

Was Jessica’s family provided with sufficient information to allow them to give informed consent to the procedure?

As noted, the family declined to participate in these proceedings. Therefore, it is difficult to determine what they felt they were told. From the testimony of Giddins and Odum, it appears that neither the Ulimaumis nor their advisers were informed about problems arising from the previous cases handled by the team; nor were they told about the team’s development to that point. The family would have likely been told about the medical issues their child faced, but without further information from them, it is not possible to determine the extent to which they understood what was involved in her treatment.

■ Finding

The failure to disclose to the family the surgeon’s lack of prior experience with performing operations of this nature without supervision is a matter that repeats itself in this case, as it does in others. Therefore the evidence tends to suggest that Jessica’s family was not provided with sufficient information to allow them to give informed consent to the procedure.

Was Jessica healthy enough to undergo an operation?

■ Finding

Just before her scheduled operation, an entry in Jessica’s medical chart showed that she had been assessed as having had a bout of gastroenteritis—a viral infection. It does not appear that this condition was appreciated before her operation. There is no entry to indicate that the matter of her previous infection had been considered and assessed to determine if the operation should have been delayed. Cornel pointed out that Jessica had also experienced a bout of diarrhea the day before surgery, but she again was not tested for a viral infection before the operation. Symptoms of a pre-operative infection (such as diarrhea) should have led the doctors caring for Jessica to order further tests to determine if she did have an infection. None were conducted. As in the Caribou case, it appears that the doctors’ practice at the HSC (of not routinely ordering tests for infection) led to a situation where the existence of an infection was not fully ruled out before a child was sent to surgery.

Did the length of surgery contribute to her death?

■ Finding

As noted in the Caribou case, the bypass and cross-clamp times for this operation were very long. The lengthy times and the failed repair contributed to the problems that arose in weaning her from bypass and ECMO.

Were the repairs properly carried out?

■ Finding

The evidence clearly suggests that the repair was never successfully done. At least once, and probably twice, Odim failed to properly repair Jessica's defect.

Did irregularities in the process of weaning her from ECMO contribute to her death?

■ Findings

The decision to wean Jessica from ECMO seems to have been a necessary one, but the manner in which Odim proceeded was less than acceptable. Odim did not appreciate that the PICU was not adequately equipped to handle any emergencies arising from such a procedure. Odim should not have undertaken the procedure without so determining. He did not ensure that there were appropriately trained and experienced staff, including an anaesthetist, in attendance to assist in this procedure. This fact suggests that he did not carry out this responsibility in a manner that was up to the standards required of him.

However, Kesselman, as the head of the PICU, also had a responsibility to ensure that the child's health was not compromised by such a procedure. In this case, Jessica's health was compromised because the PICU nurses were required to participate in a procedure for which they were neither properly trained nor equipped to carry out, but for which other properly trained and equipped personnel were available.

Odim had every opportunity to request that the procedure be booked in an OR and that the proper complement of staff be present. If the child was not well enough to be moved to the operating room, the OR staff could have attended in the PICU. Odim testified that he was unaware of this, but there is no evidence that he made any inquiries to determine if it was possible to have the OR nurses come to the PICU.

It would appear that Odim proceeded with this matter as he might have in the institutions where he had trained. In his evidence, he suggested that removing patients from ECMO in the ICU was a common occurrence in the institutions where he had trained. That Odim did not know that such practices were not common or successful at the HSC indicates that the entire program started operations in the spring of 1994 without proper preparation.

This was also reflected in the fact that there was a lack of appropriate surgical equipment at the bedside during the weaning procedure. Sending an ICU nurse to look for the Satinsky clamp was necessitated by the poor planning that marked this procedure. The length of time it took for the ICU nurse to find the clamp was a reflection of the fact that she was not trained for this type of procedure and was unfamiliar with the surgical supply room and the type of clamp for which she was looking. This is no reflection on her, because she should never have been put into that position in the first place.

In this case, it also seems clear that there was a tragic failure to clamp the inferior vena cava venous cannula and that this failure contributed to Jessica's massive blood loss and ultimate death. Jessica's condition was severely compromised at the time of the attempt to wean her from ECMO. It is unclear if she would have survived the weaning at all. However, she died due to massive blood loss that occurred through the cannula site and through the unclamped line. It is not clear as to which site caused the greater blood loss, but it is safe to say that both events were preventable.

As noted in the Caribou case, Soder concluded that:

[T]he skill and dexterity of the surgeon performing these operations were insufficient for the challenge of successfully repairing infant hearts with complex malformations. Surgical factors were the prime determinants of fatal outcome in 9 of the 12 deaths. (Boldface in original) (Exhibit 345, page 8)

The case of Jessica Ulimaumi was one of the nine that Soder identified in which surgical factors were a prime determinant in a fatal outcome. In particular, he identified the incomplete repair and the decannulation problems as major surgical factors and the lengthy bypass and cross-clamp times as minor factors.

What was the cause of death and was it preventable?

■ Findings

Based on the testimony presented at this Inquest, the evidence suggests clearly that Jessica Ulimaumi's death was caused by blood loss resulting in a cardiac arrest. This blood loss occurred during a failed attempt to wean her from ECMO and was the result of blood loss at the cannulation site and the fact that a line was left unclamped during decannulation. However, the underlying cause of death, leading to these problems, was the failed repair.

For these reasons, the evidence suggests that this was a preventable death.

Should this death have triggered a review of the program?

■ Finding

This death should have led to a serious re-examination of the program by the persons responsible for it. In his written report to this Inquest, Cornel wrote that the "Death of a patient following repair of a VSD is uncommon and troubling." (Exhibit 353, page 18)

The fact that Jessica died 13 days after Gary Caribou and while Vinay Goyal was seriously ill in the PICU, should have been a warning to Odum, Giddins and their department heads. In his testimony, Cornel was asked if he thought the program should have been reviewed after Jessica's death.

Yes, I think it certainly is a time for review and reflection and regrouping and all of those things.

When I wrote this original report, I hadn't seen the autopsy specimen and I, you know, I thought, well, this was a VSD that was missed, or the patch came off, and that was troubling by itself, but that is understandable.

When things go so completely wrong, as I think they did here, I think it really is time to stop and begin again or, you know, reflect and get some outside help if necessary. (Evidence, pages 44,746–44,747)

As the evidence makes clear, many team members were also starting to think along these lines. However, the growing communication problems, coupled with a lack of supervision by senior HSC staff, meant that no review took place at that time.

THE EVENTS OF EARLY APRIL 1994

APRIL 7 – THE CASE OF JM

JM was born on November 8, 1990, and at birth had been diagnosed with complex heart disease. On April 7, Odum performed a hemi-Fontan procedure. JM was returned to the PICU with his chest left open, although covered by a silastic membrane. He was discharged home on April 14.

During the course of the operation, an issue arose between Odum and the anaesthetist involving the use of central venous lines. In the post-operative period, four other issues were identified that led to disagreement and conflict between the PICU staff in general (and Swartz in particular) and Odum. The disagreements centred on pain control, ventilation, antibiotics and the surgeon's monitoring lines. Two other areas of concern noted were post-operative bleeding and pacemaker malfunction. All of these issues were also noted in other cases.

Issues

Central venous vs peripheral lines

Anaesthetists need lines inserted into a patient's veins in order to have a ready route through which drugs and fluid can be quickly administered and to be able to monitor the patient's central venous pressure (the pressure in the large vein leading to the right side of the heart). This helps anaesthetists to ensure that the heart's filling pressures are adequate and that the patient's brain is being provided with an adequate supply of blood.

Such lines are often inserted into veins in the centre of the body, such as the internal jugular vein, and are called central venous lines. Other lines can be inserted into veins in the periphery of the body, such as an arm or a leg, and are called peripheral lines.

Both central and peripheral venous lines can be used to measure central venous pressures. However, using a peripheral vein, such as the femoral vein of the leg, decreases the accuracy of monitoring venous pressure from the central portion of the body. This is important when determining the adequacy of blood supply to the brain. Additionally, the greater the distance the vein is from the heart, the longer it will take for any drug to have the desired effect.

In the case of JM, the anaesthetist inserted a line into the child's internal jugular vein, a vein favoured by the anaesthetists at the HSC. They felt that a central line in the internal jugular was less likely to become dislodged and provided readings of greater accuracy than a peripheral line. Although the anaesthetists could have used the external jugular vein, Reimer said in his evidence that it was more difficult to obtain proper

readings from a line inserted into this vein because of the twisting nature of the vein, as well as the presence of valves that could affect the accuracy of the readings. McNeill testified that internal jugular lines were commonplace and used by anaesthetists throughout Canada.

During JM's operation, the internal jugular line had to be adjusted because it conflicted with Odim's planned surgical procedure. This caused Odim to express his concern over the use of central lines. An agreement was reached that internal jugular lines would not be used in patients undergoing pulmonary or Fontan type procedures.

It appears that this issue was resolved in a satisfactory manner. However, the fact that the problem initially arose during the course of an operation is not satisfactory. This was yet another sign that not enough preparation had gone into the restart of the Pediatric Cardiac Surgery Program.

Pain relief

In the PICU, the practice had been to use a continuous infusion of narcotics or analgesia for pain relief. The advantage of this approach was that it provided continuous and even pain relief. Odim preferred intermittent administrations of narcotics. In the JM case, Swartz said that she followed Odim's approach but found that it did not provide stable analgesia. The following day she spoke to Odim about this issue. Swartz testified that Odim wanted to see any papers or articles that backed up her point of view. She recalled offering to provide them if Odim was serious in his request. She said he did not ask for them and she did not provide them. From that point, the staff in the PICU provided pain relief in a continuous, rather than an intermittent, fashion.

Ventilation

Another practice in the PICU had been to have children breathing on their own as soon as possible after an operation. Odim preferred to keep the patients' muscles fully relaxed with anaesthetic drugs until their chests had been closed, which meant that they would have to be artificially ventilated. Odim wanted JM to remain intubated and ventilated overnight. Reimer, who was the anaesthetist for the operation, had not known of Odim's preferences. Instead, he had anaesthetized JM in a manner that conformed to past practice. According to Reimer's testimony:

This child was basically left with a Fontan type of circulation. And with this type of circulation it is actually hemodynamically advantageous to have spontaneous breathing, that is for a patient not to be on a ventilator. And spontaneous breathing is better because pulmonary vascular resistance is lower and blood flow through the lungs is better than with controlled ventilation.

So my anaesthetic technique for this child was actually tailored in such a fashion as to allow early resumption of spontaneous ventilation at the end of this procedure. And so I had done that, the surgery was done, and at the end of the procedure Dr. Odim's opinion was that this took quite awhile, I think we should just sedate the child and ventilate him over night. And the intensivist's opinion was, look, we can re-establish spontaneous ventilation and extubate this child today.

(Evidence, pages 18,795–18,796)

As a result, JM began to breathe on his own, shortly after returning to the PICU. Odim requested that Swartz keep him intubated and ventilated. She did not follow this approach, although she did provide him with intermittent pain relief (Evidence, page 15,343).

Antibiotics

In addition to these two concerns that were identified during the JM case, the PICU staff were also concerned about Odim's use of antibiotics. The practice in the PICU had been to discontinue the administration of antibiotics after 24 hours, unless there were signs of infection. The reason for discontinuing the antibiotics was to reduce the possibility of the patient developing organisms that were resistant to the antibiotic. Odim preferred to continue to administer antibiotics until all lines had been removed from the child. In this case, the PICU staff provided the antibiotics as Odim requested.

That Odim would have different approaches to these issues is not unexpected. Furthermore, this Inquest is not in a position to adjudicate between these approaches. However, the fact that these differences emerged during patient care is a sign of the failure to prepare properly for the relaunch of this program.

OTHER PICU ISSUES

Surgical monitoring lines

A more serious issue continued to revolve around the monitoring lines that Odim employed. These lines could be used both for monitoring the patient and infusing drugs. (This was the issue that Feser had first raised with Odim at the PICU meeting of March 22.) Where Duncan had used lines that came as a single component, Odim constructed his own lines and sutured them together. According to Swartz, these lines would fall apart in the ICU.

And that would mean that the patient—that the patient was exposed or the heart—the inner chambers of the heart were exposed to air, and this can be lethal. (Evidence, pages 15,327–15,328)

On the same issue, Reimer testified that post-operative monitoring was also hindered because the transthoracic lines that Odim placed frequently came out of the heart.

The way that they were usually placed was they would be put through the wall of the heart and then tied into place with a suture. When they are tied in, obviously, the suture has to be adjusted so that it's tight enough to hold the line and not too tight that it occludes the line. But, for whatever reason, they came out on a not infrequent basis. (Evidence, pages 18,902–18,903)

Concern about the transthoracic lines was also expressed by Barwinsky, who occasionally looked after Odim's patients if he was out of town. In April, Barwinsky closed the chest of a child (CSM) who had undergone removal of a pulmonary artery band and other repairs of a complete AV canal defect. According to Swartz's testimony, Barwinsky was concerned that the monitoring lines, rather than emerging through a separate opening point, came out through the surgical wound. He was concerned when he was closing the chest that he would block or dislodge these lines.

Swartz said that she never spoke to Odim about the issue of the transthoracic lines. However, she said that Kesselman did. When Kesselman spoke with Odim about this issue, he relayed the concerns that a number of nurses had expressed about the problems with the lines. He testified that he told Odim to be more careful when constructing the lines. However, Kesselman said he could not tell Odim not to construct his own lines. Despite this conversation, Kesselman said that Odim did not change his approach to the

monitoring lines. The PICU staff resorted to using wooden sticks, similar to tongue depressors, to reinforce the joints in the lines.

Post-operative bleeding and pacemaker malfunction

In addition to these concerns, the PICU staff noted that the level of post-operative bleeding in Odim's patients was higher than they would have anticipated. Dr. Walter Duncan testified it was important not to transfer a patient from the operating room to the ICU until the patient was stable and bleeding had stopped. This had been the approach followed by Dr. Kim Duncan when he had been the surgeon in the Pediatric Cardiac Surgery Program. However, Odim felt that patients recovered best and bleeding could be better addressed in the ICU, and he felt it was important to move the patient from the operating room to the ICU as soon as possible. Therefore the patients that Odim sent to the ICU suffered more bleeding than the ICU staff had expected. This difference was also one that could have been addressed during the startup phase of the program earlier in the year.

APRIL 13 — THE CASE OF CSM

CSM was born on January 15, 1993. Shortly after birth, she was diagnosed with Down's syndrome and a complete AV canal defect. On June 3, 1993, she underwent a palliative banding of her pulmonary artery. (In this procedure a band is placed around the artery to reduce the excess flow of blood through the artery.) After that, she had had frequent bouts of pneumonia, with recurrent wheezing and increasing fatigue on activity.

On April 13, 1994, CSM underwent a procedure where the band was removed from the pulmonary artery and other repairs to her heart were carried out. She underwent CPB for five hours and fifteen minutes and had a cross-clamp time of two hours and fifty-eight minutes.

Her chest was left open for 16 days in the PICU and she required a temporary pacemaker. CSM had problems with her mitral valve, resulting in mitral regurgitation (blood flowing the wrong way through the mitral valve). She also had problems with congestive heart failure and recurrent infections. There were difficulties in weaning her from the ventilator, and she had a prolonged need for inotropic support. She spent 62 days in the PICU and was discharged on June 26, 1994. These times represent a lengthy period of bypass and a lengthy stay in the PICU. Odim agreed that her lengthy bypass time, in addition to the long cross-clamp time, might have hindered her recovery.

While in the PICU, CSM also suffered from junctional ectopic tachycardia (JET), an abnormal heart rhythm with a very rapid heart rate. This condition can be fatal if not properly controlled. There were differences of opinion among the doctors as to how this condition should be treated. This conflict revealed that Odim had not yet understood the protocols regarding the ordering of medications in the PICU.

According to Kesselman, Giddins, after discussions with Odim and Kesselman, suggested that the JET be treated with propafenone, a drug not widely used at the HSC. Odim wanted to use another drug, Pronestyl (also known as procainamide).

Propafenone was not immediately available in Winnipeg. The testimony presented to this Inquest differs as to the way in which events then unfolded. According to Kesselman, propafenone was acquired, but did not prove effective. At that point CSM was treated with Pronestyl, as Odim had suggested. According to Odim's testimony, his orders were overruled by the PICU doctors, who administered Pronestyl only when he put his "fist down".

My recommendation to use a particular drug was not followed for a 24 to 36 hour period while the patient was simply getting worse and worse to the point that I had to at the end of one of our pre-operative conferences, after I had come back to discover that nothing had been done, talk to the team.

The intensive care doctor at the time felt that in her experience a certain drug was better but that drug was not in the hospital and I said well, if you don't have the drug and we have Pronestyl in the hospital why are you not giving this child this drug who we may lose while you are waiting to get this experimental drug from Ottawa. I was overruled. They got the drug from Ottawa the next day and give it enterally or through an NG tube, so they gave a drug that's supposed to be given intravenously for a condition, they were giving it through the GI tract and at a subminimal dose.

At that point, I simply had to put my fist down, the Pronestyl was given and within 24 hours the child turned around. So that's an example of a reluctance to—because of turf issues, to follow the lead of the surgeon. (Evidence, pages 26,402–26,403)

It should be noted that propafenone was administered in the manner prescribed by Giddins.

The testimony of Dr. Fiona Fleming, the intensivist caring for CSM during this period, differed from Odim's. When Fleming took over treatment on Sunday, April 17, the HSC staff were not aware of the fact that propafenone was not easily acquired. Fleming testified that when she examined CSM the next day, she discovered that earlier that same morning Odim had written an order calling for treatment with Pronestyl. She testified that she consulted with both Odim and Giddins about Odim's order. The conclusion of this consultation was an understanding that CSM would be treated with propafenone. Fleming said it was not a unilateral decision on the part of the ICU doctors, but rather the result of a discussion between herself, Odim and Giddins. She also testified that all orders written on the charts had to be signed by the ICU staff intensivist. When the propafenone arrived and failed to bring about an improvement, Fleming testified, after a further consultation with Odim and Giddins, a decision was made to use Pronestyl.

In commenting on Odim's description of the event, Fleming testified that she did not believe the issue was one of turf but one of communication.

That my understanding was the course of action had been agreed upon, and that Dr. Odim had decided he wanted something different, which in retrospect turns out to be the correct drug, but it was left on the chart, with no telephone call to myself, no conversation to my resident, and I don't know whether he or Dr. Giddins discussed it between themselves. But certainly when I discussed it with Dr. Giddins later that morning, he said, no, we are going to use propafenone. (Evidence, pages 35,996–35,997)

As Fleming noted, it appears that the drug that Odim wished to use in treating CSM was more effective. However, it also appears that he had not familiarized himself with the PICU protocols. It also appears that he did acquiesce to the use of propafenone which, according to Fleming, was the drug preferred by Giddins.

Odin testified that it was only after this case that he came to understand that he could not write medication orders for the patients in the PICU. While he said that this concept was new to him, evidence from

Feser suggests that this had been brought to his attention in February at their initial meeting and again at a meeting on March 22. At this second meeting, it appears that Feser had spent a considerable amount of time discussing this issue. Either Odim wilfully refused to adapt to the PICU practices or he simply did not pay attention to important information that the nursing staff presented to him. Neither possible explanation speaks well for him.

On April 18, the PICU senior team leaders held a meeting. According to notes taken at the meeting by Feser, one of the issues discussed was that of Odim's attempts to prescribe medication to patients in the PICU. According to Feser, there were a number of problems that arose out of Odim's apparent lack of regard for the PICU protocol. In some instances, Odim would speak to the PICU nurses in the morning to discuss how a patient had done overnight. During these conversations, he would tell the nurse to change some aspect of the patient's medication. However, the nurses were not supposed to make any changes to a patient's medication that had not been ordered by an intensivist or an ICU resident. In addition, Odim would give orders directly to nurses at the bedside. Feser testified:

In fact, you know, by this time he is also, he is getting annoyed because he is asking, like why wasn't this done, because I had asked for this to be done. Where he is not really, he may have mentioned it to the bedside nurse or asked it, but he has not relayed that in full detail to the resident or the intensivist. So we are wondering, what are we supposed to be doing? Are we going to maybe change what we have been doing in the past? (Evidence, pages 29,989–29,990)

This problem continued throughout the year.

VINAY GOYAL — THE SECOND PROCEDURE

CONSENT FOR THE REOPERATION

Vinay Goyal was rescheduled for surgery on April 6, 1994. According to Sheena Goyal, the family did not feel that it had any options when consent was requested for this procedure. She testified, "We had no, nothing, anywhere else to turn to, nobody else to turn to. So we had no choice." (Evidence, page 978)

DELAY IN THE SECOND OPERATION

However, the operation did not take place on April 6. It was delayed for two weeks so that Vinay could recover from a viral infection. From Sheena Goyal's testimony it appears that Vinay was tested for this infection largely at her insistence on April 5.

That day I was very concerned, like my whole family was very concerned. Like he was going for the surgery and nobody even noticed that he had that cold and that could have serious infection. (Evidence, page 972)

According to her testimony, a female doctor in the PICU eventually ordered a number of tests that led to the postponement of surgery. The doctor she spoke with was Swartz. In her testimony Swartz said:

This is the perfect season for this particular virus which is called RSV, which is respiratory syncytial virus, which is not a friend to patients with congenital heart disease. And the concern is going in

for—being on bypass with RSV is essentially lethal, which might also explain why his lungs were a bit leaky and why we were having trouble with ventilation. (Evidence, pages 15483–15484)

After discussing the matter with Sheena Goyal, Swartz ordered a new RSV test. (A previous one a few days earlier had come back negative.) Swartz then spoke with Odum and suggested that the operation be postponed. According to Swartz, Odum initially opposed this suggestion because he believed that it was necessary to repair the heart as soon as possible. In the morning, the RSV test results came back positive and the procedure was postponed.

In his testimony to this Inquest, Cornel commented on the prospect of re-operating 30 days after the initial operation.

It's just about the worst time to have to re-operate. The adhesions at this stage are kind of a bloody, gelatinous mess that glue the heart and its structures, its surrounding structures together, and, obscure the details of the anatomy.

Wherever you dissect to free the heart from the other structures bleeds—not a huge amount of bleeding, but it's all oozing all the time. It obscures where you want to work, makes it difficult to work. It makes accurate dissection very difficult.

It's, it really is a horrible time to have to go back. (Evidence, page 44,761)

Cornel also testified that he believed that redo operations, particularly the management of the adhesions that form following previous operations, are very difficult. He said the management of such adhesions is a skill that surgeons only develop over time.

You do hear or do see people say in the surgical literature that re-operation adds no risk. I think they are just being macho about it. I just don't believe that it adds no risk. It certainly adds huge trouble and time. And re-operating at a month, I think adds more risk than at, say, a year after surgery. (Evidence, page 44,763)

Odum disagreed. In his testimony he said that re-operating 30 days after the original operation was not necessarily the worst time. Odum said that the time range for having these difficulties with re-operations was between three weeks and two to three months after the first operation.

Frankly, Cornel's evidence is to be preferred to that of Odum on this point. Cornel was a surgeon of considerably more experience than Odum and was much more familiar with actual day to day issues than Odum was. This was the first time that Odum had had any experience with doing a redo 30 days after an initial repair on his own, and his comments suggest more bravado than experience. It also appears, however, that Vinay's condition at this point had left the surgical team with no other option.

PRE-OPERATIVE STATUS

In her pre-operative assessment on the evening of April 17, Swartz summarized the various problems Vinay had had. She wondered if he had had an RSV pneumonia. She noted that he had a sore under his chin that had not healed. Swartz said there was increased risk for surgery because of the problems that Vinay was experiencing. In addition, she said that he could have difficulty with his heart rhythm (as during the first repair), potential heart failure as a result of a long pump run, bleeding as a result of the fact that this was a re-operation and aggravation of kidney problems. She assigned him an anaesthetic class of ASA IV.

THE OPERATION—APRIL 18

The surgical team involved in the second operation is set out in the chart.

TABLE 6.7 : Persons involved in the operation on Vinay Goyal, April 18, 1994

<i>OR team member</i>	<i>Persons involved</i>
Surgeon	J. Odim
Surgical assistants	B.J. Hancock, S. Wiseman (resident)
Anaesthetists	J. Swartz , A. McNeill
Scrub nurses	C. Youngson, C. Weber, C. McGilton
Circulating nurses	S. Scott, B. Zulak, A. Glenday, W. Yakinchuk
Perfusionists	T. Koga, M. Maas

TABLE 6.8: Length of phases of the operation on Vinay Goyal, April 18, 1994

<i>Phase of the operation</i>	<i>Time taken</i>
Induction	2 hours 20 minutes
Bypass	4 hours 14 minutes
Aortic cross-clamp	2 hours 2 minutes
Total surgical time	7 hours 50 minutes
Total operating-room time	10 hours 40 minutes

Prior to Vinay being taken to the OR, a disagreement also arose between Swartz and Odim over whether Vinay's lines should be changed in the ICU. In the end, Swartz prevailed and new lines were inserted. Swartz testified that during the discussion she had had with Odim, he told her that she had a lot of testosterone, a remark that led her to terminate the conversation.

The operation on April 18 revealed that there were patch leaks beneath the aortic valve and at the ventricular crest. These were repaired. In their report, Cornel and Duncan commented that this was a lengthy operation.

INTRA-OPERATIVE INCIDENTS

A number of incidents arose during this operation that deserve mention. These included the apparent dribbling of adrenalin on Vinay's heart, the testing of the patch by the forceful injection of saline into the heart chambers and the early removal of a cannula.

Dribbling of adrenalin on the heart

After the repair was done and before Vinay was weaned from bypass, Odim wanted to infuse adrenalin from a syringe through a line directly into Vinay's heart. According to several of the witnesses, including Swartz, Irene Hinam and the operating-room nurses, after administering some adrenalin intravenously to

Vinay, Odim dribbled the adrenalin remaining in the syringe onto the heart. Almost immediately, the heart changed color and contracted violently, creating noticeable changes in Vinay's blood pressure readings. These changes were noted on the anaesthetic record, as was the event. The other team members were surprised by this action. Swartz said this was something that she had never seen before and questioned the wisdom of doing such a thing to such a fragile heart. When Swartz asked why he did it, Odim asked—in what she interpreted as a sarcastic tone—if he should have thrown the rest of the drug on the floor instead.

Odim's recollection was different. He said that he decided to give the adrenalin into the heart through the intracardiac line to ensure that it was in a blood vessel. He said that Swartz was upset at this, but followed Odim's request. Swartz denied being upset, saying that she was familiar with the technique of infusing adrenalin directly into the heart. Odim said that once the blood pressure went up, he told Swartz to turn off the epinephrine (adrenalin) drip. Odim said that it was not uncommon to see a quick rise in blood pressure when one treated a patient with adrenalin in this way. He did not recall dribbling the adrenalin directly onto Vinay's heart. He did not, however, deny that it happened.

Hinam also testified that Odim put adrenalin straight on to the heart, making the heart turn colour, and causing the blood pressure to rise dramatically.

The testimony of the several witnesses, as well as the clear indication on the anaesthetic record of this incident, is convincing evidence that this incident occurred as the witnesses said it did. Why Odim did what he did is unfathomable. It is possible that he was simply interested in observing how the heart muscle would respond to such an event. There was certainly no medical reason for it.

Testing the patch

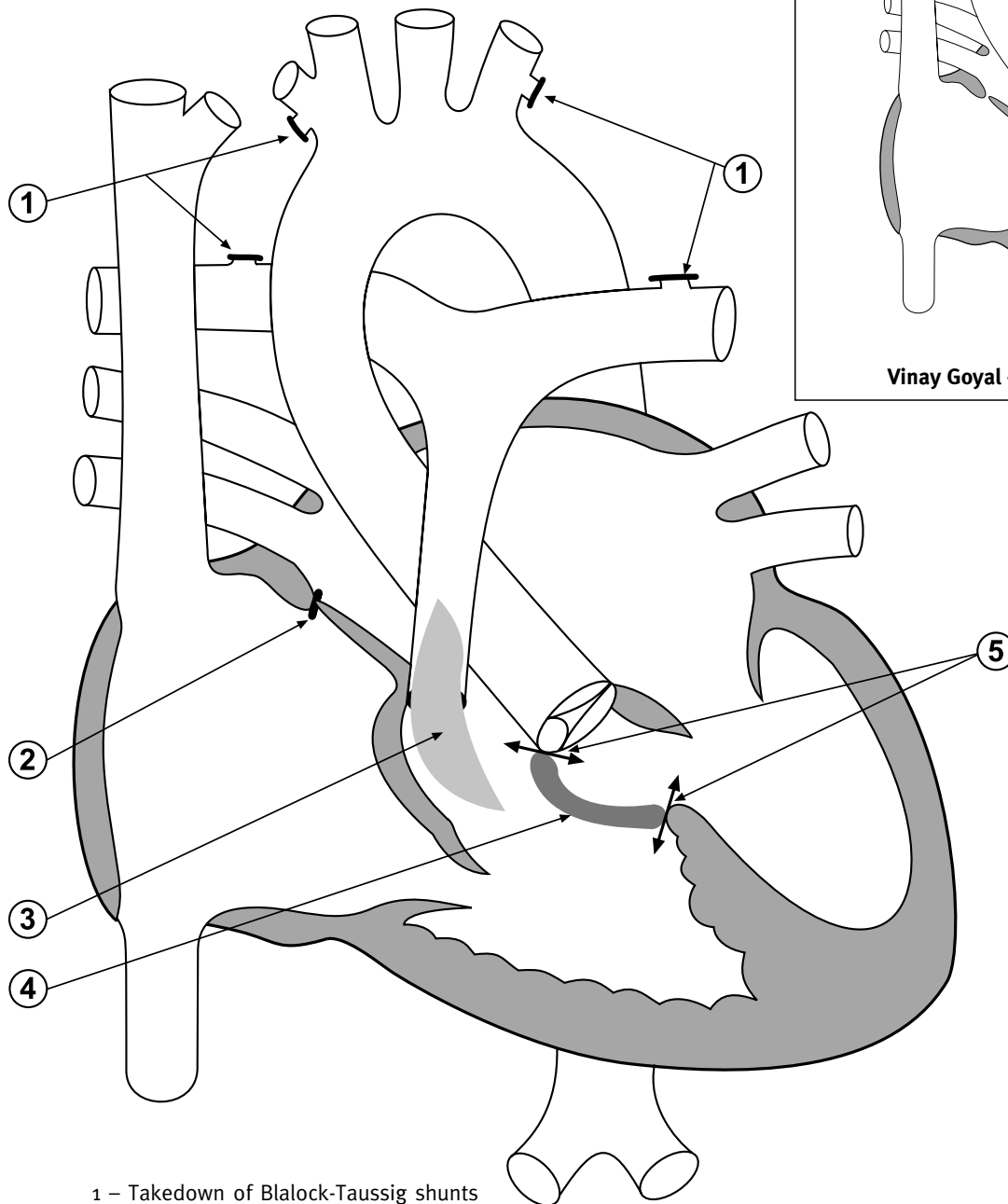
After he had repaired the patch leak, Odim performed a test of the patch repair that took the team by surprise. Youngson, Swartz and Hinam testified that Odim took a syringe filled with saline and injected the saline into the heart with considerable force. Youngson said that Odim pushed the saline into Vinay's heart through the syringe with the heel of his hand. They were all shocked by the intensity of the procedure. Youngson testified:

Because, first of all, we had just done a repair inside of this heart, what is that going to do to the repair, first of all? And secondly, there is lots of very delicate tissue, and this heart is very kind of friable, kind of mushy, the tissues aren't very strong. And to me that seemed like, it didn't seem like a very good thing to do. (Evidence, pages 8,398–8,399)

Swartz said that Odim pushed the syringe with as much force as he could, and she was concerned about that tearing the tissue. She had never seen this method of testing the integrity of a patch and was concerned by the amount of force he was using and that it might damage the heart. She testified:

I was unfamiliar with this method of assessing integrity of the patch. But I was also concerned at the time that he was using a lot of force in injecting relatively, as he said to me, blindly. And I didn't know where—you would imagine that the saline would come out at a very high pressure and that the chances of damaging the heart enters one's mind, and that thought came into my mind. (Evidence, pages 15,542–15,543)

Diagram 6.7 Vinay Goyal – post-operative heart



Vinay Goyal – pre-operative heart

- 1 – Takedown of Blalock-Taussig shunts
- 2 – Suture closure of patent foramen ovale
- 3 – Pulmonary valvectomy and transannular right ventricular outflow tract patch, with resection of right ventricular muscle bands.
- 4 – Patch closure of ventricular septal defect
- 5 – Patch site leaks

Odim testified that he administered the saline from a syringe attached to a red rubber catheter inserted into the left atrium. He wanted to see if the saline would appear on the right side of the heart. Odium said that he did not have any concerns about injuring any of the tissue by using this technique to test for leaks. He said that the tissues of the heart were probably not more friable (fragile and easily torn) at 30 days after the first operation. Odium said he didn't think this method led to tears. In his operative report, he said that the left side of the heart was filled vigorously with cold saline. By vigorously, Odium said, he meant a firm squeeze of the syringe's plunger because the red rubber catheter attached to the syringe provided a resistance that had to be overcome.

Soder said that he had seen this technique done with some frequency to test a patch repair, although he could not comment on the degree of force used.

The premature removal of a cannula

After being weaned from the bypass machine, Vinay was in unstable condition and was bleeding from the chest wall cavity. There was disagreement between Swartz and Odium as to whether or not the bleeding was due to a coagulopathy or to a surgical cause. This led to a series of dramatic, and eventually tragic, events.

A coagulopathy is treated by giving a patient various blood products, thus helping the patient's blood to clot properly and stop bleeding. Swartz said that normally when a patient was treated with blood products, clots formed. She said that the sequence of bleeding without clots, followed by the presence of clots after the administration of blood products, showed that the patient had a coagulopathy and that it was resolving. However, if the bleeding was coming from an operative site that had not been completely sutured, the bleeding was termed 'surgical', and it was necessary to find the leak and repair it. In Vinay's case, the bleeding continued despite the administration of clotting drugs. For this reason Swartz thought that there was a surgical bleed.

While Odium was searching for the leak, Swartz asked Maas to transfuse blood into Vinay through the aortic cannula to compensate for the loss of blood and maintain Vinay's blood pressure. At that point an alarm went off, indicating that there was a blockage in the cannula through which Maas was attempting to deliver blood. When Maas asked what was wrong, Odium informed him that he had removed the cannula through which Maas was trying to transfuse blood.

The fact that the aortic cannula had been removed came as a surprise to almost everyone in the OR. Odium testified that he had announced that he was removing the aortic cannula. Koga, one of the perfusionists, recalled Odium saying the aortic cannula was out but could not recall him informing the team before removing it. Hancock testified that she vaguely remembered going through the sequence of removing the cannula. From the testimony, however, it appears that none of the nurses, the anaesthetists or the other perfusionist knew that the line was out.

Youngson had no memory of assisting Odium to remove the cannula. She testified that Swartz told Odium that he should not have taken the cannula out without telling her. Maas appeared confused as to what was happening. In his testimony, Maas said he could not recall being told the cannula had come out. Maas testified that typically the perfusionist and the anaesthetist were made aware that the aortic cannula was going

to be taken out. He said that in Vinay's case they were not told that it was going to be or had just been removed, and they learned that it was out only after the fact.

The removal of the cannula greatly compromised the anaesthetists' and the perfusionists' ability to keep up with Vinay's blood loss, since other lines that the anaesthetists could use to transfuse blood could not provide the same volume of blood as the one Odium had removed. Swartz, McNeill, Maas and Hinam struggled to find another way to transfuse Vinay because it was not possible to reinsert the cannula. In addition, removal of the aortic cannula meant that it was not possible to transfuse Vinay with the blood products still present in the bypass machine. Instead, a member of the team had to leave the OR to get additional blood products.

Normally, in the decannulation process, the aortic cannula is the last one to be removed. This is precisely because it is kept in place in case it is needed for transfusing large amounts of blood to the patient. All of the available evidence compels the conclusion that Odium removed the cannula from the cannula site on his own, without warning the other members of the operating team that he was doing so. In removing the cannula, he severely compromised the team's ability to transfuse blood to the patient, who was losing blood at an alarming rate.

Furthermore, it was not appropriate to remove the cannula until the existence of a surgical bleed had been ruled out. Eventually, Odium did in fact discover that there was a surgical bleed (a tear in the heart) and sutured the defect. Odium testified that he did not know how the tear in the heart had occurred.

Unfortunately, the repair of the surgical bleed occurred too late for Vinay. His blood pressure did not recover after the bleeding was controlled and he quickly deteriorated to the point of cardiac arrest. Vinay was pronounced dead at 1907 hours in the OR.

Odium said that at the time he took out the cannula, it seemed that the problem they were dealing with was a coagulopathy. His evidence, that he believed he had told the team that he was going to take out the cannula, is difficult to accept, given that every other person in the room, except for Hancock, was certain that he had not.

Odium admitted that Vinay's death could have been prevented if they could have kept up with the blood loss. The loss of the cannula directly contributed to the team's inability to transfuse blood properly.

There were no incident reports filed on any of the events that took place during the second operation. Swartz testified that she had written a note about the incident concerning the removal of the aortic cannula, but she admitted that she might not have placed the note in the chart. She was unable to locate the note.

No member of the HSC staff made use of the incident report system to flag any of the issues. Indeed, it is distressing that many staff members did not even believe that the reporting system applied to them.

When questioned as to why she had not filed a report, McNeill, who witnessed the events, testified, "I wouldn't—I didn't write an incident report, and even in my practice now I wouldn't, because I don't sort of consider—I don't consider it a tool that I use." (Evidence, page 13,179)

Swartz testified that within 15 minutes of Vinay's death, she spoke to Odium and asked him why he had taken the cannula out and why he had failed to inform people that he was taking it out. She testified that Odium explained that he had taken it out because he was worried about problems with clotting. In addition, he acknowledged that there had been communication problems in the OR.

Shortly after surgery, McNeill also asked Odim why he had removed the cannula. In her testimony she said that she found Odim's explanation unsatisfying. She testified that:

the whole experience was unsettling and was, I don't know how more to say it. I just didn't, I didn't feel that we had sort of dealt with it, or that we had adequately, or that I adequately understood why and how it all happened. (Evidence, page 13,181)

This dissatisfaction led her to take her concerns to her section head, Dr. Suzanne Ullyot.

Odim testified that the case was discussed at a subsequent Morbidity and Mortality Round. He said he concluded that Vinay might have been saved "if we had been able to keep up with the coagulopathy and the blood loss." (Evidence, page 24,603)

AUTOPSY

Since the family objected on religious grounds to the hospital's request for an autopsy, no autopsy was performed.

FINDINGS

As noted earlier, the following issues arise in this case:

- Were Vinay's parents provided with sufficient information to allow them to give informed consent to the procedure?
- Would Vinay have been taken to surgery with a potential infection if his parents had not intervened?
- Did the surgeon demonstrate the skills and experience necessary to undertake this high-risk surgery?
- What was the cause of death and was it preventable?

Were Vinay's parents provided with sufficient information to allow them to give informed consent to the procedure?

■ Findings

In the fall of 1993, the family was initially offered the opportunity to take their child to another heart centre. However, they were persuaded not to do so after it was determined that Odim would be arriving early in 1994. They seemed inclined to have the operation done in Winnipeg if it could be done here.

It is clear from the evidence that the Goyals were made aware of the major medical issues facing their child. However, it is also clear that neither Odim nor Giddins informed them about the level of Odim's surgical experience or the death of Gary Caribou.

It is difficult to say whether or not the Goyals might have consented to Odim performing the operation even if they had been aware of his lack of experience. But that issue is irrelevant to the question of their entitlement to receive an accurate answer to their query. Sheena Goyal had

clearly asked Odim what his experience was in doing this type of operation, and he was less than forthright in telling them of his lack of experience. This evidence tends to suggest that Vinay's parents were not provided with sufficient information to allow them to give informed consent to the procedure.

Would Vinay have been taken to surgery with a potential infection if his parents had not intervened?

■ Finding

The operation that had been scheduled for April 6, 1994, had to be delayed because Vinay had an existing infection. The evidence suggests that the infection was discovered only after Sheena Goyal insisted that the team check for one—an alarming prospect, given the position of the VCHC on the danger that infections presented to children having heart surgery. This delay was appropriate, however, given the knowledge of such dangers, although it likely contributed to additional risks for Vinay's second operation. Swartz's ordering of tests to check for an infection was appropriate, but Odim's resistance to delaying the operation pending such tests was not. Additionally, it is noteworthy that despite the clear evidence of an infection, Odim seemed to be of the view that there was nothing to be concerned about.

Did the surgeon demonstrate the skills and experience necessary to undertake this high-risk surgery?

■ Findings

The failed repair from the first operation seems inexplicable. It is difficult to understand why Odim was unable to repair the heart defect properly. The procedure was not beyond the capabilities of an experienced surgeon. However, it cannot be overlooked that Odim was not an experienced surgeon, nor did the team have much experience in dealing with cases of any complexity.

The decision to re-operate on Vinay's heart 30 days after the initial operation was probably the only option remaining. It was obvious that the initial repair was unsuccessful and that without a re-operation, Vinay would likely die. It would also seem that Vinay was not in any condition to be transported any distance, although there was a possibility that another surgeon could have been brought to Winnipeg to perform the operation.

The events of the second operation include behaviour on the part of the surgeon that causes one to question his ability to perform these types of operations in an unsupervised setting. His action in dribbling adrenalin on the heart was foolish and potentially dangerous.

But the most serious action was that of removing the aortic cannula without properly preparing the team. The weight of the evidence suggests that proper notification was not given before the removal of the cannula. The removal of the aortic cannula during the critical and lengthy search for the cause of Vinay's bleeding contributed directly to this child's death. Removal of the aortic

cannula compromised the team's ability to transfuse the child appropriately and caused them to fail to keep up with Vinay's blood loss. Vinay bled to death on the operating-room table. The evidence suggests that if the aortic cannula had been in place, the surgical team would have likely been able to keep up with his blood loss until the surgical bleed had been discovered.

As noted in the Caribou and Ulimaumi cases, Soder concluded that:

[T]he skill and dexterity of the surgeon performing these operations were insufficient for the challenge of successfully repairing infant hearts with complex malformations. Surgical factors were the prime determinants of fatal outcome in 9 of the 12 deaths. (Boldface in the original) (Exhibit 345, page 8)

The Goyal case was the third in which Soder identified major surgical factors leading to a patient's death. In this case he identified the incomplete repair in the first operation as a major factor, while the prolonged bypass and cross-clamp times in both operations were minor factors, as were the excessive bleeding and cannulation difficulties in the second operation. Soder indicated that the late decision to operate on the residual VSD was also a major factor.

What was the cause of death and was it preventable?

■ Finding

Vinay died due to bleeding during his second operation. The evidence suggests that this was a preventable death.

At this time in the program's history, three children had died, partly because the surgeon did not have sufficient skills to undertake the planned repairs. As the events recounted to this point in the narrative make clear, the program had been restarted and difficult procedures had been undertaken with insufficient planning. Three of the outcomes to this point were tragic. If there had been appropriate monitoring and review of outcomes, by this time, the program would have been subjected to a review, even if one had not been called after the case of Jessica Ulimaumi.

REACTION OF THE PCS TEAM FOLLOWING THE DEATHS OF GARY CARIBOU, JESSICA ULIMAUMI AND VINAY GOYAL

Vinay Goyal's death had a significant impact on many of the people who had been involved in his case. Feser testified that she recalled walking into work on the morning after Goyal's death and seeing his empty bed. She assumed at first that he had been moved to another ward. When she was told what had happened to him, she said she cried.

In fact, I had to turn around, go back to my office, and do what I am doing now, had a good cry. And I came back to the unit because I had to come back and listen to, I wanted to know the details on what happened and I would go in to report. And I still to this day keep thinking, you know, that boy should not have died. (Evidence, pages 29,952–29,953)

Swartz testified that she felt that she and other members of the team, specifically McNeill, Hinam and Youngson, were shocked by the death of Vinay Goyal.

The deaths of three children in such a short period of time would have been unsettling for any pediatric cardiac surgery program. As suggested above, these deaths and the circumstances surrounding them ought to have led to a review of the program. The fact that no such review was ordered was a source of real concern for many of the people involved in the program, particularly the nurses and the anaesthetists. By this point, they had concerns about Odim's skills, both as a surgeon and as a team leader. Such reservations, unless expressed openly and directly, can be poisonous for a team.

Because of their concerns, by April many members of the team were trying to attract the attention of those in some position of authority in the hope of instigating a review of the program. The anaesthetists were eventually able to trigger a reduction in the program's activities in May 1994.

THE RESPONSE OF THE NURSES

Many of the nurses were developing reservations about Odim's surgical techniques and their impact on patients. Youngson testified about these concerns at length before this Inquest.

There were other things going on, other cannulation problems, other bleeding problems, or just technical things that were happening in the operating room on sort of the routine case that we were doing, you know, on the kids that are still alive. (Evidence, page 8,385)

Youngson also felt that Odim exhibited unnecessary roughness while undertaking cannulation during these early operations.

Well, he would be trying to put in a cannula, and I felt that he was very rough, his technique was very rough. He seemed to want to get that cannula in no matter what. And on occasion I would sometimes feel that the cannula was maybe too big for this particular vessel, or some concern like that.

Occasionally, he would tear the purse string, so that when the cannula was in and you went to snug up the wall of the vessel around it, you couldn't do that, and then you would be faced with a bleeding situation again. And these sorts of things were happening on an ongoing basis. We would have to repair these vessels, we would have to redo the purse strings. (Evidence, pages 8,385–8,386)

Youngson said that the roughness also extended to the manner in which Odim would handle the children's hearts. She said that she was not used to a surgeon who touched and prodded the patient's heart as much as he did.

During the Inquest, Youngson was asked why she did not take these concerns up with Odim directly. She gave the following answer:

Historically and traditionally, when nurses have a serious concern, and I'm not just talking about a little fight that you might have had with a surgeon in the OR, but a serious concern about competency, for instance, you go through what are considered the proper channels.

My understanding of that was to go to my head nurse, and then go to the director of nursing. (Evidence, pages 8,775–8,776)

Youngson followed just such a course. At first she raised her concerns informally, speaking with Dixon during their regular workday encounters about her early concerns with Odim's problems with cannulation.

Dixon recalled meeting with Youngson and other nurses after the Ulimaumi case. She testified that the primary concern they voiced was that there did not seem to be anyone in a position of authority who was aware of what was going on. She and the nurses decided to see what they could do to get someone in such a position to take an interest in what was happening.

Borton began to have a number of doubts about the program following Jessica Ulimaumi's death. Her concerns increased during the spring.

After the death of Vinay Goyal, Youngson again went to speak with Dixon about her concerns. Dixon suggested that she speak with nursing director Isabel Boyle, and a subsequent meeting took place between Boyle and Youngson.

Hinam testified that in April a number of nurses approached her with their concerns about the program. These nurses included Feser, Plouffe, Armitage and Kiesman. She said they were concerned about the amount of post-operative bleeding in patients in the pediatric cardiac program. They also expressed concern about the fact that patients were having their chests closed in the intensive care units, rather than being taken back to the OR. While Hinam had concerns about what she had witnessed in the OR, she told the nurses that she thought they ought to give Odim a chance. However, Hinam testified that Odim seemed to have continuing problems with cannulation and operative procedures:

How to hook everything up and how to put everything together, clamps not being taken off when they should, cannulas coming out, bleeding, long pump times, long circulatory arrests. There was a lot of things in the OR that were raising red flags. And you thought, is it just me or is everybody seeing this? (Evidence, pages 11,484–11,485)

Hinam and Youngson both recalled that they met with Boyle more than once during April 1994. On April 28, after the death of a fourth child, Daniel Terziski, Hinam and Youngson met with Boyle to outline their concerns. According to Hinam, Boyle indicated that she would speak to Bishop about this issue. Furthermore, Boyle told Hinam that she should continue to encourage other nurses to give Odim the benefit of the doubt. Youngson once again relayed the concerns that the nurses had over the results in the pediatric cardiac program and the effect that the deaths of the children were having on her and her colleagues. According to Youngson's testimony, Boyle agreed to ask those in charge of a special program in the hospital called the Critical Incident Response Team to meet with the nurses in order to assist them in dealing with the emotional impact of the series of deaths. In her testimony, Hinam said that at one point in the meeting with Boyle, both she and Youngson were in tears.

Following the meeting with Boyle, Hinam and Youngson discussed the question of making notes about what they had witnessed and heard. Hinam recalled:

I said to her that she should start making notes. I said, you know, you are the one that's right there, I'm in and out, I don't see it, but you are right there. And I said, one of these days, one of these days this is not going to be an aboriginal child, this is not going to be a child from up north, it is going to be an upper middle class white family that has the ins into the medical system and is going to know that this shouldn't have happened, and there is going to be a lawsuit, and I think you should chart about it, because you are going to be called for sure. (Evidence, pages 11,485–11,486)

The point that Hinam was making deserves comment. The first three children who died in 1994 were children of visible-minority families. Caribou had been a member of Mathias Colomb First Nation, Jessica

Ulimaumi had been an Inuk child from the Northwest Territories (now Nunavut), and Vinay Goyal had been the son of an East Indian family. The order in which their cases had been selected appears to be nothing more than coincidence. However, their deaths did not result in any significant public or other reaction against the hospital or the Pediatric Cardiac Surgery Program, even though two of the deaths had been clearly preventable.

In the overall scheme of things, the victims of these tragic events were from families of the least powerful in society. None of the families of the children who had died to this point were in a position to be able to influence large institutions, such as the HSC. Charlotte Caribou and Emalee Ulimaumi were from the far north, and the Goyals left the city shortly after the death of their son for an extended stay in India.

There is nothing to suggest that there was any discrimination at work with respect to these cases. However, it seems clear that if any of the deaths had involved a family that had more socio-economic standing, as Hinam suggested, events might have proceeded differently. As later evidence indicates, there were two cases in which people who were personally acquainted with individuals involved in the Winnipeg program were warned to take their children elsewhere for pediatric cardiac surgery.

Hinam's recommendation was also shaped by the earlier experiences of cardiac nurses in Toronto. Their subordinate status was underlined in 1981 when Susan Nelles, a nurse at Toronto's Hospital for Sick Children, was arrested for the murder of four children. Before Nelles's arrest, the nurses in the cardiology ward had raised concerns with their supervisors that low numbers of staff were endangering children's lives. They pointed to the deaths of 32 children in the ward. The charges against Nelles were eventually dropped for lack of evidence and motive. A Royal Commission, headed by Mr. Justice Samuel Grange, investigated both the deaths and the case against Nelles.

It is beyond the scope of this Inquest to review or comment on the Grange Commission. However, it is apparent that its impact on the nursing profession was significant. The Inquiry concluded that the deaths were the result of foul play and that the perpetrator was likely to be a nurse. Medical historian Katheryn MacPherson gives this description of how many in the nursing profession viewed the Inquest.

Still convinced that foul play had occurred, inquiry attorneys aggressively interrogated the testifying nurses. Any expertise nurses might have offered to unravel the mysterious deaths was not sought out, while medical testimony was actively recruited and respectfully received. (MacPherson, page 256)

For many nurses the Inquiry confirmed that, while they had the responsibilities of professionals, they were still subordinate—lacking in control and authority. In telling the nurses to keep notes, Hinam was recommending that the Winnipeg nurses protect themselves from being made scapegoats.

Boyle testified that throughout April she had a number of conversations and meetings with nurses about the program. She recalled that Borton and Hinam came to speak to her following Vinay Goyal's death. She said they outlined their concerns with bleeding, cannulation, and team communication.

In early May, the Critical Incident Response Team held a meeting with the nurses. McGilton testified that at this meeting the nurses were encouraged to discuss their feelings about the deaths. She said there was also discussion of the fact that Odim did not appear to be distressed by the mortality rate. However, there was no discussion of surgical issues. McGilton told the Inquest:

It was difficult for me because I'm not a sharing person with people I don't know that well anyway. I guess it was helpful to talk about it, but I came away from that thinking it hasn't fixed anything, you know, nothing is —nothing has changed, but I think that [Karin] thought it was important that we do go through that and talk about it, because it was such a very difficult time for us then. (Evidence, page 10,534)

Hinam testified that the meeting helped, in that each nurse no longer felt that she was the only one who was experiencing concerns about the program. She also indicated that at that point, the nurses thought it would have been appropriate if the program had slowed down, and complex cases had been sent out of province.

Youngson said that she made notes at home on her personal computer. When the HSC commissioned an outside review of the program in early 1995, she revised those notes to form a document to use in addressing that review. The file itself was deleted from her computer, but not until after the documents were printed. McGilton also began to keep notes on cases.

Boyle also spoke with Feser to determine if problems were arising in the PICU. She said that Feser informed her of the concerns that the PICU nurses had with the program.

PERFUSIONISTS

Throughout this period Maas spoke with the nurses and anaesthetists about their concerns. He said that after the Ulimaumi case, Swartz, McNeill, Youngson and Hinam were quite critical of Odim. In particular, they were concerned about cannulation and blood loss. Maas said the perfusionists sought to remain neutral, saying that “it takes time to learn someone's techniques, someone's abilities, and I don't believe that it's fair in one or two cases, particularly ones where some of these cases were as difficult as they were, to judge them. At least I am not capable to do that.” (Evidence, page 6,983) Maas also said that after a number of the early cases, Youngson asked him to stand at the head of the table and observe Odim's cannulation style. Maas said:

There seemed to have been more blood loss than we would have anticipated during cannulation, and that indicated that they were losing obviously blood during the venous cannulation in particular; and we were told by the nursing staff that he quite often cut some sutures, which were replaced and retightened. (Evidence, page 6,727)

APPROACHES TO WISEMAN

In the spring of 1994 several individuals approached Dr. Nathan Wiseman with their concerns about the Pediatric Cardiac Surgery Program. Wiseman was the head of the Division of Pediatric Surgery at the HSC. In that position he reported to both Blanchard and Bishop. When asked if his responsibility to each head was equal, he testified that it was “Difficult to say.” (Evidence, page 39,370) In his testimony, Dr. Brian Postl, who was the head of pediatrics and child health from September onward, said he thought that Wiseman had no reporting responsibilities to him.

Youngson spoke to Wiseman several times on an informal basis. She said she did this because he was the head of pediatric surgery and was both approachable and respected. She testified that she indicated that she was very worried about what was going on in the program. When Wiseman indicated that he had spoken to

Hancock and been given a very positive description of what was happening in the program, Youngson urged him to scrub in for a procedure. He declined to do this. Youngson testified that Wiseman later explained that he declined because he did not take orders from nurses. Wiseman testified that he believed that if he simply came in to observe one of Odim's operations, it would change the atmosphere in the operating room and not be particularly useful as a tool for determining if anything untoward was going on. That view does not explain, however, why he did not take the concerns of the nurses more seriously.

Wiseman testified that while he did not supervise Odim's operations as a result of Youngson's request, he did assist Odim in an operation on April 15. He said at that time he had been made aware of the concerns over cannulation and observed Odim's progress. He said that he found it to be smooth and reminiscent of the work of Dr. Aldo Castaneda, the Boston surgeon with whom both Odim and Wiseman had once trained. After the operation, Youngson asked Wiseman about his assessment of Odim's cannulation. She testified that Wiseman described Odim's technique as cavalier. When asked about this description, Wiseman said:

Well, we better look it up in the dictionary, I may have misused that word. Cavalier, to me, is bold. Aldo's technique of cannulating was bold. The Boston technique of cannulating is bold. Bold is different from timid. Bold isn't bad, bold isn't good, bold isn't timid, bold is different.

Bold, in this case, means to cannulate without the presence of a clamp on the vessel. That's the Boston technique. It is just the technique, cavalier. (Evidence, page 39,540)

Dixon also spoke to Wiseman on a number of occasions. At one point she met with him informally at the scrub sinks and asked him if he would scrub in for an operation with Odim. She testified that he declined to do this, saying that Hancock was present to assist Odim. Dixon testified that she approached Wiseman because she thought Odim reported to Wiseman.

Hinam also testified that she spoke to Wiseman about her concerns and asked him to observe one of Odim's operations. She testified that he declined to do this. Wiseman testified that he could not recall this conversation.

After Borton spoke to Boyle about her concerns with the Goyal case, Boyle also made an appointment to speak with Wiseman about concerns that Hinam, Borton and Youngson had raised. She said that she went to Wiseman because Wiseman was in charge of pediatric surgery. Wiseman could not recall the specific meeting with Boyle, but agreed that it had probably taken place.

McNeill testified that she also had several discussions with Wiseman about the Pediatric Cardiac Surgery Program. She said these were informal discussions, often in the hallways, that in many ways constituted venting on her part. At the same time, McNeill hoped that Wiseman would become involved in the program in some manner.

Well, I think in some ways, he was another surgeon, I knew he had had experience with cardiac surgery during his own training, and he did do ductus ligations and he does do a lot of intrathoracic work. So he has ability to, you know, he has some familiarity with what we were doing I guess.

Again, at that point I get back to what I was saying before, about being really in some ways unsure whether these were valid concerns. And so he was somebody I saw who might be able to sort of reassure me, if you will, or perhaps agree that we should be looking at things more closely.

Oftentimes our operating rooms or the operating setup is very small, like there is only five rooms that run, and it's not uncommon for surgeons to go in each other's rooms and stop in for a chat or things like that, and for an anaesthetist to go back and forth and that sort of thing.

I thought that atmosphere of people, you know, the sort of going back and forth at times, and the fact that he was this titular head of pediatric surgery, I guess in the back of my mind—I shouldn't say I guess—in the back of my mind I was hoping perhaps he might help to come in, into the room and see how things were going, to see whether some of the interaction and/or procedure was going. (Evidence, pages 13,224–13,225)

Swartz also spoke, informally, with Wiseman about her concerns with Odim. Specifically, she recounted what, in her view, had happened in the Ulimaumi case. She stated she spoke to Wiseman because he was both a respected colleague and the head of pediatric surgery. She said Wiseman told her that he had been speaking to Hancock, who provided him with a very different account of the operation.

Wiseman testified that he never thought that he was being approached as Odim's supervisor, a position that he did not believe he occupied. From the evidence it appears that Wiseman was correct, he was not Odim's supervisor and Odim did not report to him. However, it should be noted that Wiseman had a responsibility as the head of pediatric surgery to ensure that the quality of surgery offered at Children's Hospital was of the highest degree. He was also a member of the panel of three pediatric surgeons charged with investigating pediatric surgical deaths, a member of the Children's Hospital Standards Committee and a member of the College of Physicians and Surgeons of Manitoba's Paediatric Death Review Committee. He was more than a disinterested colleague.

Swartz testified that, aside from her concerns about specific operations such as the Ulimaumi case, she was starting to have concerns about case selection. She realized that Giddins was under tremendous strain.

And I found him tired, testy at times, and sometimes just run off his feet.

And then you begin to wonder, is this guy making—where does he come from when he is making his decisions? Is he able actually to have time to sit down and think and make decisions? Is he able to also be, say the administrator of Variety Heart Centre and deal with all of those issues also? So—and I don't know who—see this, he didn't ever confide in me, for example, but I had to wonder how he was managing to do all of this. (Evidence, pages 15,731–15,732)

Swartz said that by the time Vinay Goyal underwent surgery, she was becoming concerned that the program had been restarted without sufficient preparation. She said that she had discussed her concerns with other anaesthetists.

We had experience with these types of surgeries as anaesthetists, perfusionists and nurses. And I guess we assumed that Dr. Odim had experienced these procedures himself. Although I was—I had reservations, we went ahead with the procedure thinking that it wasn't—I mean, it is complex but it wasn't that complex. (Evidence, pages 15,390–15,391)

McNeill said that by the time of Vinay Goyal's death there were informal discussions among various HSC staff in which people asked why the program had not confined itself to low-risk cases. However there were no formal objections. She believed that everyone was still committed to the program.

ANAESTHETIC MEETINGS

McNeill testified that, from the middle of April onwards, she spoke informally to Ullyot about her concerns with pediatric cardiac surgery. She also said she had a formal meeting with Ullyot, in which she asked

Ullyot how she should go about raising these concerns. Swartz also raised her concerns with Ullyot, who recommended that Swartz meet with the head of the Department of Anaesthesia, Dr. Doug Craig.

Ullyot had a number of conversations with Swartz about her concerns with poor outcomes in the Pediatric Cardiac Surgery Program. The issue was also discussed at a pediatric anaesthesia meeting on April 18. Ullyot said that throughout late April and early May, she had a number of discussions with McNeill and Swartz about the cardiac surgical program.

In late April, shortly after McNeill's meeting with Ullyot, both McNeill and Swartz met with Craig. At that meeting they expressed their concerns over the program's mortality rate, particularly among the younger patients. McNeill testified that she and Swartz also had concerns that "we didn't know there was anybody actually monitoring the outcomes of the program." (Evidence, page 13,228)

On a more personal level, we asked him at that time what our responsibility was, as department members, to give anaesthetics for surgery if we felt that we couldn't do it or were not willing to do it, or had, you know, had any significant reason for not wanting to participate.

We asked him that and he reassured us that, you know, if we had valid and significant reasons for not wishing to participate in a surgical procedure of any kind, at any time, we could refuse to do so.

I guess the exception being obvious, if you are the only person available and the patient needed—you know, I am talking in general circumstances. (Evidence, page 13,229)

Swartz testified that it appeared as if there was no one in charge of the program.

There had been really no accountability that we could tell. There had really been no reviews or assessments of morbidity and mortality. We didn't know what was—you know, what was the controls of the program. (Evidence, page 15,748)

McNeill testified that at the meeting with Craig, she and Swartz also asked if there was any mechanism by which he could help them instigate a review of the program. She said that at the time Craig was supportive of the pediatric cardiac anaesthetists and was aware of the steps they were taking.

In his testimony, Craig indicated that Swartz and McNeill had told him they were worried about the results from pediatric cardiac surgery, that they had not been able to get anyone to listen to their concerns and that they wanted to know what action they might take. Craig said he told them that no anaesthetist was obliged to provide a service if the anaesthetist felt the situation was unethical or medically inappropriate. In testimony he pointed out that at the HSC, anaesthetists were allowed to refuse to provide anaesthetic care to patients undergoing abortions or for certain operations on patients who refused to receive blood products. He also said the HSC had respected the wishes of anaesthetists who "don't want to or can't work with an individual surgeon." (Evidence, page 34,480)

Craig testified that he believed from his conversations with McNeill and Swartz, and from previous conversations with Ullyot, that these concerns had been effectively communicated to Wiseman. He also testified that he had assumed that these concerns had been communicated to Odim. He was correct on the first point, but incorrect on the second point. It would appear that Swartz and McNeill had both been left very frustrated by their conversations with Odim following Vinay Goyal's death and saw little point in raising concerns with him.

Craig then spoke with Ullyot, and it was agreed that Craig would contact Blanchard, while Ullyot would contact Wiseman. Following that meeting, Craig spoke with Blanchard and told him of the concerns that

his department members had with the Pediatric Cardiac Surgery Program. Blanchard testified that this was the first time he had heard of concerns with the program (Evidence, page 36,498). He asked Craig to keep him informed of further developments, but testified that he could not recall taking any other steps.

APRIL 18 – MEETING OF THE SECTION OF PEDIATRIC ANAESTHESIA

On the same day as Vinay Goyal's second operation, the regular monthly meeting of the Section of Pediatric Anaesthesia was held. McNeill and Swartz were in the operating room, looking after Vinay Goyal until well after 1900 hours, when the meeting apparently ended. Of the four anaesthetists who provided anaesthetic care for pediatric cardiac patients, Reimer was present at the meeting. At this meeting he discussed the concerns that the four anaesthetists had with cannulation problems and lengthy surgical times.

The members of the section resolved to appoint a liaison between Anaesthesia and Surgery. The liaison person's function was to communicate the concerns of the anaesthetists to those in charge of the program and those responsible for monitoring the surgeon, on whom most of the concerns centred. The role of the liaison also apparently was to continue over the longer term and was not intended to simply be a one-shot effort. The four anaesthetists involved in the pediatric cardiac program were to meet in order to select the person who would act as the liaison.

THE CASE OF DANIEL TERZISKI

ISSUES

Daniel Terziski died on April 20, 1994, following a high-risk Norwood operation. His case gives rise to the following issues:

- Should Daniel's condition have been diagnosed earlier?
- Was Daniel's family provided with sufficient information to allow them to give informed consent to the procedure?
- Was Daniel healthy enough to undergo an operation?
- Should the HSC team have attempted the operation or should Daniel have been referred out of province?
- Should there have been better planning for this procedure?
- Did the length of surgery contribute to Daniel's death?
- Was there appropriate post-operative care?
- What was the cause of death and was it preventable?

BACKGROUND AND DIAGNOSIS

Daniel Terziski, the third son of Kiril and Danica Terziski, was born on March 18, 1994, at the Misericordia General Hospital. An ultrasound done at six months gestation was reported as showing a normal fetus. At birth, Daniel was considered an active and healthy baby and was discharged with his mother on March 23. It is clear now that he was in fact suffering from a very serious heart condition at the time of his discharge.

One of the first questions raised in this case is the accuracy of the ultrasound done at six months gestation. In their joint report to this Inquest, Duncan and Cornel state:

The information contained in the medical record suggests that a fetal echo was done and reported as normal. This seems unlikely given the fact that there was only one atrio-ventricular valve. (Exhibit 354, page 6)

As Dr. Walter Duncan testified, Daniel did not have a tricuspid valve—therefore the scan could not have shown a healthy heart.

Cornel also noted that if the perinatal and neonatal diagnoses had identified the defects earlier, the treatment might have been more successful. Cornel testified:

When dealing with univentricular circulation, one of the things that we like to avoid as early in life as possible is massive volume overload of the ventricle. That means we like to try and control the amount of blood flow through the lungs so that the return to the ventricle is less than it might be, so that there is much less work for the heart to do. And earlier diagnosis and more precise management can reduce those problems, and sometimes earlier surgery is an advantage. (Evidence, page 44,790)

Very soon after going home, Daniel's mother noted that Daniel was weak, tired easily and had difficulty feeding. On at least two occasions his mother took him to a nursing clinic at the HSC Women's Pavilion. She testified that she also took Daniel to see the family doctor, Dr. Hugh Taylor, who encouraged her to supplement his feedings.

THE DECISION TO OPERATE

On April 13, when Daniel was 26 days old, his mother took him to see Taylor's partner, a Dr. Friesen. The doctor quickly determined that Daniel needed more significant attention and told Danica Terziski to take her son straight to the Children's Hospital emergency department. At the HSC, he was seen by Giddins, who told Danica that her son had a serious heart defect and needed surgery.

Daniel was admitted to neonatal intensive care (NICU) at 1620 hours on April 13. The admitting NICU resident examined Daniel and found he was breathing rapidly, at 80 breaths a minute at rest, with moderate in-drawing below the ribs and the breastbone, and nasal flaring. Daniel was pale, his liver was enlarged and he had poor circulation to his lower body. His oxygen saturation was low, and a heart murmur was detected. A chest X-ray showed a small right ventricle, a large left heart and evidence of pulmonary edema. An echocardiogram showed:

- tricuspid atresia (he had no tricuspid valve)

- transposition of the great arteries (his arteries did not connect to the appropriate ventricles)
- a small ventricular septal defect (there was a hole in the septum between the ventricles)
- a patent foramen ovale with an unobstructed right-to-left shunt (the foramen ovale was open)
- a rudimentary right ventricle (his right ventricle was underdeveloped)
- aortic coarctation with a hypoplastic aortic arch (his aortic arch was pinched and underdeveloped).

The transposition of the great arteries and the underdevelopment of his right ventricle meant Daniel had functional hypoplastic left heart syndrome. Cornel said this could in some measure account for the delay in making a proper diagnosis. Giddins and Odum concluded that Daniel needed a stage one Norwood repair, as described in Chapter Two of this report.

The cardiology resident, Doyle, also examined Daniel before he was transferred to the NICU. She wrote that he needed open-heart surgery in the next 24–48 hours and might require transfer to another centre (Exhibit 12, page TER 45).

In his initial report, Cornel wrote:

The diagnosis appears straightforward so far as it goes, however the aortic valve and ascending aorta are described as mildly hypoplastic the ductus appears to have shunted very little on echo leading me to the conclusion the aortic outflow was supporting the systemic circulation. The VSD is described as small but no measurements are given and arm pulses were normal and blood pressure was normal or elevated.

I suspect the decision to perform a Norwood type operation was probably correct but the data that I have on hand could also support repair of coarctation with distal arch augmentation and pulmonary artery banding as the primary procedure. (Exhibit 353, page 30)

However, in his later testimony, Cornel stated that having reviewed additional evidence, including the transcripts of some of the witnesses, he believed a Norwood was required. In his assessment, Dr. Walter Duncan wrote:

Would question wisdom of Norwood attempt this early in surgical experience, but again, the child was unstable and might not have tolerated transfer. Canadian results with Norwoods are generally poor in any event. (Exhibit 20, document 363, page 5)

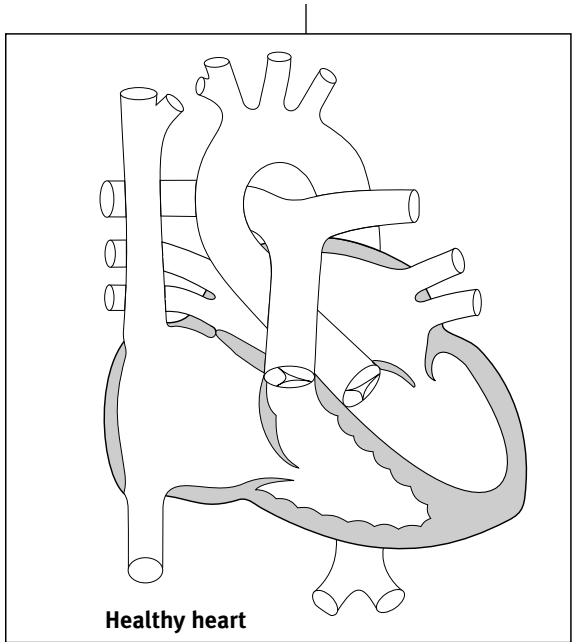
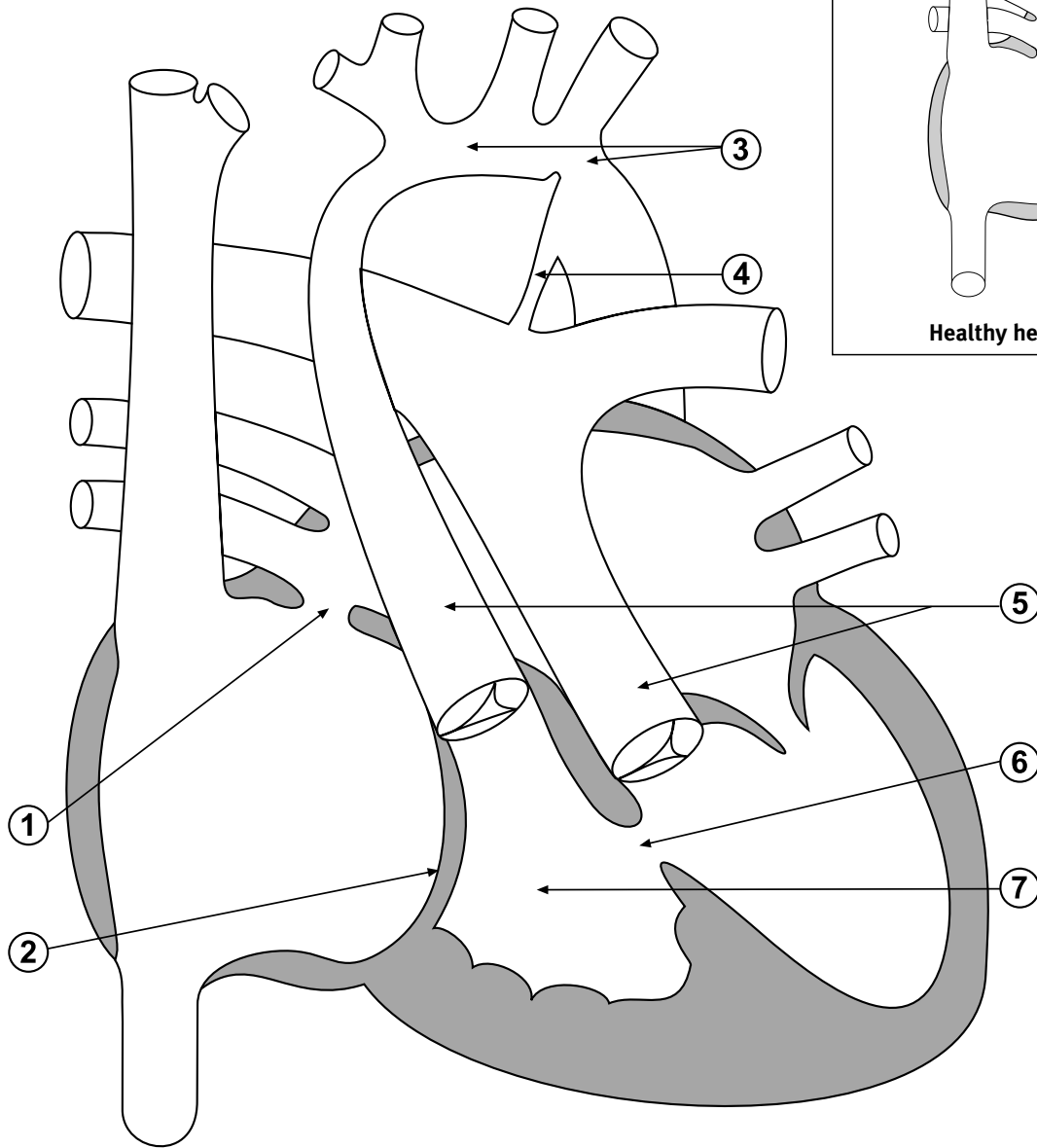
In his testimony, Cornel said that the decision to undertake a Norwood in Winnipeg at this point was very questionable, particularly considering the outcomes in the Caribou, Ulamaumi and Goyal cases.

I would expect that after these three deaths that the morale of the group is not good. If there was this failure of communication that took place in the case of Vinay Goyal, I have to wonder how functional the team was. To undertake really one of the most difficult procedures in [the] book under those conditions is unwise. The outcome is likely to be bad, and all that can do is add to the troubles for the team. (Evidence, pages 44,772–44,773)

CONSENT

On April 14, the cardiology resident, Doyle, on behalf of Giddins, noted in the chart that Giddins had “discussed with the parents the need for surgery. Dr. Odum to give impression regards surgery here or elsewhere.” (Exhibit 12, page TER 25)

Diagram 6.8 Daniel Terziski - pre-operative heart



- 1 – Patent foramen ovale
- 2 – Tricuspid atresia
- 3 – Aortic coarctation with hypoplastic aortic arch

- 4 – Patent ductus arteriosus
- 5 – Transposition of the great arteries
- 6 – Ventricular septal defect
- 7 – Rudimentary right ventricle

Odim and Hawkins met with Danica and Kiril Terziski that afternoon. They explained Daniel's heart defect. His mother was concerned about his prognosis and life expectancy and asked about post-operative complications. Hawkins indicated that she asked very pointed but appropriate questions. No final decision was reached at this meeting.

In her testimony, Danica Terziski indicated that she had asked about a transplant for her son, but had been told that a transplant was not practical in Daniel's case because of problems with rejection. She was also given a description of the defect that her son had. She testified that she was told that a reconstruction of his heart by way of a Norwood had a fifty-fifty chance of success. Odium and Hawkins also discussed comfort care with her.

The Terziskis were told it might be possible to have the operation done outside Winnipeg, in a centre such as Boston or Toronto. When Danica Terziski asked Odium where he would want a child of his operated on, she testified that he responded that it was not his place to comment on such a decision. She testified that Giddins indicated that the team in Winnipeg was as capable as any team elsewhere.

The Terziskis subsequently suggested that Dr. Christo Tchervenkov, a surgeon under whom Odium had trained in Montreal, come to Winnipeg to perform the operation. The idea had particular appeal to the Terziskis, since both Kiril Terziski and Tchervenkov were of Bulgarian descent.

Danica Terziski raised the idea with Hawkins, who according to Danica's testimony, said that it would not be possible for Tchervenkov to operate in Manitoba because his insurance would not cover the procedure. In her testimony, Hawkins said that she could not recall saying it would be impossible to have Tchervenkov perform the operation. However, she did recall saying that it would be difficult. Despite this, the Terziskis also raised the idea with Odium and Giddins. Danica Terziski testified that Giddins became very defensive at that point. She said no one suggested that they go to Tchervenkov in Montreal. Instead they were told that the Winnipeg team was capable of performing the operation. The Terziskis eventually consented to surgery in Winnipeg.

In his testimony Giddins said that he could only vaguely recall the conversation regarding Tchervenkov. He denied that he had been either impatient or angry with the Terziskis. He also testified that "intra-provincial licencing requirements, liability matters, scheduling of various individuals in various places" were, among other issues, matters that may have stood in the way of Tchervenkov operating in Winnipeg (Evidence, page 3,735). It would appear from the testimony that no efforts were made either to contact Tchervenkov or to discover whether or not these impediments would have actually prevented him from coming to Winnipeg to perform the operation.

In the death summary, Odium wrote, "All the management options were presented to the family including palliative medical therapy, heart transplantation, and the Norwood staged operative repair. The family was well informed about the natural history of each option and the risks and eventually decided upon the Norwood approach." (Exhibit 12, page TER 10) There was no mention that the family was actively seeking to have Tchervenkov come to Winnipeg to do the operation or that they were considering having the operation performed elsewhere, both of which the family considered, but from which they were dissuaded.

PRE-OPERATIVE STATUS

Daniel remained in the HSC from April 13 until his death on April 20, following his operation earlier that day. Daniel's health deteriorated throughout his stay in hospital. During the final two-and-a-half days preceding surgery, there was rapid deterioration.

On Thursday, April 14, Doyle wrote in the chart that Daniel remained stable overnight, with a heart rate of 160 beats per minute. However, he did require a dose of Lasix, for increased respiratory distress.

On April 15 Doyle described Daniel as being unchanged in his condition. He required intermittent doses of a diuretic for treatment of pulmonary edema related to high pulmonary blood flow. He also had a decrease in the strength of his pulses in his legs, which indicated a reduction in blood flow to his legs (Exhibit 12, page TER 27).

On April 16 Giddins noted that Daniel still appeared unchanged, although he was developing a difference in blood pressures above and below the aortic coarctation. Giddins also indicated that the parents had agreed to a plan for surgery on Tuesday or Wednesday. They were to come in for formal consent discussions on Monday, April 18. In her testimony, Danica Terziski indicated that she recalled that the operation had been originally scheduled for Monday, April 18 but was rescheduled to accommodate Vinay Goyal's surgery.

On Sunday, April 17, Daniel's condition deteriorated significantly. He struggled to breathe, with a respiratory rate of 80 to 90 breaths a minute. Each time he breathed he had subcostal in-drawing. He grunted with activity and was pale and jaundiced. He was also blue around his mouth, a further sign of deterioration. When his regular dose of diuretic did not relieve his rapid breathing, another dose was immediately given. At 0900 hours his blood pressure had dropped, but by mid-afternoon it had returned to normal.

Daniel's condition continued to deteriorate. The doctors could no longer feel a pulse in Daniel's femoral artery (in his groin), indicating that the circulation to his legs was worsening. A chest X-ray done at 0520 hours showed acute pulmonary edema. Subsequent X-rays done throughout the day showed signs that the lungs were becoming more dense, particularly in the left lower lobe, and losing lung capacity. After discussion with Giddins, Dr. Jacques Belik, one of the neonatologists, decided that Daniel should be artificially ventilated, in an attempt to decrease the workload of Daniel's heart. Daniel was therefore sedated and given a drug to relax his muscles, so that a breathing tube could be placed into his windpipe. The tube was then attached to a ventilator that took over Daniel's breathing.

During the course of the day, Daniel regurgitated some stomach contents. In his report, Cornel speculated that some of this liquid might have entered his lungs (a process known as aspiration). If Daniel had aspirated, this could have led to an infection in the lungs.

Later that evening, Daniel's condition was clearly unstable. His oxygen saturation was rapidly declining. As a result, the doctors decided that he required manual ventilation with 100 per cent oxygen. In manual or hand ventilation, the patient is disconnected from the ventilator. Using one hand, a doctor, nurse or respiratory technologist squeezes a bag connected to the breathing tube, thus controlling the rate of breathing and the size of each breath delivered. (This technique sometimes, but not always, offers better control of the delivery of oxygen than does mechanical ventilation, using a ventilator.) Daniel was also treated with Lasix (for worsening pulmonary edema) and dopamine (to strengthen the function of his heart).

Overnight, Daniel's condition was very unstable, with his heart rate dropping severely several times. Because his oxygen saturation was so low, hand ventilation was continued.

At 0800 hours April 18, Odum wrote in Daniel's chart: "Patient has shown signs of destabilization from single ventricle lesion with torrential pulmonary flow and obstructed systemic output via VSD." Daniel had congestive heart failure that required that he be intubated. In addition, he had a low urine output. According to Odum's note these factors had "increased his surgical risk appreciably." (Exhibit 12, page TER 37) He was scheduled for surgery on Wednesday, April 20.

At 2230 hours, Daniel's oxygen saturation fell dramatically and, despite manual ventilation, he continued to deteriorate. Air entry to his lungs was obviously greatly decreased and the amount of carbon dioxide in his blood was more than twice the normal. According to Cornel, this was a sign that Daniel was close to asphyxiating. His endotracheal tube had to be changed because it was blocked with yellow secretions. In his report Cornel referred to these secretions as a purulent mucus plug. In testimony he described such a plug as:

A very hard, thick collection of secretions that build up on an endotracheal tube, and it can—we try to keep them removed by suctioning but they don't always get removed. It's more likely to happen when there is ongoing infection. (Evidence, pages 44,797–44,798)

As a result of the presence of these secretions and a chest X-ray that showed increased areas of density in the right upper lobe, Cornel testified that:

I would have wanted the baby placed on antibiotics, cultures taken, and a period of ventilation, with controlled ventilation, and to try and reduce the pulmonary blood flow prior to surgery and get the baby as completely stable as possible. (Evidence, page 44,798)

Cornel, in his written report, concluded that

the infant was not in the most satisfactory possible condition for surgery. I believe a further delay of perhaps 24 hours to allow recovery from the severe hypoxic episode [the rapid decrease of oxygen in the blood] and to treat the possible respiratory infection would have been of benefit. (Exhibit 353, page 31)

This is one more case in which the consulting witnesses who appeared before this Inquest have raised the question as to whether or not a patient was taken to surgery with an infection.

PREPARING THE NICU STAFF

Daniel was one of the first neonates upon whom Odum operated in Winnipeg and was the first to die. Debra Armitage, the senior nurse in the NICU, said that she recalled a pre-operative meeting for this operation quite vividly. She recalled that Belik asked Odum detailed questions about post-operative care.

And the answers that he was—these were very specific questions from Dr. Belik—the answers that we were getting from Dr. Odum were less specific, they were actually quite vague. In actuality, they were to the point that he was answering the usual, or what you are used to, or not being really specific. Our previous experience had been that we were very much aware which inotropes we used, how much we needed to use of them and specifics like that.

We then moved on to ventilatory support of the child post-operative, and again Dr. Belik was asking very specific questions about how Dr. Odum liked his post-operative management in terms of ventilation, and again was asking very specific questions about the degree of pressures that the ventilator

delivers, and the rate of the ventilator, and whether or not—where he liked to keep the pH of the blood at in terms of what it was that we were trying to accomplish. Again, the answers were vague, with him repeating, the usual, or whatever you are used to.

And I was somewhat disconcerted at that point, because I certainly expected much more from him. I felt like I was essentially standing there with a light bulb on over top of my head, because I was struck with this amazing sense that he didn't know what he needed or wanted post-operative. (Evidence, pages 29,430–29,431)

Armitage said that, in the past in situations like this one, the surgeon would set very clear parameters as how to monitor and assess the patient in the NICU. The evidence suggests that Odum failed to assist the NICU in planning for Daniel's care. That failure seems to have stemmed from his inability to communicate what he wanted them to do and what they ought to do.

THE OPERATION—APRIL 20

On the morning of Wednesday April 20, Daniel underwent a Norwood Stage I palliation operation. To deal with the transposition of the great arteries and the underdeveloped right ventricle, the pulmonary artery and the aorta were connected to create a common vessel. (This is referred to as the division and anastomosis of the pulmonary artery to the ascending aorta.) The point where the left and right pulmonary arteries formerly connected to the trunk of the pulmonary artery was closed. A homograft was to be used to augment the ascending aorta. This operation also involved an atrial septectomy, division of the patent ductus arteriosus and the placement of a four-millimetre right-modified Blalock-Taussig shunt. The operating team is set out in the accompanying chart.

TABLE 6.9: Persons involved in the operation on Daniel Terziski, April 20, 1994

<i>OR team member</i>	<i>Persons involved</i>
Surgeon	J. Odum
Surgical assistants	B.J. Hancock, V. Hota (resident)
Anaesthetist	H. Reimer
Scrub nurses	S. Scott, C. McGilton
Circulating nurses	B. Zulak, W. Yakinchuk, C. Youngson
Perfusionists	T. Koga, M. Maas

The operation that Daniel was to undergo was a high-risk procedure. While the length of surgical time is always an important factor in pediatric cardiac surgery, it is of particular importance in a Norwood. Because Daniel had only a single working ventricle, that chamber was required to work twice as hard as normal. A lengthy operation could compromise this ventricle's function and increase Daniel's risk of serious complications. (Long bypass times could injure his lungs and could compromise his health, since during the post-operative period it might have become necessary to adjust his pulmonary blood flow. This is best done with healthy lungs.)

Because of all the risks involved in a Norwood operation, it was important that the operating team be well prepared. In this case, Odim did not consult in advance with either Reimer or Kesselman, both of whom had experience with Norwoods. Nor did he speak with any of his previous teachers.

Deep hypothermia with circulatory arrest and cold-blood cardioplegia were used for myocardial protection.

TABLE 6.10: Length of phases of the operation on Daniel Terziski, April 20, 1994

<i>Phase of the operation</i>	<i>Time taken</i>
Induction	1 hour
Bypass	5 hours 59 minutes
Aortic cross-clamp	1 hour 42 minutes
Total surgical time	8 hours 40 minutes
Total operating-room time	10 hours 1 minute

UNTOWARD EVENTS DURING SURGERY

Preparation of the homograft

McGilton testified to one complication during Daniel's surgery.

I remember we used homograft for Daniel and I remember telling Dr. Odim several times during the case to give us lots of warning because there is a certain protocol that you have to follow for thawing it out. It's kept on dry ice and it's protocol that you follow, circulating nurse will get it, thaw it in the sterile package then it will be put on the scrub nurses' table and kept in saline for I think it's ten minutes. It's very, very carefully timed. It's very, very important. It's a very, very important—I don't want to say piece of equipment, it's part of a child, that you can't waste it, you know, you want to do it right. And I remember telling him several times please tell us when you think you're going to need it ... (Evidence, page 10,519)

McGilton testified that she reminded Odim of the need to give her sufficient notice several times during the course of the operation. Despite this, she said, she did not receive adequate notice.

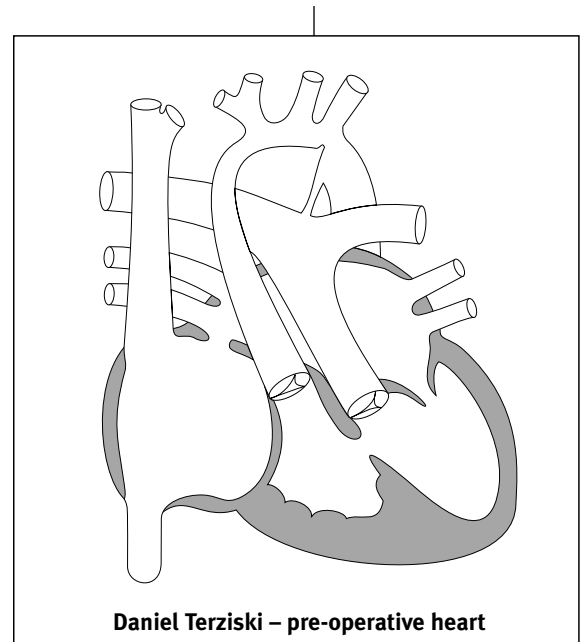
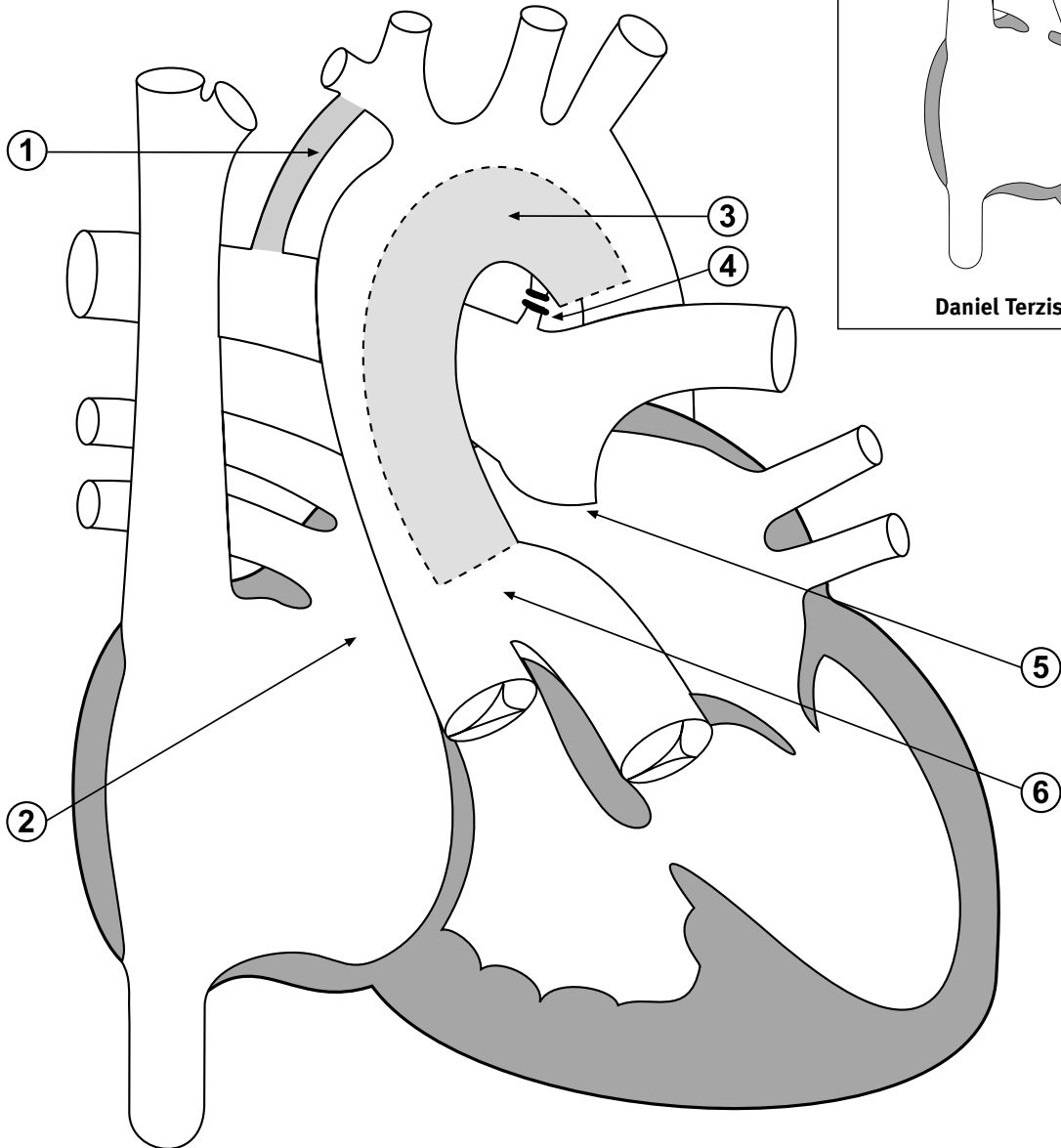
It got to the point where, okay, we need it, we need it now, where is it and, you know, it was a big panic and a big rush to get it and he wanted it and I didn't want to give it to him and it was—oops, so he ended up I think putting it in maybe a minute or two ahead of when he should have. (Evidence, page 10,520)

Odim acknowledged that, as he recalled the event, he had not given enough notice, but felt he had waited the appropriate period of time before applying the homograft.

Removing the cap from the line

At another point in the operation, Odim wanted to check a pressure by connecting the aortic cannula to a transducer. Normally the surgeon does this by either removing a cap on or a connector in the line and then connecting the cannula to a line to the transducer. To ensure that there is no blood loss, the cannula is clamped for a brief period of time while the surgeon removes the cap from the line. Youngson and McGilton

Diagram 6.9 Daniel Terziski – post-operative heart



Daniel Terziski – pre-operative heart

Norwood Stage 1

- 1 – Modified right Blalock-Taussig shunt
- 2 – Atrial septectomy
- 3 – Homograft augmentation of ascending aorta and aortic arch

- 4 – Ligation and division of patent ductus arteriosus
- 5 – Closure of pulmonary artery
- 6 – Division and anastomosis of pulmonary artery to ascending aorta

testified that Odium struggled to remove the cap. Youngson testified that after a time Maas indicated that they had to unclamp the line to allow blood to flow to the patient. The clamps were removed and then, unexpectedly, Odium took the cap off. Youngson gave the following description of events.

It finally comes right off in his hand, and now we have got blood shooting out of this cannula, because this is where the blood is coming back from the pump under, not a lot of pressure, but there is some pressure behind this flow of blood, and potentially air going into the aortic cannula. And I remember it was just a mad scramble to get this thing back on, stop the pump again, just make sure there is no air, for just a second or two, and then carry on. It was just a very startling incident. (Evidence, page 8,435)

It does not appear that the event caused any medical issues for the patient.

Problems with the shunt

While Daniel was being rewarmed, Odium constructed a 3.5 millimetre Blalock-Taussig shunt. The purpose of this shunt was to allow blood to flow from the ventricle to the lungs. The shunt was connected to the aorta (which had been reconstructed) and the pulmonary artery. After placement of this shunt, Daniel was taken off bypass. His oxygen saturation was found to be low (60 per cent as opposed to an anticipated 80 per cent). This was a sign that the shunt was not allowing enough blood to flow through. As a result, Daniel was put back on bypass. Odium then adjusted the shunt. Daniel was taken off bypass and Odium discovered that the shunt was still not permitting sufficient blood flow. As a result, Daniel was placed on bypass a third time, at which point a new four-millimetre Gortex shunt was put in place. Odium's operative report describes only one of these two revisions. These events added considerably to the length of time Daniel spent on bypass.

Odium also delayed closing Daniel's chest, choosing to use a silastic sheath. In his note, Odium wrote that Daniel's condition was stable on transfer to the NICU at 1901 hours. In testimony, Reimer agreed with this assessment, although he added that 'stable' was a generous term when one was speaking of a child who had undergone this particular operation.

THE ASSESSMENT OF THE CONSULTANTS

Cornel, in his written report, stated that the general plan for the operation was consistent with good practice. However, he identified a number of concerns with the actual procedure.

The nasopharyngeal [sic] temperature was as much as three degrees C above rectal during cardiopulmonary bypass. (Exhibit 353, page 31)

In testimony, Cornel explained that this may have been of limited significance. It is, however, an indication that that body was not cooled uniformly.

The circulatory arrest time of one hour 42 minutes was very long and surprisingly so in view of what appears to have been satisfactory anatomy. (Exhibit 353, page 31)

In his testimony, Cornel said the favourable aspect of the anatomy he was referring to was the fact that the descending aorta was near-normal in size. This provided a relatively large vessel wall on which to sew the patch. In testimony, Cornel commented:

In his operative report, Dr. Odim didn't mention any particular technical difficulties, so it's a little hard to figure out where the time went. (Evidence, page 44,810)

The choice of a 3.5 mm graft for a Blalock shunt was unnecessary and more appropriate for a central shunt. Changing the shunt added almost 1 hour to what was already a very long cardiopulmonary bypass time (total five hours fifty-nine minutes). (Exhibit 353, page 31)

Cornel testified that he believed a larger graft would have been more appropriate and easier to attach. In his report to this Inquest, Hudson commented on the length of the operation.

The duration of CPB was very long, in part because of the need to revise the Blalock-Taussig shunt twice before satisfactory pulmonary blood flow could be achieved... The long duration of CPB could have contributed to the eventual outcome. Also, the duration of TCA was much longer than is generally accepted at 18°C. If the patient had survived, he would have had an increased risk of major neurologic morbidity. (Exhibit 307, page 4.10)

In his testimony Odim said that the operation was longer than expected because Daniel's tissues were friable (tore easily). This required that he take extra care—and time—in his suturing.

POST-OPERATIVE COURSE

The post-operative care of a child who has undergone a Norwood operation can be as difficult as the procedure itself. It is extremely important that there be a proper balance between the blood flow to the child's body and to the lungs. In his testimony, Odim said that in a sense one takes the operating room to the intensive care unit to manage these babies.

When Daniel arrived in NICU, the attending neonatologist was not present, having been called to attend in another part of the hospital. Instead, a resident met Daniel and the team accompanying him from the OR. Reimer testified that after he explained the anaesthetic issues to the resident, the resident "immediately wandered off to look after another baby, who I thought at the time had a relatively trivial problem." (Evidence, page 18,876)

Reimer testified that he was dismayed by this and by the fact that Daniel was placed in the back corner of the nursery. Reimer testified:

Traditionally, infants who are more critically ill are nursed closer to the desk. That's simply a reflection of that being a location where there are usually more people around, help is more readily available, and they can perhaps be watched a little bit more closely than they are elsewhere. (Evidence, page 18,875)

In her testimony, Dr. Molly Seshia, the head of the NICU, disputed Reimer's assertion that there were priority cubicles in the NICU. Seshia also said that as a result of the Terziski case, the NICU put into place a practice whereby, whenever a child is coming from the surgical ward, the attending neonatologist must be called back to the ward to be present. This also required some form of notice from the surgical unit that the child was about to be transferred.

In light of these events, Reimer said:

I thought there was under appreciation by the staff, again, of the fragility of this child's condition, or of a child's condition who has had this procedure, and general under appreciation for, I guess, just the degree of illness they have and how easily they can decompensate. (Evidence, page 18,876)

The major issue that needed to be watched carefully in the post-operative management of Daniel's case was the balance between the blood flowing to Daniel's body, as opposed to that flowing to his lungs. His condition was such that a fatal imbalance could develop rapidly.

According to Odum, Daniel's condition was stable for 40 minutes after Daniel arrived in the NICU. At that time, he and Giddins went to see a patient in another unit. In his testimony, Odum said that he could not provide more information about this other patient. After ten minutes, Odum said, he then returned to Daniel's bedside. By that time, his oxygen saturation had dropped into the sixty per cent range and, despite hand ventilation, did not improve. Odum opened Daniel's chest at 2023 hours to check the status of the shunt. Odum testified that he asked the nurses to organize a sterile setup so that he could quickly provide some assistance to Daniel.

There was a lot of scurrying around to get sterile drapes and towels so that I could proceed, and the Betadine to spread on the chest as an antibacterial. (Evidence, page 24,828)

Armitage testified that the scene was chaotic at this point.

We were not prepared at any time to go back into Daniel's chest. In essence, we were caught off guard very badly by the fact that we were not prepared to go back into this chest. We needed equipment and supplies and personnel in order to do that, and we had none of that available. (Evidence, page 29,434)

Armitage said that it was necessary to essentially replicate the OR setting.

And we have forceps, we have things like that available to us in NICU, but not the actual surgical instruments that are required in that circumstance. There are special kinds of sutures that we do not stock, simply because we do not use them. There are various other bits of supplies that are needed.

There, again, our concern also was in talking about personnel is that neonatal nurses are highly specialized in what we do. That does not include being a scrub nurse. We are not familiar with the instruments. We don't know what their names are, never mind what they are used for. So, for him to ask me to hand him whatever, I simply wouldn't be able to do that.

The other point that I want to make in terms of equipment or possible supplies, the OR is one floor down from us. While it might take you only 30 seconds to run there, they have a very big supply room and their supplies are somewhat overwhelming, and for me to run into that room to find out what it is I am looking for, even if I know what it looks like, there is a huge time lag and the baby may very well be dead by the time I find it.

We were fortunate in fact that Carol Youngson was still in the OR cleaning up and so she was able to come up and assist. (Evidence, pages 29,435–29,436)

After opening the chest, Odum deemed the shunt to be viable. Daniel, however, continued to deteriorate. Odum gave this description of what happened next:

... the blood pressure continued to drop and we lost our sinus rhythm, and Daniel was in a cardiopulmonary arrest.

I tried vigorously to resuscitate the heart with massage and drugs, but after a period of time of all these attempts, we were never able to get any action back, and Daniel expired. (Evidence, page 24,832)

Despite 40 minutes of open-heart massage and vigorous resuscitation, Daniel died at 2059 hours.

AUTOPSY

Daniel's death occurred within a short time of an operation and therefore, under the rules of the Office of the Chief Medical Examiner, should have been the subject of an autopsy. Despite this, no autopsy was performed. There is conflicting testimony as to how that happened.

Danica Terziski testified that, on the evening of Daniel's death, she was informed that autopsies were compulsory in cases such as Daniel's and that she could expect a report in a matter of weeks. This information was accurate. However, it was still necessary for someone to obtain her formal consent. This did not happen.

She testified that the following morning, Odim telephoned her. In the course of their conversation, Danica testified that Odim:

... asked if we could have another look around. He explained that this is a very rare, complex procedure and maybe we can learn something from it. (Evidence, page 1,774)

This left her with the impression that Odim wished to perform research on Daniel, in addition to the mandatory autopsy. She withheld her consent to what she thought would be research. In his testimony Odim said that he could not recall any of the specifics of this conversation. He did state that on the evening of Daniel's death, he believed that Belik had taken responsibility for arranging the autopsy. If he had thought so, it is unclear why he phoned Danica Terziski the next morning.

In his testimony, Dr. Peter Markesteyn, the Chief Medical Examiner, gave a slightly different account of the events, although his evidence is second-hand. Markesteyn testified:

I was consulted by the medical examiner investigator, or the M.E.I., about the fact that an autopsy had been ordered, or Dr. Odim would get permission.

Q: I see.

A: He would get an autopsy, or Dr. Giddins or both and, unfortunately, that it not, due to misunderstandings, that did not happen.

Q: So your information was that Daniel Terziski would have an autopsy?

A: Yes.

Q: Performed by the hospital?

A: Yes. (Evidence, pages 38,676–38,677)

The written notes of the MEI indicate that in this case Odim informed the Chief Medical Examiner's office that he would contact the family and arrange for an autopsy.

The evidence tends to suggest that Odim did in fact telephone Danica Terziski the morning after her son's death to ask for consent to carry out an autopsy. It also suggests that he did not make his request very clear, and as a result of a misunderstanding, Danica told him she would not consent to what he was asking. She had already accepted the fact that an autopsy would be conducted. Odim, however, believed that she would not consent to the holding of an autopsy. Odim never forwarded this information to the CME's office. As a result, the CME was left with the impression that the HSC was arranging and carrying out an autopsy.

Since Markesteyn believed that the hospital pathologist was going to carry out an autopsy, and was never informed to the contrary, he did not order one on his own.

The matter was exacerbated when staff in the CME's office placed an official release on the chart, indicating that the CME was not going to direct that an autopsy be held. Markesteyn said this was done because his office had been informed that the hospital would seek the family's consent to an autopsy. Obviously that release was premature until it was known that the consent had been obtained. This release, combined with a lack of a written consent on the chart, was apparently understood by hospital staff as an indication that an autopsy was not to be held at all. Therefore, the baby's body was soon released to the family for burial. The family assumed that the autopsy had been performed before the body had been released and proceeded with funeral plans for Daniel. It was not until several months later, when Daniel's mother inquired about the status of the autopsy report, that it was determined that an autopsy had in fact not been performed.

Unfortunately in this case, it appears from the evidence that cost factors may have played a role in the decision of the staff in the Chief Medical Examiner's office not to follow the usual procedure and order an autopsy. Markesteyn testified that when the hospital asks for an autopsy report, the hospital must pay for the cost of performing the autopsy. When his office orders an autopsy, the cost of the autopsy is paid for from the Chief Medical Examiner's budget. In this case, the decision not to place a Chief Medical Examiner's direction on the chart seems to have stemmed from the desire on the part of the CME's office to avoid paying for the autopsy. These events give rise to recommendations in the final chapter of this report.

FINDINGS

Daniel Terziski was born with a very serious heart defect. That defect led to his death following an operation intended to be the first step in a long-term plan for amelioration of the defect. But the procedure was a high-risk one. Many children in Canada, with the same defect as Daniel had, died following surgery. The questions that arose from this case included the decision to perform the procedure here in Winnipeg, as well as the manner in which the case itself was handled.

The issues are:

- Should Daniel's condition have been diagnosed earlier?
- Was Daniel's family provided with sufficient information to allow them to give informed consent to the procedure?
- Was Daniel healthy enough to undergo an operation?
- Should the HSC team have attempted the operation or should Daniel have been referred out of province?
- Should there have been better planning for this procedure?
- Did the length of surgery contribute to Daniel's death?
- Was there appropriate post-operative care?
- What was the cause of death and was it preventable?

Should Daniel's condition have been diagnosed earlier?

■ Finding

Two of the consulting witnesses who appeared before this Inquest indicated that Daniel's heart defects should have been identified before his birth. In addition, his mother sought medical attention several times before Daniel was properly diagnosed. While Dr. Walter Duncan indicated that the type of defect that Daniel suffered from is difficult to detect, early detection might well have led to more effective treatment of Daniel. The evidence suggests that Daniel's condition should have been detected earlier than it was.

Was Daniel's family provided with sufficient information to allow them to give informed consent to the procedure?

The evidence suggests that the family was not encouraged to seek a second opinion. They were offered the option of sending their child out of province. However, when they raised the prospect of bringing a surgeon to Manitoba, it was made clear to them that this was unnecessary, since there was nothing available outside the province that was not available in Manitoba. This amounted to a form of pressure to have the procedure carried out in Manitoba. The assurances given to the Terziskis about the competence of the Winnipeg team must be considered in light of the comments from witnesses. Both Duncan and Cornel said that it might not have been wise for the Winnipeg team to undertake a Norwood at that point in its history, and Soder commented on the role that surgical issues played in Daniel's death.

■ Finding

As in other cases discussed above, Daniel's parents were not fully informed as to the fact that this was Odium's first Norwood, either without supervision or with expert assistance. Nor were Daniel's parents informed about the recent deaths of other patients in the program. This fact was of significance by this point, since many of the people involved in the program were clearly concerned about its mortality and morbidity rates. This evidence tends to suggest that Daniel's parents were not provided with sufficient information to allow them to give informed consent to the procedure.

Was Daniel healthy enough to undergo an operation?

■ Finding

As noted above, there was in this case, as there had been in several other cases, concern on the part of the consulting witnesses that Daniel was taken to surgery with an infection. There appears to be some evidence to validate that concern. The concerns about infection with respect to the Caribou case and the Goyal case have equal application here.

Should the HSC team have attempted the operation or should Daniel have been referred out of province?

■ Finding

In the wake of the results in the Goyal, Caribou and Ulimaumi cases, and given Odim's lack of experience (coupled with the overall lack of planning), it was unwise to undertake this operation in Winnipeg.

Should there have been better planning for this procedure?

■ Finding

The evidence suggests that there was not enough planning for either the operation or the post-operative care.

Did the length of surgery contribute to Daniel's death?

Cornel, Duncan, Hudson and Soder all noted that the operation was lengthy and that this length could have compromised Daniel's heart. In their joint report, Cornel and Duncan wrote:

There appear to be some questionable surgical management issues related primarily to the duration of bypass. We once again question the appropriateness of an inexperienced surgical team performing Norwood procedures. (Exhibit 354, page 6)

Soder indicated in his report for this Inquest that:

[T]he skill and dexterity of the surgeon performing these operations were insufficient for the challenge of successfully repairing infant hearts with complex malformations. Surgical factors were the prime determinants of fatal outcome in 9 of the 12 deaths. (Boldface in original) (Exhibit 345, page 8)

■ Finding

The case of Daniel Terziski was one of the nine that Soder identified in which surgical factors were a prime determinant in a fatal outcome. In particular, he identified the failed first repair and prolonged circulatory arrest time as major surgical factors and the prolonged bypass time as a minor factor. The evidence suggests that the length of surgery contributed to Daniel's death.

Was there appropriate post-operative care?

■ Findings

The evidence suggests that the neonatal intensive care unit was not properly prepared to deal with Daniel Terziski. Although staff in the NICU sought information from Odim before the operation, according to testimony, they only received vague responses. The fact that the neonatologist was not present when Daniel arrived from the OR indicates a breakdown in communication. It is also disturbing that the resident, and later Odim and Giddins, briefly left Daniel without a doctor being present at his bedside. In his written report Cornel noted that Daniel

should have received more monitoring of oxygen and carbon dioxide (blood gas analysis) and of the amount of potassium in his blood.

Cornel wrote that the “wisdom of managing complex open heart patients at two sites in the same small institution is questionable.” (Exhibit 353, page 32) In his testimony, Cornel expanded upon this point, which referred to the fact that in Winnipeg, both the NICU and the PICU managed open-heart cases:

It’s not just in dealing with Norwoods, I would really need to know what their experience in dealing with post-operative open heart patients was. We do about 50 babies, or less from neonates—it would be less than that. And so for neonates, to accumulate the experience in post-operative management, for the neonatal intensive care unit to accumulate the post-operative management skills would take a long time. Especially with nursing shifts, you don’t get the same nurses, it really spreads out the experience too much I think. (Evidence, pages 44,817–44,818)

In the coming months Odum did seek to have all open-heart cases managed by the PICU post-operatively.

What was the cause of death and was it preventable?

Because there was no autopsy, it is difficult to state with certainty the cause of death in Daniel’s case. It is clear that the operation failed to alleviate Daniel’s condition. It also appears the operation exacerbated the problems that Daniel was experiencing. This was due at least in part to the length of the operation. Daniel’s heart defect meant that there was torrential blood flow through his lungs, severely taxing his single (left) ventricle. As a result, he started to develop heart failure, which led to a decrease in oxygen saturation and damage to the heart muscle itself. Daniel then underwent a prolonged operation, with a very long circulatory arrest time, which led to more damage to his already compromised heart. This further reduced his heart’s ability to pump blood and the heart failed. The length of the TCA would have also caused some neurological damage to Daniel. With the heart failure came a resultant drop in blood oxygen, and a consequent decrease in oxygen delivered to the heart muscle. As Daniel’s heart struggled to pump, his blood pressure decreased. The heart rhythm then became abnormal and he suffered a cardiac arrest.

■ Finding

Given the fact that there was no autopsy and that Norwoods are a high-risk operation, it is not possible to provide a clear-cut answer as to whether or not this death was preventable. It is clear that the chances of preventing this death would have been increased if the child had been referred out of province.

WHAT HAPPENED AFTER THE TERZISKI CASE

After the Terziski case, the NICU management set about creating a cardiac bin similar to the one the PICU staff were in the process of establishing. An NICU nurse spoke with Odum and Hancock following the operation and created a list of equipment they might need in the unit. The NICU clinical instructor, Judy Wiebe, took the list and began to finalize the bin. Wiebe consulted with Youngson, Hinam and Plouffe from

the PICU about their cardiac bin. The revised list was sent to Odim for a final approval. According to Armitage, Odim never provided any feedback. It was not until January 1995 that Wiebe spoke with Odim informally and got approval for the list of bin contents.

Following Daniel's death, Borton went to speak with her immediate superior, Lois Hawkins, about her concerns with the program. She also spoke with Giddins about her concerns over the surgical outcomes. She indicated that one of her concerns was the amount of bleeding that children were experiencing after surgery. According to Borton's testimony, Giddins indicated that Odim was part of a new, faster generation of surgeons and that one of the results of changes in technique was increased bleeding. Borton also testified that she asked Giddins to speak with Youngson about the events that were taking place during surgery. Borton said that she later asked Youngson if Giddins had ever approached her to discuss the events in surgery, and she said that this had never occurred.

Borton also came to a more direct realization of her concerns when the parent of a child who was to be treated at the centre asked her if she, Borton, would allow a child of hers to be operated on by the Winnipeg Pediatric Cardiac Surgery Program.

I said, well, I really can't answer that because she's not my child, you know, I can't—well, I can't say that, I can't answer that because she's not my child.

And, in fact, that was a lie, because I had always been able to say to people, in terms of support, to say to them before, Dr. Duncan could operate on my child. I don't have children, but if I did have children, he could operate on them. I had all that confidence, I was able to say that. (Evidence, page 18,177)

Borton was not alone in having grave concerns. In the following month two other nurses asked not to be assigned to pediatric cardiac surgery cases.

Giddins himself had a very different response to Daniel's operation. He told this Inquest that the Terziski case improved his assessment of the surgical team.

That it was an extraordinarily heroic and difficult surgery, that I had seen on many occasions end with an unsatisfactory result in the operating room. This patient survived the operation.

Q: But died an hour after?

A: That's correct. Of circumstances that are difficult to be certain of, but most of the cases of that sort that I had had experience with before hadn't even made it to the NICU. (Evidence, page 3,760)

This is a disturbing comment. It is true that the Winnipeg program's success rate with Norwoods was very poor. It suggests that Giddins was gauging the team's progress along a learning curve, and the fact that child did not die in the operating room should be seen as a sign of the team's improvement. It is the case that surgeons do travel along a learning curve. However, there should be no allowance for a learning curve when analysing results of surgery where patient safety is concerned. Undoubtedly the two most effective tools in protecting patients as surgeons develop their skills are judicious case selection and careful preparation. Both were absent from the Winnipeg program in 1994.

THE RESULTS UP TO THAT TIME

Giddins's appreciation of the Terziski case aside, there was good reason to feel that the program was experiencing poor results up to that time. According to the records of the Variety Children's Heart Centre (Exhibit 62), from the time of Odim's arrival to the death of Daniel Terziski, Odim had operated on 18 children. Of those, nine underwent relatively minor closed procedures, and nine underwent open procedures where the CPB machine had been used. Of the nine in that second group of children, four had died.

ULLYOT MEETS WITH WISEMAN

Ulyot met with Wiseman on April 26 to discuss the concerns that the anaesthetists had brought to her attention. In preparation for that meeting she compiled a list of all the cardiac cases and their outcomes. According to her list, in addition to the four cardiac patients who had died, another was making a rocky recovery in the ICU. She gave this description of her meeting with Wiseman.

I told him I wanted to talk to him about the pediatric cardiac cases, that the section, the people who were involved in providing anaesthesia for those cases were concerned that the mortality was high, and that the children who did survive had long ICU stays, and some of the complications seemed to be unusual.

And he said something about, well, the mortality is not that high. I said, Nathan, the mortality is 30 to 40 percent. He said it's not that high. I said, well, here is the list of the kids, and I gave him this one. These are the children that had been done. (Evidence, page 31,245)

Ulyot was asked why she had gone to Wiseman with this information. She gave the following testimony.

Two reasons; one is because I knew him very well and I worked with him on many committees, and he looks after cardiac, he looks after surgery at Children's. He's the real working head of cardiac surgery.

The other question was, who else? Who else would you take it to? I suppose the only other person you might think of is taking it to Dr. Odim. And I particularly did not want to do that, because I felt that there was a sense within my department and nursing, and even outside of there, that we were suggesting that Dr. Odim was the whole problem. (Evidence, page 31,248)

Ulyot felt that the members of her department had been constantly questioning the way that Odim practised and raising concerns about communication. She thought the program was in need of repair, but she did not want to antagonize Odim at that point.

Ulyot said she left Wiseman a copy of her notes, but she did not question him about what he intended to do with them.

In his testimony, Wiseman said he did not recall being given the list at the April 26 meeting with Ulyot. However, the evidence seems to point to no other conclusion than that he did receive it when Ulyot said he did. She did not hear back from Wiseman before May 16.

Wiseman testified that during this period, he had a number of conversations with Odim about individual cases. He said that Odim was concerned about a number of the outcomes, but provided reasonable explanations. Aside from what happened in the Ulmaumi case, Wiseman testified that Odim had left him with the impression that there were no serious technical problems.

Wiseman did not pursue the matter any further with Odim.

MEETINGS IN LATE APRIL AND EARLY MAY

Boyle testified that within 24 hours of her April 28 meeting with Hinam, she spoke to Bishop about the concerns that had been raised. According to Bishop, she did not meet with Boyle to discuss the program until early May. Whether the meeting took place in late April or early May, Bishop confirmed that Boyle told her there were concerns with cannulation, bleeding, morbidity and mortality. In addition, she was told that the anaesthetists involved in the program had similar concerns.

Boyle testified that in May she also informed the vice-president in charge of nursing, Susan VanDeVelde-Coke, about the issues that the nurses had brought to her attention about the Pediatric Cardiac Surgery Program. VanDeVelde-Coke on the other hand, could not recall Boyle speaking to her about the PCS program until the fall of 1994.

Bishop testified that after Boyle had contacted her with concerns from the nursing staff about the program, she asked Wiseman for his assistance in determining how well-founded the concerns were. According to Bishop's testimony, Wiseman did not inform Bishop that any of the nurses and anaesthetists had already approached him. Wiseman again testified that he had no specific memory of that conversation with Bishop. However he did take steps to gather information for Bishop.

With regard to the conversations that Wiseman said he could not recall, he never denied that any of the conversations took place. In most instances, he accepted that in all likelihood they had taken place. He could not, however, recall them specifically. He apparently made no notes of them, nor of any action plan arising from them. This seems surprising, given the mounting tensions within the program, and the number of people raising concerns about what was occurring.

By mid-May, Wiseman had reported back to Bishop that he had spoken to the anaesthetists, Giddins, Hancock and a perfusionist. In addition, he had reviewed most of the cases with Giddins. He testified that following the death of Alyssa Still on May 6, Wiseman, as chief of pediatric surgery, requested a meeting with him. He said that he and Wiseman reviewed all the operations up to that point at that meeting. Giddins testified that he believed that Wiseman was satisfied with his accounting for the surgical outcomes. Wiseman, surprisingly, could not recall this meeting. Bishop testified that Wiseman anticipated speaking with a number of nurses before reporting back to her in full.

Bishop also spoke with Kesselman and Giddins. Kesselman was not prepared to assess Odim's surgical skills at that point. However, he did point to communication issues between Odim and two of the anaesthetists, McNeill and Swartz. Giddins, Bishop recalled, was very supportive of Odim.

Bishop said that she was attempting to develop a broad idea of the nature of the problems emerging in the program. She thought that it was possible that a review committee might have been set up once she knew what the problems were, but she admitted that there had been no plan to set one up when events overtook her.

NURSES SEEK REASSIGNMENT

As April progressed, some of the operating-room nurses began to express reservations about continuing to work in the program. According to Dixon, McGilton approached her and asked her if nurses could refuse

to scrub in for pediatric cardiac surgery procedures. “They were hoping, I think, that they wouldn’t have had to be part of the whole operative procedure.” (Evidence, page 12,511)

According to Dixon, McGilton asked to be removed from pediatric cardiac cases. Dixon testified that a second nurse, Helen Skomorowski, also asked to be removed from such cases. However, for resource reasons, removing those nurses from the care of these patients was not possible.

On May 9, Dixon had a formal meeting with Wiseman where she told him that morale was low and there were problems with cannulation. She testified that Wiseman told her he did not think that Odim was having any greater problems than Duncan had experienced. In addition, she testified that Wiseman suggested that the program was on a learning curve as it adapted to a new surgeon. Again it appears that those assessments were applying the concept of a learning curve, although in this instance it is uncertain if the concept was being used to justify poor surgical outcomes or the ongoing conflicts between individuals.

In testifying about this meeting, Wiseman said:

I perceived at that time that they were undergoing a kind of culture shock phenomenon, in the sense that they had for five years worked with one individual, and had a mindset of the way things were done. And you know, we tend to be creatures of habit, and when things are done differently, there is two ways we can approach them; we can sort of say, well, this is a different way of doing it and be a little I guess open minded about the advantages or disadvantage or value; or we can get to be old and crotchety like I am and not to be so flexible and think that my way is the best way. (Evidence, page 39,560)

From the evidence presented to this Inquest, it would appear that there was far more than culture shock involved. It would also appear, however, that the message that Bishop was receiving from Wiseman was simply that some members of the surgical team were having difficulty adapting to a new leader. That message failed to fully capture and report the depth of the problems facing the program.

ODIM’S VIEW

Odim was questioned as to whether or not outcomes in the Caribou, Ulimaumi and the Goyal operations raised concerns for him about how the team was working. He was also asked why it appeared that he had taken on all cases that came his way, regardless of level of risk. Odim said that he had never felt pressured into performing operations. Furthermore, he had been confident—based on his initial meetings with the team members—that the team could provide acceptable care to the children. After experiencing a number of tragic outcomes, he said that he still did not sense any major difficulties. He did say that he was beginning to have questions about the way in which team issues were being addressed.

It was also becoming apparent that from day one nobody was really attending a lot of the team functions that were set up to build team spirit and community. The only real function that was attended was the cath conference before the cases in the week, so those things sort of were evolving in the first two months but I still felt and was still enthusiastic about making pediatric cardiac surgery work in Winnipeg. (Evidence, page 24,258)

Odim said that within a month and a half of his arrival, he started to make efforts to establish extra rounds because there “wasn’t much of a team concept.” (Evidence, page 24,273)

THE EXISTING ROUNDS AND CONFERENCES

In his testimony Odim said that he believed the M & M Rounds were an appropriate forum for reviewing case outcomes.

It's usually been in the surgical arena when the cases are presented and things are discussed, that is the forum that those types of things come out. It sort of serves also as an audit function in addition to reviewing what one could do better, that type of thing. (Evidence, page 23,999)

The M & M Rounds were held once a month on Friday afternoon, although the timing of the meeting could vary. At the meetings there would usually be a presentation from Odim, Giddins or both. A wide range of people—medical students, nursing students, residents, pathologists and members of the pediatric cardiac surgery team—could attend M & M Rounds on a voluntary basis. There was generally a considerable delay between the time that an operation took place and the time it was dealt with at the rounds, particularly in the case of a death. This was to allow the pathologists time to have completed a post-mortem and to have prepared material for the presentation. McNeill gave this description of how the M & M Rounds functioned.

They would go through a sort of a listing of the cases that had been done since the last M & M conference, and perhaps sort of outcomes, and also if there had been a problem involved with the case, how that had been handled or what had been the outcome of that. That was often a fairly, like a listing, you know, we wouldn't go case by case in depth, it would be done that way.

And then there would probably be one or two cases that were presented in more detail. They could have been cases that were done relatively, like in the immediate past, or potentially a child that had had surgery three or four months before. (Evidence, page 12,916)

Anaesthetists often were not able to attend these Rounds. The Rounds were scheduled to start at 1500 hours and the anaesthetists were often in the operating room until 1530 or later. As a result, McNeill said, she attended only one or two Rounds in the spring of 1994.

Odin commented that the Winnipeg M & M Rounds were poorly attended and, as a result, the quality and substance of the discussion suffered.

Youngson could not recall if the cases of the children who had died were discussed at any of the M & M Rounds. Swartz testified that even if they had been presented, the types of issues that the anaesthetists wanted to discuss were not normally dealt with in M & M Rounds.

Generally speaking, M & M rounds were run by Dr. Odin, and so these issues would not usually come up at M & M rounds.

M & M rounds would be more to review the pathology, to review the nature of the surgery, the proposed procedure, what was actually carried out, the results, if there was morbidity or mortality, that sort of thing; but not to review technical difficulties. (Evidence, pages 15,778–15,779)

McNeill concurred with that view. She did not see the M & M Rounds as an appropriate forum in which to challenge the surgeon's approach to specific issues. She said this had also been true of the M & M Rounds when Duncan had been the pediatric cardiac surgeon. After the Goyal case, McNeill said, she had not considered taking her concerns to the M & M Rounds because she viewed it as essentially an educational venue.

Swartz testified that she also did not believe that pre-operative conferences provided the appropriate forum for discussing these issues, since they were focused on introducing the issues surrounding new

patients. When asked if it would have been appropriate at such conferences to question if the program was ready to take on a specific operation, she answered that it would not have been.

It is clear that by the end of April, the Pediatric Cardiac Surgery Program was in serious trouble. The results from the procedures conducted to date were not good. An objective consideration might well have concluded that the team was not providing a level of care appropriate to the needs of the population of the province.

Additionally, two of the department heads and possibly one of the hospital's vice-presidents had been informed that the OR nurses and the pediatric cardiac anaesthetists had serious concerns about the program.

Some of the staff in the program were worried that the HSC was incurring potential civil liability in the way it was handling cases, and that when blame was being apportioned, it would fall heavily on them.

The surgical team existed in name only. The need for a cohesive collective approach to the treatment of children was badly missing, and little was being done to address that fact. Warnings had, in fact, been given—and by and large, they had either not been fully understood or had been ignored.

THE CASE OF ALYSSA STILL

ISSUES

Alyssa Still died on May 6, 1994, following surgery on May 5. Her case gives rise to the following issues:

- Was Alyssa's family provided with sufficient information to allow them to give informed consent to the procedure?
- Was Alyssa healthy enough to undergo an operation?
- Were there technical problems with the operation?
- Was the PICU adequately equipped for her case?
- What was the cause of death and was it preventable?

BACKGROUND AND DIAGNOSIS

Alyssa Still, the firstborn child of Donna Still, was born at 39 weeks gestation by caesarean section in Thunder Bay, Ontario on November 14, 1993. Shortly after her birth, her doctor, Dr. G. Derbyshire, diagnosed Alyssa with a heart murmur. An ultrasound indicated that she had Tetralogy of Fallot. Donna Still said that she understood Tetralogy of Fallot to be a large hole in the heart, which would simply not close.

Derbyshire was familiar with Giddins, and referred the Stills to the Variety Children's Heart Centre. He advised Donna Still that Alyssa would probably have to undergo heart surgery. Donna Still and her mother, Shirley Mae Still, took Alyssa to Winnipeg in March 1994. Donna Still indicated in her testimony that she had been given the option of going to Toronto with her child, but had chosen to come to Winnipeg because it was closer to Thunder Bay. Once referred here, there was never any suggestion that the operation be performed outside Manitoba.

THE DECISION TO OPERATE

Giddins saw Alyssa at the VCHC on March 18, 1994. An echocardiogram performed that day revealed Tetralogy of Fallot, with:

- mild biventricular hypertrophy
- a non-restrictive subaortic ventricular septal defect
- a three-millimetre (in diameter) mid-muscular ventricular septal defect
- moderate muscular right ventricular outflow tract obstruction with thickened pulmonary valve leaflets.

The diameter of the bicuspid pulmonary valve was eight millimetres. The bilateral proximal pulmonary arteries were narrowed to five to six millimetres in diameter.

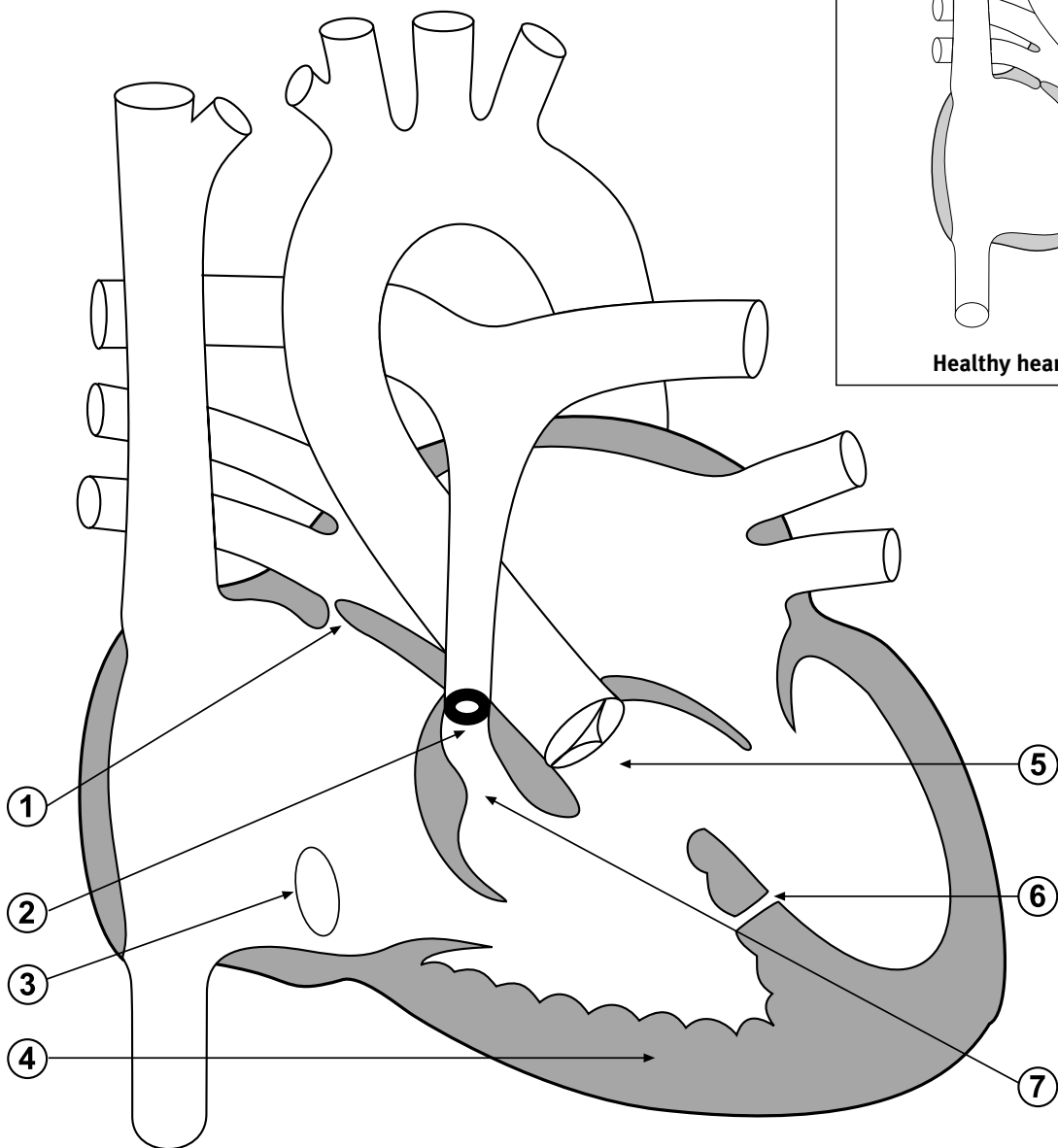
A chest X-ray done on March 18 showed that Alyssa had an enlarged heart. According to radiologist Dr. A.C. Patton, there was no evidence of acute pulmonary infiltrates. This is the term for the white areas on X-rays of the lungs. Infiltrates are also referred to as densities. The absence of infiltrates indicated that the lungs were normal. In subsequent testimony, Dr. Martin Reed, the head of pediatric radiology at HSC, indicated that he believed the X-ray actually revealed a mild abnormality.

Giddins advised that surgery was required in the near future. While the Stills had been told that an operation would be necessary, they did not expect that it would take place so quickly. Donna Still testified that the nature of the problem was explained. She was left with the sense that she had no real choice but to proceed with the operation. While Odum was not present at this meeting, Still testified that Giddins told her Odum was one of the best surgeons in North America. She said that she was left with the impression that, while Odum was new to the hospital, he had worked—as opposed to trained—in Boston and Montreal. She also said that Giddins indicated to her that the success rate for this procedure was 95 per cent.

Four days after Giddins met with the Stills, Alyssa's case was presented at a CVT conference involving Odum and Giddins, as well as staff from the Heart Centre. After the conference, Odum outlined his conclusions in a March 22 letter to Giddins. Odum described Alyssa as a four-month-old child whose evaluation confirmed the picture of Tetralogy of Fallot. She had no obvious symptoms of heart problems and was not taking any medications. He mentioned that the chest X-ray showed clear lungs and a slightly enlarged heart. His conclusions differed from Giddins's. Odum had detected an atrial septal defect, while Giddins reported that there was an intact atrial septum. Odum wrote that his view was that the child needed early repair and that he would be happy to discuss the operative approach and risks with the family (Exhibit 11, page STI 1).

On March 22 Giddins wrote to Derbyshire that "Alyssa has Tetralogy of Fallot, with an atrial septal defect and significant obstruction at both the sub-pulmonary and pulmonary valve level." (Exhibit 11, page STI 2) Giddins stated that "Her muscular ventricular septal defect is likely not significant, and overall my impression is one of anatomy highly favourable for definitive early correction. The nature of the problem was explained to the family, as was our tendency to operate before six months of age, a concept they agreed with." (Exhibit 11, page STI 2)

Diagram 6.10 Alyssa Still - pre-operative heart



- 1 – Patent foramen ovale (diagnosed as atrial septal defect)
- 2 – Thickened bicuspid pulmonary valve leaflets with stenosis
- 3 – Opening to coronary sinus
- 4 – Right ventricular hypertrophy

- 5 – Ventricular septal defect with overriding aorta
- 6 – Muscular ventricular septal defect (not identified at post-mortem examination)
- 7 – Right ventricular outflow tract obstruction

CONSENT

Odim testified that, in his conversation with the Stills, he had outlined Tetralogy of Fallot and discussed the ways in which the condition could be treated.

We discussed the surgery in detail in terms of what needs to be done, how it is—how it is done using the heart-lung machine. We discussed the issues of the risk and what types of problems that one can encounter, both being on the heart-lung machine and from the actual repair and told her that essentially in terms of numbers, you take a hundred people like Alyssa, that 90 to 93 will leave the hospital. (Evidence, page 24,925)

As his note suggests, there was no discussion of treatment outside Manitoba, nor of the team's lack of experience. The Stills did not apparently raise any questions about the team's experience with this procedure. This was not surprising. However, Odium and Giddins failed to inform them of the surgeon's lack of experience with this procedure in an unsupervised setting.

The Stills then returned to Thunder Bay to await the scheduling of the operation. Upon her return to Thunder Bay, Alyssa developed a cold. Donna Still took her daughter to the emergency ward of McKellar Hospital in Thunder Bay on April 1. There she was given a prescription for an antibiotic for one week.

The operation was set for April 21. The Stills (Shirley Mae, Donna and Alyssa) returned to Winnipeg on April 17.

PRE-OPERATIVE CONDITION—FIRST ADMISSION

On April 18 Alyssa was admitted to the HSC. A nurse on the cardiac surgical ward noted that Alyssa tired easily, especially during meals. She also noted that Alyssa had a congested cough.

That same day, a physiotherapist assessed Alyssa's pre-operative respiratory status. Donna Still told her that the baby still had a congested-sounding cough following her cold. On examination, the physiotherapist heard breath sounds equally in both lungs. She also heard a low-pitched expiratory wheeze, which was greater in the right upper lobe of the lungs than the left upper lobe. She concluded that Alyssa was not in respiratory distress, but had some upper airway congestion.

The findings of an April 19 heart catheterization confirmed previous studies and measured a large VSD. Specifically Alyssa had an acyanotic Tetralogy of Fallot with a small muscular VSD, in addition to a large subaortic VSD. There was severe sub-pulmonary muscular obstruction, pulmonary valve stenosis and mild right pulmonary artery stenosis. The coronary arteries appeared normal. At the end of the catheterization report, Giddins wrote, "Case to be discussed with the surgical team within next 24 hours." (Exhibit 11, page STI 147)

While Alyssa was in hospital, her mother and grandmother met with Odium. Donna Still testified that the heart problems were explained and she was left with the sense that the operation was common and usually successful. Again, it would appear that there was no discussion of the surgical team's experience.

A nurse recorded on the evening of April 20 that she had completed pre- and post-operative teaching with the child's mother and grandmother. She commented that both women asked questions and seemed to understand the information given to them.

That evening, Giddins and Odim concluded that in view of the recently resolved respiratory infection and the right middle lobe infiltrates seen on the chest X-ray, the operation should be postponed for two to three weeks (Exhibit 11, page STI 149). In his testimony, Odim said:

At the point at which this was brought to my attention, which was in the evening, Dr. Giddins and his staff had spent time with the mom and patient and gotten a history, and examined the patient, and they were of the opinion that given a history of pneumonia, or some pneumonic process, and their own clinical assessment, they felt that they wanted to postpone the case. And when he brought that to my attention, he took me down to take a look at the films, and I went on with his—con-curred and deferred to his clinical judgment. (Evidence, page 24,874)

The next day, April 21, Alyssa was discharged to Ronald McDonald House to await surgery. The discharge summary noted that while Alyssa was afebrile and had good air entry in her lungs, when she breathed she did have some abnormal sounds in her upper airways and a “rattly cough.” (Exhibit 11, page STI 150)

PRE-OPERATIVE CONDITION—SECOND ADMISSION

Odin met with the Stills on May 2. At that meeting, Donna Still signed a consent form. Following that meeting, and after examining an X-ray taken that day, Odin wrote to Giddins that:

As you know, she had originally been placed on the schedule a little over a week ago but was recovering from an upper respiratory tract infection and had evidence of a right middle lobe infiltrate necessitating postponement of surgery. In the intervening period she has been well without evidence of infection. She still has a cough. There is no catarrh [no runny nose]. The chest X-ray today shows clear lung fields and a bulky heart. There are some residua of middle lobe infiltration. We plan to get a nasopharyngeal swab to check for RSV and if this sample is negative I think we can proceed with definitive repair later this week. (Exhibit 11, page STI 6)

The radiologist had a different interpretation of the May 2 chest X-ray. While Odin wrote that it showed clear lung fields, Dr. Martin Reed recorded in his report that:

There is slightly more consolidation in the right perihilar region extending into the lower lobe, than on the previous examination of March 18. Abnormal densities persist in the left lower lobe as well, essentially unchanged. The appearance of the heart is not changed in the interval. Interpretation: the pneumonia appears slightly worse. (Exhibit 11, page STI 62)

The reference to pneumonia was to become a troubling one in the investigation of this case.

In coming to this conclusion, Reed had to have determined that the March 18 chest X-ray had indicated that Alyssa had mild pneumonia, while the May 2 X-ray showed that the pneumonia had slightly worsened. Reed, in other words, was making a different interpretation of the March 18 X-ray and the May 2 X-ray. Reed also testified that he did not believe her pneumonia was an unexpected abnormality, in light of the cancellation of surgery two weeks earlier because of an infection.

Reed’s report was written and distributed on May 4, the day before Alyssa’s scheduled operation. It does not appear that either Odin or Giddins read this report before Alyssa’s surgery. Nor were the Stills made aware of Reed’s report.

Odin on the other hand did not believe Alyssa had pneumonia. He testified that:

With all due respect to Dr. Reed, he didn't have the advantage of hands-on contact with the patient. The patient had no symptoms, had no signs of pneumonia, was afebrile, white count was normal, if you look at the laboratory data, no leftward shift, no indication of any infectious process. (Evidence, page 24,886)

Anaesthetist Dr. Harley Wong also disagreed with the assessment that Alyssa had pneumonia before her operation. He noted that there was no sign of a fever and that her white blood cell count, which would have been elevated if she had pneumonia, was normal. He also indicated that during the induction of anaesthesia, Alyssa did not exhibit the symptoms that one would expect from a child with pneumonia.

If the child had that pneumonia when the child came into the room and we put the child asleep, there would have been a couple of problems that we would have had to deal with right away if the child had pneumonia. First of all, we would run into problems with secretions, tremendous amounts of secretions. If the child had pneumonia, I would have had to have been suctioning the child for a lot of secretions if there had been pneumonia, and I would have had problems dealing with keeping the child well oxygenated. I would have had drops in oxygen saturations that were unexpected. I would have difficulties ventilating the patient.

I can add to that that I have seen that in patients that were brought to the operating room with pneumonia in other cases, for other reasons, that did have pneumonia, and that's exactly what we experienced. (Evidence, page 19,812)

Wong went on to testify that if Alyssa had had pneumonia, she would have not had the stable blood gas and oxygenation readings she had during the early portion of her stay in the PICU post-operatively.

In this case, as in several of the cases that preceded it, questions arise as to whether or not the patient had an infection at the time of surgery. In his report for this Inquest, Cornel wrote:

A pulmonary infection 2 weeks prior to surgery may not have completely cleared (cough reported by mother and physiotherapist on 4th May). (Exhibit 353, page 37)

Cornel pointed out that Alyssa's post-operative arrest was related to suctioning of secretions that might have been related to the infection. He stated that:

In my practice these finding [sic] would constitute a contraindication to all but the most urgent surgery, and if I must operate in the face of active infection I usually perform a palliative rather than open heart surgery. (Exhibit 353, page 39)

Witnesses before this Inquest could not be definitive about the pre-operative state of Alyssa's lungs because X-rays were missing from the files. The report prepared jointly by Duncan and Cornel also commented on this issue.

Similarly, the pre-operative chest radiograph is reported as showing pneumonia, which would normally be an indication to cancel and reschedule the surgery unless the child was in imminent danger of death without proceeding. The absence of this radiograph from the master file of radiographs is disconcerting. (Exhibit 354, page 8)

However, in their testimony, both Cornell and Duncan acknowledged that Odum might have been correct in sending Alyssa to surgery in May. Duncan explained that sometimes an X-ray does not show what the patient has at that point but what the patient had in the past. In other words, the patient may have recovered from a clinical point of view, while the X-rays show evidence of the lung in the process of healing, rather than showing an active infection. Dr. Walter Duncan testified:

I don't know if you have ever seen two physicians who could agree about anything, but, no, it's not unusual to have differing opinions. And whereas the radiologist only sees the film, the physician sees the patient. So I think perhaps one is, one tends to be biased to one's point of view, I mean, that's human nature, isn't it?

Dr. Odim would have seen and examined the child, listened to the chest and looked at the x-ray and said, well, I don't hear anything in the chest, she seems to be fine, her white cell count is normal, I think I am okay to proceed.

A radiologist would look at a film, compare it to a previous film and say, film A looks different from film B because—was that grounds to cancel? I think you could argue it both sides. (Evidence, page 41,384)

In conclusion, Duncan testified that in this case he did not “think there was sufficient grounds to cancel.” (Evidence, page 41,388) Cornel came to a similar conclusion, testifying:

In the absence of anything else, I would accept their view of things. I am always concerned about respiratory infections, as I keep saying, and I would be concerned if an x-ray was taken as a follow-up for pneumonia and nobody paid attention to it. But in the absence of any other findings, I accept what they say, that there was no evidence of an active infection and it was okay to go ahead. (Evidence, pages 44,828–44,829)

In his written report, Hudson stated:

Proceeding with an elective operation with a coexisting unresolved pneumonia is definitely not an acceptable standard of medical care. The only exception to this rule would be a patient who had chronic respiratory infections that could not be successfully treated, and there is nothing in these records to indicate that was true of this patient. There is not unanimity of opinion regarding the length [of] time elective surgery should be delayed after resolution of a pneumonia. However, any competent physician would agree that elective surgery should not be done when any clinical or radiographic signs of pneumonia are present. The fact that the chest radiograph was ordered by the attending cardiologist on 2 May 94 suggest that he was still concerned about the pneumonia. However, there is no evidence in this patient's records that any of the physicians involved in the perioperative management of this patient were aware of the radiographic findings indicating a worsening pulmonary infection. (Exhibit 307, pages 5.20–5.21)

Consulting witness Dr. Glenn Taylor reviewed the microscopic slides and also concluded that the lungs were moderately congested with irregularly expanded air spaces. He found no evidence of acute pneumonia. In a May 5, 1997, letter, Taylor said:

I did not see acute pneumonia in the autopsy microscope slides of the lungs that were sent to me. It is possible the sampling of lungs at autopsy missed areas of pneumonia, although 5 specimens from the lungs were examined. If pneumonia was present, it likely was focal. However, even mild acute pneumonia could adversely affect a child's recovery from open heart surgery. (Exhibit 336, page 5.6)

Taylor testified:

Again, previous experience with children who have had open heart surgery, have good anatomic heart repairs, have good cardiopulmonary bypass runs, come into the ICU with no minimal or inotropic support, and then start to develop problems, generally pulmonary hypertensive crises. I think that's where mild degrees of pneumonia or pneumonitis or bronchiolitis play a role, is that these young children have very reactive airways, very reactive pulmonary or lung blood vessels, and if there is hypoxia, acidosis, the vessels can constrict down, you get into episodes of episodic pulmonary hypertension and a positive feedback system, because the blood vessels cramp down, blood flow to the lungs diminishes, and the child becomes more hypoxic and cyanotic, that causes further constriction of the blood. (Evidence, pages 43,102–43,103)

In short, while Taylor did not find pneumonia in the material he examined, he could not rule it out completely. Furthermore, he believed that pneumonia could account for Alyssa's post-operative experiences.

In his testimony to the Inquest, Reed said that upon consideration of Taylor's report and the testimony of Odum and Giddins about Alyssa's pre-operative condition, "I think it is reasonable to conclude that the patient did not have an active pneumonia on May 2nd." (Evidence, page 37,425)

ALYSSA'S ADMISSION TO THE CHILDREN'S HOSPITAL

Alyssa was admitted to the HSC on Tuesday, May 4. The admitting nurse wrote that her chest air entry was good but she had an occasional dry cough. The admitting medical student charted that Alyssa's chest was clear, with good air entry in both lungs. The physiotherapist assessed Alyssa's respiratory status in the afternoon. Alyssa's chest again sounded clear, although Alyssa's mother told the physiotherapist that Alyssa still had a congested cough in the morning and evening.

At 1600 hours, Wong assessed Alyssa's condition in preparation for surgery. On the consultant's report, he wrote, "Cyanotic but potential for cyanotic episodes exist. ASA II. Acceptable risk for GA [general anaesthetic]. In good condition." (Exhibit 11, page STI 49)

That evening Alyssa's mother and grandmother toured the PICU as part of the pre-operative preparation for surgery.

In her testimony, Donna Still said that on May 4 she had reservations about going through with the operation. That day Alyssa had become very upset when a blood sample was taken. Donna Still expressed her concerns to a nurse, although she could not recall which nurse she spoke to.

I said I had a bad feeling about this surgery. Like I wasn't sure if I really wanted to go through with it. They made it perfectly clear that it had to go through, that there was no discussion otherwise. (Evidence, page 2,250)

Shirley Mae Still also testified to this hesitation. She said that she thought either Giddins or Odum was present and persuaded them to allow the operation to proceed.

In the early morning hours of May 5, 1994, as Alyssa underwent her final preparations for surgery, the nurse wrote, "...occasional congested cough noted overnight (no) nasal discharge." (Exhibit 11, page STI 40)

THE OPERATION—MAY 5

Alyssa underwent a complete repair of Tetralogy of Fallot. This included the placing of a Dacron patch over the subaortic ventricular septal defect, an interrupted suture closure of a small muscular ventricular septal defect, dilation and patching of the pulmonary arteries and valve, and excision of the right ventricular muscle bundle. Essentially, Odum patched the hole between the two pumping chambers and relieved the obstruction to her right pump. Odum testified that he did not see a still-smaller VSD that had been identified pre-operatively on the echocardiogram. Since such VSDs tend to close on their own, Odum was not concerned that he could not identify it. The PFO was left open.

The operating team is set out on the accompanying chart.

TABLE 6.11: Persons involved in the operation on Alyssa Still, May 5, 1994

<i>OR team member</i>	<i>Persons involved</i>
Surgeon	J. Odim
Surgical assistant	B.J. Hancock
Anaesthetist	H. Wong
Scrub nurses	S. Scott, A. Glenday
Circulating nurses	C. Youngson, M. Arroz
Perfusionists	M. Maas, D. Smith

The myocardial protection used was moderate hypothermia and intermittent cold blood cardioplegia.

TABLE 6.12: Length of phases of the operation on Alyssa Still, May 5, 1994

<i>Phase of the operation</i>	<i>Time taken</i>
Induction	2 hours
Bypass	3 hours 7 minutes
Aortic cross-clamp	1 hour 1 minute
Total surgical time	5 hours 30 minutes
Total operating-room time	7 hours 40 minutes

Dr. Walter Duncan described the pump run as being long.

Alyssa apparently suffered Tet spells before cardiopulmonary bypass was instituted. Cornel and Duncan indicated in their reports that these spells occurred during induction. In his testimony, Wong said that the Tet spells were minor and occurred when the heart was being manipulated for bypass. The anaesthetic record showed that the Tet spells occurred after induction of anaesthesia and before going on bypass and during the induction of bypass.

Wong also testified that he believed that, while lengthy Tet spells could be a precursor to a difficult peri-operative course, Alyssa's spells were very transient and were treated with neosynephrine. Dr. Walter Duncan testified that, regardless of the triggering event, Tet spells could lead to a difficult recovery period. At the same time, he said that the appropriate course of action at that point was to proceed with the operation. Odim testified that he was not aware until after the operation that the spells had taken place.

No other problems arose during the procedure. Indeed, Youngson testified that she was thrilled by the outcome in the OR.

The surgery, the repair seemed to go very well, if I remember correctly. And I remember we all felt really good, like, finally, we have got a case here that had gone well. The patient seemed to come out of it in very good condition, she was pink, vital signs I think were good, and she went to PICU, and everybody—I remember going home that night and thinking, well, good, this was good. (Evidence, page 8,439)

In his operative report, Odim wrote that following surgery, “The patient returned to the Pediatric Intensive Care Unit in excellent and stable condition.” (Exhibit 11, page STI 54) As later events demonstrate, this was an overly optimistic assessment.

During the course of this Inquest, consulting witnesses questioned whether or not Odim’s operative approach had provided adequate relief of the obstruction of Alyssa’s right (pulmonary) valve. In his operative report, Odim indicated that he dilated the pulmonary valve to 10 millimetres, which he considered sufficient:

The initial sizing of the pulmonary valve accepted only a 7 mm Hegar dilator. This was gently dilated up to 10 mm using the Hegar dilator. At this juncture, it was felt that given the child’s age and weight that a 10 mm orifice would be sufficient and as such we elected not to do a transannular repair. (Exhibit 11, page STI 53)

In short, Odim determined that the valve was sufficiently enlarged. Therefore he did not think it was necessary to perform a transannular repair, in which the annulus is sliced and patched to enlarge the valve.

This view was questioned by Cornel, who testified that when he examined the heart, he thought the annulus was small and the pulmonary valve leaflets were not properly formed (or dysplastic). He believed that a valve of this nature would have represented a significant obstruction to blood flow. He acknowledged that “it is hard to be certain but this may represent inadequate relief of the pulmonary stenosis”. (Exhibit 353, pages 36–37) He said that he would have conducted a transannular repair and that would have created a larger passage.

Taylor also thought the valve was small, although he said it was not significantly narrowed. He also raised issues about how well the valves themselves worked:

The issue might be, is it a regurgitant or incompetent valve, because with distortion of the cusps or the three flaps of the valve, it may not close properly, and it may allow blood to fall back from the pulmonary artery into the right ventricle. (Evidence, page 43,097)

Taylor also indicated that the best way to assess the competence of the valve would be with an intra-operative echocardiogram, but one was not performed. HSC pathologist Dr. Susan Phillips agreed with Taylor that the valve was dysplastic and bicuspid. With regard to Cornel’s reservation about the degree of relief of the pulmonary valve stenosis, Phillips testified that the size of the valve opening was not the only fact that had to be taken into consideration. It was also important to know the pressure measurements, and these could best come from an echocardiogram.

If you are only using size, but size doesn’t necessarily tell you how it’s functioning. For that you need to have the clinical input, pressure measurements, whatever information they had prior to death. The size is only one aspect of a valve. For example, these valves were dysplastic, they may not have been functioning properly. (Evidence, pages 42,180– 42,181)

In summary, Odim undertook a surgical approach that did not involve removing or repairing the dysplastic valves, as he would have done if he had performed a transannular repair. It is unfortunate that an echocardiogram was not performed during surgery. Alyssa’s post-operative problems could have been related to inadequate relief of pulmonary valve obstruction. If this was the case, an echocardiogram might well have provided HSC staff with valuable information.

However, it also appears that Odim employed one of a number of appropriate approaches to this operation.

POST-OPERATIVE COURSE

On admission to the PICU, Alyssa was very puffy, especially around her eyes. Her fluid balance at the end of bypass was 800 millilitres more than it had been at the start of the operation. Such a degree of fluid overload would make ventilation more difficult and would also make the heart muscle stiffer.

Alyssa was placed under a warming blanket because she was very pale and her arms and legs were cool, with pulses that were only weakly felt. Her blood pressure was moderately decreased and the output from her heart was low. The admitting nurse noted that her air entry was clear but decreased on the left side. Alyssa had a metabolic acidosis, which was being treated with sodium bicarbonate. She was also making occasional jerking movements of her chest. Kesselman testified that the jerking was most likely the result of one of the anaesthetic drugs wearing off.

While Odim had described Alyssa as being in stable and excellent condition on admission to the PICU, Kesselman gave a different perspective in his testimony.

Well, she was, based on those findings of somewhat impaired cardiac output and edema and everything, she was not—I was going to say critical, she wasn't critical in the sense that things were changing, but she needed close attention, and gradually improved over the next several hours.

Q: Was she stable when she came to ICU?

A: Stable in the sense that nothing was changing, yes, but things were not as perfect as one would like, but I would say that her condition was adequate and not unexpected for a post-op repair early on. (Evidence, page 33,957)

In the radiology report of a chest X-ray taken post-operatively in the PICU, Reed noted, “The heart is normal in size. There are abnormal densities throughout most of the right lung, but the left lung looks essentially clear. Interpretation: There are abnormal densities in the right lung, which probably represent retained secretions.” (Exhibit 11, page STI 63) In his testimony, Reed said that:

It is quite common to see abnormal densities in the lungs following general anaesthesia, particularly if the surgery lasts for awhile. It is not surprising to see it after cardiac surgery. (Evidence, page 37,421)

He said that the densities were not likely to be pneumonia.

During the evening and most likely before 2000 hours (there is no time on the note) Giddins wrote, “Probably fluid overloaded with high likelihood of pulmonary edema.” (Exhibit 11, page STI 46) He noted that Alyssa was quite puffy, with an increased heart rate of approximately 160. He suggested that the dose of dopamine be adjusted downwards and a diuretic started within 12–14 hours.

At 0100 hours on May 6, Colleen Kiesman, who was the bedside nurse, noted that Alyssa had a strong cough when she was suctioned. This procedure involves inserting a catheter through either the patient's nose or mouth to suction secretions out of the airways. If the patient is intubated, the catheter is slid down through the endotracheal tube. Because of the secretions in Alyssa's lungs, it was necessary for the nurse or a respiratory therapist to suction her airways. In the instructions for treatment that were left by Odim, there was no indication that Alyssa should be provided with any special treatment before being suctioned.

Odim said he did not believe Alyssa's cough at 0100 hours was related to her pre-operative cough. Nor did he think that the thick secretions that were being suctioned were related to the pre-operative condition. He said the more frequently a patient is suctioned, the less likely it is for the secretions to be very thick. Kesselman also testified that "Anyone who has a tube in and is suctioned is going to cough." (Evidence, page 33,960) He also testified that thickened secretions were not abnormal in this situation.

In a later entry note, Kiesman wrote that Alyssa was stable until 0342 hours, when she opened her eyes and started coughing. A respiratory therapist hand-ventilated her while Kiesman suctioned out a small to moderate amount of blood-tinged, thick secretions (Exhibit 11, page STI 48). Alyssa's heart rate and blood pressure began to drop. Kesselman was called to her bedside. At that point, the respiratory technologist was hand-ventilating Alyssa. Kesselman checked Alyssa's airway and chest for blockages and could not detect any. At this point Kesselman connected the pacemaker:

All the children post-operatively have transthoracic pacing wires that are taped to their chest if the need for pacing should arise. So you have to disconnect these, they are taped in place, you take the tape off and connect the leads to the pacemaker box. And so I would have done that and turned the pacemaker on, which is just flicking a switch and turning a dial to turn it to full output. And with that there was no response in the heart rate, in that the pacemaker didn't capture the heart, meaning it didn't—the electrical impulses from the pacemaker box didn't cause the heart beat to stimulation. (Evidence, pages 33,962-33,963)

Kesselman initiated external cardiac massage at 0350 hours. At that point, the heart rate was 23 beats per minute. In addition, medication was delivered in an attempt to stimulate the heart. Odum arrived at 0406 hours and opened the chest four minutes later. He began internal cardiac massage at 0414 hours.

Odim also requested epicardial pacing wires and an internal defibrillator. These were not kept in the PICU. Youngson testified that she received a phone call at 0400 hours from a PICU nurse who was looking for pacing leads in the OR. She was also looking for internal defibrillator paddles. The wires were located and attached; however, the pacemaker still did not capture Alyssa's heart.

Those at Alyssa's bedside attempted defibrillation once at 0423 hours and three times at 0429 hours. At 0430 hours on May 6, the Stills received a phone call at Ronald McDonald House. They immediately went to the hospital where they were met by Odum, who told them Alyssa was in trouble. At 0501 hours, resuscitation was stopped. Alyssa was declared dead.

According to Kiesman's testimony, Odum then said that it was the suctioning that caused the cardiac arrest. Kiesman testified:

I probably turned white, being the bedside nurse. But Dr. Kesselman had said that wasn't my fault after Dr. Odum had left, Dr. Kesselman said that he didn't know whether he would have done anything different in the situation. (Evidence, page 32,294)

Kesselman testified that he recalled hearing Odum tell Kiesman that it was the "suctioning that did it." (Evidence, page 33,984) Kesselman testified that he then reviewed the bedside monitor to determine if there were unappreciated events before the arrest. He said that he could not find any.

Did suctioning contribute to Alyssa's problems?

One of the central questions in this case is whether or not the suctioning was the cause of Alyssa's death. Odum testified that he never made any statement to Kiesman that her actions were responsible for Alyssa's death. However, this was how both Kiesman and Kesselman understood his comments. Clearly, they were left with the impression that Odum felt that Kiesman had done something wrong. As a result, Kesselman, who believed that Kiesman had not contributed to the death, felt compelled to try to reassure Kiesman.

Kiesman also testified that after Alyssa died, Odum asked her and Kesselman if Alyssa had been treated with atropine before being suctioned. Kiesman said that Odum indicated that if Alyssa had had such treatment, she might not have developed a slowing of her heart rate. Kiesman said that no such treatment had been given, nor had it been ordered, nor was it standard procedure in the PICU. Kesselman could not recall the conversation. He did indicate that the PICU would not normally have pre-treated Alyssa with atropine, since it would increase the heart's energy consumption. Odum testified that it was his experience that anaesthetists pre-treated with atropine. He also indicated that he believed Alyssa had been treated with atropine during the period when Kesselman was trying to revive her. Soder testified that atropine is used to prevent vasovagal episodes under what he described as very rare circumstances.

It is noteworthy that the medical chart does not indicate that atropine was either ordered or administered to Alyssa at any point that evening. It seems reasonable to conclude, for the reasons cited by Soder, that it was not something that was given to patients as a matter of course.

Odum's comments left Kiesman with the impression that she might have contributed to Alyssa's death. There is no reason to believe that that was in fact the case. There is a considerable body of evidence to suggest that patients who are intubated will experience coughing spells in conjunction with suctioning. There is also medical evidence to support the conclusion that the administration of atropine was not something that was done as a matter of course. There is nothing in the evidence to suggest that the manner of suctioning that Kiesman used for Alyssa that evening was out of the ordinary. Finally, there is evidence that the failure of the pacing wires to assist the heart to capture a proper rhythm was the most serious issue that the team faced that evening. The failure of the pacemaker or pacing wires to perform properly was a recurring complaint that ICU staff had about Odum's patients.

Shortly after 0501 hours, Odum met with the Stills. He told them that the problems started when Alyssa started coughing, and her heart started to slow down. Odum said:

I think we were all very, very shattered and disappointed because she had been doing so well and the mom was there and I think the grandma was there and we were all shaking our heads. We couldn't understand what had happened.

I tried to relay the events of the evening to mom and grandma and what we tried to do to reverse things, but we really were not—we were at a loss for an explanation save potential vasovagal response from suctioning and and/or pulmonary hypertensive crisis that we couldn't turn around.
(Evidence, pages 24,921–24,922)

Donna Still consented to an autopsy. The Stills left Winnipeg on May 7, 1994. At the time no one could explain to her why her daughter had died. On the Sunday following their return to Thunder Bay, Giddins called and spoke to Shirley Mae and expressed his sympathy.

AUTOPSY FINDINGS

The final report of the autopsy, which was conducted by Dr. Susan Phillips of the HSC, was released on June 29, 1994. The autopsy did not identify a cause of death. Her report indicated that the repair was intact. In addition she identified:

- the presence of a suture in the coronary sinus;
- contraction band necrosis; and
- widespread edema, including swelling in the brain, the lungs and the heart.

Various consulting witnesses before this Inquest discussed these findings, which bear comment. It should be noted that these witnesses not only reviewed Phillips' report; they also examined Alyssa's heart.

The presence of a suture in the coronary sinus

In his operative report, Odim stated that he closed a small VSD with an interrupted suture. In her autopsy report, Phillips stated that she could not identify the VSD or the suture that Odim reported placing over it. This is disturbing. It is very unlikely that Phillips would not have been able to detect such a suture if it was indeed present in the heart.

At the same time, Phillips did record finding an interrupted suture "in the region of the coronary sinus. The coronary sinus is patent." (Exhibit 11, page STI 24) Odim recorded making use of an interrupted suture in closing the VSD. This gives rise to the possibility that the suture found in the region of the coronary sinus was in fact the suture that Odim intended to place over the VSD.

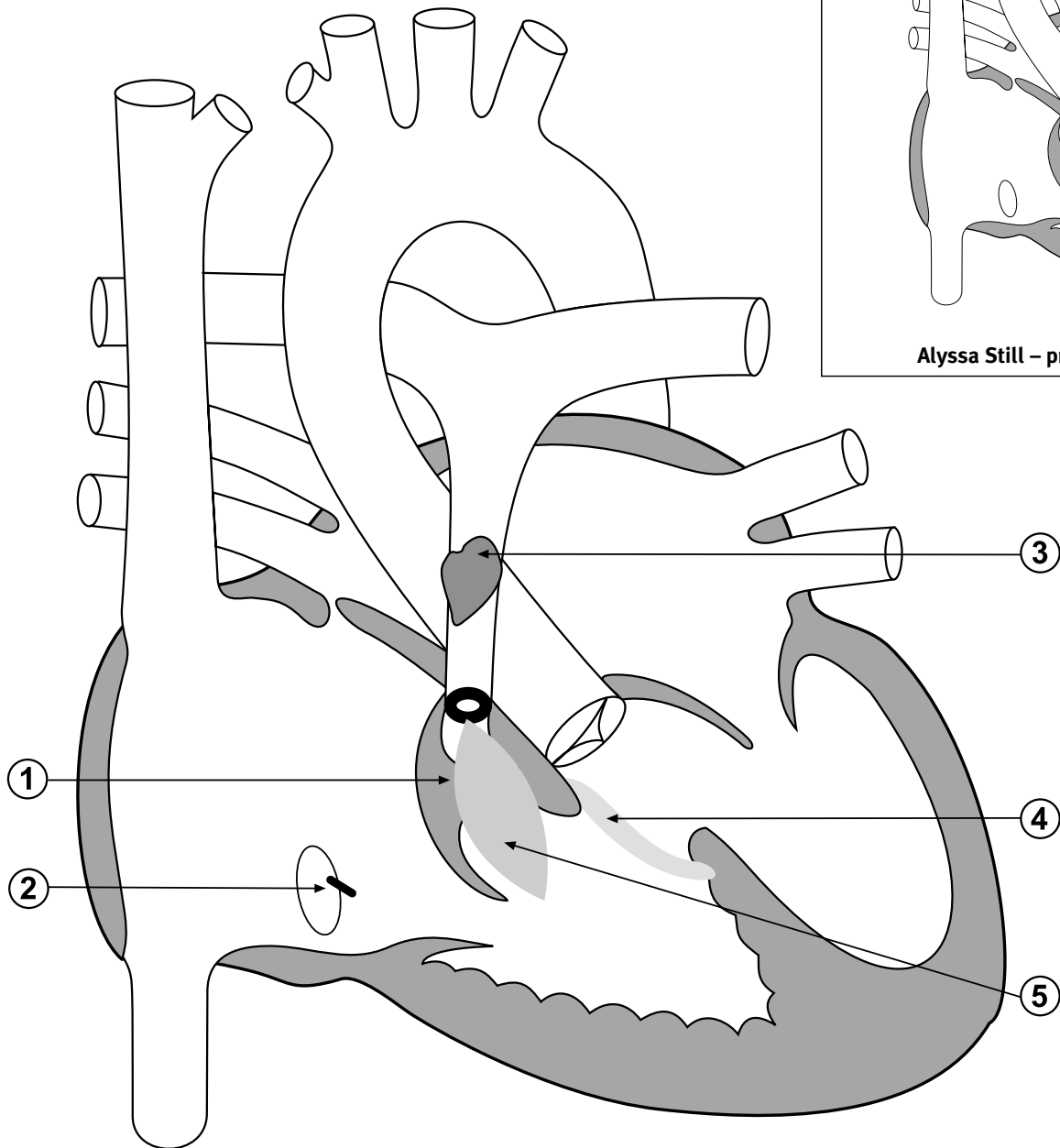
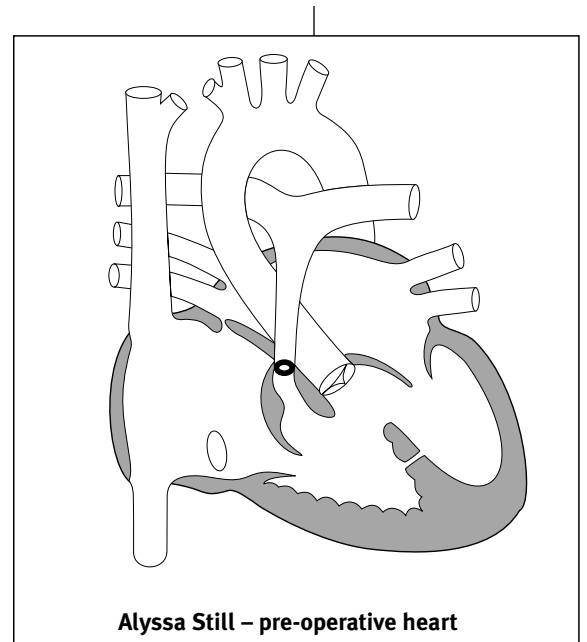
While this appears possible, there is a larger question. Did this suture close the sinus? The coronary sinus drains blood from the coronary veins, which in turn drains the heart muscle. If the coronary sinus were sutured closed, then the heart muscle would not drain properly. Taylor testified that the effect of a closed coronary sinus depends on the extent of the connection between the venous system and the ventricles of the heart. If there were few or no direct connections, an obstruction of the coronary sinus would interfere with venous return from the heart muscle. This could cause the heart to swell, leaving the child with edema or congestion in the heart muscle. The outcome would be impaired function of the heart. Because the connections are microscopic, it was not possible in Alyssa's case to determine whether there was adequate accessory venous drainage into the ventricles or the atria itself (Evidence, pages 43,059–43,060).

In her report, Phillips stated that the sinus was patent or open. Phillips also indicated that she rechecked for patency before testifying for the Inquest and again found it patent. She checked for patency by inserting a small metal probe into the opening—the sinus was described as probe patent.

In his initial report for the Inquest, Taylor concluded that the suture did not close the sinus. However, when Taylor testified, he offered a different opinion:

Of note here is a pledget suture which is placed near the coronary sinus, which is right here. And in my report I just said that it was near by, but looking at my notes from the time that I did the examination, I noted that it actually closes the coronary sinus which is right here. (Evidence, page 43,059)

Diagram 6.11 Alyssa Still – post-operative heart



- 1 – Subpulmonic stenosis following pericardial patch expansion of right ventricular outflow tract
- 2 – Suture closing coronary sinus
- 3 – Pulmonary artery pericardial patch

- 4 – Patch closure of ventricular septal defect, with probe residual leak
- 5 – Right ventricular outflow tract patch

Taylor also testified that, in his opinion, the closed coronary sinus was not a significant adverse factor but rather a minor factor (Evidence, page 43,075). Cornel, however, was concerned by the presence of the suture at the orifice of the coronary sinus, because it might have contributed to the failure to resuscitate following cardiac arrest (Exhibit 353, page 39B).

Contraction band necrosis

Necrosis is the death of an area of tissue and may follow a wide variety of injuries. The injury activates enzymes in the cells that destroy the damaged cells, resulting in dead or necrotic tissues. There is usually a lapse of time between the injury and the development of necrosis. Pathologists can often detect the signs that indicate this lapse of time.

Phillips recorded that microscopic examination of the heart revealed patchy subendocardial contraction band necrosis of the myocardium of both ventricles. Alyssa therefore had necrotic or dead areas of both ventricles of her heart (or myocardium). This necrosis specifically affected the subendocardial region of the heart muscle—the inner third to half of the ventricle. In addition, she had necrosis in the form of contraction bands. These microscopic structures in the heart muscle appear like bands of dead tissue and are formed by over-contraction of the muscle cells. The presence of any necrosis decreases the heart's ability to conduct electricity normally and to pump normally.

According to Phillips's testimony, there is normally a lapse of about four hours between the time of the injury and the development of contraction band necrosis.

Taylor testified that the type of necrosis that Alyssa experienced usually indicates inadequate myocardial protection during open-heart surgery, although it can also occur with cardiac arrest and with the administration of certain drugs, such as adrenalin. He said:

In this setting the thing I would be thinking of as far as trying to put everything together would be some injury suffered as a result of unsatisfactory or insufficient myocardial protection during the long bypass procedure. (Evidence, pages 43,080–43,081)

In Taylor's opinion, the necrosis developed during surgery and was a sign that the heart had not been provided with sufficient myocardial protection. Taylor also testified that the fact that Alyssa had prolonged surgery, needed inotropic support and was acidotic were all indications that acute myocardial impairment had occurred during surgery.

Edema

The autopsy revealed widespread retention of fluid, or edema. This may be an indication that the heart's capacity to pump had been compromised. The autopsy detected:

- subcutaneous edema (of the tissues under the skin);
- pulmonary edema (of the lungs);
- cerebral edema (of the brain); and
- myocardial edema (of the heart).

Subcutaneous edema

Subcutaneous edema was particularly apparent in Alyssa's face and eyelids. This form of edema does not necessarily signify that there has been excessive damage to the child during surgery. Rather, the presence of edema here only signifies that the patient has retained a considerable amount of fluid.

Pulmonary edema

Microscopic examination of lung tissue revealed diffuse areas of congestion and patchy areas of edema fluid in the air sacs (alveoli). Pulmonary congestion occurs when the blood vessels of the lung are so filled with blood that they are distended.

Taylor testified that:

Edema fluid in the lungs indicates that there is some left heart failure or injury to the lining of the small blood vessels in the lungs, such that blood cells can't leak out but fluid from the lung can leak out. (Evidence, page 43,078)

Taylor wrote in his report that pulmonary congestion and edema were significant adverse factors in this case (Exhibit 336, page 5.1). Pulmonary congestion and edema can develop very quickly and might have been as a result of Alyssa's cardiac arrest, rather than the cause of it.

Cerebral edema

There was also swelling or edema of the brain. Microscopic examination of the brain revealed evidence of acute hypoxic/ischemic injury or new brain damage as a result of a lack of oxygen and blood flow. Odim and Taylor differed as to the source of the damage. Odim was not surprised that there was brain damage, given the resuscitative measures undertaken. He testified that:

It's not unusual after cardiac arrest to have lack of cerebral blood flow because the heart isn't pumping for 40 minutes. (Evidence, page 24,929)

Taylor believed that the brain damage occurred most likely during the operation:

There is insufficient time for the changes to occur from when she arrested and died to when the autopsy was done. It had to be 12 hours or even longer before that. (Evidence, page 43,095)

The reduction in blood flow through the coronary sinus and the presence of contraction band necrosis in the heart meant that less oxygen could be delivered to the brain, leading to brain damage. The weight of the evidence suggests that both the heart and brain damage did occur during surgery.

Myocardial edema

Taylor also testified that he found mild myocardial edema. This can occur when fluid collects between the cells of the heart muscle. Taylor testified:

I consider that a significant factor because I believe that myocardial edema in a heart that has been subjected to open heart surgery and bypass can occasionally cause problems. And I make that statement on the basis of somewhat similar cases to Alyssa that I encountered in the past, where really the only finding was myocardial edema. I think myocardial edema occurs to greater or lesser degree after heart surgery almost always. But sometimes, depending on the metabolic state of the child,

other anatomical factors, the myocardial edema may cause the heart to become dysfunctional and put it at jeopardy for something like an arrhythmia. (Evidence, page 43,077)

Hudson did not think that myocardial damage or dysfunction caused the cardiovascular collapse:

Poor myocardial function would likely have been evident sooner, and would be more likely to be manifest as progressive deterioration rather than a sudden, catastrophic event. Therefore, I do not feel that poor myocardial function was the primary cause of this child's death. (Exhibit 307, page 5.19)

In response to questioning about the widespread edema, Odim indicated it was a result of a variety of factors: including bypass and medication. It was not, he felt, unusual, given the circumstances (Evidence, pages 24,928–24,931). While there is truth to this, as several witnesses pointed out, events during surgery may have unnecessarily contributed to the development of this edema.

The repair to the ventricular septal defect

In his examination of Alyssa's heart for this Inquest, Taylor identified a two-millimetre leak in the Dacron patch closing the ventricular septal defect. In his testimony, he said that it was not possible to determine if the leak was caused before or after Alyssa's death.

CAUSE OF DEATH

Odin noted in the chart that "Alyssa had a bradycardia episode following coughing and ET tube suctioning which led to hypotension and cardiac arrest." (Exhibit 11, page STI 47) He found no build-up of blood around her heart when he opened her chest. Despite resuscitation, there was no cardiac activity or output. He also wrote that "The cause of death was sudden and appeared related to a vasovagal episode from ET tube suctioning. Prior to the event the child's post-operative course had been entirely smooth." (Exhibit 11, page STI 47) In short, Odin appeared to be attributing the death to a bradycardia or vasovagal episode that was triggered by the suctioning. He expanded on this point in his testimony.

So my sense at the time was that she had coughed, coughing potentially could reflect increased pulmonary hypertension and then she was suctioned and when you suction she may have had a vagal response or stimulation response which slowed the heart down. In addition when you suction, at least during that brief period of suctioning, there is no oxygen getting in, in fact patients can be transiently low in oxygen and low oxygen can also cause slowing of the heart rate. (Evidence, page 24,918)

Other witnesses did not accept this view. Dr. Walter Duncan said that suctioning can be dangerous, but it is necessary for patients with endotracheal tubes after heart surgery. Without suctioning, he said, patients can literally drown in their own secretions. In his opinion, Alyssa Still's death could not be simply attributed to the suctioning.

I think her pulmonary outlet was too small. I think she had probably right ventricular hypertension after surgery, and that would have limited her cardiac output. If you take a child who has got limited cardiac output, if you look at the rest of the pressure measurements here on my 1995 report, she was still an abnormal coagulation state, which either means that her coagulation factors were consumed at the time of the bypass run and hadn't yet normalized, or her liver was not being perfused adequately with blood to make new coagulation factors.

She was also acidotic. Her pH was 7.22 which means that her cardiac output was limited. And she was using anaerobic metabolism to generate energy. Her bicarbonate was low at 14, it should be 20 at least. It came up slightly by 8:15.

If you look at Dr. Giddins' note, she was fluid overloaded. Her weight prior to surgery 6.7 kilos and at autopsy it was 7.9, which means she was up 1,200 grams, which is 20 percent increase in body fluid. Now, this does not go in keeping with somebody who has had a successful event surgically. There is too many negative things happening here. So I don't think that you can simply say this was a death due to suctioning. (Evidence, pages 41,418–41,419)

Suctioning can in fact stimulate the vagus nerve, which will in turn slow the heart (or produce bradycardia) and cause the blood pressure to drop. This is termed a vasovagal response or episode. Normally such episodes are transient but last longer in some patients, who may need treatment to raise the heart rate. Kesselman testified that with a typical vasovagal episode, the heart rate drops and then picks up again. "She didn't follow that pattern. There was a—the initial stimulus, which I think was the suctioning and maybe the vagal kind of tone stimulation was involved with it, but I think there had to be more to it than that or she would have just quickly recovered." (Evidence, page 33,965) Instead, he suggested that the situation was complicated by the fact that Alyssa's heart was compromised by surgery.

One way of treating a vasovagal episode is with a drug called atropine, although the drug may take some time to work, because the heart rate is so slow. A faster way to speed up the heart is to use a pacemaker, if one is present—as was the case with Alyssa. If the pacemaker is properly connected, it should then be possible to maintain the heart rate. Odum was questioned on why the attempt to pace Alyssa had failed. He said he did not understand why pacing had failed.

My impression was that perhaps the biochemistry was such with hypoxemia and acidosis that they couldn't pace the heart. The patient had a low heart rate for eight minutes and cardiac output in children is a function of heart rate and stroke volume, that is, with each beat you squeeze a certain amount of volume out.

Kids as opposed to adults, their squeeze out is fixed so you really have to have many beats to have an adequate output and if your heart rate goes down and stays down for an appreciable period of time, the cardiac output will go down because they can't increase the amount they eject with each beat and I think that milieu, low cardiac output and acidosis mix, sometimes can make it difficult to pace. (Evidence, pages 24,919–24,920)

Kesselman testified that during this period there had been a number of cases where there was trouble with the pacing wires. Inquiries were made with the firm that manufactured the pacing equipment and the equipment itself was examined by the HSC. In the end, Kesselman said there was no satisfactory explanation of what was wrong with the pacemakers. He speculated that:

Well, I think in this scenario where we have evidence that the heart muscle is not working very well, that it has been compromised, and evidenced I say both by her early post-operative low cardiac output, and evidenced by the slowing of her heart rate that didn't pick up as the perfusion dropped, that when the heart muscle is sick enough that it doesn't matter what stimulation you apply on those cells, if they don't have the energy, they can't respond. (Evidence, page 33,967)

In his testimony, Odum suggested that the vasovagal episode might have been prevented if Alyssa had been pre-treated with atropine. Odum also said he believed that Alyssa was treated with atropine once she suffered the vasovagal response. Kesselman could not recall any conversation regarding pre-treatment with atropine, although he said pre-treatment was not usually given at HSC. This was because the increased heart

rate from the drug was not always a positive development in some patients, and atropine also had a side-effect of drying and thickening secretions, making it harder to suction them from endotracheal tubes.

In his report for this Inquest, Hudson wrote at great length on the cause of death. In his report he stated:

I do not agree with the attending surgeon's assessment that the cause of death was due to a vasovagal episode initiated by tracheal suctioning, for two reasons. First, the decrease in heart rate began during a coughing spell prior to suctioning the endotracheal tube, thus suctioning could not have been the initial cause of the bradycardia. Second, and more important, is that a vasovagal episode would have easily responded to cardiac pacing. (Exhibit 307, page 5.19)

The evidence presented by Kesselman, Hudson, Duncan and Taylor is persuasive. Normally, a vasovagal episode would have quickly ended on its own or pacing would have brought the episode to an end. However, Alyssa's heart had been severely compromised during surgery. It therefore simply might not have been able to respond adequately to a vasovagal episode on its own, and without the assistance of the pacemaker, very quickly deteriorated. It would appear that the contributing factors to the heart's inability to respond could have been:

- lack of relief of the pulmonary stenosis;
- the suturing closed of the coronary sinus; and
- the length of surgery.

This view is supported by the presence of subcutaneous, pulmonary, cerebral and myocardial edema, as well as the autopsy finding of myocardial necrosis.

FINDINGS

As noted above this case gives rise to the following questions:

- Was Alyssa's family provided with sufficient information to allow them to give informed consent to the procedure?
- Was Alyssa healthy enough to undergo an operation?
- Were there technical problems with the operation?
- Was the PICU adequately equipped for her case?
- What was the cause of death and was it preventable?

Was Alyssa's family provided with sufficient information to allow them to give informed consent to the procedure?

It is clear from the testimony provided to this Inquest that Alyssa's family had not been told about the recent deaths in the program. Based on the evidence, it would also seem that they would not have been told about the state of dysfunction of the operative team and the inexperience of the surgeon. In fact, there is some suggestion that information was passed to Alyssa's mother as to Odim's status within the profession that would not have been accurate.

- Finding

It is reasonable to conclude that in the circumstances of this case, a patient or parent was entitled to know the true state of affairs of the program and that the team was not enjoying good results. The evidence tends to suggest that Alyssa's family was not provided with sufficient information to allow them to give informed consent to the procedure.

Was Alyssa healthy enough to undergo an operation?

- Finding

The evidence presented to the Inquest raised questions about the decision to take Alyssa to surgery in light of a possible infection. However, the consulting witnesses in their testimony deferred to the decision that was made by Giddins, Odim and Wong. It is difficult to conclude, therefore, that their decision was an incorrect one.

Was the PICU adequately equipped for her case?

- Finding

The events in PICU—including the need to call Youngson at 0400 hours—indicate that Odim had not yet ensured that the Unit was able to handle his patients postoperatively. These problems persisted, despite the efforts of the PICU staff to have the Unit properly equipped. Comments made by both Kiesman and Kesselman in testimony also raise questions about Odim's approach to his colleagues.

Were there technical problems with the operation?

- Finding

The evidence suggests that Alyssa's coronary sinus was sutured closed, that there may not have been sufficient myocardial protection and that there was not sufficient relief of Alyssa's pulmonary stenosis.

What was the cause of death and was it preventable?

If Alyssa did not have an infection, there are unanswered questions about her death. While Odim indicated that her death was due to a vasovagal incident stimulated by suctioning, witnesses to this Inquest indicated that such a problem should have responded to pacing, which it did not. This leads one to question whether Alyssa's heart had been weakened during surgery or if the repair was not adequate. In his report Cornel also noted that there might have been inadequate relief of the pulmonary valve stenosis.

The questions that were raised about the lack of relief of the pulmonary valve, the suturing of the coronary sinus, and the presence of widespread edema, myocardial necrosis, and brain damage all suggest that it was during the course of surgery that Alyssa's heart was compromised to the point that it could not

respond to pacing. Witnesses have also raised important questions as to whether or not there was sufficient myocardial protection during surgery.

Unfortunately, the records do not provide an explicit answer to this question. However, the damage done to Alyssa's heart suggests that protection was not adequate. In his report Dr. Walter Duncan commented that the three hour and seven minute pump time was lengthy. As noted elsewhere in this report, lengthy pump times led to an increase in post-operative problems.

Finally there is the failure of the pacing wires to assist the child to recover from the bradycardia that developed following the coughing spell. The wires should have worked, but either they were improperly placed or the heart was so compromised as not to be able to respond appropriately.

■ Finding

The evidence, therefore, suggests that the child died from compromise to the functioning of the heart brought about by a complicated and lengthy operation, and an inability of the heart to respond to pacing. Again, it is difficult to come to a definitive statement about whether or not this death was preventable. However, the lengthy bypass time, the possibly inadequate myocardial protection and the suturing of the coronary sinus suggest that this death might have been preventable.

BORTON ASKS FOR A TRANSFER

Borton testified that she encountered Giddins on the street outside the VCHC the day after Alyssa died. Giddins asked her about a patient who was to undergo a valvotomy. Borton said that she told him that she was not able to go into the unit, because she was so distraught about Alyssa's death. Shortly after this she recalled arranging a meeting with Boyle.

I went into her office, and I remember it distinctly because I went in and I sat down and I said to her, I just want to let you know that I have concerns about the cardiac program, and I started to cry. And she was very supportive of me, you know. I felt that she was the first person that really heard me. Dr. Giddins didn't have reservations; Lois didn't have the same feelings that I had, she didn't share that with me and I didn't—to the extent of how I felt, I felt that Isobel understood and supported me. (Evidence, page 18,197)

At that point Boyle said that she would work in helping Borton find work in another area. Before that happened, the program went into a slowdown because of the anaesthetists' decision to withdraw services. As a result, Borton remained with the program throughout the summer and early fall.

MAY 11—12—THE CASE OF FE

FE was a one-year-old child who underwent two open-heart operations in May 1994. The second operation was because of severe bleeding after the first operation.

FE was born on May 19, 1992. At birth he was diagnosed with tricuspid atresia and needed an immediate operation. He was given a right modified central systemic to pulmonary artery shunt (Blalock-Taussig) and also underwent a balloon atrial septostomy.

On December 7, 1993, a cardiac catheterization revealed severe hypoplasia of the right ventricle. Both the tricuspid and pulmonary valves were dysplastic and stenotic. There was moderate to severe tricuspid regurgitation, severe right pulmonary artery stenosis and mild mitral valve regurgitation. There was a small ventricular septal defect with a predominantly left to right shunt. The central aortic right pulmonary shunt was patent.

At the pediatric cardiac surgery conference on April 6, 1994, FE was described as cyanotic, with clubbed fingers and slow growth. It was suggested that he was a candidate for a Fontan procedure.

On May 11, Odim chose to replace FE's aortic shunt with a Glenn shunt. During this procedure, his heart was opened to allow Odim to remove the atrial septum. This ensured that blood coming back to the right atrium would have an outlet. As in a number of other operations, FE had bleeding problems. The problems were thought to be due to a coagulopathy, since they were treated with special transfusions. However, the bleeding problems were to recur.

By the early morning of the next day, FE showed signs that he could not tolerate his new shunt. His oxygen saturation was very low, and he suffered what witnesses described as a major hemorrhage from his chest tubes. Although he received a transfusion, the decision was made to re-operate. As a result, most of the surgical team was recalled and FE was taken back to the OR.

Initially a number of drugs, including nitric oxide, were used to try to increase the blood flow to his lungs. When this failed to have the desired result, Odim attempted to open up FE's narrowed pulmonary artery. When this brought no relief, Odim decided to create a new shunt in addition to the Glenn shunt.

FE was returned to the PICU in stable condition with his chest open. The sternum was closed on May 16 and he was discharged from the PICU on May 30, 1994. Several witnesses expressed concern over the amount of bleeding that FE experienced.

Swartz had earlier expressed her concern that Odim appeared often to assume that bleeding problems were due to a coagulopathy, rather than to any surgical problems. This concern had arisen in the Goyal case. However, according to her notes, this concern also arose in the FE case. When FE was taken back to the OR, she wrote:

There appeared to be sites of bleeding and other sites were very dry, yet it was only with the assistance and insistence of the assistant surgeon that these bleeding sites were finally identified and treated appropriately. The surgeon said he couldn't really see any bleeding sites. (Exhibit 127)

The FE case also increased Feser's concerns about the amount of post-operative bleeding suffered by pediatric cardiac cases arriving in the PICU from the OR. Gary Caribou had lost 200 millilitres of blood in his first hour in PICU, while Jessica Ulimaumi had lost over 600 millilitres in her first 24 hours in the PICU. FE lost 687 millilitres in his first hour in PICU. Feser testified that in her experience, a loss of at most 20 millilitres an hour was acceptable.

In his evidence, Odim suggested that post-operative bleeding was not excessive, although it might have been higher than what the PICU staff had experienced under Duncan. Odim said that he (Odim) tended to send his patients to the ICU earlier than Duncan did. Odim admitted that he felt that patients should be transferred out of the OR and into the ICU as soon as possible, because he felt that the ICU staff was better equipped to address post-operative issues than was the operating-room staff.

THE CASE OF RM

Other people who worked at Children's Hospital were becoming aware that there were growing concerns about the Pediatric Cardiac Surgery Program. Mary Jane Wasney, a surgical nurse at Children's Hospital, had heard about the deaths of a number of children and knew that operations were taking longer than expected. This was of particular importance to her, since her nephew, RM, was scheduled for a staged Fontan procedure in June 1994 at the HSC. This was similar to the type of surgery that FE had undergone. When FE had to be taken back to the OR the day after his first operation, she became alarmed. She shared her concerns with Youngson, who advised her to speak with Borton. She went to Borton in tears, worried that her nephew was going to die. Borton testified:

I told her that if you have reservations, you need to talk to Niels, you need to talk to Niels about your reservations about the surgery, and you can get him referred out, Niels could refer [the nephew] out of Province if it came to that. (Evidence, page 18,210)

Wasney made an appointment to see Giddins and Hawkins. She gave this account of that meeting to the Inquest:

I said that I wouldn't be worried if things were going well. And then he said, which shocked me, was that he would be surprised if things were going too well, that there is always a learning curve in any new program.

I understood that, and I said, yes, but children are dying. He said, yes, but that was unfortunate, but he was confident that Dr. Odum could do [the nephew's] surgery because he had done numerous of these types of surgeries. (Evidence, page 20,357)

Here again, one sees the concept of a learning curve being invoked to justify poor surgical outcomes. It should be remembered that at the same time that Giddins appeared to acknowledge that the team was making difficult progress along a learning curve, he was discouraging parents from having their children treated at other, larger centres.

Wasney also asked Wong, Swartz and McNeill for advice. Wong testified that he told her that:

... in view of all of the innuendo and all of the circumstances that were happening at that time, especially—I didn't tell her about the walkout [described in the next section of this report], but in view of the circumstances at that time, I suggested that Saskatoon might be a better place to go. (Evidence, pages 19,859–19,860)

In her testimony, Wasney recalled that all three anaesthetists she spoke with recommended against having the operation done in Winnipeg. In the end, the child was operated on in Saskatoon in June, after the Winnipeg program had reduced its scope of activity.

THE ANAESTHETISTS WITHDRAW SERVICES

MAY 16, 1994 – THE MEETING OF THE SECTION OF PEDIATRIC ANAESTHESIA

On Monday, May 16, 1994, the pediatric anaesthesia section met. It was at this meeting that the section voted to take the extraordinary step of withdrawing services to pediatric cardiac surgery. Swartz, McNeill, Wong and Reimer outlined their concerns with the program. They were concerned about morbidity and mortality, the apparent lack of monitoring and the deteriorating relations among team members. According to McNeill, the members of the section who did not give anaesthetics for open cardiac procedures all expressed their support for the four who did.

Craig was present at the meeting, although he left during the discussion. Before leaving, he indicated that he would support the section members in whatever decision they reached. At the time Craig recognized that withdrawal of services was an option under consideration.

After continued discussion, the section decided to issue a statement about cardiac anaesthesia. The statement was sent to Wiseman because he was the head of pediatric surgery. The memorandum was to inform him of a decision to suspend the provision of cardiac anaesthesia services for open cases until a review of the Pediatric Cardiac Surgery Program was undertaken. The suspension of services was to go into effect on May 17. Ulyot testified that she initially opposed the decision to withdraw services on such short notice. However, she said, the anaesthetists were adamant that the program be halted until it was determined if it was viable.

The section also selected McNeill to serve as the head of pediatric cardiac surgery anaesthesia. This appointment was not widely communicated at the time. Indeed, it was not until October 12, 1994, that Ulyot sent a memorandum to Craig, with copies to the appropriate heads and VCHC staff, announcing McNeill's appointment as director of pediatric cardiac anaesthesia.

After the meeting ended, Ulyot drafted a memorandum outlining the decision that had been taken at that day's meeting. In the evening she telephoned Craig and read the memorandum to him. Craig said he indicated that he would continue to support the anaesthetists in their action. He testified he did this because the issues they had raised were serious and it appeared that they had not been able to have them properly addressed.

THE MAY 17 MEMO FROM THE ANAESTHETISTS

On May 17, Ulyot wrote a memorandum to Wiseman informing him of the decision that the anaesthetists had made. The memorandum read as follows:

MEMORANDUM

TO: Dr. Nathan Wiseman

FROM: Section of Pediatric Anesthesia

DATE: 17 May 1994

Re: Pediatric Cardiac Program

The Section of Pediatric Anesthesia has concerns regarding the perioperative morbidity and mortality of pediatric cardiac cases at Children's Hospital.

We propose an immediate review of cases to date and the implementation of a mechanism whereby the structure and function of the Pediatric Cardiac Program can be developed in a continuous manner. The process should involve surgery, cardiology, anesthesia, nursing, intensive care and perfusion personnel.

We anticipate that ongoing planning and review will ensure the development of a successful program and we would participate fully in this process.

At a meeting yesterday of all members, the Section of Pediatric Anesthesia unanimously agreed that pending the recommendations of the immediate review we suspend the provision of cardiac anesthesia for open cases as of Tuesday, May 17, 1994.

SU/jt

cc: Dr. D Craig

Dr. R. Blanchard

(Exhibit 19, Document 240)

McNeill testified that, in her mind, services were withdrawn in an effort to draw attention to the fact that the program was not being properly supervised. She testified that before the memorandum was issued, no one from Anaesthesia had formally approached Bishop, Giddins or Odum about their concerns about the program. McNeill testified that it was apparent to her at the time that Giddins did not share her concerns about the program, since he was continuing to refer complex cases to Odum. She said she did not speak to Odum because she had found it difficult to speak with him, particularly as the relations between the surgeon and the anaesthetists had deteriorated.

In retrospect, I regret that I didn't speak to Dr. Odum just on a personal level, that I didn't speak to him. But I also, in retrospect and having knowledge now that I didn't at the time, I think that my assessment of how he would have taken my remarks was accurate. I don't think that it would have been constructive. (Evidence, page 13,237)

When asked why the anaesthetists felt it was necessary to take this extraordinary step, McNeill said:

Well, I guess we didn't have confidence that there was an active process in place that was monitoring the program. There was, the program was functioning, I mean, there was cases booked for the next week. I don't remember what they were, but we came to the point where we felt that we didn't have confidence in the program and we didn't want to wait any more time and possibly have more negative outcomes. (Evidence, page 13,242)

When asked why the May 17 memorandum did not make specific mention of concerns with Odim, McNeill testified that the anaesthetists felt that to focus on the surgeon would draw attention away from the issue of proper program management.

This was an extraordinary step to have taken. One might wish to take issue with the anaesthetists taking such a unilateral action without providing more warning or lead time. Certainly the department heads who were affected by this withdrawal expressed frustration on this point. Also, it might have been appropriate to have made further approaches to Giddins, Wiseman and Odim before taking such precipitous action, particularly since operations were scheduled for that week. Finally, when the action was taken, it might have been more appropriate to have sent the memorandum directly to Blanchard and Bishop.

These things being said, it is also apparent from the evidence that the anaesthetists had real reason to be concerned. It is also apparent that they had attempted to use a variety of informal channels and had met with no progress.

Some witnesses suggested that the anaesthetists and nurses should have raised their concerns at the CVT conferences. The evidence establishes that whenever a case was presented to the CVT conference in 1994, invariably Odim would undertake to perform the operation, rather than referring any case out of province. Giddins felt that the question of whether or not a case should be referred out of province was one that the surgeon should make, and he did not make any out-of-province referrals on his own. Giddins testified that he could recall only one instance where Odim declined to perform a surgical procedure. That one exception was a child who had initially undergone surgery in Toronto. In that case, the child was returned to Toronto for follow-up surgery.

Once Giddins and Odim had discussed the need for surgery, the patient would be scheduled for an operation at a forthcoming date. Then the case would be discussed by all members of the OR team at the pre-operative conference.

Giddins said he felt that it was at these meetings that any concerns about proceeding to surgery could be raised by other members of the team. Yet these other members indicated that they felt that by the time these meetings were held, the decision to proceed to surgery had already been made by the cardiologist and surgeon. In addition, the matter had already been discussed with the family. In other words, they felt that the decision to operate was a *fait accompli*. That being the case, they felt there was little opportunity for them to discuss any concerns or raise any objections they might have to a particular patient going to the OR the following week. The only exception would be if there was an issue specific to their field of specialty that had not been earlier considered.

Borton testified that before mid-May 1994 she never heard any discussion at a pre-operative conference of the possibility of sending a child out of province for surgery. In her testimony, Fleming said that she had attended the pre-operative conferences for children whom she was likely to be caring for in the PICU. She testified that by the time a patient was discussed at the pre-operative conference, a decision had already been made to go forward with surgery.

THE DISTRIBUTION OF THE MEMO

Ullyot said that she sent the memorandum to Wiseman because he was the head of the Pediatric Operating Room Committee and the head of pediatric surgery. She saw the matter as a pediatric concern, rather than a surgical concern.

She said she did not send a copy to Odum because she wanted to give a message that the anaesthetists did not see the surgeon as the sole problem. She testified that following the meeting that took place on the morning of May 17, she felt that she should have sent copies of the memorandum to Giddins and Odum. She said that she did not even consider sending a copy of the memorandum to Unruh and was unaware of his responsibility for Odum at the time, as section head of CVT surgery.

Copies of the memorandum were sent to Craig and Blanchard. Wiseman testified that, in his opinion, the memorandum should have been sent to Blanchard, with only a copy going to him. However, Wiseman testified that he never received a copy of the memorandum in his office.

Blanchard also said he did not receive or get the memo. He said that when he arrived at his office on the morning of May 17, his secretary told him the memo had been delivered. When he looked for it a short while later, he was unable to find it.

BISHOP IS NOTIFIED

Ullyot testified that on the morning of May 17 she telephoned Bishop to inform her of the decision. Bishop testified that she could not recall the phone call, but she did receive a copy of the memorandum that morning. After reading the memorandum, Bishop quickly arranged a meeting in her department for later that morning. Bishop also telephoned Odum and Giddins. Neither had heard of the memorandum and agreed to attend a meeting in her office. At the time of the withdrawal by the anaesthetists, a patient was scheduled for later that week.

Bishop testified that she was angered by the fact that the service was being shut down without any advance notice. She said that this made it very hard to provide patients with options. She was also surprised to learn that the anaesthetists had not fully communicated their concerns to Odum and Giddins.

Blanchard testified that he was astounded by the withdrawal of services.

It seemed to me that if you have this kind of clinical problem, and there was substance to it, and we had no idea whether there was substance to this, why hadn't that been sorted out between the anaesthetists and the surgeon and the cardiologist. (Evidence, page 36,505)

He also testified that it appeared to him that, aside from possible problems with mortality and morbidity, there were serious problems with communication and interpersonal relationships. He said the team that had been in place had unravelled. When asked if the team had actually existed in the first place, he responded:

Well, it existed. I mean, the system was there, but the functioning seemed to not be there. (Evidence, page 36,508)

He was only beginning to appreciate the seriousness of the situation.