**EXCERPTS FROM DIRECT AND CROSS-EXAMINATION OF MEDICAL EXAMINER REGARDING AUTOPSY AND OPINION AS TO CAUSE OF DEATH**

**IN CHILD HOMICIDE CASE**

**State of Washington**

**DIRECT EXAMINATION:**

**By Prosecutor:**

**Q.** Would you please state your full name and spell your last name for the record.

**A.** Dr. D.T.R.

**Q.** Your business address please?

**A.** H Medical Center.

**Q.** What is your occupation?

**A.** I am a forensic pathologist.

**Q.** Where are you currently employed?

**A.** I am employed by KC as a medical examiner.

**Q.** Dr. D.T.R., could you give us a brief outline of your background and your medical training?

**A.** I graduated from…with the degree of Doctor of Medicine, ….

**Q.** And how long have you been employed as the KC Medical Examiner?

**A.** I have been employed by KC for seven years.

**Q.** Could you just indicate in general what the term pathologist and pathology means?

**A.** Well, pathology is the science of the study of the nature of disease, and forensic pathology concentrates on the nature of injury, the causes and effects of injuries produced which can lead in most instances from my point of view to a fatal outcome.

**Q.** Do you have any idea of the number of autopsies that you have performed in your career?

**A.** I routinely perform approximately 300, 350 autopsies a year.

**Q.** And are you licensed to practice in the State of Washington?

**A.** Yes, I am.

**Q.** How long have you been licensed to practice here?

**A.** Since I came here, seven years.

**Q.** Approximately how many times would you estimate have you been called to testify in court in the State of Washington?

**A.** Approximately two to three times a month.

**Q.** In line with your work as the KC Medical Examiner, did you have occasion to perform an autopsy on the body of a child known as J.J.?

**A.** Yes, I did.

**Q.** When did you initially become involved in performing that autopsy?

**A.** The autopsy was performed by me on the 14th of June at 10:00 in the morning.

**Q.** At that time, what other information, what hospital records or police reports or records of that nature, did you have that you consulted prior to actually performing the autopsy?

**A.** Information was simply relayed to me that the death occurred in CO Hospital, and that the death involved an injury, and that was about the amount of information I had when I started my autopsy.

**Q.** Do you know what time the child had died?

**A.** Yes. The investigator’s record prepared by the investigator from my office indicates 2:30 in the afternoon.

**Q.** Then that was the day before?

**A.** The day before, that is correct.

**Q.** Could you describe initially and just in general terms, what performing an autopsy involves?

**A.** The autopsy can be broken down into two parts. There is the external examination where any abnormality, any type of injury on the surface of the body, is noted. Likewise, any congenital abnormality is noted and recorded. Then is followed the exposing of the body cavity through an incision, and the organs are then examined in their turn, and in the abnormalities, both of natural disease process or injury, and these are reported. Following a completion of this, then there is a synopsis of your observations in terms of causes, and then a list of anatomical diagnoses are rendered, and then an opinion as the cause of death given.

**Q.** Did you take photographs during your autopsy?

**A.** Yes, as a means of documenting the observations. Photographs are taken at the varying stages of both the outside of the body and any injuries uncovered during the examination. These are photographed for record purposes.

**Q.** Showing you what has been admitted as State’s Exhibit 4, do you recognize that photograph?

**A.** Yes. This is a photograph taken under my direction with the identifying medical examiner’s case number in the photograph.

**Q.** Is the child there J.J.?

**A.** Correct, it is.

**Q.** Perhaps we could start at this point and just—what internal evidence of injury did you find on the body of the child?

**A.** The injuries were essentially divided into two categories. Number one, the surgical injury, or that injury which was inflicted as a means of therapy. In this particular instance, there were needle puncture wounds over the body attributed to needle wounds for therapy. Likewise the chest cavity had been opened up, the left side of the chest, during the resuscitative efforts on the part of the attending physicians. In addition to the surgical injuries, there were other more extraneous injuries beginning with the areas of contusion or bruising of the abdominal wall just below the rib margins.

**Q.** Perhaps you can, with a pointer, you can indicate as you are describing these injuries, what you are talking about?

**A.** These faint areas of bruising or contusions that are present over the abdominal wall, these were counted, and to the best that I could determine, there were a total of nine in number. Over the forehead, there was likewise a faint area of fading bruising. Beneath the chin, which is not shown here, there was a faint bruise, and there was likewise a bruise on the inner aspect of the lip, with a small tear in the surface of the lip. Over the back, there was likewise an area of faint bruising.

**Q.** First of all, with regard to the injuries that you observed, you said a faint area of bruising on the forehead. Do you have any way of estimating how long that bruise had been there, or the age of that bruise?

**A.** The bruise had more of a brownish discoloration in contrast to the bruises on the front of the abdomen. In other words, that had a slight brownish discoloration. I would estimate that it certainly is older than what is present on the abdomen. Perhaps two or three days, maybe even longer.

**Q.** How about the bruise area that you described on the chin?

**A.** Those, again, were recent appearing bruises, very similar to the same type of bruising that was present over the abdomen, very recent, approximately 24 hours.

**Q.** So that the bruises you observed on the abdomen, then, would you estimate approximately 24 hours old.

**A.** Less than 24 hours.

**Q.** Less than 24 hours?

**A.** That is right.

**Q.** The bruises that you observed on the abdomen, what is underneath that, anatomically inside of a child that age?

**A.** Well, first of all, you have a layer of fat, then some muscle, and some very thin lining tissue which overlays the abdominal cavity, where the major organs of the abdomen lie, or sit. This includes the intestines, the liver, the stomach, the major blood vessels which cord down into the legs.

**Q.** Did all of those bruises that you observed on the abdomen, the nine that you have indicated that you observed, appear to have been of approximately the same age?

**A.** Yes, I couldn’t make any real separation, although some of them were quite faint, they did have all the features of a similar age.

……………………………………….

**Q.** Then in talking about the age of the bruises that you observed in the abdomen, and indicating that they were less than 24 hours old, are you indicating from less than 24 hours from the time that you are performing your autopsy or from the time of the death, which was about 2:30 on the 13th?

**A.** At the time of death, the chemistry of the body essentially ceases, so we are talking about the age estimated and based upon backwards from the time of death.

**Q.** With regard to the injuries that you observed on the forehead, and the chin, are you likewise referring to the age of two to three days from the time of death?

**A.** That is true of the forehead injury, but not the chin injury. The chin injury was more recent in appearance.

**Q.** Did it appear to be of approximately the same age as the bruises on the abdomen?

**A.** Yes, that is correct.

**Q.** And you have indicated some of these bruises on the abdomen appeared to be very faint?

**A.** Yes. In other words, the margins were quite indistinct and tended to fade into the surrounding tissue.

**Q.** In indicating where those are located, would you indicate whether they were on one side of the body or the other?

**A.** Primarily they were located on the right side of the body, right side of the abdomen, at least.

**Q.** When you were referring to the abdomen, is that a general term that you use?

**A.** It is a region on the surface of the body.

**Q.** What region does that encompass?

**A.** From the margins of the ribs—the ribs would be identified as the chest, from the margins of the ribs extending down to the rim of the pelvis.

**Q.** Perhaps you could use the pointer again and indicate what is the general term for abdomen?

**A.** This is the general area. This is the margin of the rib cage that can be recognized here, then this is the rib of the pelvis here, so we are speaking of the general region of the front of the body.

**Q.** Were any of the bruises that you have referred to involved in the abdominal region, did any of those bruises extend up over the sternum or the breastbone, chest bone?

**A.** Yes, certainly over the lower portion, certainly right in this area here over the lower portion, they definitely were present.

**Q.** Then the areas that you have just indicated, the abdominal bruises, the forehead, the chin, and the lip laceration, did you observe any other external signs of injury, abrasions, scrapes, anything of that nature?

**A.** Over the back, more or less in the mid-line of the back, there were three faint one-inch contusions. A contusion is a bruise.

**Q.** With regard to the bruises, or contusions, on the abdomen what kind of thing causes those kinds of bruises, or what are the possibilities?

**A.** The bruises essentially result from the rupture of small vessels in the skin, and the typical bruises result from an abrupt impact injury where the force is transmitted to the smaller vessels in the skin causing them to rupture, and I think everybody has experienced bruises as a result of bumping into something and causing injury to the vessels and causing the vessels to rupture and causing blood to leak into the tissue.

**Q.** You indicated initially what kind of internal injuries you observed, and first of all, can we talk just a moment about any internal injuries you observed to the head?

**A.** Upon the removing of the scalp, it showed patches of hemorrhage in the soft tissues overlying the skull, or in the scalp itself, that area, in which hemorrhage was present. It was about six by three inches, but in most areas, the hemorrhage took on about a two inch diameter. In other words, there was an irregular pattern in this six by three, but the average area of hemorrhage in the scalp was approximately two inches.

(State’s Exhibit #8 marked for identification.)

**Q.** (by prosecutor) Showing you what has been marked for identification as State’s Exhibit 8, can you identify that?

**A.** Yes. This is the photograph taken under my direction of the autopsy in question.

**Prosecutor:** The State offers Exhibit 8.

**Defense Counsel:** No objections.

**THE COURT:** Admitted.

(State’s Exhibit #8 admitted into evidence.)

**Q.** (by prosecutor) Before removing the skin and the hair, were any injuries observable to the scalp or to the head?

**A.** No. I did not shave the hair of the scalp to more closely inspect the surface of the scalp, but on palpating, and looking around through the hair, I did not see anything.

**Q.** What was the nature of those hemorrhages that you observed in the scalp?

**A.** Again, just simple hemorrhages in the soft tissues which covered the surface of the skull, and again a bruising type hemorrhage as a result of rupture of small vessels.

**Q.** Did those, any of those injuries, affect the brain itself, or the functioning of the brain?

**A.** The hemorrhages of the scalp are a reflection of the site of impact. You can have a neurological problem develop without any demonstrable injury to the brain itself. In other words, at the time of autopsy in a concussion type condition, we may not see any physical abnormalities of the brain itself.

**Q.** The injuries you observed to the scalp there, or to the skull, is that what it is appropriate to refer to?

**A.** Yes.

**Q.** To the scalp, were those injuries significant in terms of life or death?

**A.** The internal structures of the skull were intact. There were no hemorrhages to the brain, nor bleeding over the surface of the brain or areas of bruising to the brain itself. Now, these things that I have described are the thing that we associate with unconsciousness, and swelling, and oftentimes a fatal outcome. In this particular instance, there was some swelling of the brain, but as far as injury to the brain itself, none was identified. Did I answer your question?

…………………………………………..

**Q.** Could those injuries themselves cause death, the injuries to the skull?

**A.** No. The type of injuries we are talking about here on the skull are superficial injuries to the brain itself and it did not demonstrate the injury that we associated with a fatal outcome.

**Q.** So, as far as the inside of the skull and brain itself, there were no injuries or abnormalities other than some swelling?

**A.** That is correct. There were no injuries present to the inner structure of the cranial cavity.

**Q.** Would an injury of a type that you observed on autopsy, would you expect any kind of a neurological impact prior to death? Would you expect a person to go into shock or any kind of reactions like that?

…………………………………………….

**A.** On the basis of the injuries to the scalp?

**Q.** Right. On the basis of the injuries to the scalp.

**A.** Could these injuries be responsible for death?

**Q.** No. I was asking you what is the result of those injuries which you now know of, what symptoms would you have expected the child to have exhibited?

**A.** Again, the injuries simply reflect the site of the impact. This type of an impact can produce a concussion with a loss of consciousness, some loss of memory, some change in neurological status, but the inquiry is, in and of itself, is not considered fatal.

**Q.** What other major areas of internal injury did you observe?

**A.** The internal examination of the chest and abdomen showed, first of all, evidence of surgical intervention, with the separation of the ribs, separation of the muscular diaphragm which divided the body cavity into the chest cavity, and the abdominal cavity, these were the injuries that had been inflicted during the time of surgery. However, there were other injuries present in the abdomen consisting of tears of the mesentery, which is a thin membranous structure which attaches the intestine to the back of the abdominal wall. Also, there were tears of the liver. In addition, the bowel showed a separation of the muscle layers. In other words, portions of the muscle layers had simply been torn one from the other so that the muscle there which surrounds the intestines had simply been stripped away.

**Q.** First of all, if we can talk just a moment about the injury to the mesentery and the intestine. Could you indicate on this diagram, if possible, where and what area of injury you are talking about?

**A.** The liver is this large organ seated in the right upper quadrant of the abdomen. The injuries were present to the liver on the under surface, and likewise, over on the left portion of the liver. In this region here, the intestines, which is actually the small intestines, showed tears in the mesentery, which is a fan-like membrane which attaches the intestines to the abdominal cavity. This shows an area of repair. This likewise showed injury in the surrounding soft tissue, which was dissected, which had leaked into the muscle structure of the back. In addition, the mesentery itself was torn.

**Q.** In terms of significance in life and death, which of those injuries was the most serious?

**A.** Well, I think all are considerably of serious consequence because they separate the blood vessels and as a consequence, all sites here hemorrhaged. In terms of surgical repair, some may be easier than others to repair, but I think in terms of the injury, the blood vessels having ruptured in all these sites., as a consequence bleeding occurred. No large vessels were torn, mostly the small vessels were torn as a process of separating the tissues.

**Q.** What exactly, and maybe you can explain a little better, does the mesentery do? What is the point of the mesentery?

**A.** It is a supporting structure. During embryonic development, it plays an important role, but it is a supporting structure which acts like a fan in which the loops of the intestine are attached. It likewise contains the major blood vessels, which then are attached to the surface of the intestine. So, the mesentery carries the nutrient supply to the loops of the intestine which are followed and looped over the margin of the fan-like membrane.

**Q.** What is the effect of a tear in the mesentery, or a separation of the mesentery from the bowel that it attaches to?

**A.** Well, it depends upon the site. If a major vessel was involved, the vessel starts out rather large, and as it goes out to the periphery, or the end of the bowel, the vessel becomes quite thin. If a tear of a large vessel occurs, then the bleeding would be very brisk, and very traumatic, while the smaller blood vessel tears would simply be one of leaking over the surface of the bowel.

(State’s Exhibit #9 through #16 marked for identification.)

**Q.** Dr. D.T.R., if you could initially just briefly look through this group of photographs and indicate whether or not you recognize those?

**A.** Yes. These are photographs taken under my direction, under my examination.

**Q.** I will hand you first of all photographs 12 through 16. Could you indicate—I believe the photograph 12 illustrates this tear in the mesentery, is that correct?

**A.** Yes, correct….This space that is depicted in this photograph is the tear and this is the loop of the intestine as it folds upon itself. This is the mesentery membrane which attaches the loop of the intestine, and this space here is the separation of this mesentery with a gaping defect in the photograph here.

**Q.** Dr. D.T.R., what kind of impact would cause a tearing such as that?

…………………………………………..

**A.** The laceration is a blunt instrument type injury by definition.

**Q.** When you refer to the term “blunt instrument type injury,” what are you including within that term?

**A.** I am talking about a force impinging on the abdomen and causing the tissues to separate as a result of that force.

**Q.** Are there other injuries that you have referred to, specifically with regard to the mesentery and the bowel?

**A.** Yes. This is the intestine again. This is the area of the mesentery, and this is a length of intestine here which has become separated from the attachment. The blood vessels would attach along the margin of this length of bowel, but in fact they are separated along this margin, so it is simply separated or pulled away.

**Q.** And what is depicted in that photograph 14?

**A.** Well, this is a very close-up photograph of a segment of the bowel, but it is simply showing a piece of the outer layer of the muscle layer that is simply separated like a peeling away of an orange. The surface of the muscle has been separated from the surface of the bowel.

**Q.** And Exhibit 15?

**A.** This is the same type of thing, more to illustrate the amount of hemorrhage which is in the back portions of the body cavity.

**Q.** And Exhibit 16?

**A.** Again the four sets are attached to the outer muscle layer and simply reflect the fact that a portion of the muscle layer has been stripped away from the bowel.

**Q.** Thank you. Perhaps in terminology, is there a difference between bowel and intestine, and I think I also have seen in your report the word “gut” used. Do they all refer to the same area?

**A.** Yes, generally that is right. The intestines and the large and small intestines and large and small bowels are used interchangeably.

**Q.** Those particular injuries that you have observed on performing the autopsy of the bowel, and the mesentery, that is the tearing there, are those going to produce a rapid and abundant bleeding, or is it going to be a slower bleeding?

**A.** The bleeding would generally be slower because no major vessel is torn. It is the small blood vessels which are kind of feeder vessels to the vessels, and there is no major large vessels torn.

**Q.** I believe you also indicate that there were distinct lacerations to the liver?

**A.** Yes, correct.

**Q.** Perhaps again I can get you to step down here with regard to photograph 9?

**A.** This too orients us. This is the abdominal cavity. This is the liver which sits in the right upper quadrant, and the chest cavity with the lungs and heart exposed, but the surface of the liver shows a tear over the surface in comparison with the surrounding more normal appearing tissue. This is an irregular tear that is present, and the membrane here pretty well marks the mid-line of the liver itself.

**Q.** Now, I believe you indicated that there was one of the injuries to the liver that was on the outside, is this the one you are referring to?

**A.** Yes, this one on the outer surface, that is right.

**Q.** With regard to Exhibit 10?

**A.** Again, this is the liver this time, but looking from underneath. In other words, the liver has been lifted up and reflected so that you expose the under surface of the liver. And in this particular instance, there is a tear right through this side of the liver, which on this one would be in this area, but underneath the surface.

**Q.** And again, this is essentially a duplicate of that, and perhaps a little different view, showing the tear to the underside?

**A.** Yes, that is right.

**Q.** Again, what kind of force or impact would cause such a laceration to the liver?

**A.** Again, by definition, a blunt impact type injury causing separation of the tissues and rupture of the vessels.

**Q.** Have you previously seen similar injuries to those in small children?

**A.** Yes, I have.

**Q.** And are there any instances that come to mind of such injuries?

**A.** Traffic accident victims where the child is being held by the mother, that is the type of injury you might see. I have seen other injuries where a knee has gone into the chest and abdomen of the child causing significant tears and injuries of that sort.

**Q.** Showing you what has been admitted in evidence as State’s Exhibit 6, have you previously seen that photograph?

**A.** Yes, I have.

**Q.** And based upon the injuries that you observed at the autopsy, and in examination of the photographs, do you have an opinion as to a reasonable medical certainty whether this child falling down those steps would cause the injuries that you saw on the inside of his abdomen?

**A.** The abdominal injuries, no. I don’t think a simple fall down the steps, as depicted there, would account for the injuries to the abdomen.

**Q.** Did you observe or examine any of these, the tissues, particularly with regard to the mesentery and the bowel and the liver, did you examine any of those tissues microscopically?

**A.** Yes, varying areas of the body were sampled and examined microscopically.

**Q.** With regard to the liver, what were your findings?

**A.** The lacerations or tears were well depicted microscopically. In addition, there was some scarring or fibrosis of the undersurface of the liver. In other words, the capsule of the liver was somewhat thickened and fibrotic scarred.

**Q.** What did that indicate to you?

**A.** A previous injury which would include a natural disease type of injury, including some past inflammation or another blunt impact type injury, where you have had hemorrhage and some scarring as a result of that.

**Q.** What was the extent of that scarring, particularly as compared with the current injury, that you observed?

**A.** Well, it was primarily on the undersurface of the liver. I did not localize it in terms of how extensive it was and in terms of the involvement of the undersurface of the liver.

**Q.** Based upon a microscopic examination of those tissues, did you determine the approximate age of that older scar that you saw?

**A.** Again, the changes that I associate with injury, perhaps ten to fourteen days old, or longer. It could have been three months, but I don’t think you would see these changes before two weeks.

**Q.** Did you examine, or did you find any evidence of scarring or prior injury in the bowel?

**A.** Yes. Again, similar scarring of the surface of the bowel was present, the changes being what we have referred to as fibrosis where you have scar tissue laid down. Likewise, this was present on the surface of the bowel, but the actual extent I did not establish, only that there were other areas sampled where it was not present. It was primarily located in the area of injury.

**Q.** Do you know the approximate age again of that, or that prior scarring?

**A.** Again, I would not expect to see this type of a change short of two weeks or greater.

**Q.** Based upon your examination, and both the external examination and the internal examination in the autopsy, and your consulting the medical report in this case, and also your view of the photograph of the stairs, did you form a pathological diagnosis as to the cause of death in this case?

**A.** Yes, I have.

**Q.** What is that opinion?

**A.** This is attributed to the blunt impact injuries to the abdomen which was the tear of the liver, mesentery, and small bowel, and accompanied by internal hemorrhage.

**Q.** Based upon the areas of injury, the varying areas of injury, and the abdomen, do you have an opinion as to a reasonable medical certainty whether a single impact could have caused all those injuries on one single impact?

**A.** No. I think that because of the disparity, the separation of the distinct injuries, at least two impact sites would be required, particularly with regard to the left side, the liver, then in the min-line of the liver, plus the other injury, which was a little bit lower down, at least two sites.

**Q.** Are you familiar with the techniques of cardiopulmonary resuscitation?

**A.** Yes.

**Q.** Have you had occasion to perform autopsies where cardiopulmonary resuscitation has been performed?

**A.** Yes.

**Q.** Unsuccessfully?

**A.** Yes.

**Q.** Can you indicate whether frequently you see internal injuries as a result of cardiopulmonary resuscitation?

**A.** We see injuries frequently in adults, but rarely, if ever, in children.

**Q.** To what part of the body do you see those injuries in adults?

**A.** Ordinarily the injuries of CPR occur in the chest, fractures of ribs being the most common. Other types of injuries are rare. Many years ago, I think, we saw a variety of injuries, but we only expect now to see fractures to the ribs.

**Q.** Did you see any fractures to the ribs on performing your autopsy on this child?

**A.** No. No fractures were present, but we do not see rib fractures in children, who have a lot of elasticity in the rib cage.

**Q.** Perhaps you could indicate where on the diagram. State’s Exhibit 4, the photograph of this child, where, as the child is laying here, would the liver and the bowel and mesentery that we are talking about as to the injuries would be located?

**A.** Yes. It is pretty well captured in this diagram here. This is the area we are talking about primarily in this portion of the body.

**Q.** And in performing the cardiopulmonary resuscitation on a child of this age, where would you be focusing?

**A.** Again, the chest compression occurs primarily over the sternum in this region.

**Q.** In your opinion, could vigorous cardiopulmonary resuscitation cause the injuries that you saw in this child?

**A.** It is very unlikely, but the liver injury, particularly the left side of the liver injury, might have been produced with vigorous, perhaps inappropriate cardiac massage. I think the injuries to the undersurface of the liver, including the mesentery, and the small bowel, would not be produced by CPR.

**Q.** Did you talk with the physicians and people who had treated this child prior to the child’s death?

**A.** Yes, I did.

**Q.** Could you give, for the jury, some indications of a hematocrit, what a hematocrit measures?

**A.** The hematocrit measures the concentration of red cells that flow around in the blood. In other words, the blood is made up of two components, primarily the red cell and the watery component. Now to assess the amount of red cells present in the blood, a sample is centrifuged, and spun down so that there is a collection of packed cells which form, and now that collection of packed cells is a reflection of the status of the red cell population circulating in the blood stream. And in a normal person, it generally constitutes about forty percent, so that if a sample of blood is taken and spun down, and forty percent out of that sample will be red cells.

**Q.** If there is internal blood loss, what happens to that hematocrit?

**A.** The hematocrit may not change simply because the body hasn’t had an opportunity to change its concentration, so that if you have a volume of blood with a forty percent, and you draining out the concentration, it hasn’t changed. So even though the actual blood value may have decreased, the forty percent concentration remains the same. It is only later when there will be a redistribution of fluid that the concentration, or the percentage of red cells, would be reflected in the determination.

**Q.** Is that when more fluid is coming into the system to replace the lost blood?

**A.** Yes, that is correct. It is an attempt to keep the system expanded by fluids, then what is simply pouring into the blood, as a consequence, the concentration of the red cells will decrease.

**Q.** And then the hematocrit reading is lower?

**A.** Then it is lower, reflecting a decreased concentration.

**Q.** So it is a decrease in the concentration of the red blood cells?

**A.** That is correct.

**Q.** Approximately how long does it take for the body to have this reaction, and for the hematocrit to drop from the time of this start of the bleeding?

**A.** Depending on the rate of bleeding, the drop in hematocrit may be noticeable in less than an hour or may take several hours longer.

**Q.** Had these injuries to the abdomen of this child been discovered at an earlier time, perhaps 2:00 in the morning instead of being operated on at 2:00 in the afternoon, would those injuries have been repairable?

**A.** I think with the available surgical techniques, yes, I think they would have been.

**Q.** Now, you have referred to areas in the general area of the injuries, of the present injuries, you have referred to areas of older injury approximately ten days to two weeks in age. Would the scarring in those particular areas leave those tissues and organs weaker in a sense that it would take a less of a severe blunt impact to cause the injuries that caused the child’s death?

**A.** I think as far as the liver goes, it is pretty well fixed. It is an organ that doesn’t move around. The intestine, however, is movable. If you had some scarring, the attachment would become less plastic and as a consequence, I think it would take less force to cause the separation, but the underlying blood vessels have not really been damaged, it is simply the surface type injuries, so it may take less force to damage the mesentery. On the other hand, the liver really is not moving around and as a consequence, I don’t think it makes any difference as far as the liver is concerned.

**Q.** Having performed the examination, and having observed this older scarring, and again having examined the photographs and the stairway in State’s Exhibit 6, do you have an opinion as to a reasonable medical certainty whether, even given that evidence of old injury, a fall down those steps could have produced the current injuries?

**A.** No. The injuries are inconsistent with a fall down the steps. The abdominal injury is inconsistent.

**Prosecutor:** I have no further questions at this time.

**CROSS-EXAMINATION**

**By Defense Counsel:**

**Q.** Dr. D.T.R., the prosecutor has asked you about an older injury that was in the child?

**A.** Yes.

**Q.** Just to make sure of your testimony, you don’t know when that injury occurred, do you, from the evidence that you have before you?

**A.** No. That is correct, I don’t.

**Q.** In fact, the only thing you can testify to is that it must have been at least two weeks before the time of death, and it could have been a matter of two months beforehand?

**A.** That is correct.

**Q.** Now, the location of that old injury coincides with the location of the new injury, is that correct?

**A.** That is right.

**Q.** And in which areas does that overlapping occur?

**A.** The overlapping occurs on the under-surface of the liver and in the area around it, and in association with the tears noted in the mesentery of the bowel.

**Q.** So, in both of those two locations where there is new injury, there have been old injuries in exactly the same location, is that your testimony?

**A.** Exactly. The fibrosis was in that area, that is correct.

**Q.** So, there was an exact overlap between the new and old in two of the areas you have described?

**A.** In terms of general location, that is right.

**Q.** Now, I believe you also testified that you were unable, or you did not determine the extent of the old injury in terms of the length or size of it, is that correct?

**A.** No. I simply took what I felt was representative areas of the mesentery and removed that. From the site of the tearing, it didn’t show any of that change.

**Q.** I don’t understand your last statement. Areas removed from the site?

**A.** From the site of the injury. We are talking about an acute injury. It didn’t show that change. In other words, there were areas present in the mesentery which was free of any type of scarring.

**Q.** Then in summary, at this time, we have no idea how large the previous injury was, is that correct?

**A.** That is right.

**Q.** It could have been very substantial or it could have been much less?

**A.** Yes, correct.

**Q.** In any event, we can conclude, can we not, that the injury wasn’t fatal since the child apparently had not died from it?

**A.** Well, the previous injury?

**Q.** Yes.

**A.** Yes. That is right, correct.

**Q.** And your examination of the child’s body would indicate that there have been no previous surgeries, is that correct?

**A.** That is right.

**Q.** So, the old injury had healed without surgical intervention?

**A.** That is correct.

**Q.** And it was your testimony also that the previous old injury, which was evidenced by scarring, was probably a similar injury to the new injury, is that right?

**A.** That would be one explanation. The only explanation in the absence of any type of a past history of appendicitis or generalized infection, the only reasonable explanation was that similar type injury.

**Q.** And you are not aware of any history of appendicitis with this particular infant, is that right?

**A.** No. My background, speaking with the physicians, was that there was no history such as that.

**Q.** Now, it is your testimony that the injuries in the abdominal area of this child would have produced slow bleeding, is that correct?

**A.** Yes, that is correct.

**Q.** And it is fair to say that that bleeding could have extended over a long period of time?

**A.** That is correct.

**Q.** And it could have been a period of more or less than a day, would you say, before it became fatal?

**A.** I think less than a day.

**Q.** It could be close to an entire day?

**A.** Sure. I think that is not a hard and fast rule in terms of numbers and hours.

**Q.** What effect would vigorous CPR treatment have with bleeding and with abdominal injuries?

**A.** Probably little effect, if any.

**Q.** Isn’t it quite likely to have caused additional bleeding or accelerate the rate of bleeding?

**A.** No. It’s very unlikely.

**Q.** This kind of bleeding could have been curtailed naturally, couldn’t it, by blood clotting, something of that nature?

**A.** No. The degree of tearing was quite substantial. I think the only way it could have been controlled would be through surgical intervention.

**Q.** Couldn’t it have been slowed down by clotting?

**A.** Oh, sure. Sure, correct. There would be some natural hemostasis that would go on.

**Q.** What is hemoconcentration? Would that have affected the rate of bleeding?

**A.** Not significantly.

**Q.** Is there an equalizing of the pressure when there is internal bleeding between the body cavity and the vascular system sometimes?

**A.** Terminally, the intra-abdominal pressure may equal or exceed venous pressure but is unlikely to reach arterial pressure.

**Q.** A CPR treatment might exacerbate the flow of bleeding, isn’t that so?

**A.** It’s unlikely but possible.

**Q.** In fact, a CPR treatment could, while restarting the heart, could also exacerbate the bleeding?

**A.** It’s possible.

**Q.** In that situation, there would have to be a very fast surgical intervention, I would assume, to stop the bleeding, in order to save the life of the child?

**A.** Yes, but again, surgical intervention to stop the bleeding before or after CPR would be the key.

**Q.** It would be essential to save the child’s life, would it not?

**A.** That is correct.

**Q.** You testified about the hematocrit drop, and I want to ask you if you had additional questions about that, and could you clarify your testimony regarding how long after the bleeding began you would likely observe a drop in the hematocrit?

**A.** With some variation where you may start seeing the thing taper over a period of several hours. If the bleeding is very slow, it might take 24 hours to see a substantial change.

**Q.** So, at the time that you would have observed a drop in the hematocrit from forty to thirty, the bleeding would likely have been going on about twenty-four hours at that time?

**A.** That is right.

**Q.** In this case, if this was observed in the early morning hours between 2:00 a.m. and 7:30 a.m., it would be fair to say, wouldn’t it, that the injury had been inflicted at approximately 2:00 a.m. the day before?

**A.** No, no. It depends a lot on the vascular tone and supportive therapy that is being given to the child.

**Q.** It could have occurred as much as twenty-four hours before the hematocrit?

**A.** Yes. If you are using that as your parameter, yes.

**Q.** It might have occurred twenty-four hours before?

**A.** That is correct, yes.

**Q.** In any event, the hematocrit would not drop very shortly after this kind of bleeding, is that fair to say?

**A.** No. That is correct.

**Q.** It would at least be a substantial period of hours, is that fair to say?

**A.** Ordinarily this is true, yes. You use other signs besides the hematocrit in trying to assess whether the person is in shock.

**Q.** Doctor, based upon your examination of the body in this case, isn’t it fair to say that there were two separate injuries, one to the head and one to the abdomen?

**A.** Yes. Two separate sites of injury, that is true.

**Q.** And we have very direct evidence here in this photograph, do we not, that shows the head injuries, State’s Exhibit 8?

**A.** Absolutely. That is right.

**Q.** And those injuries to the scalp could only have been inflicted by some kind of trauma, isn’t that fair to say?

**A.** That is right.

**Q.** And that would be consistent with the fall down the hard steps, would it not?

**A.** Yes, it would be.

**Q.** And would you characterize that head injury as substantial, minor, or major, if you can?

**A.** In terms of tissue damage, it is relatively minor, but the correlation between the degree of tissue damage and the neurological deficit is not that clear.

**Q.** Could you explain what you mean by the correlation not being clear?

**A.** Right. The structure function relationship of the neurological damage which is produced doesn’t necessarily correlate with the extent of the injuries on the outside of the head. The type of injury we look for is simply one of a blunt impact injury, and using the clinical condition, a very minor blunt impact injury can produce rather significant neurological damage internally. Then these symptoms that we see here in the photograph, the evidence rather, of head injury might correlate with a fairly substantial shock to the brain, or it might have been minor.

**Q.** Looking at this alone, you can’t determine that?

**A.** You can’t correlate the extent of damage purely and simply on the basis of the outer examination of the hemorrhage, that is right.

**Q.** In this case, in addition to the evidence of bleeding in the scalp area, you also had evidence of swelling of the brain, did you not?

**A.** Yes. Correct.

**Q.** And that would indicate a more extensive head injury, isn’t that true?

**A.** No, not necessarily.

**Q.** But it could, could it not?

**A.** Yes. Correct.

**Q.** And wouldn’t it take a fairly major trauma to the head, or fairly substantial trauma to the head, to produce brain swelling?

**A.** No. It doesn’t really take all that much trauma. Again, the correlation is between the amount of trauma and the amount of neurological abnormalities. It is really not all that clear in terms of joining one with the other. You could have that amount of impact of the head producing some cerebral edema, but I think there may be other explanations for cerebral edema in this case.

**Q.** It is impossible to know what caused that in this case for certain?

**A.** Yes, that is correct. He was within a cardio-impairatory event where it doesn’t take long for a lack of oxygen to cause the brain to swell.

**Q.** So, it is impossible to tell then whether the impact to the head is responsible for the cerebral edema, or whether that is somehow related to the abdominal injury?

**A.** That is correct.

**Q.** Would you tell the jury what a cerebral edema is?

**A.** That is simply a swelling of the brain resulting from injury, whether it be injury remote from the brain or as a consequence of an impact to the head itself.

**Q.** What effect does a cerebral edema have on one’s consciousness? Can it make one unconscious?

**A.** Sure. Usually it’s not so much the cerebral edema at fault, but the injury that produces cerebral edema, the injury producing unconsciousness and subsequent edema.

**Q.** Is it fair to say that the physicians at the Group Health Hospital failed to diagnose a very serious problem in the abdomen in this case?

………………………………………..

**Q.** Is it fair to say that the physicians at Group Health Hospital failed to diagnose a very serious problem in the abdomen in this case?

**A.** Yes, that is true.

**Q.** And failure to diagnose that led to the death of the child, isn’t that true?

**A.** Yes. Correct. The absence of treatment to that area, right.

**Q.** Doctor, having reviewed all the medical records in this case, do you have an opinion whether there were any symptoms or borderline shock within the first four to six hours after the child was brought to Group Health Hospital?

**A.** I have no opinion.

**Q.** Doctor, you have testified that in your opinion the cause of the abdominal injuries in this case was a blunt trauma or blunt impact?

**A.** That is correct.

**Q.** Based upon what you have observed, there is no way for you to know what mechanism caused that impact, is that correct?

**A.** Mechanism?

**Q.** Well, let me give you a more specific question. If there was a person involved, there is no way to know the identification of the person, is there, based upon medical evidence?

**A.** That is correct. Sure.

**Q.** There is absolutely no evidence one way or the other who may have done it?

**A.** Yes. No way of knowing.

**Q.** Additionally, there is no way to know one way or another from the medical evidence whether it was an accident or intentional, referring to the blunt impact, isn’t that true?

**A.** Purely on the basis of medical information, that is right.

**Q.** And you gave the example that in this kind of injury it could be the result of an automobile accident, is that true?

**A.** Yes. Correct.

**Q.** And you said that possibly someone putting a knee into an abdomen, that could be just as easily accidental as intentional?

**A.** Such an injury is unlikely to be accidental, but it’s possible.

**Defense Counsel:** I have no further questions. Thank you.

**REDIRECT EXAMINATION**

**By Prosecutor:**

**Q.** Following up where he just left off, in talking about this kind of an injury being produced in an automobile accident, what kind of mechanism in an automobile accident would you see this kind of injury, or would you expect in this kind of injury?

**A.** Again, usually the child is free in the vehicle to impact an object in the vehicle, whether it be a seat or the dashboard mechanism. There would be other injuries, but this type of an injury we do see in that type of an accidental death.

**Q.** So, in a collision, they could be forced onto a steering column or such thing, is that correct?

**A.** Hurt on the obstructions inside the vehicle.

**Q.** When you are referring to such an accident injury as a knee in the abdomen, that would be with some force, would it not, such as someone falling on something?

**A.** No, no. Simply a fall with the weight of a hundred and fifty pound man, a knee would be satisfactory.

**Q.** With a knee in the abdomen?

**A.** Yes, that is correct.

**Q.** Isn’t that where you have previously seen such an injury?

**A.** Yes, that is right.

**Q.** The man falling on his child?

**A.** That is correct.

**Q.** With his knee in the abdomen?

**A.** That is right.

**Q.** You have indicated that the cerebral edema, and can we translate that as a swelling?

**A.** Cerebral swelling, that is correct.

**Q.** That the swelling would have other possible causes than some kind of a brain injury?

**A.** Yes. Many causes. That is right.

**Q.** Many causes?

**A.** Yes.

**Q.** And one of those causes could be the cardiopulmonary resuscitation, isn’t that correct?

**A.** That is correct. Yes.

**Q.** And wouldn’t that be the most likely cause in this case?

**A.** Yes. Correct.

**Q.** And was the brain swelling that you noted significant?

**A.** No. Essentially mild.

**Q.** You talked about a drop in the hematocrit. What is the normal range of a hematocrit of this age?

**A.** About 39 to 45. I think that a pediatrician would have the numbers a lot more available than I would, but that would be my estimate.

**Q.** When you refer to a percentage drop, measurable percentage drop, after twenty-four hours, what kind of a hematocrit are you talking about there?

**A.** I think about ten mm drops, ten percent.

**Q.** To such as 29 or— (Interruption)

**A.** Yes, 29 or 30, that is right.

**Q.** And would you expect it to be dropping gradually throughout?

**A.** That is right. That is one way that a clinician would monitor the presence or absence of bleeding is to monitor the hematocrit, and if it starts to creep down on you, you may well have a hidden hemorrhage.

**Q.** Do you have an opinion whether the head injuries that you observed upon autopsy to the scalp could have caused the cardiac arrest in this case?

**A.** No. I don’t think there is any anatomical evidence to indicate that the brain was sufficiently damaged to account for a cardiac arrest.

**Q.** So, you don’t believe those injuries could have caused the cardiac arrest?

**A.** No, I don’t.

**Q.** You have indicated, finally, regarding the older injury, that it involved the same area of the body, the same area of the abdomen. Was there any evidence in any of those older injuries of the kind of acute lacerations that you had present in these injuries?

**A.** I didn’t recognize any type of scarring which would identify laceration of the mesentery. I think it would be possible but you could have a tiny laceration which would heal over that wouldn’t be recognized.

**Prosecutor:** I have no further questions. Thank you.

**RECROSS EXAMINATION**

**By Defense Counsel:**

**Q.** Doctor, you just testified that a dropping hematocrit would indicate bleeding?

**A.** Yes. Correct.

**Q.** Would any qualified physician be able to recognize that?

**A.** It would depend upon the clinical context in which he was evaluating the patient. I am saying that I think that the clinical assessment depends a lot more than simply just on number watching.

**Q.** What if the blood pressure were dropping and the pulse were over 200, would those things be indicative of shock?

**A.** Oh, sure, yes.

**Q.** What if the extremities became cool to the touch, would that be indicative of shock?

**A.** You are describing the shock-like syndrome.

**Q.** If you put all these together, would any qualified doctor be able to recognize the child going into shock?

**A.** I suppose he should be able to, right.