

THE REPORT OF THE
MANITOBA PEDIATRIC
CARDIAC SURGERY INQUEST:

AN INQUIRY INTO TWELVE DEATHS
AT THE WINNIPEG HEALTH
SCIENCES CENTRE IN 1994

ASSOCIATE CHIEF JUDGE MURRAY SINCLAIR

PROVINCIAL COURT OF MANITOBA



THE REPORT OF THE
MANITOBA PEDIATRIC
CARDIAC SURGERY INQUEST:

AN INQUIRY INTO TWELVE DEATHS
AT THE WINNIPEG HEALTH
SCIENCES CENTRE IN 1994

ASSOCIATE CHIEF JUDGE MURRAY SINCLAIR

PROVINCIAL COURT OF MANITOBA



Canadian Cataloging in Publication Data

Sinclair, C.M. (C. Murray), 1951-

Report of the Manitoba pediatric cardiac surgery inquest

ISBN 0-7711-1516-4

1. Pediatric cardiology – Manitoba – Winnipeg.
2. Infants – Manitoba – Winnipeg – Mortality.
3. Health Sciences Centre (Winnipeg, Man.).
4. Governmental investigations – Manitoba

I. Title. II Manitoba. Provincial Court.

RJ423.S56 2000 362.19'89212'0097'12743 C00-962010-9

Web site – www.pediatriccardiacinquest.mb.ca



EXECUTIVE SUMMARY

During 1994, 12 children died while undergoing, or shortly after having undergone, cardiac surgery at the Winnipeg Health Sciences Centre.

In February 1995, following an external review of its Pediatric Cardiac Surgery Program, the HSC announced that it was suspending the program, initially for six months. Following this announcement, many parents of the children who had died demanded a public inquiry into the events surrounding the deaths of their children. On March 5, 1995, the Chief Medical Examiner for the Province of Manitoba ordered an Inquest into the deaths of the 12 children.

The Inquest commenced hearings in December 1995. The final hearings were held in the fall of 1998. In total, more than 80 witnesses testified during more than 285 days of hearings over a period of almost three years. Close to 50,000 pages of transcript evidence were produced, and hundreds of documents exceeding 10,000 pages of material were filed as exhibits in these proceedings.

Such lengthy, complex and controversial hearings do not give rise to easily summarized conclusions. The findings and recommendations in the report flow out of the events that are detailed in the following report.

This summary points to four central themes that became apparent during the course of this Inquest and are elaborated upon in the findings and recommendations.

THE CHILDREN AND THEIR PARENTS

The evidence suggests that the Pediatric Cardiac Surgery Program at the Health Sciences Centre did not provide the standard of health care that it was mandated to provide and that parents believed—and had a right to expect—that their children would receive in 1994.

GARY CARIBOU, born August 22, 1993, underwent a heart operation on March 14, 1994, and died on March 15, 1994. He was six months twenty days old. The evidence suggests that this death was possibly preventable.

JESSICA ULIMAUMI, born August 18, 1993, underwent cardiac surgery on March 24, 1994. She died on March 27, 1994. She was seven months nine days old. The evidence suggests that this was a preventable death.

VINAY GOYAL, born March 2, 1990, had two operations in 1994, the first on March 17, and the second on April 18. He died during the second operation. He was four years one month sixteen days old. The evidence suggests that this was a preventable death.

DANIEL MARKUS TERZISKI, born March 18, 1994, underwent cardiac surgery on April 20, 1994. He died the same day. He was 33 days old. The evidence suggests that the chances of preventing this death would have been increased if Daniel had been referred out of province.

ALYSSA STILL, born November 14, 1993, had heart surgery on May 5, 1994. She died May 6, 1994. She was five months twenty-two days old. The evidence suggests that this death might have been preventable.

SHALYNN PILLER, born July 20, 1994, had surgery on August 1, 1994. She died August 3, 1994. She was 14 days old. It is not possible to determine on the basis of the evidence if this was a preventable death.

ARIC BAUMANN, born December 7, 1993, underwent cardiac surgery on June 30, 1994. He died on August 21, 1994, due to a pre-existing, undetected, congenital fatal condition. He was eight months fourteen days old when he died. The evidence suggests that this was not a preventable death.

MARIETESS TENA CAPILI, born December 15, 1991, underwent surgery on September 13, 1994. She died September 14, 1994. Marietess was two years nine months old. The evidence suggests that this was a preventable death.

ERICA NICOLE BICHEL, born September 29, 1994. Erica underwent a heart operation on October 4, 1994. She died while still in the operating room. She was five days old. While the evidence suggests that Erica would have stood a better chance of survival in the hands of a more experienced surgeon and surgical team, the evidence also suggests that it is not likely that this death was preventable.

ASHTON JOHN FEAKES, born April 15, 1993, underwent heart surgery on November 1, 1994. He died November 11, 1994. He was one year three months twenty-seven days of age. The evidence suggests that this was a preventable death if Ashton had been referred to a larger medical centre.

JESSE WILLIAM MAGUIRE, born November 25, 1994, underwent heart surgery on November 27, 1994. He died while still in the operating room. He was two days old. The evidence suggests that this was a preventable death.

ERIN PETKAU, born December 17, 1994, underwent heart surgery on December 20, 1994. She died on December 21, 1994. She was three days old. The evidence suggests that this death was possibly preventable.

Parents took their children to the HSC's pediatric cardiac program at the recommendation of family physicians. They were assured that the team had the skills and experience necessary to treat their children's complex lesions. This was not always the case. The evidence suggests that at least five of the deaths in 1994 were preventable and several more were possibly preventable. Furthermore, the evidence suggests that in most of the cases parents were not provided with sufficient information to allow them to provide fully informed consent to surgery.

These findings give rise to numerous recommendations relating to any future pediatric cardiac surgery program in Winnipeg and policies regarding consent and funding for the families.

THE 1994 RESTART OF THE PROGRAM

In 1994 the pediatric cardiac program at the HSC recommenced the provision of surgical services. The program at the time had a new surgeon and a new director of pediatric cardiology. Furthermore, three cardiologists had left the program and had not been replaced. These facts should have led to a phased and well-supervised approach to case selection, to ensure that the surgical team did not attempt cases that were beyond its capabilities.

The evidence suggests that the restart of the program suffered from flaws in:

- the recruitment process
- preparation prior to the restart of surgery
- lines of authority
- staffing
- case selection.

The lack of supervision and of a phased start-up plan meant that the Pediatric Cardiac Surgery Program was marked by poor case selection throughout 1994. The evidence suggests that the program continually undertook cases that were beyond the skill and experience of the surgeon and the team. These findings give rise to a series of recommendations for changes in recruiting, staffing and lines of authority.

QUALITY ASSURANCE

The evidence presented to this Inquest suggested that there was a failure of quality assurance and monitoring of the Health Sciences Centre Pediatric Cardiac Surgery Program. This failure involved mechanisms that were internal to the HSC and those that were external to it. The Inquest Report makes two types of recommendations in regard to these issues. It recommends changes to existing internal and external review and monitoring practices and agencies. In addition, the Report recommends that the Health Sciences Centre develop ongoing policies of team building, risk management and quality assurance. This approach is detailed in the body of the Report.

TREATMENT OF NURSES

Throughout 1994, the experiences and observations of the nursing staff involved in this program led them to voice serious and legitimate concerns. The nurses, however, were never treated as full and equal members of the surgical team. This treatment mirrored the way in which nurses believed recent changes in hospital organization had reduced the status of their profession. The Inquest makes recommendations intended to bring nurses into the monitoring process and change the structure of the HSC.

**THE FUTURE OF
PEDIATRIC CARDIAC
SURGERY IN MANITOBA**

The available information suggests that the limited number of cases that can be undertaken in a province like Manitoba, with a population of just over one million, represents an increased risk of morbidity and mortality, particularly in the case of high-risk surgery. Even if the catchment area were expanded, the base population would still not be large enough to support a full service program. The Inquest recommends pediatric cardiac surgery be re-initiated in Manitoba only as a part of a regional program in Western Canada.



TABLE OF CONTENTS

Executive Summary.....	v
Table of contents	ix
Introduction	xxv
Acknowledgements	xxvii

SECTION ONE

CHAPTER 1 – INTRODUCTION TO ISSUES

Introduction	3
The calling of the Inquest.....	5
The mandate of the Inquest	6
Standing	6
Culpability	8
The issue of consent	10
The law of medical consent	10
A summary of the applicable legal principles dealing with medical consent	16
The onus of proof in inquest proceedings.....	18
Medical Standards Committees and privilege.....	18
<i>In camera</i> proceedings	19
Disclosure	21
The taking of evidence.....	21

CHAPTER 2 – PEDIATRIC CARDIAC ISSUES

HOW THE HEART FUNCTIONS, CONGENITAL HEART DEFECTS AND THEIR TREATMENT

The human heart.....	23
How a normal heart works.....	25
Congenital heart disease.....	27
Ventricular failure.....	27
Left ventricular failure.....	27
Right ventricular failure.....	28
Biventricular failure.....	28
Shunting.....	28
Pediatric heart defects and their treatment.....	28
Patent ductus arteriosus (PDA).....	28
Septal defects.....	29
Tetralogy of Fallot.....	30
Atrioventricular canal defect.....	32
Coarctation of the aorta.....	33
Interrupted aortic arch.....	33
Pulmonary stenosis and aortic stenosis.....	35
Tricuspid atresia.....	35
Pulmonary atresia.....	36
Total anomalous pulmonary venous connection.....	37
Partial anomalous pulmonary venous drainage.....	38
Transposition of the great arteries.....	38
Double outlet right ventricle.....	39
Hypoplastic left heart syndrome.....	40
Supportive care.....	41
Reconstruction of the heart.....	41
Transplantation.....	43
Summary.....	43
Risk and pediatric cardiac surgery.....	44

CHAPTER 3 – THE DIAGNOSIS OF PEDIATRIC HEART

DEFECTS AND THEIR SURGICAL TREATMENT

Special issues in pediatric medicine.....	45
General issues.....	45
An issue specific to cardiac cases.....	46
Pediatric subspecialties.....	46
Pediatric cardiology.....	47
Pediatric cardiac surgery.....	48
Anaesthetists.....	49
Nursing.....	49
How a pediatric cardiac surgery case proceeded.....	51
Events leading up to the day of surgery.....	51
Diagnosis.....	51
Variety Children’s Heart Centre clinics.....	51

Surgical consultation	52
Cardiovascular thoracic conferences.....	52
Consent	53
Scheduling of the operation	53
Admission to hospital.....	53
Pre-operative conference	54
Pre-operative anaesthetic evaluation	54
Contact with the child and the family.....	55
Preparation of the patient	55
The day of surgery	55
Preparation of the operating theatre.....	55
Operating theatre personnel.....	56
The team	58
Charts	59
The three phases of the operation.....	60
Post-surgical care	71
The NICU and the PICU	71
Preparing for intensive care.....	73
Transfer to the Intensive Care Units	75
Responsibility for care	75

CHAPTER 4 – THE HEALTH SCIENCES CENTRE

Establishment of the Health Sciences Centre.....	77
The 1994 HSC Reorganization	78
Administrative structure.....	79
The Board of Directors of the Hospital	79
The President.....	79
The Vice-Presidents	79
Vice-presidents and portfolios before June 1994.....	80
Vice-presidents and portfolios after June 1994.....	82
Issues raised by the reorganization	82
Medical departments	83
Surgical sections	83
Pediatric sections	85
Anaesthetic sections	86
Medical staff	87
Medical Staff Council	88
Medical Advisory Committee	88
Remuneration	89
Nursing.....	89
The Division of Pediatrics and Child Health Nursing –	
Patient Service Division (Pediatrics and Child Health)	89
The Nursing Council	91
Perfusionists	91
Staff discipline	92
Committees whose activities touched upon the events of 1994.....	92
The Pediatric Operating Room Committee	92
The Children’s Hospital Management Advisory Committee.....	93

TABLE OF CONTENTS

Quality assurance.....	93
Quality Assurance Committee.....	93
Morbidity and Mortality (M & M) Rounds	93
Incident reports	94
The College of Physicians and Surgeons of Manitoba	94
The Manitoba Association of Registered Nurses	96
The Office of the Chief Medical Examiner	96
Budgeting.....	97
The relationship between the HSC and the Faculty of Medicine	98

SECTION TWO

CHAPTER 5 – PEDIATRIC CARDIAC SURGERY IN WINNIPEG 1950–1993

Introduction	101
The start of pediatric cardiac surgery at Children’s Hospital— the Ferguson-Cumming Era: 1950s-1981.....	101
The Collins era: 1982–1993.....	102
Collins’s background and vision	102
Relations between HSC and St. Boniface.....	103
The Provincial Advisory Committee on Cardiac Services in Manitoba	104
The establishment of the Variety Children’s Heart Centre	105
Collins and de la Rocha.....	105
Recruitment of Dr. Kim Duncan.....	107
The matrix concept.....	107
The relationship between Collins and Duncan.....	108
Collins’s role in monitoring performance	109
The VCHC’s caseload	110
Issues for the Variety Heart Centre.....	110
Operating rooms	110
The VCHC offices	110
The medical fee schedule	111
Relations with adult surgery and the hospital administration	111
Assistance for Duncan	112
Lack of cases	113
The number of anaesthetists	113
Intensive care.....	113
Departures.....	113
Replacing Duncan	115
The search committee	115
Dr. Jonah Odim.....	116
Recruitment.....	118
Letters of reference.....	120
The Boston references.....	122
HSC reference questionnaires	123
Who was in charge?	124

CHAPTER SIX – THE RESTART OF PEDIATRIC CARDIAC SURGERY IN 1994

JANUARY 1, 1994, TO MAY 17, 1994

Problems from the beginning 127

The start-up 128

 January 1994 128

 Orientation and integration 128

 February 1994 130

 The restart of the program 130

 Team building 131

 The nurses’ attempts to initiate an orientation..... 132

 Case selection 135

 Summary 136

Surgery from February 28 to March 14 137

 February 28—The case of ST..... 137

 March 7—The case of DR – the first open-heart case 137

 Odim’s lack of familiarity with the OR setup 137

 Odim’s problems with cannulation 138

 Odim’s treatment of nurses 140

The case of Gary Caribou 140

 Issues 140

 Background and diagnosis 141

 The decision to operate 142

 Consent..... 144

 Pre-operative condition 145

 Conclusion as to Gary’s pre-operative status 149

 The operation – March 14 150

 Post-operative course..... 153

 Autopsy findings 154

 Findings 155

 Was there an inappropriate delay between the time of Gary’s diagnosis
and the date of the operation on his heart? 155

 Was Gary’s mother provided with sufficient information to allow her
to give informed consent to the procedure? 156

 Was Gary healthy enough to undergo an operation? 156

 Did the length of surgery contribute to his death? 157

 Did a post-operative abdominal drainage procedure contribute to his death? 157

 What was the cause of death and was it preventable? 158

 Post-mortem issues 159

The case of Vinay Goyal – his first operation 161

 Issues 161

 Background and diagnosis 161

 The decision to operate 164

 Consent..... 164

 Pre-operative condition 165

 The operation—March 17 165

 Post-operative course..... 167

 Overall condition 167

 Breathing problems 167

TABLE OF CONTENTS

Heart problems	168
Concerns of the nurses and the family	168
Decision to reoperate.....	168
The case of Jessica Ulimaumi	169
Issues	169
Background and diagnosis	169
The decision to operate.....	172
Pre-operative condition	172
Consent.....	173
The operation—March 24.....	173
Post-operative course.....	176
Autopsy findings.....	181
Post-mortem events	182
Findings	184
Was there an inappropriate delay between the time of her diagnosis and the date of the operation on her heart?	185
Was Jessica’s family provided with sufficient information to allow them to give informed consent to the procedure?	185
Was Jessica healthy enough to undergo an operation?	185
Did the length of surgery contribute to her death?	185
Were the repairs properly carried out?	186
Did irregularities in the process of weaning her from ECMO contribute to her death?.....	186
What was the cause of death and was it preventable?	187
Should this death have triggered a review of the program?	187
The events of early April 1994.....	188
April 7 – the case of JM	188
Issues	188
Other PICU issues	190
Surgical monitoring lines	190
Post-operative bleeding and pacemaker malfunction.....	191
April 13 – the case of CSM	191
Vinay Goyal – the second procedure.....	193
Consent for the reoperation	193
Delay in the second operation	193
Pre-operative status.....	194
The operation—April 18	195
Intra-operative incidents.....	195
Dribbling of adrenalin on the heart	195
Testing the patch	196
The premature removal of a cannula	198
Autopsy.....	200
Findings	200
Were Vinay’s parents provided with sufficient information to allow them to give informed consent to the procedure?	200
Would Vinay have been taken to surgery with a potential infection if his parents had not intervened?.....	201
Did the surgeon demonstrate the skills and experience necessary to undertake this high-risk surgery?.....	201
What was the cause of death and was it preventable?	202

Reaction of the PCS team following the deaths of Gary Caribou, Jessica Ulimaumi and Vinay Goyal	202
The response of the nurses.....	203
Perfusionists.....	206
Approaches to Wiseman.....	206
Anaesthetic meetings.....	208
April 18 – Meeting of the Section of Pediatric Anaesthesia.....	210
The case of Daniel Terziski	210
Issues.....	210
Background and diagnosis.....	211
The decision to operate.....	211
Consent.....	212
Pre-operative status.....	215
Preparing the NICU staff.....	216
The operation—April 20.....	217
Untoward events during surgery.....	218
Preparation of the homograft.....	218
Removing the cap from the line.....	218
Problems with the shunt.....	220
The assessment of the consultants.....	220
Post-operative Course.....	221
Autopsy.....	223
Findings.....	224
Should Daniel’s condition have been diagnosed earlier?.....	225
Was Daniel’s family provided with sufficient information to allow them to give informed consent to the procedure?.....	225
Was Daniel healthy enough to undergo an operation?.....	225
Should the HSC team have attempted the operation or should Daniel have been referred out of province?.....	226
Should there have been better planning for this procedure?.....	226
Did the length of surgery contribute to Daniel’s death?.....	226
Was there appropriate post-operative care?.....	226
What was the cause of death and was it preventable?.....	227
What happened after the Terziski case	227
The results up to that time.....	229
Ullyot meets with Wiseman.....	229
Meetings in late April and early May.....	230
Nurses seek reassignment.....	230
Odim’s view.....	231
The existing rounds and conferences.....	232
The case of Alyssa Still	233
Issues.....	233
Background and diagnosis.....	233
The decision to operate.....	234
Consent.....	236
Pre-operative condition—first admission.....	236
Pre-operative condition—second admission.....	237
Alyssa’s admission to the Children’s Hospital.....	240
The operation—May 5.....	240

TABLE OF CONTENTS

Post-operative course.....	243
Did suctioning contribute to Alyssa's problems?	245
Autopsy findings	246
The presence of a suture in the coronary sinus	246
Contraction band necrosis	248
Edema	248
Cause of death	250
Findings	252
Was Alyssa's family provided with sufficient information to allow them to give informed consent to the procedure?	252
Was Alyssa healthy enough to undergo an operation?.....	253
Was the PICU adequately equipped for her case?	253
Were there technical problems with the operation?	253
What was the cause of death and was it preventable?	253
Borton asks for a transfer	254
May 11–12 – the case of FE	254
The case of RM	256
The anaesthetists withdraw services	257
May 16, 1994 – The meeting of the Section of Pediatric Anaesthesia.....	257
The May 17 memo from the anaesthetists	258
The distribution of the memo	260
Bishop is notified	260
 CHAPTER SEVEN – THE SLOWDOWN	
MAY 17 TO SEPTEMBER 1994	
The meeting in Bishop's office	261
The decision to conduct a review	263
What to do about the existing cases?	264
Informing HSC senior management	264
Membership on the Wiseman Committee.....	265
Assessing the problems	266
Were the anaesthetists justified in their action?	267
Options not taken.....	269
Blanchard speaks with Odum	270
The issue of committee records	270
The first meeting	271
Preparing for the process	273
Nursing concerns	273
Communication	273
Morale.....	274
Role confusion	274
Anaesthetic concerns	274
Input into the decision-making process	274
Communication	274
Follow-up.....	275
ICU concerns	275
Surgical equipment/materials to be available in PICU for emergency and elective procedures in the PICU	275

Clarification of areas of responsibility in post-operative management and communication about patient status and proposed changes in therapy, both to the surgeon and from the surgeon	276
Surgery and Cardiology concerns.....	276
The anaesthetists agree to return	277
The Wiseman Committee begins its discussions	277
Corporate reorganization takes effect	278
The work of the committee during the month of June.....	278
The trip to Saskatoon (June 13–14)	279
The case of VM	280
The June 29 committee meeting.....	281
Conflict over out-of-province referrals.....	283
Swartz’s notes	284
Craig and Odim meet	285
The case of Aric Baumann.....	285
Issues	285
Background and diagnosis	286
The decision to operate.....	288
Consent.....	288
Admission to the hospital.....	290
The operation-June 30	290
Post-operative course.....	292
Autopsy.....	294
Findings	294
Could Aric’s pulmonary vein stenosis have been identified before surgery?	294
Would Aric have benefited from a heart-lung transplant?	295
Was Aric a high-risk patient at a time when the program was not undertaking high-risk cases?	295
Were Aric’s parents provided with sufficient information to allow them to give informed consent to the procedure?	295
What was the cause of death and was it preventable?	296
Kim Duncan’s visit	296
The case of SK	296
The case of KZ.....	297
The July 13 Wiseman Committee meeting	298
The July 27 committee meeting.....	298
Nurses and the Wiseman Committee	300
The issues raised by Odim	301
Communications.....	302
Team meetings	302
Post-operative care and anaesthesia	303
Odin responds to concerns about cannulation	303
The case of Shalynn Piller	303
Issues	303
Background and diagnosis	304
The decision to operate.....	306
Consent.....	306
Pre-operative status.....	307
The operation-August 1.....	307
Post-operative course.....	308

TABLE OF CONTENTS

Post-mortem findings.....	311
Findings	311
Were Shalynn's parents provided with sufficient information to allow them to give informed consent to the procedure?	311
Should the program have undertaken this operation at a time when neonates were supposed to be sent out of the province?	311
What was the cause of death and was it preventable?	312
Pressure builds for a return to full service	312
The August 10 committee meeting	313
The tricuspid atresia case	313
Post-operative care	313
Forthcoming cases.....	314
The draft interim report	314
The interim report is distributed	319
The Wiseman Committee plans to return to full service.....	320
The anaesthetists agree to return to full service.....	321
The return to full service	321
Conclusion.....	323
Communication	324
Decision-making.....	324

**CHAPTER 8 – EVENTS LEADING TO THE SUSPENSION OF THE PROGRAM
SEPTEMBER 7, 1994 TO DECEMBER 23, 1994**

September 7—the return to full program	325
Craig's meeting with the anaesthetists.....	326
The case of Marietess Tena Capili	327
Issues	327
Background and diagnosis	328
The decision to operate.....	330
Consent.....	331
Pre-operative status	332
The operation-September 13.....	333
Cannulation issues.....	334
Problems with distension of the heart.....	336
Surgical bleeding and coagulopathy.....	336
The superior vena cava syndrome	336
Post-operative course.....	338
The family on the day of surgery.....	339
Operative reports	340
Post-mortem findings.....	342
Findings	342
Should the operation have been performed in Winnipeg or should Marietess have been referred out of province?	342
Were Marietess's parents provided with sufficient information to allow them to give informed consent to the procedure?	343
What caused the superior vena cava syndrome?.....	343

Should the surgical team have kept Marietess in the OR until the cause of the superior vena cava syndrome from which she was suffering was identified?	344
What was the cause of death and was it preventable?	345
The appointment of Dr. Andrew Hamilton	346
Dr. Brian Postl is appointed head of pediatrics.....	346
September 20—the case of ML.....	347
Wiseman’s memorandum to the department heads.....	348
Odim’s letter of September 26	348
September 27—the case of JB.....	352
The September 28 meeting of the Wiseman Committee	352
September 30—the meeting of department heads	353
The end of September: the nurses are distressed.....	354
Whistle-blowing	356
The case of Erica Bichel	357
Issues	357
Background and diagnosis	357
The decision to operate.....	358
Pre-operative status.....	362
A desperate situation	362
Preparation of the NICU.....	364
The operation-October 4	364
The issue of cardioplegia	366
The failure to wean from bypass.....	368
Post-mortem findings.....	369
Findings	370
Should the Winnipeg team have attempted a Norwood procedure, given its recent history and its level of experience? Should Erica have been transferred out of Winnipeg? Should the operation have taken place before October 4?	371
Were her parents provided with sufficient information to allow them to give informed consent to the procedure?	372
Was Erica given adequate myocardial protection?	372
What was the cause of death and was it preventable?	373
October 20—the case of ER.....	373
The Wiseman Committee meeting of October 17	375
The meeting of the anaesthetists on October 19	376
The department heads meeting of October 28	376
The case of Ashton Feakes	377
Issues	377
Background and diagnosis	377
The decision to operate.....	380
Consent.....	381
Pre-operative status.....	383
The operation-November 1.....	383
Post-operative course.....	384
Increase in mitral regurgitation.....	387
November 7—the mitral regurgitation worsens.....	388
November 8—a small improvement	389

TABLE OF CONTENTS

November 9 – a turn for the worse.....	389
November 10—the opportunity for mitral valve replacement passes	389
November 11	391
Post-mortem findings.....	391
Findings	393
Were Ashton’s parents provided with sufficient information to allow them to give informed consent to the procedure?	394
Should Ashton have been referred out of the province during the summer of 1994?	394
Should consideration have been given to performing a mitral valve replacement before November 10?.....	395
What was the cause of death and was it preventable?	395
Early Winter.....	395
November 8—the case of KF	397
November 10—the case of ID.....	398
The November meeting with Marietess Tena Capili’s family	402
The case of Jesse Maguire.....	403
Issues	403
Background and diagnosis	403
The decision to operate	404
Consent.....	406
Notifying the OR nurses	407
Hamilton not called in.....	408
Pre-operative status	408
The operation-November 27	408
Repairing the VSD while on TCA	410
The dislodging of the cannula	412
Post-mortem findings.....	417
Findings	418
Should the operation have been performed in Winnipeg or should Jesse have been referred out of province?	418
Were Jesse’s parents provided with sufficient information to allow them to give informed consent to the procedure?	420
Should Dr. Andrew Hamilton have assisted in this operation?	420
Was a cannula inadvertently dislodged at 1630 hours?.....	420
Were all the repairs intact?	420
What was the cause of the poor perfusion following the initial repair?	421
Were Jesse’s parents fully informed about the circumstances surrounding his death?	421
What was the cause of death and was it preventable?	422
Meeting of the department heads – November 28.....	423
The impact of the Maguire case.....	423
The case of JR – December 2	426
Blanchard’s meeting with Unruh and Odim—December 5	428
The case of KQ—December 7.....	429
The Wiseman Committee meeting of December 7.....	429
Ullyot meets with Postl—December 9	430
The case of Erin Petkau	431
Issues	431
Background and diagnosis	431
The decision to operate and consent	432

Pre-operative status.....	434
The operation-December 20	434
Autopsy findings.....	440
Findings	441
Were Erin's parents provided with sufficient information to allow them to give informed consent to the procedure?	442
Should the ventilation intra-operatively have been different?	442
Was the Blalock-Taussig shunt too small?	443
What led to the shunt failures?	443
Should Dr. Andrew Hamilton have assisted in this operation?	444
What was the cause of death and was it preventable?	444
Reactions to Erin's death	445
Postl calls a meeting	446

**CHAPTER 9 – 1995 – THE AFTERMATH OF THE SHUTDOWN
JANUARY TO MARCH 1995**

From Lindsay to Williams and Roy	449
The Williams and Roy Report	453
Responding to the report	454
The role of the President and vice-presidents	454
The parents	456
The Quality Assurance Committee.....	458
Delays in the autopsy reports.....	458
The College of Physicians and Surgeons	459
The Office of the Chief Medical Examiner.....	461

SECTION THREE

CHAPTER 10 – FINDINGS AND RECOMMENDATIONS

Introduction	465
The loss and recruitment of program staff before 1994	467
Loss and recruitment of program staff	467
The compensation paid to pediatric cardiac surgeons.....	470
Problems within the Pediatric Cardiac Surgery Program	470
Unclear lines of authority.....	470
The responsibility of department heads.....	470
The responsibility of Dr. Jonah Odum and Dr. Niels Giddins for the events of 1994	472
Misusing the concept of a 'learning curve'.....	472
Administrative issues	473
Inappropriate staffing levels	475
Treatment of nurses	477
Treatment of the families	479
The issue of informed consent.....	479
The experience of the surgeon and the team	479
Information about surgical risk.....	480
Information about the May 17 withdrawal of services by the anaesthetists.....	480

TABLE OF CONTENTS

Information about the Williams and Roy Report and the February 1995 suspension of the program	480
Funding for the families.....	482
Compensation	483
Monitoring of issues and problems within and outside the HSC	483
Monitoring within the HSC.....	483
Monitoring outside the HSC.....	485
Human and medical error	487
Error, accident and humanity	487
Dealing with human error.....	488
Blaming	488
Learning from human error.....	488
The investigation of human error	489
Hierarchy of the effects of error	489
The importance of early reaction to error	490
Human factors analysis.....	491
A new approach to the handling of medical error at the HSC.....	492
Quality assurance	493
Risk management	494
The integration of quality assurance and risk management.....	494
Critical incident review policy.....	495
Team performance.....	496
The future of pediatric cardiac surgery in Manitoba	498
Combining the ICUs	500
Referral to the College of Physicians and Surgeons of Manitoba	500
Conclusion.....	501
APPENDIX 1	
Glossary of terms used in this report.....	503
APPENDIX 2	
Parties to the proceedings and counsel.....	511
APPENDIX 3	
List of witnesses and dates of testimony	513

DIAGRAMS

Diagram 2.1 Normal Heart (with blood flow).....	24
Diagram 2.2 Heart contracting - atrial contractions.....	26
Diagram 2.3 Heart contracting - ventricular contractions	26
Diagram 2.4 Patent ductus arteriosus	29
Diagram 2.5 Atrial septal defect (ASD)	30
Diagram 2.6 Ventricular septal defect (VSD)	30
Diagram 2.7 Tetralogy of Fallot	31
Diagram 2.8 Atrioventricular (AV) canal defect	32
Diagram 2.9 Coarctation of the aorta	33
Diagram 2.10 Interrupted aortic arch.....	34
Diagram 2.11 Pulmonary stenosis (valvular).....	34
Diagram 2.12 Aortic stenosis (valvular).....	34
Diagram 2.13 Tricuspid atresia	36
Diagram 2.14 Pulmonary atresia.....	36
Diagram 2.15 Total anomalous pulmonary venous connection	37
Diagram 2.16 Partial anomalous pulmonary venous drainage	38
Diagram 2.17 Transposition of the great arteries	38
Diagram 2.18 Double outlet right ventricle.....	39
Diagram 2.19 Hypoplastic left heart syndrome.....	40
Diagram 2.20 Functional hypoplastic left heart syndrome.....	40
Diagram 2.21 Stage 1 of hypoplastic left heart syndrome reconstruction	41
Diagram 2.22 Stage 2 of hypoplastic left heart syndrome reconstruction.....	42
Diagram 2.23 Stage 3 of hypoplastic left heart syndrome reconstruction	42
Diagram 3.1 Operating room suite.....	56
Diagram 3.2 Operating room number 2	57
Diagram 3.3 Venous and aortic cannula	66
Diagram 3.4 Aortic cannulation	66
Diagram 3.5 Neonatal intensive care unit.....	72
Diagram 3.6 Pediatric intensive care unit.....	74
Diagram 6.1 Gary Caribou – pre-operative heart	143
Diagram 6.2 Gary Caribou – post-operative heart.....	151
Diagram 6.3 Vinay Goyal – pre-operative heart	163
Diagram 6.4 Jessica Ulimaumi – pre-operative heart.....	171
Diagram 6.5 Depiction of the connection of the ECMO lines to Jessica Ulimaumi	178
Diagram 6.6 Jessica Ulimaumi – post-operative heart.....	183
Diagram 6.7 Vinay Goyal – post-operative heart	197
Diagram 6.8 Daniel Terziski – pre-operative heart	213
Diagram 6.9 Daniel Terziski – post-operative heart.....	219
Diagram 6.10 Alyssa Still – pre-operative heart	235
Diagram 6.11 Alyssa Still – post-operative heart	247
Diagram 7.1 Aric Baumann – pre-operative heart	287
Diagram 7.2 Aric Baumann – post-operative heart.....	291

T A B L E O F C O N T E N T S

Diagram 7.3 Shalynn Piller – pre-operative heart	305
Diagram 7.4 Shalynn Piller – post-operative heart	309
Diagram 8.1 Marietess Tena Capili – pre-operative heart	329
Diagram 8.2 Marietess Tena Capili – post-operative heart	335
Diagram 8.3 Erica Bichel – pre-operative heart	359
Diagram 8.4 Erica Bichel – post-operative heart	365
Diagram 8.5 Ashton Feakes – pre-operative heart	379
Diagram 8.6 Ashton Feakes – post-operative heart	385
Diagram 8.7 Jesse Maguire – pre-operative heart	405
Diagram 8.8 Jesse Maguire – post-operative heart	409
Diagram 8.9 Erin Petkau – pre-operative heart	433
Diagram 8.10 Erin Petkau – post-operative heart	435

T A B L E S

Table 6.1 Persons involved in the operation on Gary Caribou, March 14, 1994	150
Table 6.2 Length of phases of the operation on Gary Caribou, March 14, 1994	150
Table 6.3 Persons involved in the operation on Vinay Goyal, March 17, 1994	166
Table 6.4 Length of phases of the operation on Vinay Goyal, March 17, 1994	166
Table 6.5 Persons involved in the operation on Jessica Ulimaumi, March 24, 1994	173
Table 6.6 Length of phases of the operation on Jessica Ulimaumi, March 24, 1994	173
Table 6.7 Persons involved in the operation on Vinay Goyal, April 18, 1994	195
Table 6.8 Length of phases of the operation on Vinay Goyal, April 18, 1994	195
Table 6.9 Persons involved in the operation on Daniel Terziski, April 20, 1994	217
Table 6.10 Length of phases of the operation on Daniel Terziski, April 20, 1994	218
Table 6.11 Persons involved in the operation on Alyssa Still, May 5, 1994	241
Table 6.12 Length of phases of the operation on Alyssa Still, May 5, 1994	241
Table 7.1 Persons involved in the operation on Aric Baumann, June 30, 1994	290
Table 7.2 Length of phases of the operation on Aric Baumann, June 30, 1994	290
Table 7.3 Persons involved in the operation on Shalynn Piller, August 1, 1994	308
Table 7.4 Length of phases of the operation on Shalynn Piller, August 1, 1994	308
Table 8.1 Persons involved in the operation on Marietess Tena Capili, September 13, 1994	333
Table 8.2 Length of phases of the operation on Marietess Tena Capili, September 13, 1994	333
Table 8.3 Persons involved in the operation on Erica Bichel, October 4, 1994	366
Table 8.4 Length of phases of the operation on Erica Bichel, October 4, 1994	366
Table 8.5 Persons involved in the operation on Ashton Feakes, November 1, 1994	384
Table 8.6 Length of phases of the operation on Ashton Feakes, November 1, 1994	384
Table 8.7 Persons involved in the operation on Jesse Maguire, November 27, 1994	408
Table 8.8 Length of phases of the operation on Jesse Maguire, November 27, 1994	410
Table 8.9 Persons involved in the operation on Erin Petkau, December 20, 1994	436
Table 8.10 Length of phases of the operation on Erin Petkau, December 20, 1994	436



INTRODUCTION

This document is the final report of the Pediatric Cardiac Surgery Inquest. Readers are advised that there are three sections to this report.

Section One of this report outlines the legal, medical, and organizational issues that the Inquest addressed and contains four chapters. Chapter One deals with legal issues. Chapter Two outlines the pediatric cardiac anomalies that are discussed in this report. Chapter Three provides an introduction to the various medical professions involved in treating these anomalies and the steps through which a pediatric cardiac patient would have progressed in Manitoba in 1994. Chapter Four outlines the structure and staff of the Winnipeg Health Sciences Centre in 1994.

Section Two is a narrative account of events in the Pediatric Cardiac Surgery Program. Chapter Five outlines the program's history up until January 1994. Chapters Six, Seven and Eight recount the program's history in 1994, providing detailed accounts of the events surrounding the deaths of the twelve children whose cases are under examination in this report. Specific findings are made at the end of the discussion of each case. Chapter Nine recounts the events of 1995 up until the calling of this Inquest.

Section Three contains only one chapter, Chapter Ten. This chapter contains further findings, which provide an understanding of why these deaths occurred, as well as recommendations for the prevention of future deaths.

Throughout the report there are numerous diagrams illustrating specific heart anomalies, procedures, and areas in the Winnipeg Children's Hospital. In addition, there are pre-operative and post-operative representations of the hearts of the twelve children who died in 1994. Readers should be aware that these illustrations are generic diagrams, meant to assist in understanding the text. These diagrams are not intended to be anatomically accurate nor are they intended to represent detailed drawings of each specific child's heart. Doctors Glenn Taylor and Jan Davies provided extensive advice in the preparation of these drawings. They are, however, the product of the Inquest.

A NOTE ON SOURCES

This report is based on the evidence that was presented to the Inquest. The evidence and transcripts will be available through the Provincial Archives of Manitoba. However, *in camera* testimony will not be made available to the public. The report does not identify certain children who successfully underwent cardiac operations in the Children's Hospital in 1994. Although the transcripts and evidence do identify the names of those children, readers are reminded that information about their cases was deemed to have been given *in camera* and therefore restrictions on public dissemination of their identities and cases apply.

Quotations from the oral testimony presented to this Inquest are cited by referring to the page or pages of transcript of the evidence. The evidence of the first witness to appear before this Inquest, Dr. Cameron Ward, makes use of a different numbering system than the rest of the transcripts. As a result quotations from his transcript are cited as being from the Evidence of Dr. Cameron Ward. Documentary evidence is identified by the exhibit and document numbers that were assigned to them by the court.



ACKNOWLEDGEMENTS

Putting together a report of this magnitude and managing the process that led up to it, is an impossible task for one person. Many people contributed to this report and to that process.

Christina Kopynsky, Q.C., and Don Slough fulfilled their role as Crown counsel and the Inquest proceedings admirably. They reviewed all documents, interviewed and organized the calling of all the witnesses, prepared ‘will-says’ for counsel for the various parties summarizing anticipated witness testimony, and prepared excerpts from the exhibits and transcripts for hearings. Additionally, they each participated in the management of Inquest staff. They fulfilled their public responsibilities in a highly professional manner.

Donna Jorgerson and Debby Tack undertook the duties of court clerk for the Inquest hearings. They managed the thousands of pages of exhibits that were filed and operated the courtroom computer and projector. They also contributed to the smooth operations of the proceedings.

Thomas Fone and Paul Cech-Manek, Sheriff Officers, provided courtroom security.

Lanyse Guay was seconded from the Chief Medical Examiner’s office for a short while as a Medical Investigator. She was replaced by Betty Owen-Nordrum, RN, who organized the medical charts so that they made sense to non-medical people. She also prepared case summaries from the charts of each of the twelve children, participated in interviewing witnesses, assisted counsel for all the parties with locating medical and other information when asked, and found material needed for the final report. She coordinated the preparation of the diagrams and medical drawings used in the report, as well as helped in proof-reading it. Her contribution was immeasurable.

Kathy Bhola kept the office organized, running the Inquest’s administrative operations, maintaining records, and performing numerous other tasks. She would be an asset in any organization. Tera Cooper, Krista Sommer, and Agatha Kostefko were the Inquest’s administrative assistants.

Dr. Jan Davies taught us all about human error and human factors analysis. Much of the information and material in this report on those subjects is a result of her work. She also assisted in proof-reading the final draft of the report.

ACKNOWLEDGEMENTS

Dr. Glenn Taylor provided invaluable assistance in the diagrams and drawings used in the report, especially with those drawings intended to represent the hearts and anomalies of each of the twelve children.

Cindy Chuckree created the illustrations that appear in this report.

Law students Kelly Moar and Rachel Charette read and summarized thousands of pages of documents and transcripts, and researched numerous legal issues. Jock Bates did the copy-editing, and the staff of Manitoba Culture, Heritage and Tourism – Information Resources Division supervised the printing and web-site development.

The firm of Finlayson Reid Reporting Services provided transcripts for the Inquest on a daily basis.

The professional expertise and patience of Steven Rosenberg, Debbie Crump and the staff of Doowah Design, who undertook the design and layout of the Report, is also gratefully acknowledged.

Finally, Doug Smith performed two important roles for the Inquest – those of researcher and writer. Armed with a remarkable ability to flesh out a series of ideas, thoughts and concepts into a highly polished written state, he put in countless hours reading transcripts and documents to become familiar with the material and to check sources, facts and quotations. His ability to digest and understand huge amounts of detail and information is impressive, but more importantly, his dedication to completion of a task, even one as enormous as this, was inspiring. I was very fortunate to have been able to convince him to work with me on this.

While all of the people mentioned played a role in the development of this report, its contents including any errors are my responsibility.

ASSOCIATE CHIEF JUDGE MURRAY SINCLAIR