score was what?
A. As far as I recall, it was 3. I haven't seen the actual Apgar scores. There is an extrapolation I have from the University Hospital chart in my records. I didn't look at the Ashtabula chart.
Q. Well, assuming that is true, that would mean that

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just based on Apgar scores alone, and statistics, there would be a 95 percent chance that Matthew Layman wouldn't have cerebral palsy?
A. That is correct.
MR. BECKER: objection. Move to strike.
Q. How valid are Apgar scores, in themselves, as a prognosticating tool as to what will happen to the child in the future if they are low?
A. Well, let's get it straight. Apgar scores designed by Dr. Apgar were not intended as a measure of prognosis. They have been used to try and determine that.
Apgar scores were designed to determine whether a child is in need of help at birth. That was the major compelling reason behind it.
It has been used for other purposes,
Q. Now, let's talk specifically about Matthew Layman for a moment. You have told us that, in your opinion, his hypoxic ischemic injury to his brain was incurred sometime during the perinatal period. I take it you can't narrow it down any closer than just that perinatal period?
A. I have not reviewed the records in a manner that would enable me to even address that issue beyond

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the fact that I said it is around that perinatal, which I defined as the 48-hour. But in the absence of the records, I didn't intend to and I can't determine that.
Q. The records you haven't reviewed are the records at Ashtabula Hospital and the antepartum records of Dr. Woo; is that right?
A. The antepartum records -- who is Dr. Woo?
Q. Dr. Woo is the obstetrician who I represent.
A. Okay. I have reviewed nothing prior to records that began with University Hospital staff.
Q. All right. Did Mr. Becker ever offer while he was writing this letter to you of December 2, or at any of your conversations with him since that time, to allow you to review the birthing records and the obstetrician's records so that you could formulate a more specific opinion on time?
A. Let me make this very clear. When Mr. Becker asked me first and foremost for records, we submitted what we had. When he called and wanted to meet with me, I made it very clear, number one, I didn't want to testify. I would only do my obligation as a treating physician.
Number two, I preferred not to be an expert or anything else, and I wanted to be subpoenaed.

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And, in fact, he must have forgotten, because had I dug in, I wouldn't have come without a subpoena.
I also told him I wasn't going to review any record, and I was not going to act as an expert or adviser or anything else, and I have stuck to that piece of what I told him I would do.
The only exception was that I should have looked for a subpoena because I did not want to be an expert in this case.
He never offered the records, I didn't ask for them, and had he offered them, I would have refused to look at them.
Q. The earlier records?
A. That's correct.
Q. You have met with Mr. Becker before today?
A. That is correct.
Q. You have in other cases reviewed medical records even when you are a treating doctor?
A. That's correct.
Q. Could you explain for me why in this case you have refused to do that?
A. For a number of personal reasons I didn't want to do it.

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Q. Well, what personal reasons?
A. I would prefer not to answer that question.
May I just say while you are looking at that, to dispel any misunderstanding, any personal issues I have do not relate to the Laymans as people. My reluctance in this case has nothing to do with the Layman family.
Q. Could you explain for the jury what the difference would be between an acute hypoxic ischemic event and a chronic one?
MR. BECKER: objection.
A. Well, to me, an acute hypoxic ischemic event would be something that happens over a period of minutes to hours. How many hours is hard to say. I mean, I suppose, let's say, 6, 8, 10, 12 hours. A chronic one is something that might be going for days, weeks, or even months.
Q. In this case are you able to formulate a view whether this was chronic or acute?
MR. BECKER: Same objection.
A. I did formulate a view in this case?
Q. Was this a chronic or an acute injury, in your opinion?
A. In my opinion, it was an acute injury.
Q. Is there any way to determine whether it was an

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acute injury superimposed on a chronic one?
A. I think you can determine that.
Q. Could you determine that if the chronic event had only lasted a week or two before the birth?
A. I think you could determine that.
Q. How would you determine?
A. Well, if the chronic event was of sufficient degree to have caused damage, you should have seen the evidence of that damage on the neuroimaging study.
Q. That means the CAT scan?
A. Right. I will leave it at that.
Q. Did you see or read about when you were reading the official interpretations of the CAT scan something on there that convinced you that we were dealing with an acute hypoxic ischemic incident?
A. What I saw on the CAT scan, from my view and my personal look at it, and, again, looking with a neuroradiologist that looked at this case, to me the understanding was that the findings were entirely consistent with an acute event with no evidence of any chronic underlying event of significance.
Q. Now, Dr. Horwitz, if an unborn child has a

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hypoxic ischemic-caused injury to the brain that predates labor, in other words, it existed before the labor began, and that child goes through labor, can the child show a normal autonomic nerve function on the monitor strip by means of variability?
MR. BECKER: objection. You are not consistent with the facts of this case.
A. As I understand the question, just so I get it right, you said this would be a child that has undergone hypoxic ischemic damage prior to the onset of labor?
Q. Yes.
A. There is damage to the brain?
Q. Yes.
A. And in that child with a pre-existing damaged brain, could you go through labor and show normal monitoring strips?
Q. No, normal variability, in other words, the autonomic nervous system as showing as being normal by means of variability.
MR. BECKER: Objection.
A. Well, I am not an expert on monitoring. I don't look at the strips. But there is no reason why a damaged child's autonomic system can't behave

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normally and can't behave abnormally. It can be either/or.
MR. BECKER: Move to strike.
Q. Let me phrase it a different way, then, Doctor.
Children that have cerebral palsy caused by an hypoxic ischemic event before labor, can they exhibit an intact autonomic nervous system during labor as determined by variability of the heart rate?
MR. BECKER: Same objection.
A. That is the same question.
Q. And I am asking --
A. The same answer.
Q. Is the answer "absolutely yes"?
A. Yes.
MR. BECKER: Move to strike.
Q. Would the reason you answered that question "yes" be because portions of the brain that are damaged for cerebral palsy are different than the portions that control what is known as the autonomic nervous system?
A. Well, you know, you are giving me a very general theoretical question here, and I don't want to give the implication that cerebral palsy has an absolute correlation with very specific areas of

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brain damage. It can be specific, it can be generalized, it can be a mixture of all sorts of things.

But the motor part of the brain, if you want the definition of cerebral palsy which I gave, the motor **part** of the brain is damaged in the cerebral palsy; the autonomic part may or may not be damaged along with it.

Q. You have given me a rather long answer to the question, and I am not sure you have answered it. Let me read you from your deposition, page 50, and ask you if you remember giving me this rather short answer to the question.

Well, to read it in context, starting at Line 1, "As I understand the question --" This is you asking me this, "As I understand the question, if a child has had in utero brain damage well prior to labor --" and I said, "Yes," you continued "-- and already has the brain damage and is going to have cerebral palsy later, and that child goes through labor, can it show normal autonomic function?"

And I said to you, "You have got it exactly."

"Answer: And the answer is absolutely yes,

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you can have normal autonomic function."

Now, the question I just asked you a couple of moments ago, "And the reason is what, because portions of the brain damaged for cerebral palsy are different than the portions that control the autonomic nervous system?"

"Answer," your answer, "That is why."

Do you still adhere to that?

A. Yes, that is what I said just now.

Q. And that is the short answer, "That is why," isn't it?

A. Yes.

Q. What is the autonomic nervous system, so the **jury** understands what we have been talking about for maybe five minutes here?

A. The autonomic nervous system is a part of the nervous system that controls vital function such as blood pressure, heart rate, bowel motility, perspiration, body temperature.

Q. What part of the brain controls the autonomic nervous system?

A. Well, it is primarily areas of brain -- areas of cells and nerve tissue located in the hypothalamus, and areas of the medulla, the brain stem, particularly the vagal complex in the brain

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stem.

Q. Are there things you have learned to look for, Dr. Honvitz, in the first hours and days of life after an infant is born with a diagnosis of birth asphyxia to determine whether or not brain damage was incurred during the labor period?

MR. BECKER: objection.

A. I am not sure -- could I have the question again?

MR. KALUR: I will ask the court reporter if she can repeat it for you.

(Record read.)

A. As I understand it, you are looking in the first hours of life to see if brain damage has occurred.

Q. No, I don't think that is my question. Let me try to simplify it. Have you learned, as a pediatric neurologist trying to make a diagnosis on a child who is born in a depressed condition with low Apgar scores, have you learned under those circumstances to look for various clinical signs and symptoms in order to determine the timing of any brain damage which that child may have suffered?

MR. BECKER: objection.

A. There are some symptoms and signs the child has

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that can give you some indication of when damage has occurred or might have occurred.

MR. BECKER: Move to strike.

Q. Well, if a child is damaged before birth, say 42 to 72 hours before birth, will that child, from your experience, tolerate labor well?

MR. BECKER: objection.

Q. If it is the type of damage that is going to cause cerebral palsy later in life and motor retardation?

A. It is very variable.

Q. Well, how does it vary? Give me the variables. Some of them will, some of them won't; is that what you mean?

A. Yes. There are children, infants, who for a variety of reasons you think were damaged an extended period before who may have tolerated labor very well. There are others that don't. It is an either/or.

Q. And those that don't, would you say that they would be more susceptible to have difficulty in labor during the period of the second stage when the head is being compressed passing through the birth canal?

MR. BECKER: objection.

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A. With any honesty I don't know the answer to that question. I have never looked at this specific thing in the second stage. I can't answer that at all.
Q. Let's go back to what we talked about earlier on, Dr. Horwitz, that significant, serious partial asphyxia that can occur to a child in utero and cause HIE.
During the first 12 hours of life for a child that has had this serious, significant asphyxia that causes brain damage during labor, that is what we are talking about now. Now I am talking about during the first 12 hours of life for such a child, would you expect to see the child be stuporous or comatose?
MR. BECKER: Objection. Again, requesting such a general inquiry cannot be applied to this case.
A. The majority of infants who are asphyxiated and come out with obvious evidence of depression so that there is an acute problem, most of those infants, if they have hypoxic ischemic encephalopathy, if their depression is severe enough to have caused it, I mean, the whole process is serious enough to have caused death,

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most of those patients over the next period of time, 12, 24 hours, are going to be stuporous or comatose.
MR. BECKER: Move to strike.
Q. Please explain to the jury what stuporous or comatose means with respect to infants who receive significant asphyxia so they get brain damage just before birth?
A. Well, the word "stupor" -- or comatose means that you are totally unresponsive, for practical purposes, to any stimuli. And "stuporous" means that the individual gets some primitive reactions to stimulation, but otherwise has very impaired reactivity to the environment.
Q. Well, don't all of the children who actually get brain damage, as opposed to just getting some asphyxia and not brain damage, but those who get brain damage during labor from asphyxia so that they are going to have cerebral palsy and retardation, that significant, serious asphyxia that we talked about, don't all of them become stuporous or comatose within approximately the first 12 hours?
A. No.
Q. Would you say -- what percentage would you say

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do?
MR. BECKER: objection.
A. Again, I haven't done a study, and I don't know a specific study. I have seen infants who came out depressed who were resuscitated within a brief period of time, are neither stuporous nor comatose, and those infants have seemed alert, even hyperalert, and then subsequently, 12 hours, 24, 36 hours after birth have deteriorated rather dramatically into what is then a stuporous state and done horribly.
Let me be clear here that when we are talking about stupor or coma, we are not taking about a child you are just resuscitating at that time, you are talking about a period after you stabilized the resuscitation.
Q. We are talking about the first 12 hours is what I am asking you.
A. Yes, but what I am saying is the first 12 hours is a period --
Q. Yes.
A. -- and if you come out of an Apgar of 2, you know --
Q. Oh, I see. You mean as opposed to the first few minutes?

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A. That is what I am trying to say.
Q. And would stay in that condition of stuporous and comatose for about 12 hours?
A. That is what I said was --
Q. Well, you said that most of these kids are in a stuporous or comatose condition, but there are some you are saying that can be this hypertense condition?
A. Yes.
Q. Hyperirritable, I *think* you --
A. Yes.
Q. Now, didn't you tell me -- I can get this out, but didn't you tell me as early as last week 80 percent at least are in the stuporous or comatose situation?
A. That is what I said.
Q. Dr. Joseph Volpe, you are familiar with his textbook Neurology of the Newborn, aren't you?
A. Yes.
Q. I believe you feel that Dr. Volpe is a person in the field of neurology of the newborn whose opinions must be relied upon?
MR. BECKER: Objection.
A. His opinions -- I feel that Dr. Volpe's opinions need to be respected, and he is certainly an

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acknowledged writer and an acknowledged scholar of the newborn. It doesn't mean that we have to agree with everything he writes or says.

Q. Well, I didn't ask you if you agreed with everything he wrote. We will get to that. But you do agree that you did tell me at page 98 of your deposition last week, didn't you, when you were under oath, "He is clearly a great expert. It doesn't mean we agree with everything he says, but he is probably the person whose writings are most relied on."

A. I would agree that is what I said.

Q. In fact, you have testified previously under oath, haven't you, that his work in his book is authoritative?

MR. BECKER: objection.

A. If we use -- I always object to the word "authoritative." But if you want to use it, he is the expert writer.

Q. Well, we use it in the context that he might say something you might not agree with. All right?

A. I only -- seeing as you brought it up, I mean authority often gets interpreted as being the Bible from which there is no deviation from the truth, and I don't think anybody implies that --

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Q. Well, Doctor -- go ahead.

A. -- this is the Bible.

Q. Well, Dr. Volpe, as you know, discusses hypoxic ischemic injury through three chapters in his textbook; does he not?

A. He does.

Q. Let me read you something here to see if you agree or disagree concerning your testimony about those fetuses born with significant or serious asphyxia and brain damage and the comatose or stuporous state.

MR. BECKER: objection.

Q. I will give you the book to look at in a second when I read this. He says on page 315, "The following discussion is based primarily on our findings with infants who have sustained serious intrauterine asphyxia." That means asphyxia before they are born, right, intrauterine?

A. *Yes.*

Q. "Birth to 12 hours. In the first hours after insult, signs of presumed bilateral cerebral hemispheral disturbance predominate. The severely affected infant is either deeply stuporous or in coma that is not arousable and with minimal or no response to sensory input."

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I put a little check mark next to it there, Doctor. There is nothing about a hyperirritable state there, is there?

A. No. I have read that, I know that.

Q. He doesn't have anything in there about some 20 percent or so may be hyperirritable, does he?

A. No, he doesn't.

MR. BECKER: Move to strike, lack of foundation.

Q. So you would suggest, though, that in your experience there is another -- that we can't just say 100 percent the way Dr. Volpe indicates here.

A. It is not only my experience. I think you -- when Dr. Volpe writes a book, as most people do, and I am sure you could check that with him, you write what is the common experience. If you want to elaborate further, you can say that there are four percent exceptions on these, there are five percent on these, and six percent on those.

On any disease or any process there is a certain percentage of outliers, but most books are written for the common and the usual guide. And that is what he is doing there.

He knows -- I mean, I know Dr. Volpe, he has, I am sure, seen the same things. Boston and

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St. Louis are no different from Cleveland.

Q. Well, your view that there is a 20 percent group that may not be stuporous or comatose, you have held that for a number of years?

A. The figure of 20 percent I think I qualified that I couldn't be sure on percentages. I was giving you a rough guesstimate.

Q. Have you held that for many years, or is that something that you just decided this year?

A. No, I was still busy on my answer.

Q. Go ahead.

A. Earlier on when we would see some area that we see something is different, I can't quite understand this, and, therefore, he didn't fit into the picture.

As the years have gone by, we have seen enough of them to say, "This is not at the one percent level, it is more common." Now if you tell me there are 20 percent of those, we see 16 percent, I mean, I can't -- it is somewhere -- it may be 10 percent, I don't know, I can't tell you.

But we have certainly seen that here, and I have read records in patients of mine treated elsewhere the same thing was seen. So if you ask

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me exact percentages, I give you a ball park figure, but certainly it is not accurate.
Q. Well, do you remember testifying, Doctor, both in deposition and at trial in the John Carcaro case against Southwest General Hospital?
A. Oh, I don't remember that.
Q. Mr. Monteleone was asking you questions.
A. I remember the case way back, then. That is several years ago, so --
Q. There was a case. In fact, I asked you to testify, didn't I?
A. Yes, true. It is some years ago.
Q. I am going to hand this to you so you can read it to make sure I am reading it correctly, but let me ask you if you still agree to what you said then under oath,
MR. BECKER: objection.
Q. Page 48, "Question: You also indicate under Item 3 that there was no period of impaired consciousness. How are we to know whether this occurred or not?
"Answer: It is so obvious when the baby has impaired consciousness. The baby does not wake up, does not suck. I mean, mother notices, the nurses notice. It is fundamental. It is

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right there. It doesn't have to be seen, it is there for the seeing.
"Question: May be difficult to arouse?
"Answer: It is more than difficult to arouse.
"Question: Can't wake the baby up?
"Answer: The baby is profoundly stuporous or comatose.
"Question: Does this happen in all cases, Doctor?
"Answer: In all cases of significant asphyxia?
"Question: Yes.
"Answer: Yes."
Do you want to take a look at this?
A I don't doubt that I said that. And I have just said the same thing. As I said earlier, the majority are stuporous and comatose. That one is easy.
And I said if you asked me a few years ago, I would have given that answer, and did give that answer. But we had seen some kids that we used to put a question mark and didn't know what they were.
But I have seen enough of them now to

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recognize that there is the small number that seemed to have this hyperalert period, and that is what I testified.
If you -- I agree with what I said at that time. But medicine is a learning experience.
Q. Well, since 1987 you have evolved a different view that there are a few that will show this hyperirritable state?
A. Be very specific here.
Q. Now --
A. Again, I am sorry, I haven't finished.
Q. Go ahead.
A. I still maintain what I said. What was it, in 1987?
Q. Yes --November 12, 1986.
A. For the vast majority of cases, that applies. And if I were to teach my residents, like Dr. Volpe, that is what I would teach them.
These other cases that are alert, we have now come to recognize that there are some like that. Even my deposition the other day I indicated that, that they have fooled us at times because we thought the baby would be doing very well.
Q. Now, hyperalert, these few children that will

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exhibit this after intrapartum asphyxial significant brain damage, you have had an opportunity to look at the University Hospital records, did this child exhibit hyperalert actions in the first 12 hours?
A. The child was alert. Hyperalert may be a bad term. Alert, wide-eyed. In fact, you quoted Volpe, and let me just say, again, that I didn't want to have all of this theoretical discussion or deposition, but Volpe also talks periods where the child may look seemingly very alert after a period of time. It is clearly in his book. He just puts it a little later than. It is --
Q. Well, he puts it at 12 to 24 hours, doesn't he?
A. I agree that we have seen that, too. But we have seen the early ones. Now, hyperalert may be a bad term. But the term is alert with a lot of movement. It is not just that you look -- they sort of look wide-eyed, but it is not hyperalert as if they are going to read the Constitution of the United States, it is just that they look awake, but there is often a lot of additional body movement.
So that alert, I don't know. Others have called it irritable, hyperirritable. It is a bad

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term across the board because the alertness is -- how do you really tell whether a baby is alert?
Q Well, nobody characterized this child in this record in the first 12 hours as being hyperalert, did they?
A. They characterize baby as "eyes open."
Q. Any baby that is okay is going to have its eyes open. That is not unusual, is it?
A. If the baby is okay, the eyes open. But there have been children whose eyes are very open, they almost look so wide awake that people have used the term "hyperalert."
This one, from the record, the eyes were open, there was a lot of movement, and that was the context I used the term "hyperalert."
Q. Neither your pediatric neurology resident, nor you characterized this child in your consult note as hyperalert, did they?
A. No, we didn't use the term "hyperalert," that's correct.
Q. Nor did you make any observations about that that would conclude that you could conclude the child was hyperalert in that consult, did you?
A. We said that the child was very irritable.
Q. Well, the child had been just through quite an

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episode at about 12 hours that required three shots of morphine to calm the child, didn't it?
A. That is so that the -- why did the child have to be calmed?
Q. Because the child had stridor, Doctor. You are aware of that in the record, aren't you, from 13 different intubation efforts?
A. The child required -- the child was extremely ill -- there are notes that medication was to be given for agitation. This child required sedation for procedures, even after intubation.
Q. Doctor, you have looked at the record. How many times --
MR. BECKER: Excuse me. Excuse me, I don't think he finished the answer.
Q. Have you finished, Doctor?
A. When the child is intubated, the stridor is irrelevant, you have overcome it. That child was still required sedation to have procedures done.
Q. To have the intubation done?
A. No.
Q. What other procedures were done when the morphine was being given?
A. The child -- if you will look, orders were given here, and the child was given medication for the

Page 6

CAT scan.
Q. The child was actually given morphine in twice the dosage normal and twice as fast as normal, wasn't it?
A. It is not twice the normal, it is within the accepted range.
Q. It was 1.4, and the accepted range is 1.7 by Vaneroff, isn't it?
A. There is a range of --
Q. .7?
A. -- .1 to .2 per kilogram of morphine.
Q. We agree that child got, for its size and weight, got quite a bit of morphine --
A. Got a good --
Q. -- quite a little bit in a little bit of time, Doctor; would that be fair?
A. Yes, that is fine.
Q. And the child got morphine in and around an episode where the resident who was here at University Hospital had significant difficulty in intubating the child?
A. First of all, that was not a resident.
Q. A fellow.
A. There is a difference, there is a big difference.
Q. There is no difference that that doctor had

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trouble intubating.
A. That doctor had trouble intubating.
Q. Whether it was a resident or a fellow, there was trouble intubating.
A. Yes.
Q. The reason for the intubation was because stridor developed while the child was on room air; isn't that also correct?
A. That's correct.
Q. And there is evidence in the record that the child became combative as a result of lack of oxygen; isn't that fair?
A. There is -- the child became combative, period.
Q. Will individuals, human beings, become what doctors characterize as combative when they have lack of oxygen?
A. That is not necessarily correct.
Q. Well, is there some truth to it?
A. Well, I think let's -- you raised the question, I will give you the answer. There are people who get lack of oxygen who get very sleepy and lethargic.
If you go into a stuffy room, you are usually not combative.
Q. Well, there are some that do get combative before

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they become lethargic; isn't there?
With lack of oxygen -- the word "combative" is very different from being stressed or irritable or -- combative usually means you are fighting.

And children with stridor don't usually fight, They are very stressed, but they don't fight.

Well, while we talk about stridor, we are talking about what, a sound, a breathing sound? Is that what stridor is?

.. Right.

And you are aware the nurse did note that, say around noon on 8/20; is that reasonable?

I will accept that. I would have to look it the note. If you say so, I will accept that.

Isn't it also true -- we started out talking about stuporous and comatose children after intrapartum events. Now let's move on since we have the stridor here to respiratory problems in children who have recently had serious asphyxia and sustained brain damage, for example, during the last hour of labor.

Wouldn't you expect, Doctor, that approximately 70 percent of those children are going to be ventilator dependent for four or five

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days?

MR. BECKER: objection.

.. We are talking about severe asphyxia enough to cause severe neurological impairment?

'. Yes, sir.

.. Yes.

Q. Certainly, as you said, severe profound neurological problems are what Matthew Layman has?

.. Yes.

Q. Yet he was able to be removed here and was removed at University Hospitals from the ventilator and put on room air at 10:15 a.m. on 8/20/92?

. Right.

Q. And was able to stay off of -- on room air for approximately three and a quarter hours until the stridor problem developed?

.. Yes.

Q. All right. Let's move on, then, from conscious state and respiratory states to swelling of the brain on CAT scan which you already alluded to about an acute injury.

Would you say that you have, as a rough figure, Doctor, seen approximately 200 CAT scans

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from sick newborns?

A. Yes, that is probably somewhere in the ball park. I mean, it is pure relying on memory.

Q. Well, as best you could -- I mean, we know you are not keeping an accurate record with that?

A. Right.

Q. But would you also agree that you have seen approximately with the cases that have been brought to you and you have been asked to review on and consult on on the timing issue of injury, about 50 cases, roughly?

A. Yes.

Q. Is it also true that out of that, roughly, 250 different CAT scans on children that were ill, quite ill at the time they were taken, you don't recall seeing edema when the CAT was taken before 24 hours after birth?

A. I don't recall seeing it. And, again, in the total number I don't know how many were actually taken before 24 hours after birth. I can't give you those figures. I certainly know it is by far the minority of those x-rays.

Q. But, in essence, you can't recall with all of those that were taken, ever seeing a CAT scan in less than 24 hours show edema of the brain?

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MR. BECKER: Objection.

A. That is what I said. I can't, as of this time, recall such an instance. Again, I am not saying it did or didn't occur, I just don't remember.

Q. Well, isn't edema or swelling in the brain of a newborn who has just had a serious asphyxial incident such as to cause profound problems later on, isn't that type of edema usually present after about 24 hours, and maximal in its extent of edema by about 48 hours?

MR. BECKER: objection.

A. That's a good question and a difficult question. I think, in general, relying on what the experience has been and what the radiologists have told us, you have taken sort of a ball park figure that edema peaks at about 72 hours. And there has been a rough rule that you can see it after 24 hours.

The fact that can you see it before, et cetera, I honestly don't know. I have to defer to radiologists, again, and I would like to see a good study on that.

I have always -- well, I will leave it at that.

Q. Well, you haven't always deferred that question

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to a radiologist, have you? In fact, as recently as the Richard Wells case you commented on that very subject, didn't you?
A. I certainly did in that case.
Q. On September 23, 1994, let me read you what you said.
MR. BECKER: I am going to object. Again, this is being totally unfair to Dr. Horwitz, as he is asking general questions -- you are asking general questions almost in a vacuum, and asking him to recall things that have occurred many years ago. I just think it is not being fair with the doctor.
Q. Years ago? This is 1994, Doctor. You remember the Richard Wells case quite well. It was in Akron.
A. I know that case well. You can read it.
Q. Page 24 of your testimony in that case of the deposition, "Of what significance to you is it that there is damage to tissue shown at six days and three hours of life on the CAT scan?
"Answer: There are several. First of all, the description of the CAT scan means that there is at the time it is taken no edema or swelling of the brain.

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"Question: Why is that of significance to you?
"Answer: Well, edema or swelling of the brain, as seen with acute asphyxia, is usually present after about 24 hours, maximal or really evident at about 48, and then over the next week or so it tends to be gone, a little variable, but it tends to be gone.
"And there is no edema here. All we can say is it is not here. Whether it was here or not, it isn't here at this point."
Here is the thing if you like to read it?
A. Oh, I think --
Q. You still agree with what you say there now? I didn't see you -- you seemed to agree with it.
MR. BECKER: Let him answer the question.
MR. KALUR: I am asking a question.
MR. BECKER: Let him answer. Give him an opportunity to answer the question.
MR. KALUR: I am asking it, and he can have all he wants now to answer it.
MR. BECKER: You are cutting him off.

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MR. KALUR: I can't cut him off until I ask a question. I just asked it, and now I am letting him answer.
A. Again, let me make it clear that I said that that is what I have been told by the radiologists. That has been common belief if you say it usually doesn't occur before 24 hours. I didn't say it didn't occur before 24 hours because I don't have the experience beyond that. I haven't done enough scans, it is not a good study.
So I have to believe that that is what we have said. I haven't said it can't occur, it won't occur, it will occur. "hat is the usual belief we have.
Q. Have you also learned that it is usually gone after about a week, the edema?
A. It is usually gone after a week. That has been our experience. I have it said that it is there ten days and longer, but I haven't seen it. Again, this is all -- I can't remember seeing it after a week.
Q. Well, in this case you have looked at the CAT scans or just the interpretations?
A. I looked at those scans.
Q. You looked at the CAT scans. I know from our

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talk last week you agree that there is edema shown on the first CAT scan, don't you?
A. I thought there was.
Q. The first CAT scan, I want you to assume, was taken at 13 and a quarter hours of life, approximately.
A. Right.
Q. And then a second CAT scan is taken two days later on 8/28, about 58 hours later. That scan shows either reduced, substantially reduced, edema or no edema, doesn't it?
A. Correct.
Q. Therefore, Doctor, wouldn't you agree that we have a choice here; A, if there was damage during the last hour of labor to the brain, then we are seeing edema at about half the time you have ever seen it on a CAT scan at 13 hours?
A. Wait a minute. This is unfair. I have not reviewed these records. To say it is half of what I have seen, I said I didn't recall seeing it. It doesn't mean I haven't seen it. I simply said in the present time I can't recall seeing it. I also used the word "usually" if you go back to that deposition.
Q. Well, it says "usually present after about 24

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hours." So this is unusual, then, if it is present at 13?
A. Again, I have told you that from my experience I can't tell you I have seen it 20 times or even once. But I have seen -- I don't know how many CAT scans I have seen before 24 hours. There have been very few.
So I am saying that usually we see it after 24 hours, and usually we look. I can't tell you. And I would defer to a radiologist on that. I didn't do a study on that.
My understanding, I will repeat it again, is that usually we see the edema after 24 hours, that's when I get the CAT scan. That has been my understanding that we usually see it. It doesn't mean that there is not an outlier or that there is an outlier. I don't know. And I am deferring that. I don't know whether you see it at 11, 13, or 17. I don't know a study.
Usually you see it after 24. And, as I said in my deposition the other day, I tell the residents and say, "Get it after 24," because that is the time you are more likely to see it from my experience or what I have been told. I don't want to have to do it twice.

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Q. Well, let's go to the other end of the spectrum, then, if we can't be finite on the first part. If the edema is gone or substantially resolved by two days plus ten hours after birth, does that indicate to you that the time of that damage must be substantial before the hour before birth?
MR. BECKER: objection.
A. My understanding is usually the edema is subsiding around 72 hours.
Can you take it 24 hours earlier, 24 hours later? I don't know studies that have been specific. I defer to a radiologist. On the usual thing that is what we have tended to see.
Have I seen it beyond 72 hours? I don't know. I may have and I may not have. I can't recall. I have never addressed it specifically. My understanding generally has been that it is gone by 72. How often do we get it to see that it is gone by 72? I don't get them very often.
Q. You are saying gone by 72, but what I read to you from the Broadwater testimony was you said that then over the next week or so it tends to be gone.
A. Yes.
Q. A week to me is seven days. Is it different for you?
A. Over the next week it tends to be gone. So usually at the end of a week, it is gone. Can one go in five days or 72 and 48?
Yes, no, I don't know.
Q. Well it would be certainly -- from what you are saying it is logical to say it would be unusual for it to be gone at 58 hours?
A. I didn't say that at all. I didn't say that at all. I said by a week it is usually gone. But then I said could it be gone by six days, five days, or 4%hours or 72 hours? I don't know. It is usually subsiding at 72.
I can't tell you the number of cases we have done it because usually if I find edema at 24 hours and it is very clear, there is no medical reason for us to run another one at that time. It is an unnecessary test, I wouldn't do it.
Q. Well, you are saying it is -- in other words, it is not impossible it could be gone in 58 hours, it is just not usual from what you have seen?
A. I don't know. I defer it out. I don't know. I haven't specifically studied 58 hours. I mean, I can give you -- again, I defer that to someone who has really done a study or looked at that. I

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haven't done it. I haven't found it necessary clinically, and I can't answer that question.
Q. All right. Let's return to the -- we will leave the CAT scans then since you are deferring here today. Let's go to other indications of recent serious asphyxia that could cause brain damage in the last hour or so before birth that we started all this with, stuporous and comatose, as you will remember.
But turning now to white blood counts, for example, is it common in such situations or usual, as we have used that word today, to see an elevation in white blood cell count?
MR. BECKER: objection. You can answer.
A. I honestly don't know the incidence if you are asking me an accurate figure. I have certainly seen it. Now, early in my career I thought it was funny, it was infection or something. That wouldn't do it.
But I have seen it so many times that it certainly happens quite frequently. I don't know if it is a half or third. Somebody may have written it. I don't know. But I certainly have seen it.

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Q. The answer is you have seen it with such children, but you don't know if it is caused by it? I am trying to --
A. Oh, no, no, no, no. I have seen it in such children, absolutely, and it is part of the reaction to asphyxial stress. But it doesn't occur universally. And why it happens in some and not others, I don't know. And I don't know the exact percentages.
Q. Well, how long -- do you have knowledge as to how long it takes after birth for the white blood cell count to become elevated?
A. Again, I don't know a study, but I can certainly tell you after --
MR. BECKER: objection.
A. Again, the --
Q. I am sure he didn't mean to not let you answer, Doctor. He wants you to have full answers today, and so do I, so go ahead.
A. I have seen it within a couple of hours of birth, on the first blood count that was done.
If you asked me to correlate that fact with how many hours the asphyxial event commenced, I have no knowledge of it, I have never attempted to do it, and I have no idea of it. But I have

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certainly seen it very early on.
Q. So the jury understands, are you telling me that if there is an elevated white blood cell count after birth, you are unable, with your experience and background, to tell how long before that elevated count is seen the injury to the brain may have occurred?
A. Yes, I can't tell at all.
MR. BECKER: Can we take a break?
MR. KALUR: sure.
(Thereupon, a short recess was taken.)
(Thereupon, Defendants' Exhibit B was marked for identification.)
BY MR. KALUR:
Q. Dr. Honvitz, we are going to finish talking about white blood cells here in a moment. But I am handing you what we have marked as Exhibit B for Defendant Woo. Would you would you please tell us what that is.
A. It is a printout of University Hospitals of Cleveland reference value for test results.
Q. And that is what is published here at the hospital for the benefit of the physicians as to what the norms are in various lab tests?
A. Physicians and nurses.

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Q. Now, this child at 5:02 a.m., the Layman child, Matthew Layman, 5:02 a.m., one hour and 33 minutes of life, in the Ashtabula records I want you to assume had a 31,000 white blood cell count, total white blood cell count.
A. Okay.
Q. What are the norms at University Hospital for pediatric or newborns with respect to white blood cell count?
A. White blood cell count, 0 to 30 days?
Q. Yes.
A. 9,000 to 30,000.
Q. So this would be 1,000 above the high limit of normal?
A. If you use the University Hospital counts.
Q. Yes. Do you have a different count you use?
A. The problem with 0 to 30 is it is lousy. It should be first day, one week -- this is too spread apart. But --
Q. Do you want the chart that goes by days in the Avery's neonatology book?
A. I will look what that one says, that's fine. I can also look --
MR. BECKER: Let the record reflect an objection to showing the doctor a

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textbook for which he has not recognized as authoritative. Let me just again state how unfair this is to ask the doctor general questions and then attempt to apply them to the specifics of Matthew Layman when the doctor has not even looked at Matthew Layman's records from Ashtabula County Medical Center, and he has already indicated his desire --
MR. KALUR: Mike, I have given you a continuing line of objection. Really, the jury is not going to hear any speeches anyway, so there is really no reason to slow us down.
7 have given you a continuing line, and I reiterate that you have it.
Q. (Continuing.) Doctor, just for one part of that objection, you certainly know what book I have given you, don't you?
A. Yes.
Q. It is a recognized reference for physicians for laboratory values; is it not?
A. It is a recognized textbook of neonatology. And he has put down a source of -- he has put down a range of white cells without telling us what the source is, but it is a good book.
Q. You asked -- the reason I handed it to you is you

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said you wanted to look at a book or a text or a reference that had, by days, what the white blood cell count was. Does that have that?

A. No, this one doesn't. There is a better reference, but it doesn't matter if you say 25,000 or 30,000. What is the difference in that?

Q. Well, at 8/20 what might be the difference, at 3 hours and 51 minutes at University Hospital the white blood cells had fallen to 28,500. Does that say anything to you, that they are going down?

A. Nothing.

Q. What if they continued on down right after that, always down to -- but staying within the normal range, does that tell you anything about the timing of the asphyxial incident?

A. I am not even going to speculate on that one. I don't have the remotest idea of that issue.

Q. Then we will leave the subject.

Now, another one of the areas that you might look to to determine timing of these events or the existence of brain damage would be kidney function?

A. Yes. I don't know about timing.

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Q. Oh, it might not --

A. Let's make it clear. Associated organ involvement due to asphyxia. There may be timing, fair enough. I will withdraw that.

Q. You can have kidney involvement, for example, to follow up on what you are saying, within limits, and maybe to make clearer what you were saying, you can have some kidney involvement, in other words, some signs of kidney damage from injury anywhere during the perinatal period; would you agreewiththat?

A. So I am clear, what you are asking again --

Q. Perhaps it is not clear.

A. Theoretical question?

Q. Let me try it again.

A. If somebody had asphyxia, you are talking about --

Q. Yes.

A. -- in the perinatal period?

Q. Yes.

A. And the infant was born, could they show signs of kidney damage? Is that what you are asking me?

Q. Yes, sir.

A. It will depend on when the urine specimen was obtained, but certainly yes.

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Q. Well, whether the child -- so we get this clear, too, the first one, if it is taken within a very short time after birth, within the first few hours, should reflect a normal value because the mother is performing the kidney function for the fetus; isn't that true?

A. But it depends what you are talking. You can make -- I mean, you can make the statement, but I can't.

Q. If we are dealing with asphyxial injury, you are not going to see the results of the asphyxia on an early BUN lab report, are you?

A. Right. You are asking me if there has been asphyxia and the kidneys are involved --

Q. Yes.

A. -- and the baby is born, and we do a blood test which measures the blood, Urea, nitrogen, the BUN?

Q. Yes.

A. Would we see an abnormality done -- will we see them if it is done how soon after birth?

Q. Within the first two, three hours.

A. No, not in that test.

Q. And the reason is because what? Why will it show as normal, then?

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A. Because it will have cleared through the mother's body.

Q. It is only after that first two or three hours that we might see kidney involvement by an elevated BUN level. Would you agree with that?

A. It will take some hours before we see that. I don't know if it is two or three, specifically. I would have thought it is a little longer, but I don't have specific data.

Q. Well, if at four or five hours, Doctor, this child's BUN was 18, would that be out of the normal range according to the University Hospital charts for blood, urea, nitrogen?

A. They don't have a newborn level in here.

Q. What do they have?

A. They have adult and "peds."

Q. And the "peds" is what?

A. From this definition?

Q. Yes.

A. I don't know. I didn't make up the lab slips. We don't use this any more.

Q. Well, here is one I can give you on hours. Here is 1 to 12 hours in the same neonatology book that we just looked at before, Avery's textbook, that you said is a reference source for lab

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values.
What does it give, 1 to 12 hours for BUN levels as normals, the range?
A. This is low birth weight -- oh, here. You are giving me term infant?
Q. *Yes.*
A. It is giving 27-33.
Q. 27 to 33?
A. Yes. I *think* you have asked me again -- let me make clear, I have no intention of going through all of this. I think it is not what I wish to do. But I would like to refer to the University Hospital chart on that question.
Q. As to what, the level? Certainly --
A. No. And the laboratory standards. I don't want to refer to this.
Q. They are right here. The labs you will find in the back.
A. Right here.
Q. Let me ask you while you are looking, are those labs for newborns or peds, the norms that are shown in there?
A. As you will -- you gave me this exhibit, it is from a different era, it is not from this chart.
Q. Well, my question is whether the values for norms

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that are shown in there are for newborns by days, as you said you want to see 1 to 2 days and 2 to 3 days, or are they for first weeks of life, or from peds after newborn?
A. These are for newborns. They are specifically supposed to have programmed it for newborns.
Q. Okay.
A. The BUN that is given at University Hospitals, normal range is 4 to 15.
Q. 4 to 15. So 18 would be just barely elevated if that is the correct one that should apply at 12 hours?
A. Correct.
Q. Again, is there anything about the timing of the onset of the first elevation of BUN above a normal range in the asphyxial situation that could let you time it backwards to know when the event occurred?
A. Not that I know of.
Q. Again, talking about kidneys. In some of the cases that you have seen, is there blood in the urine after an asphyxial incident?
A. Yes.
Q. There was no blood in the urine in this case, was there?

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A. Not in the specimen that was taken, no.
Q. Is that the more severe cases that have blood in the urine, of asphyxia?
A. Sometimes it is. I have also seen it in the moderately severe. It is variable.
Q. How about shutdown, where there is no urine being produced, as opposed to decreased, as there was in this case, is it more severe to have shutdown?
A. I am giving you a very rough ruling. Total shutdown is usually an indication that there has been a very severe asphyxial episode.
But, you know, you can have just as severe an asphyxial episode, or more common than shutdown, you get oliguria, or reduced output.
Q. In this case there was protein +1 found in the urine. That is a sign also of some asphyxial damage to the kidney?
A. It is an abnormal finding.
Q. What is the scale, +1 to plus what?
A. +4.
Q. And the worst is +4?
A. +4.
Q. And +1 is the least?
A. Well, 0 is none.
Q. Yes.

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A. 0 is normal.
Q. Right. Is it fair to characterize the degree of kidney involvement in this case from the record review you did do of the University Hospital records as mild?
A. I would call it -- no, I would call it more in the moderate range.
Q. Has there been some fact that has been brought to your mind between today and last Friday when I deposed you to change your view from mild to moderate?
A. Yes. The only factor is that in looking at this again, on the biochemical values, the BUN and the creatinine and the protein in the urine you would say was rather mild.
But there was several days of significantly reduced output, which would put it more to the moderate range.
You know, mild, just to qualify, mild would be if you see fewer red cells and a little protein and maybe a tiny elevation of BUN like here, but output is perfect, that is mild.
So this is getting close to moderate. We are not far apart.
Q. Maybe you can clarify something for me here. You

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said you didn't review these records with an idea of giving the type of opinions I am asking you about today.
A. Right.
Q. But between your deposition and last Friday and today you have changed your view from mild to moderate on kidney involvement based on your review of these records, so you have been reviewing the records, haven't you?
A. As you will recall, you told me to review some of the stuff again. You said you would ask me, so I went back and reviewed those few days.
Q. So for the jury's benefit, you have not only reviewed them before your deposition last week once at night, but you have reviewed them in the interim period before today?
A. I reviewed them, as you had told me that you would require me to look at them, and so I looked at a few things, again, reluctantly.
Q. And one of the few things you did allowed you now to change your testimony from mild to moderate kidney involvement?
A. That's correct.
Q. Again, going back to those things that can be seen after significant serious asphyxia that

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leads to brain damage in the last part of labor, how about heart and liver enlargement? Are those seen on occasion when you have taken care of children so that they have profound problems later?
A. Yes.
Q. Is there any notation in the record now that you reviewed at least twice of either finding heart or liver enlargement above the range of normal?
A. No.
Q. Now, there was a subject of a heart murmur. I think Mr. Becker even asked you about heart murmur before the last deposition in one of your meetings, didn't he?
A. Right.
Q. Does that have any significance in this case, that there was a heart murmur detected?
A. I just made it clear that a heart murmur can be of significance, but this was very transient, and from my perspective had never really been thoroughly evaluated. And, therefore, I was going to do nothing with that information either way. It meant nothing to me.
Q. Now, in the record, Doctor, when I was looking at it, I noticed that there were some discrepancies

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in the measurement of the head circumference on different days. Somebody had one measurement of how many centimeters, and then another one was a little larger, and then a little smaller.
Is that of any significance in this case at all if anybody were to come in later and say, "I can tell because the head circumference measurements change that there was recent brain damage"?
What significance would that be to you, as a pediatric neurologist?
A. Again, I am going to tell you that I had never intended to go through all of this. I haven't even looked at what those measurements were, so I don't know if they went down up, down, or sideways, and I am not going to comment on them.
I can give you a couple of -- I will leave it at that, I am not going to comment on them.
Q. Well, I want you to assume that since you can't remember what they were, or didn't look for them, or didn't want to, let me give you an assumption as to what they were because I think it may be important for me to get your opinions as a pediatric neurologist on this.
I have them listed and broken out from the

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chart, and I will mark that as Exhibit C when we get a chance.
I am going to ask you to assume that that is a correct summary of the various head circumference measurements that appear in the chart. Now, are those measurements of any significance to you here in timing any asphyxial incident at all?
A. No.
Q. Why not?
A. Well, all of the -- let's look at them, you have got 1, 2, 3, 4, 5, 6 measurements over six days.
With the exception of -- I will just read the numbers so I will be clear. 35.5, 36, 35.25, 36.5, 38 -- I want to come back to that one -- 36.5, 36, 36.5.
If we just take out the 38 for a moment, the difference between 35.25 and 36.5, and measuring a baby's head like that is so dependent on technique. These are paper tapes. If you pull them tight, they stretch.
If the baby has a little bit of scalp edema, depending on the position the baby is in you can get variability. I can challenge any of us here to go in and measure now. Even with ten years of experience, you will get all this variation

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moment to moment.
The 38 is a told outlier on 8/23, and I don't know why. To go up a centimeter and a half one day, down a centimeter and a half the next day, I can't explain it, but I have a pretty good idea of what it is.
Q. What is that?
A. Is an inaccurate measure. I mean, there is no sense in this at all.
Q. Okay.
A. You can make -- I am going to leave it at that.
Q. Dr. Horwitz, would you agree that the most common area for injury when the brain is injured by an asphyxial incident during labor is in what is known as the parasagittal or watershed area of the brain?
A. Yes.
Q. Would you also agree that the injuries in this case to Matthew Layman are not in the parasagittal or watershed areas of the brain?
A. I am not sure that area is spared. There is some basal ganglia injury. It is not typical parasagittal.
Q. Well, I won't characterize your answer, I will just ask you if you remember these questions and

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answers from page 97 of your deposition just less than one week ago, six days ago, page 97, "Are any of these damages in the cerebrum in the watershed areas of the brain parasagittal regions?
"Answer: I would have to see the exact film to see, but this seems a little bit more than parasagittal.
"Question: Seems more than parasagittal?
"Answer: No, I don't think it is parasagittal."
Have you changed your testimony?
A. No, I haven't looked at it again.
Q. All right. So this is still your testimony under oath then?
A. Yes.
Q. So this is not a parasagittal or watershed injury in this child?
A. Not a classical one, no.
Q. Now, meconium, the passage of meconium, that is a fetal bowel movement in effect; is it not?
A. Yes.
Q. You have seen that in many of the cases where you have had infants you thought had received an asphyxial injury during labor, haven't you?

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A. Seen what?
Q. The passage of meconium, or meconium staining on the baby?
A. Okay, the passage -- are you talking about the passage of meconium before the baby is born, so we can be specific?
Q. Yes, sir.
A. Yes, sure I have seen it.
Q. Would you explain to the jury why the meconium is passed and what its association with asphyxia is?
A. Meconium is a bowel content that is not usually passed after the baby is born. In some cases meconium can be passed for reason that are just obscure, it happens before the baby is born.
It can also be passed when a baby is being stressed in utero, and during the stress period it has some effect on the bowel propulsion and expels the meconium.
Q. Of course that doesn't occur in all cases like this, apparently there are some cases where the meconium won't be passed?
A. Right.
Q. And nobody knows why it is passed sometimes or not passed others; is that fair?
A. I *think* that is fair.

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Q. Let me just ask you a few questions here in sort of summary fashion so we can move to the conclusion of my questions. I am going to phrase this question as one large question, and we will deal with the subcategories of it, and maybe we can move through it quickly that way.
If I were to -- I am going to **ask** you if each of these things that follow, if you found them to be negative, for example, whether or not that would mean that the child could not have been damaged 24 or 48 hours before labor?
A. Just so I understand, are we talking about this case, or is this in general?
Q. In general.
A. All right. Because I haven't reviewed all to answer in this case.
Q. Right.
MR. BECKER: Same objection.
Q. For example, Doctor, if there were no growth retardation in the baby, so the baby was not a growth retarded at birth, would that mean that you could not have had damage, asphyxial damage, brain damage, 24, 48 or 72 hours before birth?
A. I am *sorry*, ask it again.
Q. If someone told you as an expert and said, "Well,

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you couldn't have damage to this baby at 48 hours before birth because the child is not growth retarded," docs that make medical sense to you?
A. No.
Q. If someone told you that "I can look at a base deficit after birth. 40 minutes after birth, of 17.2 on a blood gas, and I can tell you exactly when the child, within 10 or 15 minutes, when that child began to be acidotic before birth," would that comport with your knowledge of medicine?
A. I have no knowledge of that.
Q. In other words, you have no knowledge that being calculable from that number?
A. I have no knowledge of that.
Q. Or if a person claiming to be a reputable expert told you that the lack of an elevated hematocrit or hemoglobin with respect to the blood after birth meant that you couldn't have damage 24, 48 or 72 hours before the birth, would you accept that as making medical sense to you?
A. No.
Q. If that alleged reputable expert told you that you will only see blood in the urine in asphyxia situations where there is a DIC condition, would

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that make medical sense to you from your experience?
A. That has not been my experience.
Q. The fact of some degree of organ damage, Doctor, whether it is mild or mild to moderate, does that mean there must be brain damage from the incident that caused the organ involvement, the kidneys or liver?
THE WITNESS: could I just hear that again?
(Record read.)
A. I don't know how to answer that.
Q. Well, more simply put, can you have organ involvement, like kidney or liver, for example, without having profound brain damage?
A. Yes.
Q. Now, there were various movements -- well, let me ask you this: Are seizures and edema connected, or are they separate things? Do you have to have edema, in other words, before you can have seizures or are they unrelated?
A. Well, they are not unrelated. I mean, the -- if you have seizures and you have edema, whatever the cause is of the edema is also the cause of the seizures.

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Q. But docs the edema cause the seizures? Is there a direct causal relationship?
A. Not that I am aware of.
Q. And is the onset of the time of seizures after birth, whenever they are first noticed, does that give you, as a pediatric neurologist, any ability to tell us when before birth the injury occurred to the brain?
A. No.
Q. In Matthew Layman's case there were -- I want you to assume that there were -- there was some trembling of the jaw noticed at Ashtabula before transfer, and fencing state of the child, in other words like a fencer, at one point.
Do those, in and of themselves, those type of findings, indicate to you that those were seizures in progress?
A. This is very difficult because I haven't read the specific description. And, you know, I don't know what people describe, but generally I will say that trembling of the jaw is not a seizure.
Q. How about fencing, a fencing description?
A. A fencing can be a seizure.
Q. You mentioned an EEG, an electroencephalogram, earlier. Are you able -- you have a special

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expertise, don't you, you are certified or something of that nature in reading EEGs?
A. I am not certified, but I have read a lot of them.
Q. And an EEG, are you able to look at an EEG on a newborn and come to a conclusion as to what time any brain damage was incurred?
A. I can't do that.
Q. Life expectancy, Doctor, you said into the early 20s. You said that is based on some of your patients having lived to that age?
A. No, I said I have some patients that have lived to that age in these similar conditions, and that the change in the quality of health care for these children, the availability of resources and the improved care, the improved ability to help the families, has shown these children doing very well after a number of years.
But the standards we have today weren't there 20 years ago. I think I was very clear on that. So while I have had people of 20 years, the number would have been less than they are going to be now. Am I making it clear?
Q. You are speculating that with the changes that have been made in health care for these children,

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more of them could live to their 20s?
MR. BECKER: Objection to the word "speculative."
Q. Well, you don't have any studies done, have you, on that subject because you just said there are new things?
MR. BECKER: Doctor -- excuse me. Go ahead, Doctor.
A. There can't be studies because the availability and the things we are using aren't 20 years old. But what I am saying is that looking at our experience in the past and the things that caused them to die, and looking at what we do today, I think it is reasonable to form an opinion that, to a reasonable degree of probability he will live until 20 years, if you want call that speculating.
Q. That would be a semantic argument. I won't get into it. You would say, though, Doctor, that you have no statistics compiled whereby you looked at even a certain set number of patients either that you had or this hospital has had over the last 20 years, for example, or any number of years, and determined how many of those patients with severe cerebral palsy, with just cerebral palsy, with

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mental retardation, G tube dependent, all of the things that you testified the Layman child has, how long those children really lived, do you?
A. No, there is no such study.
Q. Your conclusion is based on the fact that you have seen some children live that long that have been under this type of disability, and that you believe there have been some advances in medical science that will allow others to live to that age?
A. That's a fair *summary*.
MR. KALUR: Thank you, Dr. Horwitz. Those are all the questions I have.

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CROSS-EXAMINATION

BY MR. SWITZER:

Q. Doctor, I am Don Switzer. I represent the hospital, and I promise to be very brief.
A. Thank you.
Q. I will not repeat the questioning by Mr. Kalur. Is it fair to say, Doctor, that you did not prescribe any treatment for the cerebral edema this child had?
A. Well, let me make this clear. Just so we get the

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terminology straight, I was not the managing physician of this child, Matthew, in the acute phase of his illness at University Hospital. I was a consultant.
As such, I could recommend treatment, but I couldn't prescribe. That is the responsibility of the treating physician.
Q. Is there any treatment for cerebral edema?
A. At this age?
Q. Yes.
A. No. There is plenty of treatment, I think I would like to qualify it, there is no effective, proven effective treatment.
Q. You did not agree with the decision to have the first CAT scan taken on August 20; is that correct?
A. When I first was confronted with the fact that a CAT scan had been done, I didn't agree with it until I got some explanation from Dr. Watts, and then I deferred to her better judgment on that issue.
Q. Well, you would have preferred to have waited 48 hours before doing the first CAT scan?
A. I will tell you after -- let me again make it clear, I have not seen the Ashtabula records.

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Based on what she told me after I had spoken with her, I too would have gotten that scan before 24 hours, but for reasons that were different.
Q. The reasons that were different would be to see if there was a hemorrhage?
A. A hemorrhage due to mechanical injury, that is the only reason.
Q. Of which there was none in this case?
A. That's correct.
Q. Doctor, one of the or some of the -- let me withdraw that question because I don't want to -- Doctor, in a child who sustained permanent neurological brain damage, you would expect to see an absent suck or a depressed gag and an absent Moro in the first 12 hours after birth?
A. The child who sustains brain damage from asphyxia?
Q. Yes.
A. And has the usual neurologic picture that such children have, you would expect the suck, the gag -- what else did you ask me?
Q. Moro.
A. You would expect them to be absent or very markedly diminished, impaired. Again, that is in the vast majority of babies.

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Q. Doctor, most of the babies or fetuses that are asphyxiated 48 hours before birth, such that permanent neurological impairment results from that, most of those babies don't tolerate labor; is that correct? In other words, they don't go through labor very well?
A. Are you asking me a baby who had an episode at 48 hours who was then relieved, or is that continuing some degree of asphyxia? Even there the answers might be different.
Q. Well, let's take the condition where the baby has -- a fetus has an hypoxic ischemic insult 48 hours before labor begins, and has some degree of permanent neurological injury as a result of that insult, most of those fetuses do not go through labor very well?
A. Probably true. I am not sure about that. I don't know. If most is 51 percent, I haven't seen an exact study. But, you know, 1 don't have any basis to say absolutely no.
My instinct would be to say that most of those, at least over 50 percent, don't tolerate Iabor perfectly well.
Q. If a fetus, again, taking that same scenario, has existing neurological injury from an hypoxic

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ischemic insult let's say about 48 hours before labor begins, so that that insult affects the muscle tone, then would you expect that fetus not to be able to undergo the normal muscle movements, and, therefore, would not go through the normal rotation in labor?
MR. KALUR: objection. Not in evidence. Again, no basis in foundation for the hypothetical.
MR. SWITZER: okay.
Q. (Continuing.) I think you can answer that.
A. Again, you have asked me a very general question.
Q. Yes.
A. I can only give you an answer -- it would depend on whether the baby is damaged from that episode, whether it is recovered from that episode, the degree of damage. If it was profound damage --
Q. I want you to assume profound damage from that episode.
A. If I assume profound damage from that episode, then I would assume that fetal movements would be diminished.
Q. Doctor, the medical care and treatment that Matthew Layman has received since his birth, from all the physicians, as well as the therapy and

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counseling that has been provided by the Ashtabula County Board of Mental Retardation and Developmental Disabilities, I take it it is your opinion that all of that care has been appropriate; is that correct?
A. To the best of my knowledge, the care that Matthew has received has been fine and appropriate.
MR. SWITZER: Thank you very much, Doctor.
MR. BECKER: Off the record.
(Thereupon, a short recess was taken.)
MR. BECKER: Before I begin any redirect examination, the record should reflect that we renew our objection to questions beyond the scope, general questions that don't apply specifically to Matthew Layman.
Dr. Honvitz has already indicated he has not had the opportunity or the desire to look at these records. And we are going to proceed with redirect without waiving that objection.
We want to state that for the record.
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REDIRECT EXAMINATION
BY MR. BECKER:

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Q. Doctor, Ijust have a few questions for you on redirect examination. Perinatal asphyxia includes asphyxia occurring within labor and delivery, correct?
A. Yes.
Q. And you recognize, Doctor, that severe asphyxia during labor and delivery can cause serious brain injury, correct?
A. Yes.
Q. Now, Doctor, there was some discussion and play with the concept of statistics by defense counsel, and throwing out something about a 90 or 89 or 95 percent people that don't have brain injury from -- or cerebral palsy from labor and delivery. Do you recall that, Doctor?
A. Yes, I -- yes.
Q. Doctor, is it fair to state that the majority of those kind of children aren't severely depressed and asphyxiated at birth, correct?
A. The --
Q. The majority of the high number he is throwing out aren't severely depressed and asphyxiated at birth, correct?
A. Yes.
Q. In those kind of cases it is a situation where a

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normal labor and delivery, the child is not depressed, and suddenly cerebral palsy develops?
MR. KALUR: I am going to show an objection to the leading nature of the question. This is supposed to be redirect.
Q. I will withdraw the question, Doctor.
A. I am sorry, I got confused --
Q. I will withdraw the question.
Now, Doctor, we have had a lot of questions on cross-examination by the defense counsel, all interesting discussions, but getting to the issue, Doctor, did you or do you have any basis to a reasonable degree of medical certainty to now say, based on the materials that you have reviewed, when the timing of the hypoxic ischemic insult occurred in this child?
MR. KALUR: Objection to the first portion of the question up until the question started to be asked.
A. I think I made it clear that I had not reviewed all the records, and that I was not addressing the timing of the insult either way.
Q. I just want to make that real clear for the ladies and gentlemen of the jury so there is no misunderstanding here.

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Now, Doctor, would you defer to those individuals that have carefully reviewed the records of the Ashtabula County Medical Center, the prenatal records, the ultrasounds that were taken the day of delivery, and the intense -- strike the word "intense," and the analysis of the fetal monitoring strips as to when, in fact, any hypoxic ischemic injury occurred, would you defer to someone like that?
A. I am deferring that, period.
MR. BECKER: One moment. I think I am done.
That is all we have.
- - -
RECROSS-EXAMINATION
BY MR. KALUR:
Q. Doctor, to pick up with that last question, is it fair to say you could have attempted to, by greater inspection of the records, narrowed the time frame of when the damage occurred in this case, but you have chosen not to for personal reasons?
A. I have chosen not to for personal reasons. Whether I could have made an assessment of when it occurred, I can't tell without looking at the

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records. Maybe I could have, and maybe I couldn't have.
Q. Is one of the reasons you may not have been able to because it is quite difficult to distinguish the timing of an incident, HIE asphyxia-caused damage -- strike that. It is quite difficult to determine asphyxial damage, at least HIE, a distinction between 2 hours of life, 24 hours of life, or 48 hours of life?
A. Well, I think that is a general statement. Sometimes you can tell it very easily, sometimes you --
Q. Actually, I misspoke. I mean of life, I meant before birth.
A. Sometimes you can, sometimes you can't.
Q. All right. There is some degree of difficulty there, isn't there, in separating those?
A. In some cases it is very straightforward, and others you can't tell at all.
Q. Now, one of the ways that you can tell is if the child is hypotonic in the first 12 hours, during the first 12 hours of life, that is a typical sign that you had brain damage close on up to birth, isn't it?
MR. BECKER: objection. Beyond

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the scope of redirect.
A. If you have hypotonia in the first 12 hours, you could have had the damage -- let me withdraw that. It doesn't have to be damage, you could even recover from that.
If you had the hypotonia in the first 12 hours, and it would have to be a baby that came out very depressed, you would have to have all of those features, we can at least say it was depressed at the time of birth and is still hypotonic.
Whether that happens three hours or that was a 24-hour continuous thing, I can't answer it accurately.
Q. Well, doesn't Dr. Volpe, who we have already discussed, in his book indicate that with serious intrauterine asphyxia such as would cause brain damage, that the large majority of infants at this stage are markedly and diffusely hypotonic with minimal spontaneous or elicited movements being the first 12 hours of life?
A. Oh, yes.
MR. BECKER: objection.
A. Oh, yes.
Q. You would agree with that?

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A. Oh, yes.
MR. BECKER: Move to strike.
Q. Now, when you saw this child at --
A. I am *sorry,* I misunderstood your question. It sounded quite different to me.
Q. I am sorry, maybe I didn't get it, as usual, clearly. Let me try once more on the subject.
When you saw the baby on the 20th of August after your resident had examined the baby and presented the baby to you, the only abnormality of tone at that time was some hypertonia or increased tone in limbs; is that right?
A. Yes.
Q. And the record would reflect that that was after 3:40 in the afternoon? Are you aware of that?
A. Yes, it has to be after 3:40.
Q. And the record also reflects that before the episode with the reintubation at about 1:30, that from about an hour after the child was born until then normal tone had been observed, doesn't it?
A. No.
Q. Were is abnormal tone noted between about 4:30 in the morning -- well, you didn't see the Ashtabula records, so we will start between 8:30 when the child first arrived at University

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Hospital, and the time at 1:30 when the episode began with the intubation after the stridor.
MR. BECKER: objection, still beyond the scope.
Q. When is abnormal tone described?
A. I have to look at the records, but my recollection is it is described. I would have to look at the records.
Q. Do you know where you want to look in the records?
A. I will have to look in the first few days, the first day.
Q. Do you want to look in nurses' notes or --
A. I want to look first in the physician notes.
Q. Go ahead and look whenever you want. I will give you the other edition, the other first set.
(Thereupon, a discussion was had off the record.)
A. I don't find the physician's notes.
I saw good tone.
Q. The intern notes at 11:50, summarizing his observations of the child from 8:25 to 11:50, good tone, doesn't he?
A. She.
Q. She notes that he, Matthew Layman, had good tone

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between 8:30 in the morning and 11:50?
A. Yes.
Q. All right.
A. I thought I had seen one earlier. Then certainly later we saw it.
Q. You saw hypertonia?
A. Right.
Q. Increased. You didn't see decreased when you saw this child?
A. No, no.
MR. KALUR: That is all I have. Thank you.
MR. SWITZER: No further questions, Doctor.
- - -
FURTHER REDIRECT EXAMINATION
BY MR. BECKER:
Q. Doctor, this concept of hypertonia going along, and then you mentioned earlier about the child crashing after 24, 36 to 48 hours going into hypotonia, and that happens in some of the babies you have seen, do you know why that is?
MR. KALUR: Show an objection. There is no testimony like that today.
MR. SWITZER: objection.

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MR. KALUR: YOU must have been listening to a different depo, or something.
Q. You can answer, Doctor.
A. I don't know a specific reason. There has been speculation that it was the edema, and so on. I think that most people think that is incorrect.
I think most people would feel that you, after the asphyxial event, you get some recovery of neural function, but there is also an accumulation of a variety of chemical by-products from the asphyxial episode. And then over a period of hours to a day that causes severe destruction of nerve cells, and that is the point it crashes.
MR. BECKER: Thank you, Doctor. I have nothing further.
MR. KALUR: Nothing further, Doctor.
Doctor, we will ask you if you will waive your right to read and have this videotape played, read the transcript, and have the videotape played.
THE WITNESS: I will waive.
MR. KALUR: And I take it we may also have a similar waiver on filing requirements

on the tape as we gave you on the transcript?

MR. BECKER: Sure.

MR. KALUR: Thank you very much.

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(DEPOSITION CONCLUDED.)

(SIGNATURE WANED.)

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CERTIFICATE

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

I, Diane M. Stevenson, a Registered Professional Reporter and Notary Public in and for the State of Ohio, duly commissioned and qualified, do hereby certify that the within-named witness, SAMUEL J. HORWITZ, M.D., was by me first duly sworn to testify the truth, the whole truth and nothing but the truth in the cause aforesaid; that the testimony then given by him was by me reduced to stenotypy in the presence of said witness, afterwards transcribed by means of computer-aided transcription, and that the foregoing is a true and correct transcript of the testimony as given by him 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, employee or attorney of any party, or otherwise interested 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 _____ day of _____, 1995.

_____
Diane M. Stevenson, RPR, CM
Notary Public in and for
The State of Ohio.

My Commission expires October 31, 1995.