

Release Date: Monday, March 29th, 2004

**THE PROVINCIAL COURT OF MANITOBA
Winnipeg Centre**

IN THE MATTER OF:

The Fatality Inquiries Act, S.M. 1989-90, C.30 – Cap. F52

AND THE MATTER OF:

BABY COLLIN DORBER SQUIRE, Deceased
(Date of Death: September 8th, 1996)

**Report on Inquest and Recommendations of
The Honourable Judge Charles N. Rubin
Issued this 24th day of March, 2004**

APPEARANCES:

- Ms. C. Kopynsky, Q.C. - Counsel to the Inquest
- Ms. L. Dorber, in person - for the parents, Liese Dorber and Peter Squire
- Mr. T. Campbell - Counsel for the Physicians, Drs.
and Ms. N. Watson Seager, Patel, Collison, Idiong, Cronin, Caces and Seshia
- Mr. M. T. Green - Counsel for the Victoria General
and Ms. K. Dixon Hospital, St. Boniface General Hospital, Health Sciences Centre, and Winnipeg Regional Health Authority
- Mr. M. Samphir - Counsel for the City of Winnipeg
and Mr. W. Stovel Ambulance Service

[1] From the time of the death of her child, until the 20th of May, 1999, Ms. Dorber had actively inquired, pursued, interviewed and aggressively petitioned and lobbied every person, agency and department who might be of assistance to her in pursuing her desire to have an Inquest called to examine the circumstances of the death of her child.

[2] She was successful in having the members of the Children's Inquest Review Committee consider her loss and the circumstances surrounding it. They unanimously recommended to the Chief Medical Examiner for the Province of Manitoba that an Inquest be held in this matter.

[3] As a consequence of this, the Acting Chief Medical Examiner, Dr. A. Thambirajah Balachandra, MBBS, FRCPC, FCAP, by letter dated May 20th, 1999, directed Ms. L. Stannard, the Director of Prosecutions, that an Inquest be held for the following purposes:

- (i) To determine the circumstances relating to Collin Dorber Squire's death including, but not limited to, the following:
 - Were there indications that Mrs. Dorber Squire's pregnancy involved high risks to the baby?

- Is the Obstetrics Unit at the Victoria General Hospital adequately equipped and staffed to deliver high risk cases?
 - Is it necessary to change the staffing policies of the Obstetrics Unit at Victoria General Hospital? (Example: 24-hour on-site obstetrician; Emergency Department doctors to deliver babies in urgent situations; permission for obstetric nurses to deliver babies in urgent situations; by whom and how soon should newborns be resuscitated and assessed in complicated cases.)
 - To what extent should the decision of the choice of hospital for delivery, whether tertiary or community, be left solely to expectant parents?
 - What is the efficacy of the current system of assigning priority designation of emergency inter-facility transfer of neonates by the City of Winnipeg Emergency Measures Service?
 - Is there a need for the Neonatal Intensive Care Unit at St. Boniface General Hospital to upgrade its facilities to handle complicated cases; such as, severe meconium aspiration syndrome?
 - Are there adequate numbers of neonatal intensive care beds available in the city?
 - Is the policy of the Health Sciences Centre, in particular in the Intensive Care Unit, regarding repair and replacement of equipment, appropriate?
- (ii) to make any recommendations as would serve to reduce the likelihood of death in circumstances similar to those resulting in the fatality subject of this Inquest.

[4] Pursuant to that direction, and the directions of the Chief Judge of the Provincial Court, I met with Ms. Christina Kopynsky, Q.C. of the Prosecutions Branch in the Manitoba

Department of Justice. I reviewed this matter with Ms. Kopynsky, with the information at hand and a copy of a letter written by Ms. Dorber, outlining her concerns and the questions for which she required answers.

[5] I am indebted to the expertise and professionalism of Ms. Kopynsky, who presented this matter on behalf of the Department of Justice. Her assistance in obtaining the witnesses and examining them with respect to their evidence was invaluable and professional in every aspect.

[6] It was agreed that we would be able to proceed with the full Inquest during the months of April, May and June of 2000. The opening of the Inquest was scheduled for March 27th, 2000, in order to record the appearance of those parties seeking standing before the Inquest, as interested parties. Subsequent thereto, the Inquest commenced hearing evidence on the 3rd day of April, 2000, and daily and weekly thereafter until the 29th day of June, 2000 when the final witnesses were heard and final submissions were presented to the Court.

[7] During the course of the Inquest, evidence was obtained from a number of professionals from the health care system that had been involved with the specifics of this particular matter, as well as those who had been active and, in

fact, are called experts within the health care system – both locally and otherwise. Their expertise and opinions were of invaluable assistance in attempting to respond to some of the outstanding issues, and particularly the questions asked by the Chief Medical Examiner in his directions with respect to these proceedings.

[8] Upon the completion of the Inquest, pursuant to section 33(1) of the ***Fatality Inquiries Act***, the presiding Provincial Judge is required to

(a) make and send a written report of the inquest to the minister setting forth when, where and by what means the deceased person died, the cause of the death, the name of the deceased person, if known, and the material circumstances of the death;

(b) upon the request of the minister, send to the minister the notes or transcript of the evidence taken at the inquest; and

(c) send a copy of the report to the medical examiner who examined the body of the deceased person;

and may recommend changes in the programs, policies or practices of the government and the relevant public agencies or institutions or in the laws of the province where the presiding provincial judge is of the opinion that such changes would serve to reduce the likelihood of deaths in circumstances similar to those that resulted in the death that is the subject of the inquest.

[9] It should be noted that, whereas the first part of the section is mandatory in its application, the same legislation

provides for discretion in the Provincial Judge as to the making of recommendations.

Cause of Death

[10] Baby Squire was pronounced dead by intervening medical staff on the 8th day of September, 1996 – approximately 24 hours after the baby had been born. The cause of death, as disclosed in the Report of the Chief Medical Examiner, Dr. P. H. Markesteyn, dated April 8, 1997, was severe hypoxia due to persistent pulmonary hypertension as a consequence of severe meconium aspiration syndrome.

Underlying Facts

[11] The issues and concerns raised in the course of this Inquest were with respect to the birth of Collin Dorber Squire and the course of the neonatal existence subsequent to that birth.

[12] The mother of Baby Squire was 41 years of age at the time of this birth, and this was her third pregnancy. The previous two pregnancies ended in a full term birth in 1994, and a spontaneous loss in 1995. The birth of Baby Collin Squire was a full term 40-week gestation pregnancy.

[13] The evidence and the records would indicate that the pregnancy was relatively uneventful, and that during the course of the pregnancy there was in fact only one episode with the fetus that was of concern. That incident was with respect to a decrease in the fetal movements approximately 3 weeks prior to the actual birth. But there was nothing subsequent to this up to the time of birth and, therefore, no intervening action was taken by the obstetrician.

[14] Ms. Dorber was admitted to the Victoria General Hospital in the early afternoon of September 7th, 1996 following some vaginal bleeding at home earlier in the day. This was of concern to her and as a consequence, she attended at the hospital. Upon being examined at the hospital, she was diagnosed as being in the early stages of labour. She was admitted to the hospital and the process of preparing her for delivery was undertaken.

[15] As a result of the findings by the examining nurse, Ms. Dorber's obstetrician, Dr. M. G. Seager was contacted. Dr. Seager gave instructions to have Ms. Dorber admitted to the Victoria General Hospital and to have her prepared for delivery. The examining nurse also advised Dr. Seager of the momentary deceleration of fetal heartbeat. Dr. Seager instructed the staff to start a course of antibiotics and to keep in touch with her. She

advised that she would be in later on to rupture the membranes to augment the contractions. At that specific time, her labour was described as an early or false labour.

[16] Dr. Seager arrived at the Victoria General Hospital approximately 1 hour and 20 minutes later. She confirmed that the antibiotic had been administered and reviewed the progress of the labour through the charts kept by the attending nurses. At this point, she consulted with the patient and recommended the rupturing of the membranes in order to assist with the progress of the delivery.

[17] At that point, Dr. Seager indicated the concerns which were of issue – that being the maternal age, the fact that the baby was full term, some thick meconium showing, and the two decelerations of the fetal heartbeat. She concluded there was nothing to be gained by not augmenting the labour.

[18] Dr. Seager then examined Ms. Dorber and found the cervix to be dilated and the head to be well enough down that there was no concern about rupturing the membranes. This particular exercise is done by the use of an amni hook, which is a long plastic instrument that looks somewhat like a crochet hook. The membranes are then penetrated and manually

enlarged at the opening, at which point a thick meconium showing was observed in the fluid draining from that area.

[19] Thick meconium is described as meconium that is particulate – that has particles in it, as opposed to meconium that stains amniotic fluid and gives it a green color. Thick meconium is the only meconium that is concerning, and particularly so should it be inhaled as it could cause pneumonitis or an irritation of the lung and subsequently could cause damage to the lungs.

[20] Meconium aspiration syndrome was the major issue with Baby Squire. The management of him during his short life was all related to the treatment and results respecting this often misunderstood, but not infrequent event in newborn babies.

[21] Any time there is a delivery with thickened meconium, the baby needs to be intubated, which involves putting a tube down past the baby's vocal cords and suctioning out any meconium that can be cleared out. This is done once the head of the baby is delivered, and before the rest of the body is delivered to try to prevent any inhalation of the meconium after the baby is born.

[22] In this instance with Baby Squire, once the fluid drained from the membranes, Dr. Seager had placed a scalp clip onto the baby. This is an internal electrode that monitors the fetal heart rate more continuously and more reliably. Dr. Seager then left instructions for the staff to perform continuous monitoring. The concern at that point was that if the labour did not progress in a normal fashion, then the need to deliver by cesarean section would be considered.

[23] At this point in time, Dr. Seager did not view the delivery as a high-risk delivery, so there was no need to transfer the patient to another hospital. What they required was to have someone look after the baby's airway because of the thick meconium delivery. In the doctor's opinion, the Victoria General Hospital had excellent ability to deal with a baby's airway at the time of delivery. They were also equipped to do resuscitation of newborn babies.

[24] Ms. Dorber was being continuously monitored with the internal electrode and the nurses were instructed to call Dr. Seager if there were any more decelerations in the fetal heartbeat.

[25] Dr. Seager indicated that she could not anticipate whether Ms. Dorber would be ready to deliver in an hour or if the

delivery would take place in a number of hours. As a consequence, she left the hospital after having given instructions to the staff to call her should there be any decelerations of the baby's heartbeat, or if labour was progressing to the point where delivery was imminent. She indicated she could be easily reached and would arrive back at the hospital in a very short time.

[26] At 4:52 p.m., a viable male child was delivered with the assistance of Dr. Seager. The baby's head was delivered first, and progress was delayed in order for Dr. Seager to suction the mouth and the nose to be sure that as much meconium as possible was removed. Dr. Seager's observation at this time was that there was very little meconium. The umbilical cord was cut and clamped quickly, and the baby was removed to the warming bed in the nursery by one of the nurses. .

[27] Once the delivery was completed, Dr. Seager cut off a section of the umbilical cord and sent it to the respiratory laboratory to do cord gases. She then assisted with the delivery of the placenta and continued to tend to the mother, Ms. Dorber.

[28] The anesthesiologist Dr. Patel was then responsible for Baby Squire until the pediatrician arrived. He continued to work at cleaning out the baby's airway.

[29] At this point, Baby Squire was approximately 12 minutes of age, was grunting and in-drawing, and his oxygen saturation was relatively low. The baby was being given oxygen in the nursery via an oxy-hood, which was a more reliable method of delivering a higher concentration of oxygen to the baby at this point.

[30] The pediatrician Dr. Collison had been contacted earlier and advised of the situation. He gave instructions over the telephone for a chest x-ray and blood work to be done on Baby Squire. Upon his arrival at the hospital, approximately 50 minutes after the delivery, he was updated on the status of the mother and baby before proceeding to the nursery to exam Baby Squire. Dr. Collison then immediately called for the neonatal transport team.

[31] The pediatrician Dr. Collison then worked with the assistance of Dr. Patel to stabilize the baby by using intubation and hand ventilation. This process continued with the oxygen level of the baby rising to 90%, with the assistance of the hand ventilation, which appeared to be stabilizing Baby Squire.

[32] The neonatal transport team called for by Dr. Collison did not arrive until 2 hours and 22 minutes after the baby was born, and 1 hour and 32 minutes after it had been requested.

[33] Approximately 3 hours and 8 minutes after the neonatal transport team arrived at the hospital, they had a diagnosis of the problems of Baby Squire as meconium aspiration persistent pulmonary hypertension of the neonate and congenital heart disease, or sepsis. The decision was made to take the baby to the St. Boniface Hospital and the team arrived there 14 minutes after leaving the Victoria General Hospital. At this point, the baby was 5 hours and 44 minutes of age.

[34] The records show that after Baby Squire was admitted to the St. Boniface Hospital, Neonatal Intensive Care Unit, he received standard treatment for a baby with severe lung disease and pulmonary hypertension. This included a chest tube and aggressive hyperventilation.

[35] Eventually the situation was evaluated by a resident neonatologist who concluded that the hypoximia was intractable and that the baby should be referred to the Children's Hospital for a new procedure known as NO therapy nitric oxide. This decision was made 9 hours and 35 minutes after the baby had arrived at the St. Boniface Unit, and 13 hours and 13 minutes

after the transport team had arrived initially at the Victoria General Hospital.

[36] At the Children's Hospital, the nitric oxide therapy had no effect on the oxygenation of the infant and the eco-cardiogram which was taken at that time, ruled out any structural heart problems. Subsequently, at 13:30 hours on September 8th, 1996, a decision was made with the parents to cease intensive care of Baby Squire.

[37] Consent was given by the parents for a partial autopsy to be performed regarding an examination of the lungs. The autopsy was done in Winnipeg and was reviewed in Houston, Texas, USA, by a consulting pathologist with consistent analysis and conclusions. The findings showed changes of severe meconium aspiration and increased muscularization of the perfol blood vessels of the lung. This is theorized to be the explanation for the pulmonary hypertension experienced by some neonates with severe lung disease.

Expert Evidence

[38] Many of the quotes that I will refer to within this Report will be directly from the transcripts of the evidence that

was presented at the Inquest by the various professionals who were canvassed respecting this matter.

[39] The following quote comes from the evidence of **Dr. S. Menticoglou**, an obstetrician since 1982, on staff at the Health Sciences Centre in 1987, and Head of Clinical Obstetrics at the Health Sciences Centre at the time of this Inquest.

If you were going to pick a time during the course of labour when the fetal heart rate tracings indicated a heart rate drop, then you would say it is most likely this baby would have aspirated meconium if it occurred during labour, then one would say the likeliest time may well have been in the last 30 minutes. - - - I would have qualified that with if it had occurred during labour because it's known that many cases of meconium aspiration have their genesis before labour starts.

. . . . but for quite a number of years there had not been a death ascribed to meconium aspiration of a baby that had actually been born at the Health Sciences Centre.

At the time the practice at the Women's Hospital, Health Sciences Centre was that if during the course of labour there had been the passage of thick meconium; what is thick meconium to one nurse or

doctor may not be thick to an other nurse or doctor , there is no objective way to decide this, but if during the course of labour there has been passage of thick meconium, it is - - the practice at that time (fall of '96), was to ensure that a nurse from the pediatric side of the nursery plus a doctor, either a resident or a fellow or an attending, but a pediatric doctor, be present or try to be present at the delivery.

One wants to have somebody present at the delivery who can take care of the baby's airway, if this thick meconium is blocking the windpipe or the mouth.

In other hospitals - - it is not my understanding that it is required that a pediatrician be present for all cases of thick meconium.

It has always been one of the understandings of an obstetrician's training that he or she may have to look after the baby for the first 10 or 15 minutes if the baby unexpectedly came out in bad shape.

I suspect the reason that other places it is not the custom to have a pediatrician present at all cases of thick meconium is that the cases of thick meconium are far, far, far more numerous than actual bad outcomes.

And the expectation is that part of the obstetrician's training is that if unexpectedly the baby comes out bad that for the first 5 or 10 minutes the doctor could take care of the baby until experts did arrive.

But to have an obstetrician in place for 24 hours a day is the required practice in tertiary care hospitals.

I didn't think the presence of thick meconium alone with the normal tracing was reason enough to go to a bigger hospital - - if you undertook to transfer to a bigger hospital you may end up with a worse situation when delivery is imminent.

I don't think I would have done anything different as an obstetrician. That in terms of the care obstetrically, I don't think I would have done anything differently.

[40] The issue was raised with the witness as to whether or not there are any procedures presently known to identify meconium in the uterus prior to birth. The witness responded as follows:

There are two ways you could detect meconium before labour. Both somewhat invasive. One technique is that many years ago people were doing or still can do, is you can do an amniocentesis. You can put a needle through the abdominal way into the uterus and get

fluid from around the baby and see if there's meconium there. The second method that was in vogue for many years in the late fifties, early sixties, was a technique called amnioscopy, where you introduce like a cone shaped plastic device into the vagina. It has a narrow end and you introduce it through the cervix and you look with a light through and you can actually see the membranes when put directly up against the membranes, an observation of whether meconium is there can be made. Neither of these methods apparently are used at the present time. It was thought for a time if meconium was seen in the water around the baby, that it reflected a baby that was in trouble and was having low oxygen levels, or that might be about to have some catastrophe happen to it. So meconium had this terrible implication that this is a baby that's already in trouble. And so attempts were made to see if there was a way to get the baby out. - - - It is no longer thought that the passage of meconium in itself, in a baby at term actually is a sign that the baby is low on oxygen or is about to be in trouble. It is thought, however, that meconium is bad in the sense that if the baby aspirates it around the time of delivery, that can be bad for the baby. The shift in opinion has now directed itself to see if thick meconium during labour that you don't want the baby to aspirate this and get it into its lungs.

QUESTION: In a great number of cases, the babies clear the meconium out of their lungs in a natural process and eventually recover from that little setback after birth and carry on very well, in the large majority of cases.

RESPONSE: That's correct. What puzzles doctors in this situation is why in most cases, the great majority of cases, nothing bad seems to happen to the baby when aspiration takes place, and why in the odd baby it kills the baby. It's a puzzle.

There is a suggestion that what obstetricians should do is during the labour introduce a plastic catheter through the vagina into the cervix above the baby's head into the uterus and through that plastic catheter inject a litre or so of sterile salt water or water to actually dilute the thickness of the meconium. There is an opposite view, of course, suggesting that the difficulty with that is, you might be doing this 100 or 200 times to prevent one bad outcome, and if you do something a couple of hundred times you may get complications far greater than the problem you're attempting to resolve.

With a thick meconium show, the goal is to prevent the baby from aspirating it or getting it into the baby's lungs. If the baby has already aspirated into its lungs, it is difficult to get it back out. However, in many

cases, the baby's mouth and nose may be full or clogged with this thick mucus or thick meconium and as the baby comes out and takes its first breath and breathes in, this meconium in its mouth and nose may go down into the windpipe. If there has been thick meconium, as soon as the baby's head is delivered, but while the rest of the body is still in the mother, as soon as the head is delivered, a plastic catheter into the mouth and into the nostrils and suction out what might already be in the mouth and nose. By putting in a tub in the windpipe and the larynx, the physician has an opportunity to see if there is any meconium in the windpipe and also to remove any meconium with suction that may be in the windpipe. This is an attempt to prevent meconium from going into the lungs.

[41] Dr. Menticoglou also indicated

At no point would the vast majority of obstetricians have said we have to do a cesarean section or put on forceps or deliver this baby any sooner.

[42] The advice and opinion was sought and received from **Dr. Michael L. Marrin**, Associate Professor, Pediatrics at McMaster University and Director of NICU at Children's Hospital, Hamilton Health Sciences Corporation, and is a noted neonatologist with extensive experience in neonatal care.

[43] As well, the advice and opinion of **Dr. David C. Young** from the Department of Obstetrics and Gynecology at the Dalhousie University in Halifax, Nova Scotia was solicited. Dr. Young's expertise is in the area of obstetrical management leading to birth, and his opinions are based on a review of the documents that were forwarded to him, which had been filed as exhibits at this Inquest.

[44] Reviewing the obstetrical care given to Ms. Dober, Dr. Young indicated:

However, in mid August 1996 because of decreased fetal movements, she visited the Emergency Department at the St. Boniface Hospital, had a fetal bio-physical profile carried out where the antenatal record indicates a scoring of 8/8 obtained. There is nothing unusual in this antenatal care.

After careful review, I believe the medical and nursing care provided at the Victor General Hospital's Family Birth Unit met the standards practiced in Canada for labour and delivery of a 41 year old G3 following the passage of thick meconium.

Meconium aspirations syndrome of this severity is rare and tragic. I do not believe that the intrapartum

clinical findings and fetal heart rate tracing would have warranted a cesarean section at any point during the labour, and if cesarean were considered in the last 20 minutes prior to birth (which I don't), vaginal birth would have occurred before a cesarean could be done in most units.

There was obviously a tragic outcome, but one which I am not sure could have changed by any form of intrapartum management known at present.

The level of care documented in the hospital record from the Victoria Hospital would not have been exceeded in the vast majority of labour and delivery units across Canada. Nursing care is well documented by frequented notes which reflect fetal status and uterine activity on the fetal heart rate tracing record. Continuous presence of a physician, in particular of an obstetrician, would be available in very few tertiary units across the country.

[45] **Dr. Susan Maxine Phillips** had been a Section Head of Pediatric Pathology since 1993, and was Assistant Professor for the Department of Pathology and Department of Pediatric and Child Care at the University of Manitoba. She was also a member of a number of committees who reviewed issues that subsequently became the subject of the Perinatal Morality Review Committee of the Health Sciences Centre, and which passed its

information onto the Perinatal Maternal Welfare Committee of the Province of Manitoba.

[46] The Pediatric Mortality Review Committee would pass issues to another committee in the College called the Pediatric Death Review Committee. All of these Committee's findings and conclusions were passed onto the Children's Inquest Review Committee. This Committee is a multi-disciplinary committee chaired by the Office of the Chief Medical Examiner to discuss all medical examiner cases that the Office of the Chief Medical Examiner has undertaken to investigate. The purpose of that Committee is to assist the Chief Medical Examiner in deciding whether an Inquest should be called, or what disposition should be taken by any of the cases.

[47] Dr. Phillips performed a limited autopsy on Baby Squire and, for the benefit of the Inquest, produced an anatomical diagram of the issues that would subsequently be discussed relative to the autopsy on the lungs of Baby Squire. This diagram was of great assistance to the proceedings as Dr. Phillips went on to give the Inquest some basic anatomy about the lungs in order to understand the meconium aspiration syndrome. She described this as follows:

First of all, cells and organs of the body require oxygen in order to function properly. That oxygen comes from the environment, we breathe in the oxygen through our lungs. There's an exchange in the lungs between the air space of the lungs and the blood, and the blood gives off a by-product in metabolism called carbon dioxide or CO₂. That exchange takes place within the lung. The oxygenated blood from the lung goes to the heart and then from there, it's pumped to the rest of the body. And that's how all the organs and cells of the body acquire oxygen to function properly.

The air is inhaled from the environment through a system of first of all larger tubials, or tubes, the larynx, the trachea, and then smaller and smaller branching bronchial tubes. Eventually the air is taken into a grouping of small out pouchings or balloons off the side of these very small branches. This grouping is called an acinus, each individual little balloon is an alveolus. This is the only place where gas exchange takes place. The more proximal or larger airways as you move back up towards the mouth are only used for conducting air.

Capillaries are the very smallest branches of arteries with the very thinnest walls and are found between the alveoli. Capillaries carry poorly oxygenated blood, or deoxygenated blood to the lungs. So when you breathe out, you are getting rid of the carbon dioxide

which is accumulated in the alveoli and exhaled. When you breathe in, you are bringing in fresh air that is carbon dioxide poor and oxygen rich. The oxygen moves across these capillaries, then leaves the lung and they are oxygenated and go to the heart. The heart pumps out oxygenated blood around the body.

After birth, the right side of the heart is responsible for pumping deoxygenated blood to the lungs, and it comes back to the left side from the lungs, and then the left side of the heart pumps it into the rest of the body.

This happens with each inhalation/exhalation that occurs in millions of these little bubbles throughout the lungs on both sides. It is a very efficient process because there are millions and there is lots of reserve capacity. So if a few of these are knocked out for whatever reason, there are many more to take over the function. If oxygenation in the blood is impaired in some way, hypoxia or anoxia or asphyxia, which are used interchangeably, simply means poor oxygenation of the blood and subsequently poor oxygenation of the organs. And if the inspired air is poor in oxygen, then you are going to have hypoxia.

The bellows action of the respiratory muscles, which are the chest muscles that allow the chest wall to move in and out with breathing, can also be impacted

by how well oxygenated the blood is. If the muscles are weakened from fatigue, which can happen in a small infant who is struggling to breathe, possible fatigue very easily can impair the bellows action.

In utero the placenta takes the function of the lungs. There is not an exchange of air per se, there is an exchange of oxygen within the mother's blood. The mother breathes in the oxygen – the oxygen enters the blood system of the mother. It reaches the placenta by the uterus and this same sort of exchange occurs within the placenta, so that the exchange would occur between the mother's blood and the baby's blood via the cord. The cord takes the oxygenated blood from the placenta through the baby and bypasses the lung almost entirely. The lungs do not function as a gas exchange organ in utero. So the mother is doing the breathing for herself and for the baby through the placenta.

At the time of birth, the transition from in utero to extra utero (out utero) an existence that requires the transfers of this gas exchange function from the placenta to the lungs. Baby's first breath gets rid of fluid within the lungs. So the blood is able to flow through the lungs, the connection will close almost immediately, so the blood is no longer diverted past – the right heart is now functioning as a pump – to pump all the blood through the lungs so that the two

systems are now – right and left heart are now functioning as they would in an adult.

Meconium aspirations syndrome is just a constellation or a set of findings that are related to each other. In this case, it is a respiratory distress or troubled breathing related to or associated with meconium aspirations. Meconium is the normal intestinal contents of a baby – stools, if you will. Sterile combinations of mucus, amniotic fluid, sloughed cells from the gut.

Throughout the baby's development, this meconium gradually fills more and more of the gut, so at term, the baby has meconium far down in the gut near the rectum and has developed the musculature and the neuro system to allow it to defecate. Should the baby defecate outside, that does not cause any problems. However, should the baby defecate in utero, it can pass into the amniotic fluid and you get meconium staining or meconium passage.

The passage of meconium can be any situation that causes hypoxia of the baby. It can be very brief and inconsequential, or it can be very severe. In later gestation, the baby breathes amniotic fluid in and out continually during its development. It is very important to lung development so that they do have breathing efforts. However, in the presence of

asphyxia, that can be exaggerated and they can make larger and more frequent efforts to breathe, so that culmination of passing meconium and fetal gasping may lead to inhalation of the meconium. You need the breathing movements to get the meconium into the lung.

The syndrome implies a respiratory distress of some sort, and that can be very mild and easily treatable to very severe and cause death. Very few babies who have amniotic fluid meconium actually become ill with it, and very few of them actually die.

Asphyxia needs to be severe enough to not only induce the passage of meconium and the gasping, but also has to actually damage the lung in order for meconium to have a detrimental effect and for the whole meconium aspiration syndrome to evolve.

This is discernable in autopsy by virtue of the presence of alveolar damage, which would certainly start in utero and would have continued after birth, indicative of some sort of asphyxial event severe enough to embark upon all the problems that he would have had, culminating in respiratory distress. It needs to be an episode – either repeated episodes or a chronic or single episode large enough to damage the lung.

The findings are that generally only a certain percentage of babies that pass meconium are asphyxiated and will develop the full blown syndrome. Those babies also appear to have alverolar damage.

[48] The diagnosis and opinion of Dr. Phillips was confirmed by Dr. Clare Langston of the Balor College of Medicine at the Texas Children's Hospital in Houston, Texas, whose specialty was pediatric/pulmonary pathology.

Chief Medical Examiner's Questions

1. Were there indications that Ms. Dorber Squire's pregnancy involved high risks to the baby?

[49] Within the guidelines of the College of Physicians and Surgeons of Manitoba, there is a section entitled "Pregnancy After 35 Years of Age". The currency of this particular document was March of 2000.

The proportion of births in women over 35 years has increased from 7.6 percent in 1989 to 9.5 percent of total births in Manitoba in 1994. Although there is no obvious age cutoff at which a woman becomes more susceptible to pregnancy complications, the age of 35 has previously been used, especially when referring to women pregnant for the first time.

In women over 35 years of age, there is an increased incidence of hypertension, gestational diabetes, intrauterine growth retardation (IUGR), macrosomia and preterm delivery. The fetus is at an increased risk of chromosomal abnormalities and stillbirth with increasing maternal age.

[50] Three of the experts previously referred to in this Report whose opinions were sought, were of great assistance in assessing and determining the issues that were raised herein. Their conclusions were that there was nothing unusual in the antenatal care afforded the mother.

2. Is the Obstetrics Unit at the Victoria General Hospital adequately equipped and staffed to deliver high risk cases?

[51] From the information obtained from the various witnesses it is obvious and practical, in light of the urgent requirement, to assign health care funds in the most efficient manner, that only two Winnipeg hospitals would be staffed, equipped and be assigned the responsibility for dealing with high risk pregnancies, as they have within them the neonatal intensive care units for this very purpose.

[52] It is an obvious given that a community based hospital would not and could not be expected to have the same facilities and staff that the tertiary hospitals have in relation to this matter.

[53] The birth at issue was a normal and ordinary delivery until at the moment of delivery the advent of thick meconium became an issue, and accordingly, became the factor that required emergency care. The care given and the personnel available were reviewed by the experts with the same conclusion – that the Victoria General Hospital provided the standard of care equal to any community hospital that were within the knowledge of the experts and their experience.

[54] There was a concern that the obstetrician who eventually attended on the delivery of Baby Squire was not at the hospital but was on call, and that situation could be remedied by an obstetrician or pediatrician being available on a 24-hour basis. The evidence was that in community hospitals of this type, that remedy was not a given. In this particular instance, the doctor who was on call did arrive within 30 minutes, attended to the delivery, and within 5 minutes after arriving, the birth took place and the doctor proceeded to aspirate the meconium show from the infant before completing its delivery.

[55] Upon delivering the baby, the doctor then turned the baby over to the staff anesthesiologist who was present throughout and waiting to attend to the baby, should it require assistance. The assistance was given, the baby was intubated and whatever meconium was observed was then removed. However, it was significant that the anesthesiologist who attended to the baby did not see any meconium in the deeper recesses of the lungs and thorax, which he had observed carefully.

3. Is it necessary to change the staffing policies of the Obstetrics Unit at the Victoria General Hospital?

- (Example: - 24-hour on-site obstetrician;
- Emergency Department doctors to deliver babies in urgent situations;
- Permission for obstetric nurses to deliver babies in urgent situations;
- By whom and how soon should newborns be resuscitated and assessed in complicated case.)

[56] The previous review of the information has responded to a number of parts of this question. However, it is obvious that if one were to satisfy the requirements as outlined in that particular question, it would become readily apparent that community hospitals are not, and have not been, staffed in a

fashion that would comply with or satisfy that inquiry. Community hospitals, by and large, do not have 24-hour on-site obstetricians. In this particular case, the anesthesiologist was on hand and responded to the needs of the obstetrician with the intubating and suctioning of any meconium that might have been missed by the obstetrician's actions. Neonatal services are only available at two tertiary hospitals in the City of Winnipeg, as described.

[57] However, it is recognized that the birthing process, in most instances, is a normal and natural event. Statistical information available at the time of this incident and more recently, confirm that births of the nature encountered in this situation were a rare exception to the general experience in Manitoba.

4. To what extent should the decision of the choice of hospital for delivery, whether tertiary or community, be left solely to expectant parents?

[58] In practical terms it is generally the physician, in consultation with the patient, who ultimately determines the site of delivery. It is generally based on the physician's assessment of the individual patient risk factors, the compatibility between the patient's needs and institutional resources, the physician's pattern of practice, and the physician's evaluation of the margin

of safety intrinsic to the institution. The fluidity of site selection is dictated by the experience and may be altered with the appearance of new risk factors, as determined in the prenatal period.

[59] The other issue discussed and reviewed was the clarity and availability of information and printed material from the Victoria General Hospital. Of course, one must keep in mind that the mother had an uneventful and successful delivery of her first son two years earlier at the same hospital without problems, despite a long labour and some meconium staining. She chose the same hospital for the delivery of her second baby.

[60] It has long been the established practice for the Victoria General Hospital to provide prospect patients with a detailed description of its routines of care for the mother and the newborn baby, as well as the postpartum patient. They would also provide explanation and clarification of the issues of concern to the patient.

[61] In light of the College of Physicians and Surgeons of Manitoba's "*Recommended Standards for Hospital Resources, Maternal and Newborn Care*", under the heading "*Ethical*":

Each facility must recognize both the extent and limitations of services offered, inform the community, serve and thus empower individuals to make their own decisions regarding venue of care.

Neonatal Transfers

[62] We have learned from Dorian St. Clair-Ince, who was the current Program Manager of Women's Health at the Victoria General Hospital in September of 1996, that in terms of staffing for the Birth Centre, there was no in-house obstetrician but the pediatricians were always on call. As well, there was an emergency room doctor and an anesthetist that were in-house.

[63] The protocols in place for Victoria General Hospital indicated there were occasions where the emergency room doctors were called to assist in the delivery room. This was not so much as with respect to the delivery of a child, but more than likely for postpartum hemorrhaging by the mother.

[64] It was also indicated that if delivery is imminent and the physician had not yet arrived, the nurse may or may not have to deliver that baby. In the event that the summoned physician does not arrive in time, the medical house officer is on standby. The emergency room doctors are aware that they might be called

upon if things are happening quicker than the obstetrician can respond to.

[65] In the period of time that we are referring to, the Victoria General Hospital annually delivered approximately 1900 babies. A very small proportion of those children were transferred out of the centre by way of the neonate transport team – the proportion was approximately 2% per year. However, in the year after that, there were 20 transfers, which is roughly 1% out of 1900 births. It was explained that the nurses have been trained and are now more skilled in attending to the needs of neonates, which means that the hospital is keeping more babies at the facility instead of transferring them. The trend is being reversed as a consequence of the improved training that the nurses receive.

[66] The observed difference in perinatal mortality rates between tertiary and community hospitals are, to a large degree, the result of screening patients by perceived risk. The higher prenatal mortality rate at the tertiary hospitals is an indication of appropriateness of this process and not an indication of lower quality of care at the tertiary hospitals.

[67] The review of the process in initiating a neonate transfer team response to any given situation determines that,

from the protocols of the Victoria General Hospital, a pediatrician's written, verbal or phone order is usually required prior to transfer. In an obviously urgent situation a pediatric consultation is not required, and the anesthesiologist or family physician may order the transfer. The physician will make arrangements with the receiving facility unless the transfer is by the neonatal team.

[68] In answer to whether or not a nurse can call the neonatal team, the response was – yes – the nurse can and often does make the call, but it is usually with the doctor's order. It was further qualified as follows:

If the nurse suspects that a baby needs to be transferred, she can do that prior to getting in touch with the doctor. She may have put a call out for the doctor, but if the baby is really sick she might say – well, this baby definitely needs to be transferred so she'll talk to the neonatal team prior to that.

A medical decision is sometimes made by a nurse on behalf of the attending physician. On occasion, nurses can initiate a call for the Neonatal Transfer Team, which is generally subsequently confirmed by the attending physician as well. As a consequence, the call is prioritized by the transport team.

[69] The protocol further indicates that it usually takes the team 30 minutes plus traveling time to arrive at the facility. At night it takes about 30 minutes longer as the pediatrician has to be called in. Following the protocol further, it directs that the following procedures should be performed on the neonate prior to the team's arrival:

- a. blood sugar and CBC;
- b. chest x-ray;
- c. blood gases;
- d. photocopies of the patient's prenatal sheet, labour and delivery records, the infant's chronological records, copies of the lab reports, chest x-ray films and relevant information;
- e. 10cc of maternal blood in a plain red cross tube accompanied by an addressographed group and hold form with the signature of the person drawing the blood; the requisition should otherwise be left blank.

[70] Further to the above, there is also a list of eleven different conditions which require the presence of the neonatal team. The most significant one in this particular instance was **"11. any condition that renders the neonate critically ill"**, which was the situation in this case.

[71] Upon assessing and determining the condition of Baby Squire, the attending pediatrician Dr. Collison made the call from

the Victoria General Hospital to the Neonatal Transfer Unit at the Health Sciences Centre. The information transmitted with respect to the respiratory distress was the referral reason given by telephone.

[72] The transport team is then mobilized and generally has a target standard of mobilization within 45 minutes of the call. The nurses in the unit then attempt to rally all the other team members within the prescribed time. The doctor who is on call for a 24-hour period is then summoned. That doctor is generally at home, but immediately available and proceeds directly to the hospital to assemble the team. Often the decision to assemble the team is made in advance of the decision to transport so that the running start, so to speak, of the team has begun.

[73] Depending on what time the call is received, the nurse or physician receiving the call may decide to call in staff who are at home and scheduled to begin their 12-hour shift in the subsequent time. The purpose of this is that staff on shift may, for reasons of fatigue, be advised to continue their shift in the unit rather than attending to a call, and the next shift is called in early. The shift changes are usually at 7:30 p.m. and 7:30 a.m. The call for the transport team on September 7th, 1996 originated at approximately 6:00 p.m.

[74] The transport service being the ambulance service was then booked for a specific time, allowing the assembly time to take place. The team then began to assemble the various pieces of equipment that would be required for the transfer of Baby Squire from the Victoria General Hospital to a hospital designated by the physician.

[75] The transport equipment included the unit's large stretcher, which is equipped with an isolate or an incubator. There is also a ventilator and other equipment and material such as the medication box.

[76] The attending ambulance is required to leave their stretcher equipment at the unit and load the team's equipment onto their ambulance for the call. It was also explained that after making the call and completing the transport of a neonate, they will subsequently have to return to the unit to retrieve their stretcher and equipment before they can make themselves available for further service.

[77] A great deal of time was spent in determining exactly the designation and priority system within the ambulance service. In capsulated form, we were advised that with special arrangements for neonatal transport and billing purposes, the

calls were recorded as a Code 2 call, (which is not an urgent call) but was dispatched as a Code 3 call, which requires prompt response – no lights or siren. The more serious calls are treated as Code 4, which are designated as urgent response – all lights and sirens. Code 3 would be appropriate in most neonatal transfers because, by and large, these are transfers from a medical facility to the tertiary hospital and neonatal unit.

[78] In this instance, Baby Squire was in hospital being attended by physicians and in their care. As a consequence, he had all of the hospital's facilities available for treatment at the particular moment the call was made.

[79] The reason given for not using a Code 4 call (the most urgent), was that except in very extreme circumstances, it is an inherently dangerous procedure both for the personnel in the ambulance and the baby being transported. It was stated that it never saves a significant amount of time, but contributes to the distress of the child because of the noise and roughness of the ride. It also inhibits making proper assessments of the patient while en route. It was also explained, the addition of speed, noise and vibration, the chances of losing the monitoring equipment which would be critical as a consequence of the shaking, vibration and jostling, affects the accuracy of the assessment of what the child's system may or may not be doing.

Accordingly, except for visualization of the child, a really close watch of the baby's condition is made very difficult.

[80] The referring hospital generally has personnel assemble all of the relevant information respecting the mother's prenatal charts and records of the treatment and progress of the child while at the referring hospital. As well, they collect the baby's charges and all other material generated at the referring hospital – which is the Victoria General Hospital in this instance. They have this available to be carried by the transport team to the referred receiving hospital. If the receiving hospital is known at that particular time during the dispatch, the hospital is then alerted to the particulars of the transfer, and as much information as possible is communicated to them in order to assist in their readiness to receive the patient.

[81] In the course of giving evidence by one of the nurses who had been on duty at the time in the NIC Unit at the Health Sciences Centre, it was determined that she was certainly aware that inhaled nitric oxide trials were taking place at the NIC Unit at the Health Sciences Centre, but were not available at the St. Boniface Hospital. However, as determined subsequently, the decision to treat with inhaled nitric oxide is a medical decision that was left to the transport doctor to discuss with the attending neonatologist following the assessment of Baby Squire.

[82] It is generally understood that if the attending neonatologist had wanted to speak to the physician at the referring centre, that advice would only be given on request, since there was in fact a pediatrician present at that time. Therefore, advice was available if requested.

[83] The second transfer of Baby Squire which resulted in a move from the St. Boniface Hospital to the Health Sciences Centre, was accomplished in a more timely fashion. The ambulance was called for at 8:39 p.m. and arrived at 8:50 p.m. – a matter of 11 minutes. This was partially accomplished by virtue of the fact that on Sunday mornings, the ambulance service is not generally quite as busy as other times during the week. However, again the ambulance did not respond on a Code 4 routing, mainly because Baby Squire was being cared for at that time in a tertiary care centre – the St. Boniface Hospital. A Code 4 dispatch would not have made any significant difference in the treatment that Baby Squire was receiving at that time, nor in the time that it took to arrive, which was only 9 minutes from departure.

[84] Upon arrival at the St. Boniface Hospital, the team made a visual assessment of Baby Squire. They received the report from the caregivers, and determined that the baby was

critically ill at that time. It was important for the team to move carefully and swiftly as they proceeded to disconnect some of the equipment that was connected to Baby Squire at the St. Boniface Hospital and transfer all of the monitoring equipment to their own stretcher and replace that connected equipment with their own.

[85] The issue that presented itself with respect to this transfer was that the ambulance was equipped with a mechanical ventilator, but one that has only a limited rate of speed that it can deliver breaths. Because the jet ventilator was used at the St. Boniface Hospital, the transport ventilator equipment was not ventilating that quickly.

[86] As a consequence, the team made the decision that they could ventilate more effectively by using a manual bag ventilation versus the mechanical one that was available. Although this is a more arduous and tiring procedure for the team, these decisions were made based on the exigencies of the moment.

[87] A jet ventilator within the ambulance would be difficult. The machine is of substantial size and cumbersome, which makes them impracticable for transport purposes.

[88] The purpose of this last transfer was to take Baby Squire to the Health Sciences Centre in order to utilize the nitric oxide therapy that was available only at that centre. The question, of course, was raised as to why the nitric oxide could not be brought to the St. Boniface Hospital to be used on the baby. It was pointed out that from a practical standpoint, the nitric oxide canisters are rather large and awkward to handle. As well, because it is a volatile gas, it creates a further risk in transport from one treatment centre to another.

[89] Fortunately, the trip was uneventful and Baby Squire arrived without any further deterioration as a result of the trip to the NIC Unit at the Health Sciences Centre. This was a Code 4 call – a lights and siren trip specifically because it was short and there was a substantial urgency.

[90] When the transport team arrived at the Health Sciences Centre, they went straight to the ward with no stops in emergency whatsoever. It was a direct admission. The receiving nurse was anticipating the admission and, as a consequence of prior advice from the unit by phone, knew what equipment would be required – how many pumps, how many transducers, etc. – and had these waiting for the arrival of the transfer.

[91] There is generally very little communication en route with such a transfer, unless something significant is required. Once a child is delivered to the NIC Unit, the responsibility becomes that of the staff and in-house neonatologist.

[92] Subsequently, the Inquest heard from Susan Roberts, who was the nurse coordinator for the neonatal transport team on September 7th, 1996, and had been in that position since 1983. The program itself was initiated on July 15th, 1981. She worked directly with the Medical Director for the program – Dr. Roberta Caces. The advent of the program and their goal was to assist hospitals in referring neonates to the centres to be able to be mobilized as quickly as possible, and in as good a condition as possible by having the hospitals do what they could in terms of stabilizing the child prior to transport.

[93] Essentially, this means that the program was basically to provide better stabilization at the referring hospitals prior to the baby being transported, and the transport of the baby in a more stable condition.

[94] Part of the goal was to provide technology to the referring hospitals with respect to transfers that had not previously been available. Another one was to provide educational opportunities for the staff at the referring facilities as

to their role on site prior to transport. This was done by including the referring hospital staff to work with the NICU Neonatal Transport Team and observe and assist in the procedures.

[95] This subsequently resulted in a formal outreach program which involved the actual attendance at referring hospitals by the Nursing Director and Medical Director, and the providing of education sessions with the staff, as well as reviewing case studies and the management that occurred during transport.

[96] The program is such that it is run independently of the two NIC Units, two tertiary care units and ongoing reviews of charts from transport programs, evaluations and assistance from referring hospitals on evaluations are an ongoing activity.

[97] Another part of the goal was to provide sufficient medical staff so that the 24-hour period could be covered completely on an ongoing basis, with a backup team available should a transport come at the same time as the initial transport team was involved. The team was then made up of one nurse, one doctor and one respiratory therapist. The limits in this regard were dictated by the availability of space – whether it be ambulance, air ambulance or otherwise. But the team could

vary according to the needs of the patient. Where the patient might not have respiratory issues, the respiratory therapist would not necessarily be required to participate.

[98] The Inquest also heard from representatives of the City of Winnipeg Emergency Response Service, which is a blend of the Fire and Ambulance Departments. There is a Staff Inspector of Communications responsible for all aspects of communication, as they relate to the Ambulance Communication Centre and the ambulance communication process, including dispatch and record keeping.

[99] At the time of this Inquest, the communication operators were divided into four platoons with three operators each. They worked 12-hour shifts – 2 day shifts followed by 2 night shifts, followed by 4 days off. There is always one platoon working a day shift and another working a night shift.

[100] Comprehensive records are kept and computer generated recording time of dispatch, time of arrival and so forth. The incident number is generated automatically by a computerated dispense system on a sequential basis.

[101] All of the ambulance units' staff physically input information into the computerated dispatch terminal by

activating various status buttons contained within the radio system of the unit. This puts the system on a 24-hour around the clock record.

[102] When the ambulance crew transports a patient to a hospital, they will transfer responsibility for the patient to the hospital staff. Once this has been accomplished, they make up their stretcher and put their ambulance in dispatch order, replacing any equipment or supplies that they may have used, thus becoming ready for further dispatch forthwith.

[103] The only delay that may occur is when the dispatch is a neonatal one. This is where the neonatal team provides its own stretcher and the ambulance stretcher has to be removed from the ambulance by the neonatal crew and left at the pick up site to be recovered later, before they can return to service.

[104] In September of 1996, the City of Winnipeg had 10 ambulances working 24 hours a day. At the time of this hearing – June 12th, 2000, the City still had only 10 ambulances working 24 hours a day.

[105] A shortcoming of the system was determined by virtue of the status sequence for arrivals and departures of the ambulances from activity as the vagaries of the radio system and

radio interference sometimes caused a lack of recording certain information.

[106] There was nothing in the directives that indicated a back up to the radio system could be accomplished by the driver simply recording, in a manual fashion on his record sheet, the appropriate times of arrival and dispatch. The manually recorded information could then have been compared with the computer-generated information for its accuracy. In fact, this had been the process prior to the automated computerization of the program.

[107] Somewhat surprising during the course of the evidence gathered in this matter was the apparent lack of knowledge, from time to time, of the professionals within the system regarding the activities of other professionals within the system. For instance, a number of doctors advised us that they were not aware of the capabilities and equipment carried in the emergency service ambulances. As well, doctors were not aware that the nitric-oxide therapy trials were ongoing at the NIC Unit at the Health Sciences Centre in conjunction with a larger international program trial.

[108] We were further advised that more recently all of the fourth year medical students spend time riding along with the

ambulance service in order to familiarize themselves with the program, the capabilities and equipment available within the ambulance. However, emergency physicians use the ambulance on a fairly frequent basis and are much more familiar with the equipment and the capabilities of personnel and procedures.

5. What is the efficacy of the current system of assigning priority designation of emergency inter-facility transfer of neonates by the City of Winnipeg Emergency Measures Services?

[109] The issue arose respecting the process by which an admission from a neonatal transport team is made to either one of the tertiary hospitals. During the Inquest, we were told that primarily, the referring physician chooses a facility that he wants the patient to be transferred to, and this is generally disclosed at the time of the call for the transport.

[110] Some doctors practice mainly at the St. Boniface Hospital, and some doctors mainly practice at the Children's Hospital. Others attend to both hospitals, but it is the pediatrician's primary decision as to which neonatal facility the newborn baby is directed.

[111] The St. Boniface Hospital facility is a little smaller than the Health Sciences Centre facility. On occasion, one or the

other may be closed as a consequence of a lack of available space or available staff to take another admission. In that situation, the child may be referred to the Children's Hospital.

[112] In order to alternate unspecified referrals to each hospital in turn, a "med-ticket" system has been incorporated, which rotates the admissions between the two neonatal units. The availability of beds very much affects the referral pattern as to which hospital on a day-to-day basis has a bed available for admission. As a consequence, it cannot always be guaranteed that a bed is available in the facility requested by the physician.

[113] There are other factors that affect this as well. Very little neonate surgery is done at the St. Boniface Hospital, so if a patient arrives with an anomaly that they know is going to require surgery, that transfer is referred to the Children's Hospital. In other words, if a baby has a known cardiac anomaly, and it is certain that it is a structural cardio defect, that baby would probably be brought to the Children's Hospital in the anticipation that it may need to be sent out of province for treatment. Thus, one step in the transferring and handling of the baby would be eliminated.

[114] It should also be noted that there are more diagnostic facilities for children in terms of cardiac problems at the Health Sciences Centre Unit.

6. Is there a need for the Neonatal Intensive Care Unit at St. Boniface General Hospital to upgrade its facilities to handle complicated cases; such as severe meconium aspiration syndrome?

[115] With respect to meconium aspiration victims, they are now brought to either facility, whereas in 1996, the inhaled nitric oxide therapy was not available at the St. Boniface General Hospital.

[116] The trials for that particular therapy started in 1994 and were completed in late 1996, at which time it was being used on a non-experimental basis. These trials had been part of a multi-centre trial for nitric oxide, both in the United States and in Canadian centres. It is actually a therapy for babies with persistent pulmonary hypertension. It relaxes the pulmonary arteries so that they are not constricted, but are opened up so that the blood may flow more freely to the lungs.

7. Are there adequate numbers of neonatal intensive care beds available in the city?

[117] It would appear from the structured rotation of beds between the two tertiary hospital intensive care units that the number of beds presently available are adequate to serve the needs of the community at this particular time.

8. Is the policy of the Health Sciences Centre, in particular in the Intensive Care Unit, regarding repair and replacement of equipment, appropriate?

[118] As a consequence of this question, we heard from the Manager of the Respiratory Therapy at the Health Sciences Centre for both the Children and Women's Health Programs. As Manager, their duties included patient care management as well as management of staff and resources, equipment and supplies.

[119] In discussing the types of ventilators available within the facility, three different types of ventilators were described: the conventional ventilator, the high frequency jet ventilator, and the high frequency oscillator. Equipment of this nature is contained within a pool of equipment in the hospital and is dedicated from that pool to specific areas that are in need of a specific piece of equipment. The Manager also advised us that, from time to time in 1996, they had just one jet ventilator in the system, but had an agreement with the St. Boniface Respiratory Therapy Department that if a further jet ventilator was required or a jet

ventilator malfunctioned and their jet ventilator was not being used, it could be loaned out, or vice versa.

[120] A description was given of a situation that arose on one occasion in 1996 where an oscillator ventilator was being used and malfunctioned while in use on a patient. As a consequence, the patient had to be taken off that particular machine and placed on another ventilator. Protocol directed that an immediate phone call was made to the company supplying the machine and they arranged to fly the technician in to repair the ventilator immediately.

[121] The technician arrived within 24 hours and upon examining and servicing the ventilator, discovered that only one problem could be solved and another replacement part was required. Directions were given to have that part shipped from eastern Canada on that same day for receipt by the Bio-Medical Engineering Department. Instructions were then given by the company representative to that department on how to replace the part when it arrived. The part arrived, the installation was completed and the equipment was placed back in service in short order.

[122] As a consequence of that information gleaned from this example respecting equipment maintenance and

replacement, it was my view that appropriate protocols were in place to ensure early compliance and completion of replacement or repairs to essential equipment.

[123] In some instances, the recording of material times of various procedures, attendances and references were made and asked of the various witnesses. It became relatively apparent that not all the records are kept on-the-clock basis. In other words, in many instances the records are completed either before or after an event, depending on the availability of time to those making the records who are also involved in the active treatment of the patient.

[124] At times these are not consistent with one another; however, there were no instances where any major event flowed from these necessarily inadvertent recordings of specific and exact times and events.

[125] In situations such as experienced in this particular sequence of events, the mother giving birth to a child in circumstances similar to this, is undoubtedly impacted by the various events taking place around her. These are then subsequently questioned as a consequence of the unfortunate outcome that was determined by factors beyond her control.

[126] The outcome for this particular baby was pre-ordained and regardless of the efforts, procedures and processes attempted with respect to his survival, the outcome was unfortunately irreversible.

[127] It is apparent from the testimony heard during the course of this Inquest that I am not placed in a position to challenge the expertise of the witnesses, nor the evidence given by them with respect to their particular roles in the entire process.

[128] To be critical without being constructive would be counter-productive in my view.

Recommendations

[129] In concluding my report, I would make the following recommendations:

1. The Victoria General Hospital is the major birthing centre outside of the tertiary hospitals in Winnipeg, for the delivery and care of newborn infants. It would be practical and germane to place the wellbeing of expectant mothers in the forefront of concern, with the addition of a 24-hour a day pediatrician on staff, which would add to the confidence, safety and mental wellbeing of each and every parent whose child is to be delivered in that facility.
2. The Victoria General Hospital is lacking a mechanical ventilator, which would seem to be a worthwhile and significant addition to their equipment availability when required.
3. It would be highly desirable for the Victoria General Hospital, on a regular basis, to review and refresh the information that it provides to expectant mothers regarding the availability of personnel and patient care within the hospital.

The hospitals and the doctors who practice therein, share a responsibility to inform and advise their patients regarding this care. But the information needs to be updated and revised regularly, so that the patients have a clear, well informed and unequivocal review of the facilities and services and care available to them.

The patient should also have an informed knowledge of what services are not available within the delivery service of that facility.

4. It was apparent that there was a general lack of understanding and information within the medical community with respect to the nitric oxide protocols being developed at the Health Sciences Centres and the eventual resulting use of it. The importance of continuing education and familiarizing the obstetricians, pediatricians anesthesiologists and neonatologist with the availability and progress being made with respect to these protocols was demonstrated as being of immediate concern.

5. A more collaborate working contact should be developed with obstetricians and pediatricians, particularly from the aspect of the neonatal transport service, to keep everyone informed and current on the process of the transport service.

I respectfully submit my recommendations and conclude this Report, this 24th day of March, 2004, at the City of Winnipeg, in Manitoba.

I hereby order that all exhibits will be forwarded to the Chief Medical Examiner's office.

Original Copy signed by:

Judge Charles N. Rubin

Copies to:

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The Honourable
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Provincial Court of Manitoba

The Honourable Gord Mackintosh
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