THE STATE OF OHIO,)
) SS:
COUNTY OF CUYAHOGA.)

HARRY JAFFE, J.
(sitting by assignment)

IN THE COURT OF COMMON PLEAS

(CIVIL DIVISION)

ZACHARY HAMMON, etc, et al.,

Plaintiffs,

vs.

MARYMOUNT HOSPITAL, et al.,

Defendants.

CASE NO. 209957

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EXCERPT OF PROCEEDINGS
(Testimony of Elias Chalhub, M.D.)
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APPEARANCES:

On Behalf of the Plaintiffs:

BY: CHRISTOPHER M. MELLINO, ESQ.

On Behalf of the Defendants:

BY: JEROME S. KALUR, ESQ.

Thomas C. Walters,
Official Court Reporter
Cuyahoga County, Ohio

MONDAY MORNING SESSION, JUNE 28, 1993

MR. KALUR: Yes, we'll call Dr. Elias Chalhub to the stand, your Honor.

Thereupon, the Defendant, in order to further maintain the issues on his part to be maintained, called as a witness, ELIAS CHALHUB, M.D., who, having been first duly sworn, was examined and testified, as follows:

DIRECT EXAMINATION OF DR. ELIAS CHALHUB

BY MR. KALUR:

Q Would you state your full name, sir, and spell your last name?

A Elias George, Chalhub, C-h-a-l-h-u-b.

Q What is your professional address, Dr. Chalub?

A 1720 Spring Hill Avenue, Mobile, Alabama.

Q Would you tell us your area of medical specialization, and tell us the years you have been involved in that practice?

A I'm a pediatric neurologist with special competence in child neurology, and have been practicing medicine since 1969, and have been

practicing child neurology exclusively since 1976.

Q Would you tell us what your present job title is, sir?

A I'm the president of the the Mobile Infirmary Medical Center which is the large nonprofit hospital in the state of Alabama.

Q Approximately how many beds does the hospital have?

A 704.

Q And when did you assume those duties?

A Two years ago.

Q And before that assumption, what was your time devoted to as a physician?

A Well, the year prior to that I was the medical director of the hospital and spent in excess of 50 percent of time in practice. I still practice medicine, although in a limited amount. Prior to that I was essentially 100 percent.

Q So in 1988 were you essentially 100 percent in the practice of pediatric neurology?

A Yes, I would see some adults, but predominantly pediatric neurology.

Q Would you tell us about what board certifications you hold and when you attained them?

A Yes. I'm a pediatrician boarded by the

American Board of Pediatrics. I believe that was in either 1976 or 1977. In 1977 I became boarded by the American Board of Psychiatry and Neurology with special competence in child neurology.

Q Would you tell us what college you went to and medical school and when you graduated?

A I went to Emery University undergraduate school in Atlanta, Georgia from 1961 to 1965. From 1965 to 1969 I went to Emery University Medical School and graduated in 1969.

Q And what about your internship and military service?

A I interned at the University of North Carolina in Chapel Hill, did an internship in pediatrics. From there I went to the National Institute of Allergy and Infectious Diseases at the National Institute of Health in Bethesda, Maryland which was in the public health -- the U.S. Coast Guard as an officer -- and in doing research in infectious diseases.

Q And following the completion of that NIH Internship in infectious diseases, what did you do?

A Then I went to Barnes-Childrens Hospital in St. Louis, Missouri and did a residency in pediatrics which was then followed by a child neurology and

adult neurology fellowship for a year, followed by a child neurology fellowship.

Q How long did that residency period take in St. Louis?

A Four years.

Q Well, we have already, with Dr. Wiznitzer, I discussed with him a book called, Neurology of the Newborn, by Dr. Joseph Volpe. Did you know Dr. Volpe?

A Yes. Doctor Volpe was a full-time faculty member at Childrens Hospital in St. Louis and was my mentor during those years.

Q Have you had occasion to write articles with Dr. Volpe?

A Yes.

Q And what states have you received licenses in to practice medicine?

A In the past, in Florida, Georgia, North Carolina, Virginia, Washington, D.C., Missouri, which where I basically trained, and I'm currently licensed to practice in Alabama.

Q Doctor Chalhub, you have discussed for us your own test that you took to gain certification. What role have you palyed in the tests of physicians who wish to obtain board certifications?

A Well, I'm a board examiner for the American Board of Psychiatry and Neurology and have been since 1980 which means you examine candidates for competency in the area of adult and child neurology.

It's an oral. The exam itself is the only board left that has an oral examination, where individuals come and examine patients in front of you and then they're asked a number of questions concerning the way they do an examination, and then about their knowledge in the area.

Q What has been the area of your primary research activities as a physician over the years?

A It's been basically involved in infections of the nervous system and also congenital malformations or developmental problems.

Q What constitutes the nervous system in the human being?

A The nervous system is made up the central nervous system and peripheral nervous system. The central nervous system is made up of the brain and spinal cord, and the peripheral nervous system is made up of the nerves that come out from the brain and which go to the eyes, nose and the throat, the other parts of the baody, going out into the arms and legs.

Q Approximately how many articles have you authored in so-called peer review journals, medical journals for other physicians?

A Somewhere between 20 and 30 articles.

Q Of that number of articles, approximately how many deal with infections of the brain in newborns or infants?

A A good portion of them. I think about approximately half. I would have to count them exactly.

Q Have I asked you to review cases for me in the past, Doctor?

A Yes, you have.

Q Approximately how many?

A I believe four; three or four.

Q And have you ever testified at my request before?

A Yes, I have.

Q In a courtroom, how many times?

A On one occasion.

Q We've had reference in this case to radiologic studies such as CAT scans and MRI's. Would you describe for the jury your experience in reading CT scans and MRI's with respect to brain injuries?

A Sure. It's the part of a neurologist's

training to become competent in reading imaging studies which are CT brain scans and MRI scans.

While at Barnes, the Mallinckotd Institute of Radiology is a leader in imaging. They had the first MRI scans and CT scans available. So CT scans first came in in the early 1970's and we really had the luxury of being able to able to image babies and children and see portions of the nervous system which we have never seen before.

Q Was that a regular part of your activities, the reading of CAT scans and MRI's?

A Yes, as it relates to the patients that you take care of, certainly.

Q Now, would you tell the jury what materials I supplied to you so that you could render the opinions that you are going to render today?

A The mother's records at the hospital where the baby was born; the birth records of the baby; the University Hospital records; the brain scans and MRI scans of which there's a number of them; the depositions of Dr. Wiznitzer, Dr. Edelberg, and -- it starts with an E --

Q Dr. El Mallawany?

A No.

Q Oh, Edelberg?

A Dr. Edelberg and a radiologist whose name escapes me.

Q Kirkwood?

A Kirkwood, yes.

Q All right. Doctor, based on your -- I'm going to ask you the global question, then we'll go into the details of why you hold these opinions.

I want to ask you first, the overall opinion. Do you hold an opinion, based on your experience and your training and your review of these records in this case, as to what was the cause of the cerebral palsy that Zachary Hammon suffers from?

A I do.

Q And would you tell the jury what that opinion is?

A Well, I think it's very clear from the chart and the subsequent records that Zachary Hammon suffers from the effects of an intrauterine infection, secondary to E. coli, secondary to endotoxin and had consequences after birth as a result of this.

There was E. coli in the placenta, the blood, the urine, and in the child. The child really has all of the symptoms related to that.

Q We'll go into the details of that, each facet,

but I want to ask you another opinion question first, and we'll go into the details of this later.

Do you have an opinion, again based on your experience and training and your review of the records and films in this case as to what role, if any, a lack of oxygen around, right around the time of birth, as to what role that played in causing cerebral palsy for Zachary?

A It really has no role, and particularly in the aspect of perfusion to the brain.

Q What do you mean by perfusion to the brain?

A Blood flow.

Q Now, let's go to the details now of the first, the first opinion that I asked you about where you told me that the infection and endotoxin has caused this damage.

Would you tell us, tell us what endotoxin is and how it caused injury to Zachary's brain as best you can tell us?

A Sure. First of all, endotoxin is a product of bacteria, and a gram-negative bacteria which E. coli is one of those types. It's the component of the cell wall of the bacteria. It's sugar in the fat big time, polysaccharide. That is an extremely potent substance and it does many things in which ever host

it gets in.

In newborns, either preterm or term newborns, it will infect the cells in a particular area around the brain which is the area around the ventricles of the brain or the periventricular areas and it inhibits the glio cells which coats these cells which are the insulators of the nervous system, and it causes the death of those cells.

It also interferes with blood flow and perfusion on a local basis around that area, also in the back portions of the brain, predominantly the white matter of the brain. This is documented clinically and also in the experimental studies.

Q Does every child who gets an infection before birth suffer -- from a gram-negative bacteria like E. coli, suffer endotoxin damage?

A No. It's not really entirely known, the absolutes of why that occurs, but we know that it has a lot to do with the type of bacteria, the strain of bacteria, the amount bacteria, the immunologic response of that particular baby, and also there's a genetic predisposition.

The analogy would be in a child with meningitis, they know there's certain children that cannot respond to infection the way another child

does or there's children that respond better. It has to do with the genetic makeup and there's a number of studies that indicate that.

Q How does a child's ability to fight infection before birth compare with a child's weeks out, after birth?

A Well, the more mature the child is, the greater the immune system is developed and can respond to infection. And certainly, the older the child is the more mature the nervous system.

Endotoxin, as well as a lot of other insults will infect a developing nervous system far greater than somebody who is more mature.

Q You mentioned some areas of the brain that the endotoxin has an affect upon. I've got a model, a cut-away of the brain. I wonder if you could show the jury -- if I can keep it on the stand -- what areas of the brain you're talking about?

THE COURT: Is it an exhibit?

MR. KALUR: It's not going to be an exhibit. It's just going to be used for demonstration purposes, your Honor.

THE COURT: Okay.

Q Maybe you could orient us and tell us what area of the brain would be affected by the

endotoxins?

A Obviously, this is the nose and the front of the brain is in this direction. The back of the brain is here, the top here.

What you are looking at is the inner portion of the brain. This is called the corpus callosum. This connects both halves of the brain. These areas around here, this is called the periventricular area. The ventricles are in here which contains the spinal fluid.

This is an area that is particularly vulnerable or particularly damaged or likely to be damaged by endotoxin and infection.

And there is also back in this back portion, the cerebellum which has a lot of white matter, too, and is vulnerable, which means it can be infected rather easily. The mechanism may cause death of the cells that myelinate or insulate and also impairs blood flow to those areas.

Q I don't want to make these people into neurosurgeons, but when you say myelination, could you tell us what that is in a term baby, a baby that is between between 38 and 42 weeks?

What is the concept of myelination and if the endotoxin inhibits myelination, what happens?

A Well, the brain is a magnificent organ. It undergoes reproducable stages of development. The last stage a myelination. That is when the cells become insulated or these cells make the substance which covers the nerve cells to allow it to conduct.

Q Conduct meaning what?

A Electricity or impulses from one cell to the other. Now, when that is damaged you are unable to do that, and what it usually does is, in children at a later time, is spasticity or increase tone.

If it infects the white matter of the rear cerebellum which controls the coordination, then you're incoordinated or ataxic or unable to have control over your voluntary movements.

What is particular about this is that it usually spares the top parts of the brain which are the thinking parts of the brain.

Q Could you show us with your finger what is the top part, the cerebrum?

A This is the cortex. This is what carries on most intellectual functions.

Q Now, you have looked at the CAT scans and MRI films that were taken at birth around then in 1990?

A I have.

Q Would you, first of all, before we show the

films, if there is this product from the bacteria called endotoxin that is causing this damage, this metabolic damage and interfering with myelination and the other cell damage that you discussed, will that normally be seen on a CAT scan or an MRI?

A No, generally not. Now, you can occasionally see some dilated ventricles that have myelination. This is some cell loss. You could see that.

But, generally, you're not going to see that on the imaging study, and you could do it pathologically which is the way we have correlated these changes both experimentally and clincally in newborns.

Q Pathology meaning --

A At autopsy.

Q And you said the ventricles occasionally may be enlarged. Show us why the ventricles -- tell us what the ventricles do?

A Ventricles contain the spinal fluid, and what happens is that the ventricles will expand if there are no cells around there or there's a decreased number, so it will be slightly enlarged or decreased myelin also. The remainder of the head continues to grow which is the cortex.

Q Now, we have got -- the first CAT scan in the

that I talked about that contain the spinal fluid, the dark areas, and this is the cortex of the brain, these lighter areas out here.

And you don't see the back part of the brain because the head is too high. If you went lower you would see that cerebellum part back there.

Q Is the cerebellum shown on the other films?

A Yes. It goes all the way up and you will see that both in the MRI scans it's a little different. The MRI can give you pictures that are almost as good as the model, at least in defining the anatomy and it's really quite an exquisite study.

This is the area, what we call the ventricles and the periventricular area that would be subject to damage and which is where the myelination occurs. That is where the matter is. It's the same place in the back of the brain.

Q Now, what did you determine as to whether this CAT scan is normal or abnormal?

A This is a normal scan or what appears to be normal using this technique.

Q Now, I'm actually going to jump out of order, since I've got you standing up, and if there had been oxygen depravation, so that there was substantial serious loss of blood flow and oxygen delivery to the

brain so that you would have a diagnose of HIE or hypoxic-ischemic encephalopathy which leads to cerebral palsy, what would you see on a CAT scan such as this taken out a year and a half or so of life? What would you expect to see as a pediatric neurologist?

A Well, it comes in various forms, but in the term infant that had decreased blood flow to the brain, for example, from a cord compression, one would see what is called a watershed infarct or distal field infarct. And that term is taken from the concept of irrigating a field.

If you have a faucet and you have hoses going out to the field, if you turn off faucet, the area that is damaged the most is the distal part or the watershed area because blood doesn't get all the way out there, and that is seen on the brain --

Q We'll call this Exhibit M.

A Now, this is looking at the brain; the front here; the back here. This is the back part of the brain. And the watershed area is this top part which is part of the cortex. And the reason for that, the blood vessels come up here. They don't connect.

When you turn that faucet off these areas survive that are closest. The areas furthest

away get damaged. What you basically see is a stroke or holes in the brain or severe blood pressure damage all the way from the top to the back. And you basically see a child that has seizures, microcephalic --

Q Wait -- microcephalic?

A Small brain, because it doesn't grow -- often blind -- which is -- it's quite a different picture than you see in this particular case.

Q Now, the we have got a side view here and tat is like a loaf of bread. This is not. We have got a slice of bread here.

How did these areas which are damaged here, if we look at the side, looking down in the slice, where do you look to see if these areas would be here on Exhibit L?

A You're saying slice this way -- what you would see is damage on the other parts. You would see big holes. It's not a subtle problem.

Q Have you reviewed what the radiologists at University Hospital had to say concerning their interpretation of these films that have been taken over the years?

A Yes, I have.

Q I put them together as exhibit, Defendant's

Exhibit K. I pulled them out of separate medical records; one, two, three, four different interpretations, and tell us, the one taken on day four of life, the first CAT scan, how is that read?

A It says no abnormal extra-cerebral fluid collection or focal parenchymal, meaning the brain substance is noted -- high attenuation or density noted within the dural venous sinuses which may represent a normal phenomenon secondary to hemoconcentration or concentrating blood.

Q Now, those are fancy medical words, but is there anything to indicate that there is anything abnormal or that there was an HIE around the time of birth?

A No.

Q The next one taken on 9-26-89, day 24 of life, this one by a different radiologist, Dr. Kaufman -- what is the impression after reading that CAT scan?

A It's normal.

Q 1990, March, the one we just looked at, what is the impression by Dr. Kaufman, same radiologist reviewing the films?

A Normal.

Q And the MRI, October of 1990, by Dr. Lanzieri, this time a third radiologist, reading this time an

MRI film -- by the way, is an MRI in some respects more accurate than a CAT scan, more specific?

A It can be more specific.

Q What is his impression after reviewing the MRI requested by Dr. Wiznitzer?

A It's normal.

Q What does your review of the films, the neurologist who saw this child and interpreted them at University Hospital, and your knowledge of medicine, lead you to conclude with respect to whether this child suffered brain damage, the lack of oxygen at birth?

A Well, the scans are really normal. There may be some question as to whether they're slightly enlarged ventricles which would be consistent with a endotoxin problem, but if you were to have a baby that was deprived of blood flow to the brain at the time of birth, then you would have a distal field infarction or the watershed type of facts, and that would be quite different than you see on these scans.

Q Now, having gone off on that tangent, I'm going to come back again to endotoxin damage. I want to ask you first, is the type of damage that you believe occurred here, is that confined to just -- can that just happen in mature babies or can it happen in term

babies?

A No. No. It will happen in term babies also. Myelination goes on for, vigorously, for two years and really continues up until 18 years of life.

Q Now, once antibiotics were given to the baby shortly after birth, can we presume that the damage from endotoxin ceased as soon as the antibiotics got into the blood or not?

A No. In fact, that is an interesting question. It makes the situation worse oftentimes and it's does that for very specific reasons.

First of all, antibiotics do not neutralize endotoxin. It doesn't do anything to endotoxin. That is a product of the bacteria. Antibiotics kill bacteria. When you kill bacteria you release more endotoxin, so what you oftentimes see in gram-negative infections, and why there's such a high mortality rate from infection, over a 24 to 48 hour period such as in Zachary where the blood pressure is unstable, it's hard to maintain it, oftentimes it's difficult to resuscitate multiple organs involved, so it doesn't necessarily stop it.

Q This is sort of a paradoxical question maybe. If you give antibiotics and they kill the bacteria in the blood, why can that make the endotoxin which is a

part of the dead bacteria worse for the brain?
A Well, there is more of it available and it's a highly potent substance. So what you do is, you have to get rid of the bacteria. That is why you treat with the antibiotics.

What you have to go through is a period of time in which had you know that things may worsen. That is when the majority of children that have these problems either have significant problems or die -- adults, too.
Q Let's turn to the University Hospital record a moment. What mention is there in the University Hospital records of that initial visit after he was transferred from Marymount to indicate that his injuries are due to endotoxin damage from infection?
A Well, Mr. Mellino asked me that in my deposition. There really aren't any. The reference is made to sepsis and E. coli for treatment, but there is no mention.
Q Well, what analysis were you able to determine there was at University Hospitals to try to go back and decide what was the actual reason why he was the way he was there?
A Well, I mean there is absolutely no question that the mother was infected and this baby was

infected with E. coli, and suffered the affects of endotoxin. This is evident throughout the entire record, and it's also evident now that you have subsequent scans to look at and clinical examination to be able to correlate it.

That is difficult when you are taking care of a child on a day to day basis. You can't see all of those factors. Once you have a number of years of studies and can be able to look back and look at those in sequence it becomes clearer as to what the ideology is and what the cause is.

Q I want you to assume that there is a discharge summary in this case. I know you read the discharge summary, and it was prepared by a pediatric surgical resident, because they had pyloric stenosis and they had to operate later in his confinement there during his first visit.

I want you to assume there was a neurology consult on day four, not by Dr. Wiznitzer, but by some resident, and Dr. Wiznitzer wasn't even able to tell us if he was a neurology resident or not.

Assuming those things to be true and that he wrote, this resident, who we don't know whether was he was neurology trained or not, he wrote

hypoxic encephalopathy. Wiznitzer never signed-off on the note to indicate he read and approved it, and then the pediatric surgical resident, relying on that note, wrote in his discharge summary, hypoxic encephalopathy.

MR. MELLINO: Objection.

Q Assuming those facts to be true --

MR. MELLINO: Objection.

MR. KALUR: May I finish?

MR. MELLINO: I thought you were done.

Q -- what value do you place on that attempted diagnosis?

MR. MELLINO: Objection.

THE COURT: May answer.

A Well, it's a surgical resident who probably knows little about the nervous system. He's reading the chart and it's not uncommon to carry diagnosis through, particularly at the time when that was a possibility, so, you know, I think you have to take it in perspective.

You have to practice medicine on all of the facts and all of the data and put it with things that we know and understand as to how are diseases caused, how it relates, and how it occurs.

In this particular case I think the evidence is quite clear that it didn't occur as a result of a lack of blood flow to the brain.

Q Now, the term, birth asphyxia, is used in the chart a number of times for a diagnosis. Can we use the terms birth asphyxia and brain damage interchangeably here or is that wrong?

A No, I believe that is wrong. Asphyxia is from a process and it occurs as a result of many things, but at this time it doesn't necessarily imply that you would have brain damage.

You can a raising of blood gases, impaired organ function, but you may not have brain damage, so you can't use the terms interchangeably.

Q What is meningitis?

A Meningitis is an inflamation and infection of the central nervous system.

Q Does it matter in this case to your conclusion with respect to endotoxin damage whether or not Zachary had meningitis?

A No. I believe that the mechanism that Zachary has, his neurology problem, is as a result of the endotoxin. Whether he had cells in the spinal fluid -- incidentally, there was no cell count done. Really, it's immaterial. If there was meningitis

there may have been further damage.

Q Now, there was a lumbar puncture done here at about 20 hours of life, a successful one, and the antibiotics, I want you to assume were given just as soon as they started.

Marymount started to give them about 2:08, 2:09. What is the significance of doing a lumbar puncture 20 hours after antibiotics are begun in determinig whether meningitis existed?

A Well, the cultures are what, in all probability, would be negative. There still may be cells if the cell count was done, so you cannot rely on the culture results absolutely at that point.

Q And a lumbar puncture is what?

A It's a spinal tap. It's taking spinal fluid sticking a needle in the lower part of the back and removing it and analyzing it.

Q What is the effect of giving antibiotics for 24 hours on that spinal fluid as to whether the bugs, the E. coli would be there if they were there at the beginning?

A Well, it hopefully kill the bacteria as we have talked about, but the products may be still there. But when you culture fluids you don't culture for products, you culture for a live bacteria.

Q Let's turn to the mother's infection signs for a moment. Could you tell us what signs and symptoms she had to indicate infection prior to birth?

A Sure. Well, the mother had a temperature of, I believe, somewhere around 102. She had a urinary tract infection from which E. coli was cultured, and was greater than 100,000 colonies.

There was foul smelling amniotic fluid. There was inflamation of the placenta. There was a culture of the placenta, E. coli, and it grew out E. coli, and subsequently the baby had E. coli growing out its blood.

Q Now, the baby's blood also had something in it called NRBC's. By analysis, what are they?

A NRCB stands for nucleated red blood cells which are premature forms of red blood cells, and I believe the level in Zachary was about 40 percent which is extremely high, meaning that this baby has been stressed for an extended period and infection is one of those things that causes the stress.

You produce more immature forms of red blood cells in response to this, so that level is high.

Q And the baby also had tachycardia or high heart rate for a prolonged period of time before birth,

several hours. To what do you attribute that?
A That is often the result of infection and stresses the baby.
Q Now, based on what you know now of having read the whole record, and based on those signs in the mother and the baby that we have just talked about, do you hold an opinion, based on reasonable, medical probability as to what the neurologic condition, what the central nervous system condition of Zachary Hammon was just before the forceps were applied at 1:47 in the afternoon?
A Yes.
Q Would you tell us what that opinion is?
A Well, when you have a baby that is suffering an infection, particularly from endotoxin, which is a serious infection from gram-negative bacteria, it affects the nervous system.

When it affects the nervous system, you're limp. You would expect the baby to be extremely limp during that time period of delivery.
Q This limpness, does that affect the muscles?
A Yes. It means tone, just like almost like a dish rag.
Q What affect would that have on the baby's ability to turn its shoulders he delivered.

MR. MELLINO: Objection.

THE COURT: May answer.

A I'm not an obstetrician and I don't deliver babies, but when we look for the ideology of dystocia or babies that have difficulty getting out of the delivery process, one of the things we look for is whether there's any other neurologic impairment that will cause the baby to be limp and unable to be delivered in the usual fashion, because it usually takes tone to go through the birth canal and something that is limp or unable to do that often has a problem.

Q Are you able to tell what his condition was because you now have all the facts or was that determinable at that time before the delivery?

A No, I don't believe it was determinable prior to the delivery. It's only when it occurs and there is no way to anticipate that.

Q We have been told that there was good heart rate variability on the fetal monitor. I'm not going to get into fetal monitoring, reading those, because I know that's not your area, but if the heart exhibits good variability, such that there's changes in the rate at which the heart moves up and down, what does that tell you as a neurologist as to

whether or not that child will have or has cerebral palsy?

A Well, it really doesn't have a lot of direct correlation. You have to understand the fetal monitor is on the heart, not the brain. You can have babies with marked fetal heart abnormalities for hours and be absolutely normal.

And you can have a normal fetal heart tracing and have a significantly involved baby because the majority of babies that have cerebral palsy or that are damaged at birth are the result of problems that occurred prior to the delivery period.

It's a misconception to think that the fetal heart monitor will predict brain damage.

Q What is anacephalic?

A One basically with no brain and they have a normal fetal heart monitor.

Q Would you tell us what was the effect -- let me start it, before 1:47 there's a notation that the heart rate, although tachycardic, was stable. And what I'm interested in finding out from you is, in this baby, in Zachary Hammon, before there was shoulder dystocia, the child was in effect on a life support system from the mother. Let me use that term term.

What was the effect of the shoulder dystocia insofar as we can presume it caused some lack of blood flow to the baby, why did the baby, in other words, come out the way it did with zero Apgar scores?

A Well, I think there's two reasons, one of which is that endotoxin affects cardiac function, can cause cardia arrest or inability to pump blood and perfuse.

The other is that in the delivery and in a baby that has shoulder dystocia the blood flow to the baby is compromised. You have to ask yourself, what is the type of damage that occurs as a result of that and how do the rest of the pieces fit?

There are many things that may appear to be the case, but when you look at the facts of what we know about medicine it's not the case.

Q Well, if the baby had been -- let's say at 1:47 that Dr. El Mallawany had said, no, I'm not going to use forceps. I'm going to push the baby's head back up, and we'll presume the baby wouldn't have been injured by that, and do a cesarean section, and we'll forget about any risks to the mother. At that point he does the cesarean section.

And we'll presume that the baby is delivered, even though he's a large baby, without any

major problems, from the uterus by a surgical operation.

Do you have an opinion based on what you know about the record and your experience and training as to whether the baby would have been substantially different in anyway in the first few minutes of life when resuscitation was needed?

A No. I think the baby would have been exactly the same.

Q Why is that?

A And actually the baby continued to have problems after birth from the endotoxin.

Well, you're essentially cutting off the life support again, and when the baby is born and doesn't have that life support, the baby is in shock. The baby has the infection of endotoxin. The damage already occurred to the nervous system and may continue to occur because you still have endotoxin present. You're killing bacteria as soon as antibiotics are given and the bacteria are growing prior to that.

Q Well, why does the baby go into shock when the mother's life support system goes off here? Why not? Why not before or why not? Why does it happen?

A Well, we don't have all the answers to that.

It depends on, again, the baby's response, being mature, the amount of endotoxin and the timing.

Q Well, there are a number of events, recorded events in this chart dealing with the resuscitation of the baby -- observed in these records. I want to ask you about their relevancy to the endotoxic shock that you have just discussed now.

The consult note that is written by Dr. Stork is in evidence in this case. Her consult note indicates that she had difficulty starting an umbilical artery catheter, umbilical vein catheter line, and I'll stop there for a second.

I'll get to what the -- tell the jury what those are. You got pediatric training -- so we know what we're talking about?

A Well, these are the vessels in the umbilical cord which are easy to access in babies so you can you can get fluids and antibiotics into the baby. It's right at the umbilical cord.

Q So they're trying to thread a line through what is left of the cord?

A Just like putting an IV in the arm, but in this case you actually see of the blood vessel. In some cases it's easier. In some cases it's harder to do that.

Q The umbilical artery and the umbilical vein line catheter, what is the difference between the two?

A One is an artery and one is a vein. One has more tone and higher pressure than the other and they also go in different directions.

Q And tell me once again, why you want, why Dr. Stork would want to start those lines while she is trying to resuscitate the baby?

A The baby is in shock and poorly perfused. You will have a hard time starting a peripheral line in the arms and legs. The baby is basically basal constricted. The blood vessels aren't open and you have to get a central line in. These are central lines to the liver, and directly to the heart.

Q What she noted was that there were blood clots in both the vein and the umbilical artery, and she had to clear those clots before she could insert those.

I guess, what are they, plastic or polyurethane, whatever those lines are, to try to start those lines.

What is the significance there? First of all, is that normal to find clots there?

A No. No. I'm glad you asked that question.

It's an important point. The endotoxin causes clothing problems in babies. And what you will find are clots, not only in the placenta and the products of conception, but also in the blood vessels, and the fact that many clots were found tells us unequivocally that the baby was suffering from the ravages of endotoxin.

Q Why does the baby start clots? I want you to tell us about the circulation; when a baby is going into shock, so we can understand why there were clots there, that Dr. Stork had a terrible time dealing with?

A Two things; first of all, the perfusion of blood pressure is decreased, but the most important thing, endotoxin affects the clothing mechanism.

So, in essence, you have a lot of clots, then you are unable to clot because it consumes all of the factors that allow us to clot our blood.

Q Now, at 2:23 in the records, they drew blood and tested it for oxygen and Ph. They had did a blood gas study?

A Yes.

Q Ph is -- I'll bring this over. Now, on the bottom, of course, you have seen these lab reports,

the lab sheet?
A Yes.
Q There is a Ph at 2:23. The baby is born at 1:52. That is seven minutes -- 30 minutes after birth they drew blood, and if you remember the heart rate, the heart has been going since 1:59.
What is the significance of a 6.876 Ph? What's it mean, and what is the significance at 2:23?
A It means that the baby is acidotic or has acid in the blood which is a result of inadequate perfusion, because what happens when you don't exchange oxygen in the tissues it becomes acid. It doesn't metabolize the products.
Q But this baby had a tube down and breathing with 100 percent oxygen for that 23 minutes and more, and the baby had a full active heart rate for over 23 minutes. Why would the baby still be acidotic at 2:23?
A Well, that is the problem with endotoxin. You can still have a heart rate and you can still have cardiac output, but it's decreased and the blood vessels are constricted in the arms and legs and other organs. You simply cannot perfuse those.
Q When you say they're constricted in the arms and legs, why, when a baby is in shock this way from

endotoxin, why do you have the blood in the fingers, arms, legs? Why is it less in those areas?

A It's a normal response we all have is that when we have compromise of blood flow it's going to go into more vital organs, and the brain is the most vital. The brain is going to be preserved to the expense of the other organs; the arms, the legs, the liver, kidneys, the heart, and it will continue to do that as long as possible.

Q Is that a finding that you would see with an HIE baby that just had a major oxygen loss, this peripheral pooling?

A Not, not generally.

Q We'll get back to the rest of the blood gas analysis in a moment. But you raised the issue of lack of perfusion in the arms and legs. And I have extracted from the Marymount records and the University Hospital records some observations that were made by the people that were taking care of Zachary.

Can you see this or is too far away? The first one at Marymount is a consult note, Exhibit N. The first note is Dr. Stork's consult note. It says infant appeared pink centrally, but mottled peripherally throughout all resuscitative efforts,

and there's a progress note shortly after arrival by a resident at University Hospital, says, admissions off service note, poor peripheral perfusion, poor capillary refill, and the neonatologist saw the child, noticed pale and mottled, and the nurse's note at 2115, 9:00 in --

A 11:10 in the evening.

Q 2310 would be 9:10, peripheral pulse is equal. Weak nailbeds, dusky at basis, extremities cool four to five seconds, capillary refill, poor perfusion.

Again, a nurse's note 8:15, the next day now, color pink with nailbed same, and nurse's note, color pink, extremities slightly cool, capillary refill five to six seconds, nailbeds pale pink. What's all that mean?

A It means what we are talking about, there was poor perfusion to extremities and all other organs.

Q Due to what?

A Due to endotoxin. Due to infection and it's difficult to treat.

Q Let's go back to this blood gas analysis again. The PCO2. This is the laboratory report. First of all, this is Ph 6.876. What is the normal range so we can understand when you say acidosis? What is the range?

A Usually 7.2 to 7.6.
Q And this 6.876 how does that stack up? Is that all bad, little bad, medium bad?
A Whenever you get below a Ph of 7.0 it's an extremely difficult situation. What happens then is cardiac output is compromised because of the acidosis. You have to get the Ph up as quickly as possible.
Q What does the acid in the blood, this acid, why does that continue to occur despite all this oxygen going to the baby with this infection?
A Well, the oxygen isn't getting to the tissues, it's just not being able to push because the blood vessels are constricted so you still have poor perfusion.
Q The PCO2, what's that relate to it's 116. That is --
A That is high. That means that the baby is having difficulty exchanging CO2 and oxygen in the lungs.
Q And why is that under this condition of shock?
A Well, it could be due to compromise of the lungs as a result of decreased profusion or an inability to ventilate because of the problems with the lungs and the endotoxin -- could be a number of

reasons. It's hard to tell from one set of blood gases.

Q The saturation level is listed as 24. That is a period of time, isn't it?

A Correct.

Q Of what significance is that?

A That is extremely abnormal, being that the normal is usually 80 to 100 percent.

Q And under these circumstances why is it so low?

A The baby is poorly perfused. The blood cells aren't able to pickup oxygen because it's not getting there.

Q And the PO2 in the blood is 269. What is the significance of the oxygen level being that high?

A They're giving the oxygen and it's just not getting to the tissues that it needs to be gotten to because the blood vessels are constricted.

Q They're constricted because they're in shock?

A That's correct.

Q And there is a 23.6 bicarb. CO is for bicarb?

A Yes.

Q What's that mean?

A It means that the baby just received some bicarbs. That would be higher. Normally we would expect the bicarbs to be lower in babies that are

acidotic.

Q The normal Ph range would be what?

A 7.23.

Q Okay. Now, up on the top of that board I put some blood pressures down. These are the first blood pressures that are recorded in the chart. I didn't see any in the Marymount records, so we got 5:00 p.m., which would be what, two hours and seven minutes of life?

A Correct.

Q The first blood pressure is taken at University Hospitals in the neonatal intensive care unit and it's 50 over 27, and mean or M for 37, what does that mean?

A Well, that's the perfusion pressure. That is the mean pressure of the diastolic and systolic.

Q And the diastolic is the bottom number under blood pressure, the 27?

A Correct.

Q The top is the systolic pressure, 50?

A Correct.

Q Though this baby was a 4,700 plus gram baby at term, what should the middle range of normal blood pressure be for this baby?

A Well, I can't -- the you have to have -- it

should be somewhere around in the 70 over 40's.
Q And the mean pressure should be about where for that size and date of baby?
A Should be above 50.
Q The fact that both of these, both of these figures, for over the first two and a half hours in that case that night, until they started giving Dopamine, were below the middle range of normal. Of what significance is that to you?
A Well, the baby is in shock. The baby is poorly perfused. There's no question about it.
Q Well, was this baby getting liquids into it circulation from the time of the resuscitation on award?
A Yes.
Q Why didn't they by bring the blood pressure up because you're putting more fluid in?
A Because you have endotoxin. You can't eradicate endotoxin. It has to go away.
Q What happens to the liver and kidneys when you have low blood pressure from shock?
A Well, they sustain damage, cellular damage and that often is manifested by decreased urine output and increased renal function studies, abnormal liver function studies. That certainly occurred in Zachary

Hammon.

Q Now, I mentioned that they started a drug called Dopamine for the kidneys that night, on the night of September 2nd. Of what significance is that in your view in this case?

A Well, they're trying to maintain the stable blood pressure and increase the blood pressure and Dopamine is a common drug that is used to do that.

Q Dr. Chalhub, the brain damage here, you've said the period in which it's going on, do you have an opinion as to when it actually started?

A It started before birth, but I can't tell you the exact time.

Q Why can't you tell us that?

A Well, you don't know how long the endotoxin was -- whether it was 24, 48, 72 hours, was manifested, if the mother had a urinary tract infection for at least a number of days and bacteria was present, endotoxin was present, so there is no way for me to know.

Q Now, hypoxic-ischemic encephalopathy, what is it?

A Well, that is the end product of a process due to lack of oxygen and blood flow in a newborn from whatever the cause.

Q We already covered what you did see on the CAT scans. If that had happened, what you would see on the CAT scans, if that had happened, there's been a statement in this case from Dr. Wiznitzer that he believed he saw on an MRI some damage in the region of the thalamus.

First of all, did you see that when you reviewed these films?

A No, I didn't see that. But that would be an area that would be appropriate if you had endotoxin damage because the thalamus is in the periventricular areas. It's not on the top parts of the brain. You would have no problem if, indeed, he felt that is where damage was.

Q Is the thalamus -- if you have this perfusion injury where a lack of oxygen gets delivered to the brain for a prolonged period of time so that you have HIE, are you going to see damage restricted to the thalamus and have otherwise normal areas of the brain in the watershed areas?

A No, for the reasons that we talked about, the way the blood vessels go in a normal term baby and, you know, the watershed area and turning on and off the faucet, so, no, it would be directly opposite.

Q Now, what is an Apgar score?

A An Apgar score is a score given to newborns to help the physician decide whether to resuscitate the infant.

Q And why has it been studied with respect to what the score is, and then looking out over the years to see how many of those children with certain scores develop cerebral palsy or not?

A Well, it's scores measured and reported at the bedside and many people have tried to corollate it.

Really, the only thing that appears to corollate is if it is low for a prolonged period of time, a time greater than 15 to 30 minutes, it doesn't correlate with a long problem. It still doesn't tell you what the cause is.

Most babies with low Apgars is because of their developmental basis during the time they were carried, not as a result of the birth process.

Q We did -- what does the Apgar score measure?

A Well, it measures heart rate, respiratory rate, tone, color, and reflection, irritability or movement.

Q The baby can get for each of those categories a maximum score of two?

A Yes.

Q And five times two, maximum score of ten?

A That's right.
Q This baby's Apgar score after one minute -- they're traditionally one minute and five minutes and sometimes ten minutes?
A Yes.
Q What were these baby's scores after the one minute, five minutes and ten minutes?
A Zero, zero and three.
Q And the three was for what, heartbeat over 100, not two?
A Yes.
Q And the respiratory effort, probably one?
A I believe so.
Q Now, I discussed with Dr. Edelberg the National Institute of Health studies and correlating Apgar scores with outcome and we went through that at five minutes of zero to three Apgar score, one percent have cerebral palsy. At 15 minutes, nine percent, and at 20 minutes 53 percent.

Taking those statistics into consideration and what you know went on here, of what significance was the period of time after the forceps were applied and before they got a heartbeat to the outcome?
A Really not much significance. There was less

than 15 minutes. It doesn't tell you about long term morbidity or long term problems as a result of that problem. It tells you that you have a baby that is is severely depressed at birth and a baby that is very difficult to resuscitate, and what you know by the other information, you put that together and you come up with a conclusion based on these facts.

Q In this case we have the forceps being applied, according to nurse's note, at 1:47 and a slow delivery of the head. We don't know whether that took 30 seconds, a minute, whatever.

Then we have a heart rate back at 1:59. Is it possible to tell in between how -- when there was no heartbeat, for how long?

A No, I can't do that.

Q Why not?

A There's no way to. There wasn't any measurement. There is no way to measure that.

Q Do you expect that the heart would stop immediately once there's a shoulder dystocia here?

A No, I wouldn't expect that to occur.

Q The cardiac massage and the intubation for delivery of oxygen, would that help circulation in the baby?

A Well, it would help the cardiac output, but it

isn't going to get blood and oxygen to certain organs and to the extremities which are basal constricted. You have can't force blood through a tight pipe or a tight tube.

Q In this infant -- the jury saw Zachary -- would you expect there to be significant mental retardation along with cerebral palsy in a child that has had severe HIE?

A Due to lack of perfusion?

Q Yes, lack of oxygen delivery and perfusion?

A Yes, I would, because of the reasons we talked about, and the blood vessel distribution and where the damage usually occurs, usually over the top parts of the brain.

Q How do you square the situation where he appears to have ability to communicate -- we have seen not one shred of testimony in evidence that he has anything other than normal intelligence?

A Well, I mean I think that is consistent with what occurred here and where the damage is, is in the inner parts of the brain due to endotoxin. And the type of neurological problem that he has with his balance is due to the white matter and spasticity -- due to the white matter injury around the ventricles and in the cerebellum which is the back part of the

brain that controls coordination.

Q From the pediatric records in this case we have drawn up a chart of the head circumference. I think you checked that over for us.

Would you tell us about these X's that are going up here? What do they mean?

A That means that his head is growing properly, that the cortex is intact. I have seen that on the brain scans of babies that have a stroke or have damage to the cortex as a result of a lack of blood flow, and is damaged and the head doesn't grow.

What you would see is a chart that would go something like this, because there is no, there is no brain. The skull gets big because the brain grows -- forces it out.

Q What does growth chart show with the X's down here?

A This would be a baby whose brain did not grow and this is because of what you see. This is considerably below, considerably below as the baby gets older.

Q And the chart of Zachary's growth, of what significance is it staying within the normal range to you in this case with respect to whether it was endotoxin damage or lack of oxygen or perfusion of

the brain from lack of oxygen?
A Well, the parts that we talked about are preserved and will continue to grow, expand, make the head enlarged, and it's consistent with the type of damage that we talked about.
Q Now, there is some, in evidence here, is Dr. Wiznitzer's chart. Have you had a chance to look through his chart?
A Yes, I have.
Q There are just a couple things that I want to ask you about in that chart. In November of 1992, last year, November, he has sent Zachary to have something called immunoglobin studies.

Why is it, as a pediatric neurologist, and in this case, do you try to get immunoglobin studies in 1992 after the baby is born in 1988?
A Well, you know, I can't speak for Dr. Wiznitzer, but I would tell you if somebody has ordered that kind of test in a baby with these problems, he's looking for the cause of the baby's problems.

There is a degenerative disease of the nervous system called ataxia-telangeictasia that involves immunoglobins. That is a cause of the ataxia or incoordination in a compromised child. I

suspect that is what he was looking for to exclude.

What it tells us is still unclear as to what caused this child's problems.

Q He mentions in a letter that he sends to the child's pediatrician that Zachary has no seizures.

What is the significance of seizures if a baby has HIE as opposed to a baby whose had endotoxin damages?

What is the significance of a lack of seizures?

A Well, it's significant in the fact that babies that have strokes over the top parts of the brain due to lack of blood flow, I told you have a small brain, microcephalic, have severe spasticity and seizures because the cortex is the area that causes seizures to occur when it's damaged.

Q Now, along that same line, at 22 minutes of life the nurses have written down that Zachary had myoclonus. What is, and of what significance is that to you occurring at 22 minutes of life?

A Well, in the first place it's extremely early in time. You have an abnormal involuntarily action which would be a reflection of a severe involvement of the white matter. It tells you that it's go going on for an extended period of time.

Usually seizures or involuntarily movements are as a result of lack of perfusion or damage to the top parts of the brain occurring 12 -- 24 hours.

Q And not 22 minutes after?

A No.

Q He has a specific note here on a letter of September 25, 1990 that Dr. Wiznitzer wrote to Virginia Nowachek at Health Hill Hospital. I'll read to you what Dr. Wiznitzer wrote on page two.

"Referring to Zachary his increased deep tendon reflexes suggest central rather than peripheral nervous system dysfunction. I would appreciate it if you would schedule a MRI to look for white matter or posterior fossa or abnormalities that can explain his physical examination."

Now, you have reviewed the MRI that was done at his request?

A Yes.

Q And you agree that was absolutely normal?

A Correct.

Q Now, what is the significance here of Dr. Wiznitzer in December of 1989 asking that an MRI be done to explain, to see if there's white matter damage to explain Zachary's physical condition?

Of what significance is that to you for his ability to diagnose the situation?

A Again, it's I think a prudent physician looking for the problems of -- the cause from this child's problems and an MRI scan would be another way of trying to define where the damage is and put all the pieces in the puzzle together.

Q Did the MRI reveal any white matter or posterior fossa, abnormalities?

A No.

Q Would you expect such abnormalities if there had been HIE, an hypoxic-ischemic damage to the brain?

A I would expect it in other areas, over the top parts of the brain. I would not expect to see it in a child that has a metabolic problem or inhibition of the myelination process or cell death as a result of that on the inner parts of the brain.

Q And finally, Doctor, then after all of this, in all our discussion do you have than opinion as to what was the proximate cause of Zachary's Hammon brain damage?

A Yes.

Q What was it?

A It's due to endotoxin as a result of the

E. coli infection involving this child's inner parts of the brain and back part of the brain.

MR. KALUR: That is all I have your Honor.

THE COURT: Counsel approach the bench.

(Thereupon, a discussion was had between Court and counsel off the record at the bench, after which the following further proceedings were had in open court:)

THE COURT: You may step down, Doctor. Ladies and gentlemen, we'll have our morning recess, about a 15 minute break. Please remember not to discuss this case with anyone. Do not discuss it among yourselves.

(Thereupon, a recess was had.)

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CROSS-EXAMINATION OF ELIAS CHALHUB, M.D.

BY MR. MELLINO:

Q Dr. Chalhub, you don't have any idea what Zachary Hammon looks like, do you, sir?

A No, I have not examined him.

Q You have never examined him, have you?

A No.

Q This child who is four and a half years old, you've never examined him, is that correct?

A That's correct.

Q And you're relying for your clinical picture of what Zachary Hammon looks like, you're relying on Dr. Max Wiznitzer, aren't you?

A Yes, I'm relying on the physical findings that were described.

Q And you told the jury that you have been a hospital administrator for the last two years. You have been the hospital administrator for the last three years?

A Well, somewhere. It's about two years.

Q About two years. Do you remember when I took your deposition, sir, May 11, 1993, about a month ago?

A Yes.

Q You were under oath at that time?

A Sure.
Q Under oath means you're going to tell the truth?
A Yes.
Q Okay. Page 12, line 22, I said, "Well, what do you do on a day-to-day basis?
"Answer: I run the hospital.
"Question: All right. That is an administrative position?
"Answer: Yes.
"Question: Okay. How long have you been the president?
"Answer: Oh, about three years."
So it's three years, isn't it?
A Well, it's two or three years.
Q And the year before that you were the medical director of the hospital correct?
A That is what I said today.
Q Okay. And currently you see patients only one afternoon a week?
A Also on Thursday. I attend a state institution for the mentally retarded on Thursday.
Q Do you remember that you were an expert, identified as an expert witness in the case of McGee versus Booth Memorial Hospital?

A No, I have no problem with it.
Q Pardon?
A No, I don't remember if case.
Q You're deposition was taken April 11, 1991?
A That is over two years ago.
Q Okay. I'll show it to you. Page 6, line 13.

The question was, "Okay. How much of you're daily practice is spent seeing patients as opposed to being CEO and administration?

"Answer: Well, I spend approximately a half day week seeing patients."

Did I read those questions and answers correctly?

A Sure. Two hours on Monday and it's an hour on Thursday, at this time about a half day a week.

Let's read through the rest of it. That's been asked and answered a number of times and --

Q Do you want to look through the rest of it?
A No, that's fine. That is the sum -- the time.
Q So it's two hours on Monday one hour on Thursday?
A That's correct.
Q But there's some weeks that you don't even see patients because you're testifying, correct?

A No, that is not correct, Mr. Mellino. There's some weeks in which I run the largest hospital in Alabama. Sometimes they're cancelled, but then it's made up at other portions of the week.

Q All right. You will admit that there's some weeks that you don't see any patients at all?

A Sure. I take vacations. We have board meetings. We have a number of things that go on.

Q And you don't treat newborns?

A No, not anymore.

Q You don't even treat patients in the hospital that you are president of, do you, sir?

A No, you can't. You have to be on call for that and I'm not on call any longer.

Q You don't see patients in any hospital?

A Well, I see them in an office setting, that's correct.

Q And you have never published or written any articles on cerebral palsy?

A No, the articles that are written, they refer to the problem of a differential diagnosis.

Q But you have never written one on cerebral palsy?

A No.

Q You had, however, retracted an article that

concluded that cerebral palsy could be caused by lack of oxygen and blood flow in birth trauma, isn't that true?

A Oh, sure. There is no question about that.

Q Okay. And do you have a copy of that article?

A No.

Q Is the reason that you retracted that article so you couldn't be cross-examined on it in all these cases that you have been retained?

A No, Mr. Mellino. The article was out of date needed to be updated and, you know, things have changed since the mid-1980's.

Q Excuse me. But ACOG accepted that article for publication, didn't they?

A No, not ACOG.

Q Who was it?

A The American Journal of Obstetrics and Gynecology. The article was not finished. The article was not appropriate, so therefore, it was not published.

Q Well, wasn't it in the process of being published and you retracted it?

A Yes.

Q Would they accept it for publication if it was out of date?

A That is up to the author, Mr. Mellino.
Q And you told the jury about your -- you called it your area of research specialty. I forget the term you used. But the fact of the matter is, sir, you haven't made any contribution to the medical literature since 1986, isn't that true?
A That's correct.
Q You do, however, review 40 to 50 malpractice cases per year, almost all of them for the defendants, isn't that correct?
A Less the last couple of years, yes.
Q And you derive at least ten percent of your income from reviewing and testifying in medical malpractice cases for defendants?
A I do.
Q And you were paid $84,000 for testifiying in malpractice cases in 1986, isn't that true?
A No, that is not true. I was paid $84,000 by a carrier for multiple things which included Workers' Compensation, personal injury; other things along with that, so alone, you know -- so I don't know. I can tell you they were not all for medical malpractice cases.
Q Do you remember your deposition being taken in the Cortez case?

A Yes.
Q Okay. In fact, that was when, June 18th, a week ago, correct?
A Yes.
Q You were asked the question about being paid $84,000 for medical malpractice work in 1986. You said, yes, I have. Correct?
A Well, if you want read the whole deposition, it goes into explaining what the make up of that is; what those cases were and what they related to.
Q Yeah?
A I will be glad to go through them.
Q The question that you were asked page 102, you were paid for medical malpractice in '86, $84,000, correct? And your answer was, yes, I have?
A It was a long deposition.
THE COURT: Was that the question and answer at the time?
THE WITNESS: Yes.
THE COURT: Okay.
Q And last year, 1992, you made a little bit less than $100,000 for testifying?
A Yes.
Q You have been retained by Mr. Kalur in the past, correct?

A Yes, I have.
Q And you're not an obstetrician, are you?
A No.
Q You don't use electronic fetal monitors in any part of pediatric neurology?
A No. That is not a tool that pediatric neurologists use.
Q The practice of pediatric neurology doesn't include resuscitating neonates?
A If you're there and you have to, it does.
Q When is the last time you did that?
A Probably in the 1980's.
Q But you testified, told the jury you gave opinions in this case on the cause of the shoulder dystocia, is that true?
A Yes.
Q And you're not an obstetrician, are you?
A Can I finish my answer, Mr. Mellino?
Q The question was, did you give an opinion to this jury on the cause of the shoulder dystocia in this case?
A Yes. Sure. That is part a of pediatric neurology, in terms of inquiring as to what the problem is and why babies have difficulties.
Q You gave an opinion as to how shoulders would

turn before the baby is delivered?
A No, I didn't give an opinion on that.
Q You did give an opinion on the fetal monitor, correct, whether or not you can use it to diagnose cerebral palsy?
A I think that is fairly common knowledge.
Q You wouldn't use that to diagnose cerebral palsy anyway?
A No.
Q It's a non -- it's a common nonsensical question, isn't it?
A I would look at it. I think it's clear by obstetricians, as well as pediatric neurologists that the fetal monitor is on the heart, not the brain.
Q My point is, it's not a tool that you use in pediatric neurology?
A It is a tool. I don't read them as an expert. I don't read an EKG. I'm not a cardiologist. I use the information I gain from them. Same think with the sophisticated laboratory tests, you don't do them, but you use the results.
Q When you treat patients this one to three hours a week, how much of that time do you spend reading electronic fetal monitors?
A Oh, I don't.

Q And the opinion that you gave us as to the cause of the shoulder dystocia, was low tone, correct?
A Correct.
Q So you disagree with Dr. El Mallawany who put in his discharge summary that the cause was broad shoulders, correct?
A Well, I believe it is due to low tone and --
Q So, if --
THE COURT: Let him finish the answer.
Q Sorry.
THE COURT: Let him finish the answer.
A You know, the shoulder of the child may be broad and there's no way for me to speak to that.
Q If it's Dr. El Mallawany's opinion that appears documented in the Marymount chart that the cause was broad shoulders, then you agree with that?
A Well, you know, that may be in addition. There is no question that this child was infected, was involved, and that is a common cause of the child having difficulty during the labor process, like it is with a child that has congenital muscular dystrophy or another cause that can result in

difficulty at the time of the delivery that is not uncommon.

Q Well, Dr. El Mallawany was there at the delivery, correct?

A Yes, he was.

Q You weren't, were you?

A No.

Q You have never even seen Zachary Hammon?

A No, I haven't, but I know Zachary had E. coli in his blood, endotoxin in his blood and there were multiple sources of infection.

Q If it was caused by low tone, he could have put that in his discharge summary?

A You will have to ask Dr. El Mallawany. I don't know.

Q Zachary didn't have an infected brain, did he?

A Yes, I think it was infected.

Q Is that meningitis?

A No, it was infected by endotoxin and the products.

Q He didn't have meningitis though?

A We don't absolutely know that, do we? There is no cell count.

Q Well, I'm going to hand you what I have marked as Plaintiff's Exhibit number 14. It's your report

in this case?
A Yes.
Q I would like for you to read that to the jury, from dear Mr. Kalur to very truly?
A "I have reviewed the above stated records at your request and based on these records, within a reasonable degree of the medical probability, the infant suffered an intrauterine septic event secondary to E. coli organism. This is a substantiated by the clinical features, the lab data and the subsequent events. If you require any further information feel free to contact me."
Q An intrauterine septic event just means he had a bacterial infection?
A It's secondary to E. coli. We know the bacteria.
Q He had an E. coli infection, just means he was infected in utero?
A No, it means he was infected in utero and it caused his problem.
Q An intrauterine septic event?
A Yes.
Q That is what that means?
A Yes.
Q I asked that question, once again you're under

oath, line 17, page 17 -- line 2. Got it?

What is an intrauterine septic event?

"Answer: Usually a bacterial infection, but can be viral or fungal in which an infant is infected and is related to symptoms at the time of birth."

That is the question I asked, and the answer you gave?

A Yes, but I think that is what I said.

Q And I asked you in that deposition also whether or not the fact that he had an intrauterine septic event would mean that he had brain damage and you said no.

A No, you can or you cannot. It's not absolute. But when the symptoms and the findings and the x-rays and the laboratory features are consistent, then you come to that conclusion.

Q But your report doesn't say anything about Zachary's neurologic condition, does it?

A It says, the probability is that infant suffered an intrauterine septic event secondary to E. coli.

I was giving an opinion as to the relation of what the child's problem was. That is self-evident, Mr. Mellino.

Q Maybe I didn't make the question clear. Did you say anything in your report about what Zachary's neurologic condition was?

A No. I wasn't asked to give what his --

Q Does that report have the word cause in it?

A You know, we spent and hour in my deposition going over that. Secondary means cause.

Now, you wanted to play word games during the deposition, and I don't have any problem if you want me to put cause and substitute that for secondary. That is what it means.

Q Well, Doctor, I don't want to play word games. The fact of the matter, your report doesn't say anything about Zachary's neurologic condition or anything that caused is neurologic condition?

A No, it does. Mr. Mellino, we went through that and hopefully you understood what I meant by it. That was the purpose of the deposition, to explore my opinions. And it is the cause. That is what I was asked to give testimony on. I don't how to explain it to you any differently.

Q The CT scans and the MRI's that are done, those are neurology studies?

A Yes.

Q And you're not a neuroradiologist, are you?

A No.
Q And you don't have any expertise in neuroradiology, do you?
A No, I do not.
Q Do you remember your deposition being taken in Caves versus Donald Markston?
A When was the date?
Q October 30, 1987?
A I don't believe so.
Q All right. You were asked, do you consider yourself an expert in neuroradiology, and your answer was no.
A That's right. I'm not a neuroradiologist, but --
Q You're not?
MR. KALUR: Can he finish?
A I do possess the skills to interpret and read films. That is part of your training as a neurologist. You have to read your own films.
Q Are you done?
A If you just let me finish, it would be helpful. Yes, I am.
Q The question was, you're not an expert in neuroradiology?
A No. I have told you that today, I'm not a

neuroradiologist.
Q And you said that you read Dr. Kirkwood's deposition?
A Yes.
Q And he disagrees with you, doesn't he?
A Well, I think he disagrees with everybody, Dr. Wiznitzer, the radiologist, who read the scans, as well as myself. He's the only one that has that opinion.
Q You were asked, have you asked anyone if they disagree with Dr. Kirkwood?
A No, I just read the reports and read Dr. Wiznitzer's testimony. They're not even close.
Q Well, the doctor from UH, the scan read at UH is normal?
A Yes, you mean all of them or --
Q Well, you're right, the initial CT scan was read as abnormal by someone?
A No. No. I believe was normal their interpretation.
Q All right. So you read Dr. Kirkwood's deposition?
A I did.
Q And what he describes is a subtle pattern which is consistent with HIE, right?

A No, he describes some changes that may be consistent with a number of things, but the subsequent scans and the MRI scan don't demonstrate that. It's not fair.

Q Looked at all the scans?

A Yes, but the only one that described it as abnormal was the first one.

Q And he have found damage in the perisagittal area?

A No, he found that there may be damage in the perisagittal area in the first scan, but you can see the scans. There is no damage there.

Q If Dr. Kirkwood is correct, then you're wrong?

A No, I don't belive so.

Q Well, if there's damage in the perisagittal area, isn't that inconsistent with the endotoxin theory?

A Well, show me the damage. We have looked at the scans and the reports of the other radiologist and in looking at the reports of the treating neuroologists there isn't any damage, so I don't know how you can say that.

Q I would be more than happy to give you every opportunity to answer my question. I would appreciate it if you would answer the question if

there's damage in the perisagittal area as Dr. Kirkwood testified, then that is inconsistent with your endotoxin theory, isn't it?

A That would be correct, but then the child would have a different set --

Q Thank you.

THE COURT: The question is, was it inconsistent?

THE WITNESS: Yes.

THE COURT: Just answer the question.

Q Now, did you testify to the jury that there was brain damage to that occurred to Zachary after birth?

A I said that was a possibility, yes.

Q Oh, it's a possibility. So it's not anything that you're testifying to to a reasonable degree of medical probability?

A Well, as I explained it, the endotoxin is there. The baby is in shock and has difficulty being resuscitated.

Q My question is, the opinion that you are testifying to, is to a reasonable degree of medical probability or is that just a possibility?

A I don't know for certain, Mr. Mellino.

Q Okay. Do you know, within a reasonable degree from medical probability?
A No. I mean there is no way to absolutely measure that.
Q And meconium doesn't tell you if someone sustained brain damage before birth, does it?
A No.
Q Doesn't tell you anything in terms of causation or timing, does it?
A Well, there is some evidence to suggest that the color and the nature and timing may be an indication, but, no, 20 percent of babies have meconium.
Q So it doesn't mean anything in terms of timing here, causation, correct?
A It depends a lot on individual circumstances. I can't say categorically, no.
Q Well, do you remember the Barducci case, deposition was taken July 9, 1990 and you were asked about meconium in that case?

Why don't you read for the jury what your answer was?

THE COURT: Read the question and the answer.

Q Line 19?

A No, 20 percent of all babies are born with meconium which, as I said, it doesn't mean fetal distress. It doesn't."

Q Just read your answer.

A "It can be seen, you know, in certain situations that everything was consistent with that and consistent with an acute event or chronic event, but the fact that you have meconium does not tell you anything." Which is really what I said.

Q And the baby could have been infected either through the placenta or could have been an ascending infection, correct?

A Yes.

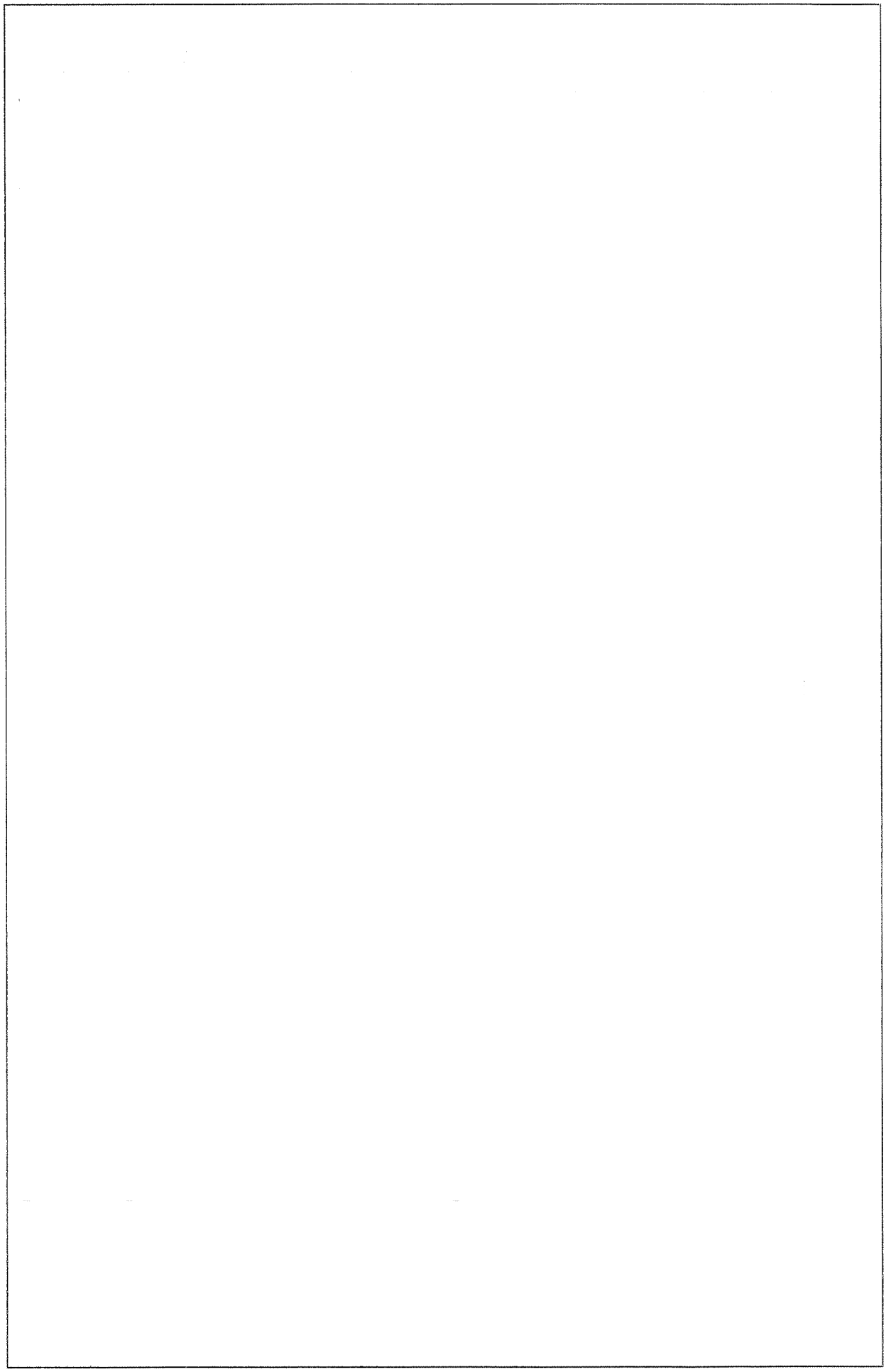
Q So if it was an ascending infection, the placental findings don't really help you in determining whether the baby was infected, correct?

A I don't understand.

Q Isn't part of your hypothesis based on the plaental findings that there were placental findings showing that there were some changes?

A Well, that is one of them, but the mother had a temperature, elevated white count. The baby had an increased nucleated red cell count. The fluid was fouling smelling. There's so many indications.

The baby also had E. coli. Elevated



saying that anybody at University Hospitals thought that Zachary's brain damage was do to E. coli sepsis, correct?

A Yes, sir.

Q And the discharge summary, this is not some resident's opinion, he reviews the chart to see what the opinions are of all of the doctors taking care of him?

A Not usually.

Q Not usually? He just usually makes it up or gives his own opinions?

A No. He will take summary statements, but if a surgery resident -- they don't really have a great deal of information in terms of the neonatal area. It's there and I accept what is there.

Q It was signed by Dr. Izant. That is who signed it as the attending physician, Izant?

A Yes.

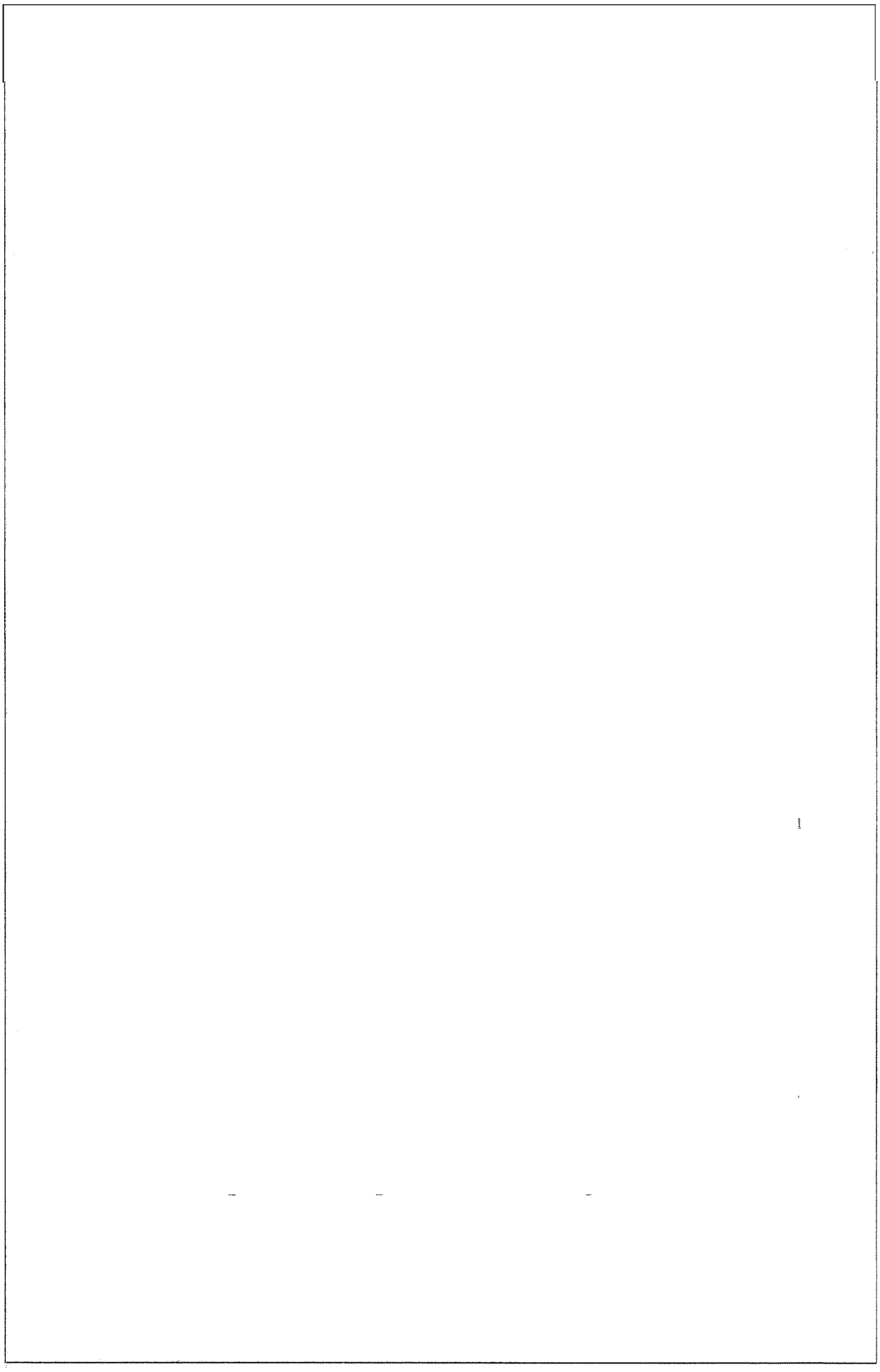
Q And one of the things that they did was rule out infectious ideology secondary to maternal temperature and increased white count and foul smell, correct?

A Correct.

Q That is what they did, they ruled it out?

A Well, no, they actually ruled it out because

they had a positive blood culture.
Q They're ruling out infectious ideology?
A No. No. They're ruling out the fact that there was infection, not the ideology.
Q Rule out infectious ideology to me, that means they're ruling out the ideology. To you, that means something different?
A There's absolutely no question that this baby is infected.
Q I agree with that. Okay. Now, their final diagnosis is hypoxic-ischemic encephalopathy secondary to difficult birth?
A It says possible.
Q Possible hypoxic-ischemic. I agree possible means possible?
A But the facts don't support it.
Q So this directly conflicts with your opinion, also?
A Not just with my opinion, the facts, the x-rays, the clinical condition of the child.
Q So they misinterpreted the facts at University Hospital?
A No, I think they did exactly what they should have. They said possible, and at the time that may be all of the information they had.



Q Well, the only studies on this is from animals, correct?

A Oh, no. I think Dr. Gillis has a number of clinical studies, and in babies I think 34 to 42 weeks, about the periventricular damage secondary to infection.

Q You're talking about the clinical studies. Those are from autopsy data?

A What else do you have? You can't take and inject endotoxin in it and watch what happens.

I mean, I don't know how to do it. So how do you do that?

THE COURT: You asking him?

A I was asking about the question, to simplify the question.

Q The question, there are no studies done of living, breathing, living human infants, is there?

A No, there is. I told you the studies.

Q The date is data is from autopsy studies?

A No, it's also from the clinical presentation, the fact that they have cultured gram-negative organisms out of the mother and take it to the animal model and inject the endotoxin and the toxin causes problems in the periventricualr area.

Q In animal studies?

A Yes.
Q Animals aren't the same as humans?
A No.
Q You can't translate animal studies to humans, can you?
A Not entirely. That is why you use clinical studies and try to develop a model.
Q The only human data -- all those kids get bacteremia?
A The mother's did -- babies did.
Q The babies died?
A Some did, not all of them.
Q They're all from autopsy studies?
A Not everyone of them. There's a number of other studies besides Dr. Gillis about infection in the newborn.
Q Name one study for me where they followed a live human infant. Do you have that for us?
A I don't understand by followed a live human infant.
Q Where they suspected that somebody had endotoxin damage and they followed him out five, ten years later?
A Doctor Shalford, by Dr. Figan, by Dr. Baker, a number of studies.

Q What are the names of them?
A I can't tell you by memory all of the names. They're in the Journal of Infectious Disease and Pediatric Infectious Disease.
Q By the way, you're not an infectious disease doctor, are you?
A No.
Q You're whole -- by the way, the other cases that you were retained by Mr. Kalur and the Bard case and the Paramore cases, do you remember those cases?
A Some things about them.
Q Well, your opinion was exactly the same as it is here, the damage was caused by endotoxin?
A Well, I can't remember the exact testimony. There's some films from the Paramore case right there. I would be glad to show them to you.
Q But your opinion is that it was endotoxin which is what caused the damage?
A Well, yeah, it's a different organism. Not in the Paramore case. That was an exotoxin. That was a group-B strep.
Q Your opinion was that that infection is what caused the brain damage?
A Infections cause a lot of brain damage, sure.
Q And your hypothesis is premised on the fact

that that six minutes that Zachary wentr with out oxygen and blood didn't have any affect on him whatsoever?

A No. That is not correct. My premise in this case is based on the fact that what we know about endotoxin and what we know about whatever it does to the nervous system, and what we know in this child as to where the damage is; this child does not have portal damage.

This child does not a have an infarct secondary to decreased blood flow as a result of a pinched cord, but damage to white matter. That caused the spasticity and caused the incoordination and that is what the data supports. I can't change that.

Q I thought you didn't see any abnormalities on the scans?

A I did.

Q How can you tell the jury where the damage is in his brain?

A Because of his clinical features.

Q And you're relying on Dr. Wiznitzer to know what his clinical features are, aren't you, sir?

A Well, sure.

Q And I don't understand. Are you saying that he

had a cut-off of blood and oxygen supply to his brain for six minutes or he didn't?

A No, I don't know. I don't know any way to tell that.

Q You don't know any way to tell that far?

A I do know he doesn't have any damage related to that because it doesn't show.

Q Well, if he did have a cut-off oxygen and blood supply to his brain for six minutes, he would have irreversible brain damage?

A Most likely.

Q In fact, you testified that you can have permanent irreversible brain damage with as little as two to three minutes of lack of blood flow and oxygen to the brain, isn't that correct?

A That's correct, in the appropriate situation. But then you have the facts that chill it clinically, features and the radiographs.

Q Doctor Wiznitzer is right and Kirkwood is right we have the clinical features and we have the radiographs that show it, correct?

A I'm sooty. You lost me.

Q If Dr. Wiznitzer is correct and Dr. Kirkwood is right, then we do have the clinical features and we have the radiographs that show hypoxic-ischemic

encephalopathy?
A No. I don't think so. That is what the case is. If you have it due to lack of blood flow to the brain it's going to be a distal field infarct. There is no distal field infarct on those CT scans and --
Q Well, Doctor --
A Can I finish? -- and if you did have that, then you would have a child that was microcephalic, the child is blind, severe spasticity and seizures, but we don't have that. We have a child that has damage in a different area.
Q Is it your testimony that every child that has HIE has all those things, that they're blind, that they have seizures; is that your testimony under oath?
A Not every child, but every child that has cord impingement, zero Apgars, and multisystem infectious organisms will have those symptoms.
Q All those times, those are the people with the most severe cases that are brain damaged, isn't that true?
A Not the most.
Q They have severe encephalopathies?
A Well, they can.
Q Well, those are the people that you are

describing?

A I've lost you. I'm sorry.

Q Zachary didn't have a severe encephalopathy, does he?

A Well, not now. But Zachary had a severe problem at birth. He had Apgars of zero and zero.

Q That is a different issue, whether he had severe problems or severe encephalopathy?

A Encephalopathy is the result of the problem over along term. The cute problem was significant.

Q Doctor, my question, did he have a severe encephalopathy?

A Yes, he did.

Q Does he have one now?

A No, he has -- he has a mild to moderate encephalopathy.

Q And if someone has mild to moderate encephalopathy, you wouldn't expect him to be blind or have seizures?

A No, particularly when it's a different mechanism.

Q I mean you disagree with Dr. Edelberg in this case, correct?

A In terms of -- I can't remember his exact testimony.

Q That there was a cut-off of the blood and oxygen to Zachary's brain for six minutes which contributed to cause his brain damage?

A Oh, I disagree with that.

Q And you disagree with Dr. Wiznitzer the treating physician, correct?

A Well, the reason I disagree --

THE COURT: The question is --

THE WITNESS: Could I explain?

THE COURT: He just asked whether you disagree.

Q And you disagree with the other expert hired by the defendant that Zachary, getting stuck for that six minutes causes asphyxia. You disagree with Dr. Kirkwood on that?

A Well, no. I suppose you could have asphyxia, but it didn't cause any brain damage.

Q So, if Dr. Kirkwood testified that shoulder dystocia and asphyxia contributed to cause Zachary's injuries, you disagree with that?

MR. KALUR: Objection. That is not his testimony.

THE COURT: He may answer.

A I'm sorry. Repeat the question.

Q Sure. If Dr. Kirkwood testified that shoulder

dystocia and asphyxia contributed to cause Zachary's injuries, you would disagree with that?

A That is not what the data shows. I would have to disagree.

Q So you disagree with Dr. Kirkwood?

A Right.

Q And you disagreed with Dr. Dierker as to what the CT scan shows?

A As well as everybody else, yes.

Q What do you mean, everybody else? Those are all of the doctors that testified in this case, and you disagree with all of them?

A No. No. I agree with Dr. Wiznitzer and the other radiologist that interpreted the films.

Q You agree with Wiznitzer now?

A On the films, absolutely.

Q You disagree with Dr. Kirkwood who's the expert neurologist?

A The films don't show it.

Q Do you agree or agree with?

A I do.

MR. MELLINO: No other questions.

THE COURT: Any other questions?

REDIRECT EXAMINATION OF ELIAS CHALHUB

BY MR. KALUR:

Q Mr. Mellino read something from the record. He didn't tell us where it was. It says CAT scan showed the probability of lucid areas secondary to hypoxic-ischemic encephalopathy.

Where is that statement that he pulled out?

A That is in the pediatric surgery discharge summary.

Q Written by the pediatric resident?

A Yes.

Q Is there anything in the CAT scan taken by the neuroradiologist's interpretation that supports that statement?

A No.

Q That is off the wall, isn't it?

A Well, I don't know if it's off the wall. It's not what I would put down.

Q Let's look at the neuro-consult sheet. Child neurology. This is the September 6th when we have the resident who --

THE COURT: What year?

THE WITNESS: 1988.

MR. KALUR: This is the

University Hospital, your Honor. Same hospitalization.

Q What have I got underlined that he writes down?

A No focal abnormality.

Q CAT scan?

A Yes.

Q Now, can you square no focal abnormality written here with the discharge summary that says a possibility of some lucid areas secondary to hypoxic encephalopathy?

A Well, you know, they're obviously different and I think this is a possibility -- this is by a person whose in neurology, but the biggest and the most important piece of evidence, it's not there now.

If you have an infarct, you have lucidity, and dead brain tissue. It's going to show up. It doesn't go away.

Q Now, you were asked about Dr. Wiznitzer's views. You were asked about them in detail. Has Dr. Wiznitzer in his office record or in the entire University Hospital records ever written that he has a diagnosis of HIE for this baby? Has he ever said it to anyone but these lawyers?

A Not that I could find.

Q Now, you were asked about the Bard case and

whether you said there was endotoxin damage. You remember that a staph pneumonia-A meningitis case -- didn't have anything to do with endotoxins, Doctor?

A No.

Q In fact, the issue there was whether the diagnosis was made in time, wasn't it?

A I believe so.

Q Why have you been called upon to testify as often as you have, Doctor?

A Well, I think several reasons; one of which is there's only so many child neurologists. There's about 500 in the United States. There's some 20,000 cases pending -- I mean some 10,000 cases pending against children and both sides have to have somebody that can review the case.

We need a whole lot more child neurologists than are available.

MR. KALUR: That is all I have.

THE COURT: May step down.

Thank you. Any other witnesses?

4-261, Estate of Ashley Carr

DEPOSITION OF ELIAS CHALUB, M.D.
[Estate of Zachary Hammon]

TAKEN ON JUNE 28, 1993
by CHRIS MELLINO, ESQ.

Pg/Ln	
7/15	Testified for Kalur 3 to 4 cases
9/16	I think it's **very** clear from the chart and the subsequent records that Zachary suffers from the effects of an intra-uterine infection! secondary to E, coli, secondary to endo-toxin
13/8	Periventricular area / vents central spinal fluid - this is an area particular vulnerable to endotoxin and infection
15/14	Can see the infection during (?) autopsy
1-7/14 [or is it 18/10]	Diagnose of **HIE** - watershed. infarct or a **distal** field in-farct

**** 18/19 [or is it 18/24 - 19/ 2] when *you* turn that faucet off these areas survive that are closest. The areas furthest away get damaged, What you see is a **stroke** or holes in the brain or severe blood pressure damage

25/1 Wiznitzer never signed-off on the note to indicate he read and approved it

77/10 In all probability the cultures would be negative (20 hours after antibiotics were started). There still may be cells if the cell count was done, so you cannot rely on the culture results absolutely at that point.

33/19 You're killing bacteria ax soon as antibiotics are given

37/9 6.876-Ph: is the result of inadequate perfusion

39/10 - 20 Poor color due to infection - difficult to treat

40/16 PCO2 - difficulty exchanging CO2 and oxygen - 116

44/21 Defines HIE	**HIE** is an end product due to lack of oxygen and blood flow in a **newborn** from whatever **the** cause
59/18 - 60/25	retracted cerebral palsy article because it would help plaintiffs
70/13	cave -vs- Donald: I'm not a neuroradiologist
73/1-5	Damage in perisagittal area is inconsistent **with** endotoxin
82/7	**Is** not an infectious disease **doctor**