A District Health Board

A Report by the

Health and Disability Commissioner

(Case 05HDC13401)

Parties involved

Ms A	Complainant, consumer's sister
Ms B	Consumer
Dr C	Cardiothoracic surgeon
Dr D	Cardiologist
Dr E	General practitioner
Dr F	Obstetrician and gynaecologist
Ms G	Midwife
Dr H	Cardiologist
Dr I	Obstetrician and gynaecologist
Dr J	Cardiologist
Dr K	Obstetrician and gynaecologist
Dr L	Cardiology registrar
Dr M	Cardiologist
Dr N	Cardiothoracic surgeon
Hospital 1/DHB1	Regional Hospital
Hospital 2/DHB2	Provider, a city hospital
Hospital 3	Public Hospital, in another city

Complaint

On 14 September 2005, the Commissioner received a complaint from Ms A about the services provided to her sister, Ms B. The following issue was identified for investigation:

The appropriateness and adequacy of the care and treatment provided by a District Health Board [DHB2] to Ms B over a period of six months in 2004.

Ms B's family complained about the care she received in Hospital 2. They also raised concerns that although Ms B had wanted to have a termination, she had been either persuaded by staff that the risks were small, or that it was (by 21 weeks) too late for the termination to be legally performed. They stated that Ms B "did not want to be an incubator" and had wanted the baby to take his own chances. They added that she did not believe that she would survive the pregnancy and wanted it terminated to give her the opportunity to live.

An investigation was commenced on 29 March 2006. The investigation has taken more than 12 months to complete owing to the number of providers involved and the complexity of the issues.

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Information reviewed

Information from:

- Ms A
- Dr K
- Dr I
- Dr F
- Dr H
- Dr E
- Ms G
- Dr D
- Dr N
- Dr M
- Dr C
- The District Coroner
- DHB2
- DHB1
- Ms B's clinical records from both DHBs.

Independent expert advice was obtained from Dr Lesley McCowan, obstetrician and gynaecologist, and Dr Ian Crozier, cardiologist.

Overview

Ms B had congenital aortic stenosis[1] and had an aortic valve replacement in 1997. She had her first baby without complications in 1999. In 2004, Ms B was found to be pregnant with her second child. At her first cardiac assessment during the pregnancy, at 21 weeks, Ms B was found to have significant redevelopment of aortic stenosis.

At her further cardiac assessment, at 25 weeks, Ms B was found to have signs of cardiac failure and was admitted to the antenatal ward at Hospital 2.

On admission, early delivery was considered. Ms B's condition stabilised after her admission, and the plan was to deliver the baby and possibly perform valve replacement surgery depending on Ms B's condition. During her admission, she was seen frequently by the cardiology team and maternal fetal medicine team. The cardiothoracic team was also involved.

[1] Aortic stenosis: narrowing of the opening of the aortic valve.

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Near the planned delivery date, Ms B's condition deteriorated significantly and, despite an emergency Caesarean section and heart surgery, both Ms B and her baby died.

Information gathered during investigation

Background

In August 1997, Ms B (aged 29) had an aortic valve replacement because of congenital aortic stenosis. The surgery was performed by Dr C, cardiothoracic surgeon, and was a difficult procedure due to a narrow aortic valve and the presence of calcification deposits. Dr C thought it likely that Ms B would require further surgery at a later date, and that subsequent surgery would, in his opinion, be riskier.

Ms B's cardiac condition was assessed every 12–18 months by her cardiologist until his retirement in 2000. Thereafter, Ms B continued to be regularly reviewed by Dr D, cardiologist.

In 1999, Ms B had her first baby at Hospital 1. The birth was a normal delivery without any problems.

In October 2001, Ms B was assessed by Dr D. Ms B was considering a second pregnancy. Dr D wrote to her general practitioner, Dr E:

> "[Ms B] is currently stable, and I have advocated that we see her again in two years' time with a repeat echocardiogram at that stage. I have said to her that I see no reason why she could not go through with a pregnancy at this time, but explained that the increased demands of pregnancy may accelerate any deterioration in the tissue valve. I would be very happy to see her early on in her pregnancy, if that is the decision that she takes."

On 13 November 2003, Ms B attended Dr D's cardiac clinic for assessment. She was seen by a cardiology registrar. Ms B discussed with the registrar the possibility of having a second baby. Following that discussion, the registrar wrote to Dr E and confirmed that although she had "mild aortic regurgitation", she was "clinically … very stable" and there was "no reason why she cannot get pregnant".

GP consultations

In April 2004, Ms B consulted Dr E for a pregnancy test, which confirmed that she was pregnant. Ms B saw Dr E again the following month in relation to her pregnancy. Because of her heart condition, Dr E referred Ms B to the gynaecology team at Hospital 1 (the regional hospital) and the cardiology team at Hospital 2 (the city hospital). He also arranged to review her again. In the meantime, she was seen by obstetrician Dr F.

In May, Ms B returned to see Dr E. He noted:

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> "Well but scared [about] heart and her age … sees [Dr F] again next week … scan yesterday 9 [weeks] and no word yet re [Hospital 2]/cardiology."

Dr E recalls:

> "When I asked [Ms B] about the cardiology appointment … I was surprised that no notification had been sent to her. As is my standard operating process I asked her to contact [Hospital 2] to find out what was going on and to let me know if there was a problem."

Dr E saw Ms B again in June and confirmed that Hospital 2 had been in contact with her. The records note "has finally got [cardiology appt]"

Obstetric review
In May, Ms B was assessed by Dr F, obstetrician and gynaecologist. He reported his assessment to Dr E:

> "[Ms B] has had an aortic valve replacement 8 years ago [by Dr C]. The operation was a success and the valve has worked well. I notice her last assessment by a Cardiologist suggested stable aortic valve function and no contraindication to pregnancy.
>
> …
>
> I believe that you have arranged for her to have a cardiology assessment as requested by the Cardiologist."

Dr F recalls that he discussed with Ms B the possibility of termination in the "context of fetal abnormality, not in the context of her cardiac problems" because he felt Ms B was "well with no suggestion of heart failure". They discussed and booked an amniocentesis.[2]

Ms B had an ultrasound scan in May, and Dr F wrote to Dr E to advise that she was 11 weeks pregnant, and the due date was calculated. In his letter, Dr F stated:

> "[Ms B] has not yet chosen her lead maternity carer [LMC]. I have given her advice on that and a list of those who act as lead maternity carers in [her area]."

Ms B saw midwife Ms G late in May to discuss available maternity options, including the choice of an LMC. Ms G recalls that Ms B was concerned about her heart condition and the possible pregnancy problems associated with her age.

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[2] Amniocentesis: withdrawal of amniotic fluid from the uterus for the purpose of an analysis of the cells in the fluid.

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Emergency Department, Hospital 1
In June, Ms B had some vaginal bleeding. She presented to the Emergency Department at Hospital 1 at 3am. It was considered that Ms B was threatening a miscarriage and arrangements were made for her to have a scan later that day to confirm a viable pregnancy. The scan was arranged by Ms G and this confirmed that a leakage of amniotic fluid[3] had occurred. The fluid had reduced in volume around the baby. Ms G advised that an amniocentesis would put the pregnancy at risk.

Ms G reviewed Ms B a few days later and found her to be "hopeful, but anxious she was unable to have the amniocentesis". Ms G organised a further scan. This showed some improvement in the volume of amniotic fluid.

Lead maternity carer
In July, Ms G became Ms B's lead maternity carer. Ms G discussed the future management of the pregnancy and advised:

> "[Ms B] did not ask me for information regarding termination of pregnancy although my notes reflect that she had wished, at times, that her cardiac surgery could proceed without consideration to her pregnancy."

Ms G considered the pregnancy high risk and she intended to continue working with Dr F. To that effect, Dr F reviewed Ms B again later in July.

The following day, Dr F wrote to Ms G. He noted the improvement in the amniotic fluid levels and confirmed that the baby was growing normally. Dr F stated in his letter:

> "With regard to [Ms B's] cardiac status she is well though somewhat short of breath today. She puts this down to the weather and certainly her chest was clear. [Ms B] is going to go to [Hospital 2] at the beginning of August for a full cardiac assessment. I would be pleased if you could refer her back to me once she has had that assessment so that I can review the situation."

First cardiac review
The cardiology referral appears to have been received three days after it was dated. There is a handwritten note (dated a few days later) on the letter of referral which states that the referral is for Hospital 2.

Later in May, cardiologist Dr H wrote to Dr E regarding the referral. Dr H noted that the last echocardiography indicated that the AVR prosthesis was stable. Given that there was some mild obstruction, he advised that a further echocardiogram would be scheduled in the next two months. As she had previously been seen by Dr D, Dr H booked Ms B into Dr D's clinic.

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[3] Amniotic fluid: fluid around the fetus which maintains pressure and provides a barrier against infection. A reduced volume indicates that there may be problems with the health and viability of the pregnancy.

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20 weeks into her pregnancy, Ms B was reviewed by Dr D. He identified that she had significant redevelopment of aortic stenosis, and suggested she be managed in a high-risk obstetric clinic setting. Dr D gave Ms B his mobile phone number and arranged to see her again in four weeks' time.

Dr D reported his consultation to Dr E and sent a copy of his letter to Ms G, Dr H, Dr F, Dr I,[4] and Ms B. The letter states:

> "It was a pleasure to meet [Ms B] today again. She was last reviewed by our Team in October of last year at which stage she was haemodynamically stable and echocardiographically had a moderate degree of aortic valve obstruction as previously noted.
>
> …
>
> [Ms B] has significant re-development of aortic stenosis now eight years after her aortic valve replacement. She does have some breathlessness now, but the situation is muddied somewhat by the presence of asthma and she certainly has no clinical features to suggest heart failure currently.
>
> Nonetheless given the features, [Ms B] needs close monitoring during her pregnancy and I would strongly suggest that she needs to be managed in a high-risk obstetric clinic setting. …
>
> [Ms B] was quite tearful with the news of the fact that her valvular problems have worsened over time and in particular expressed the wish that she could have considered a termination, although this certainly does not seem a possibility at this point in her pregnancy."

Dr D attempted to contact Dr I by telephone to discuss Ms B but was unsuccessful. Dr D explained that he wished to clarify whether the clinic provided services to Ms B's region. He added the following to his reporting letter:

> "PS: Dear Dr [F]
>
> This woman sure will need close monitoring because of significant aortic valve disease in her pregnancy. I am not sure what the arrangements are in [her area] for management of what I think is a high-risk pregnancy, but would welcome your thoughts and possible interaction with [Dr I] here [at Hospital 2] as to the best means of managing this."

Dr D explained that Ms B raised the subject of termination, and he advised her to discuss it with her antenatal providers. He admits that his comment in the letter about

[4] Dr I is a consultant for the high-risk antenatal clinic at Hospital 2.

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termination was based on his "limited understanding of the difficulties with performing termination at this stage of the pregnancy". He stated:

> "As a clinician who is not an obstetric clinician I believe that it would have been inappropriate for me to discuss termination with [Ms B] at this time. I suggested to [Ms B] that she needed to discuss this further with her antenatal providers."

Dr D clarified that he did not discuss the termination option nor advise Ms B that a termination was out of the question at the consultation.

Consultation with LMC
Ms B called Ms G. Ms B was very upset and said that her valve graft was failing. Ms G arranged to see her the next day. Ms G discussed with Ms B the management of her pregnancy. Ms G advised that Ms B was to be referred to the high-risk team by her cardiologist. It was anticipated that there would be an early delivery of the baby and then Ms B would have cardiac surgery. Ms G recalls that "[Ms B] stated she wished she was not pregnant so she could have the surgery immediately".

Consultation with obstetrician
Ms B was reviewed again later in August by Dr F at the request of Ms G. Dr F wrote to Ms G:

> "[Ms B] is now 37 years old and at 22 weeks in her second pregnancy. This pregnancy seems to be progressing well now after a bleed at about 15 weeks. [Ms B] herself is feeling reasonably well but is having some shortness of breath. This is almost certainly on the basis of a degree of cardiac compromise. [Ms B] has an artificial aortic valve which has unfortunately developed severe stenosis.
>
> …
>
> At the moment [Ms B] seems quite stable despite her severe aortic stenosis. She is going for a return visit to the cardiologist in two weeks' time and I will see her shortly thereafter. I am sure we can continue to monitor her here and in [the main centre] but I agree with [Dr D] that she probably needs to deliver in [Hospital 2]. Once I have an update from [Dr D], I will be in touch with the High Risk Team in [Hospital 2] to set in place some sort of plan."

Shortly afterwards, Ms G saw Ms B for a routine antenatal check. Her blood pressure was normal at 110/80.

Second cardiac review
Dr D reviewed Ms B in September at his cardiac clinic. Ms B complained of feeling unwell in the last week, and had been very breathless and unable to sleep. Dr D

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arranged a chest X-ray and an echocardiogram. These showed evidence of both pulmonary congestion and cardiomegaly.[5]

Dr D contacted Dr J, a cardiologist at Hospital 3, another city hospital, for advice. Dr J recommended that enoxaparin (an anticoagulant) be prescribed owing to Ms B's reduced mobility, and that the baby's delivery should take place in a cardiothoracic theatre.

Dr D also discussed Ms B's condition with Dr K, the obstetrician on call that day at the high-risk clinic. The two specialists arranged for Ms B to be admitted to the antenatal ward straight away. He discussed the plan with Ms B, which he noted as being:

"— Rest and diuretics.

— Aim to nurse thru to delivery at > 30 weeks.

— At time of delivery to be invasively monitored and in a situation where, if needed, could have urgent [cardiothoracic] surgery.

— To look at redo AVR [aortic valve replacement] in the post natal phase. May be able to wait a month or two as she may settle after delivery."

Dr D wrote to Dr E, and copied the letter to Dr I, Dr F and Ms G, and stated:[6]

> "[Ms B] had no problems with her first pregnancy, but has been certainly breathless with this second pregnancy. In the last week in particular, she has experienced marked orthopnoea[7] and paroxysmal nocturnal dyspnoea[8]…
>
> …
>
> While [Ms B] has been taking Ventolin in the past for her breathlessness it has become increasingly clear this has not been of any help to her.
>
> …
>
> An echocardiogram today confirmed once again the presence of severe aortic stenosis … There was certainly a suggestion that the left ventricular function was not as good as it was four weeks ago.
>
> …

[5] Pulmonary congestion and cardiomegaly: clinical signs of cardiac failure.

[6] The letter was also copied to a cardiologist at Hospital 3, "Clinical Notes, [Hospital 2]", and the cardiothoracic surgical unit at Hospital 2.

[7] Orthopnoea: breathlessness that prevents a patient from lying down.

[8] Paroxysmal nocturnal dyspnoea: acute onset of breathlessness at night.

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> We performed a chest X-ray which showed evidence of cardiomegaly, but clear evidence of also pulmonary congestion."

Admission to Hospital 2
Ms B was admitted Hospital 2 at 4.45pm in September 2004. She was now 25 weeks and 2 days into her pregnancy. Dr K took over from Ms G as Ms B's LMC.

It was decided to prescribe diuretics to treat Ms B's heart failure, and Ventolin to assist with her breathing. Steroids were also given to improve fetal well-being. Ms B was to have daily cardiotocograms (CTGs),[9] and the Maternal Fetal Medicine (MFM) team was to review her.

Dr K assessed Ms B and recorded that she had become increasingly breathless over the last few weeks. She had intermittent chest pain on exertion and was now unable to walk more than 10 metres without feeling unwell. He authorised a further cardiac review and also made note of the possibility of an induction of labour to deliver the baby. Ms B was placed on four-hourly observations of pulse, blood pressure, oxygen saturation level, and fetal heart rate. Midwifery staff were instructed to give oxygen if Ms B's oxygen levels fell below 92%.

At 6pm, the nursing record noted:

> "[Ms B] tearful. Doesn't want to be in hospital and wishes she'd never become pregnant."

Later that night, Ms B told another midwife she was afraid she was going to die.

The following day, Dr D reviewed Ms B. The clinical record notes that Ms B was feeling better, and her condition and observations had improved. Dr D asked for Ms B to be weighed daily and her fluid balance (intake and output) to be monitored. The medical notes state that her management would be discussed with Dr C, her cardiothoracic surgeon.

On the same day, Ms B was reviewed by Dr K, who noted that her breathing had improved. Her care was discussed with Dr I, who advised an anaesthetic consultation, which occurred the following day.

The following day, maternity staff discussed with Ms B the importance of not over-exerting herself and also how to maintain her fluid balance requirements. Ms B was given a maximum daily intake and shown how to measure and record her fluid intake and urine output. Her weight that day was 109.6kg.

Dr D reviewed Ms B and recorded that he had a discussion with her about the plan of action to deliver at less than 30 weeks and, if necessary, perform urgent surgery.

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[9] Cardiotocogram: electronic recording of the fetal heart rate.

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In its response to the provisional opinion, the DHB explained:

> "The planned date for major intervention of elective caesarean section at 28 weeks' gestation with possible emergency cardiac surgery at the time of the caesarean was scheduled to both minimise risk of cerebral palsy from iatrogenic prematurity and optimise 'continuity of care/r' with both [Ms B's] obstetrician and her cardiac surgeon available at the scheduled time.
>
> The reasons for not providing Ms B with the choice of pregnancy termination at 25 weeks were threefold — namely:
>
> - the initial dramatic and then apparently sustained improvement to low-dose diuretic;
> - the report of a similar case in another city being 'eked' through successfully to a viable gestation (near 30 weeks) with small incremental increases of medication in the preceding weeks; and
> - the near viability of the healthy fetus."

Her case was discussed at a cardiology/cardiothoracic meeting. It was decided to perform a Caesarean section at the 28–30 week stage. The clinical notes record that the plan was discussed with Dr I who "would consider delivery at 27–28 [weeks]". It is noted that the patient was aware of the plan, and if there were problems over the weekend, there were instructions about who to contact.

Dr O, consultant anaesthetist, attended the meeting and circulated an "anaesthetic alert" to his colleagues in order to provide essential information should they attend Ms B:

> "Delivery planning: [Ms B] was discussed at a cardiothoracic case conference on [Friday]. The current plan is as follows —
>
> Attempt to prolong pregnancy till approx. 30 weeks' gestation.
>
> Interval procedure for repeat [aortic valve repair] 1–2 months post delivery, aortic valvotomy prior to delivery not likely to be beneficial.
>
> Delivery by elective Caesarean section, under general anaesthesia, in Main Theatre Block. Transfer to ICU post op.
>
> Anaesthesia — 2 consultant anaesthetists (Obst & cardiac preferable), cardiac type anaesthetic with RSI."

Dr D subsequently clarified that he discussed the recommendations with the MFM team and Ms B. He advised that a copy of the letter from the multidisciplinary meeting was also sent to the Hospital 3 MFM specialist.

Ms B continued to be closely monitored, and was reviewed by the cardiology team.

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The obstetric team recorded a plan for a Caesarean section in October, but that the decision was to be reviewed the week before and, if Ms B was stable, the pregnancy could possibly be extended for a further three weeks.

Ms B had another ultrasound scan which showed the baby had grown well and remained within normal limits.

Three further cardiology reviews occurred in September. The DHB advised that regular meetings took place between the cardiology and obstetric teams; however, these meetings and a summary of any discussions were not recorded in Ms B's medical records. During this period, the midwives caring for Ms B recorded various comments by her about being unhappy about her long hospital stay. She was anxious about her and her baby's health. Ms B's family were concerned about her condition and felt that she was becoming weaker every day.

Dr I and Dr K reviewed Ms B. They reiterated the plan to deliver the baby on the planned date, but to consider delaying the birth until 32 weeks if Ms B was "cardiologically stable". Dr D reviewed Ms B on the same day, confirmed the delivery date, and recorded:

> "I am away next week but will ask Dr L, my registrar, to keep an eye on [Ms B].
>
> I will review ([on return from leave]).
>
> If concern next week then I will be contactable by cell phone."

Dr I planned to deliver the baby on a day when Dr C would be available to proceed with the cardiac surgery. The house surgeon contacted Dr C, who requested that information about Ms B's care be sent to him. He was advised of the plan to deliver the baby, and the house surgeon recorded that Dr C "think[s] it will be okay on [that date]". The house surgeon also contacted the intensive care department to book a bed following Ms B's operation(s).

Dr D performed another review late in September. His recorded impression was that Ms B was stable, with no evidence of left ventricular failure. Dr D planned to review Ms B regularly.

Two days later, the house surgeon was contacted by the cardiothoracic team, who had decided that a dental clearance (removal of Ms B's teeth) was required prior to her surgery. The house surgeon made an urgent referral to the dental department to perform this. He also recorded that the cardiothoracic team had requested that Ms B "may need to be transferred to [the] cardiothoracic ward the night before [surgery]".

Dr L, cardiology registrar, reviewed Ms B later the same day. Dr L recorded that Ms B remained stable, and no change in plan was ordered.

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Friday
Ms B was reviewed by Dr K. The clinical record of the assessment states:

> "Feels okay but not better
>
> Thinks leg swelling getting worse
>
> Due to be seen by [Dr D] on Monday
>
> For discussion with partner on Monday
>
> [Ms B] getting more 'tired' and prefers to have [Caesarean section] on [Tuesday]."

Ms B's family were concerned at her condition. She was now short of breath all the time.

Dr L reviewed Ms B later that day, and noted that Ms B had been increasingly short of breath with a cough over the previous two days. Her impression was of "mild" left ventricular failure. She decided to increase Ms B's dose of diuretic medication, and intended to review her over the weekend and discuss her treatment with Dr D. Dr D advised ACC:

> "[Ms B] became more breathless on [Friday] and I was phoned by my registrar on that day. [Ms B] had been due to have her planned Caesarean section performed the following Tuesday … and our initial strategy was to increase the dose of diuretic in expectation that she would respond to this."

At 6.50pm, the midwife recorded that Ms B said her shortness of breath was unchanged, and that Ms B was "[n]ot obviously [short of breath] in appearance". Her general observations were consistent with previous readings; her oxygen saturation level was 96% on room air (without receiving oxygen).

Saturday
The midwife recorded at 2.00am that Ms B was not sleeping, and was generally uncomfortable. The midwife repeated her clinical observations, which were unchanged. The midwife recorded that Ms B did not want to "see anyone — just wanting to sleep". The midwife explained that she would like to report how Ms B was feeling to the registrar, and Ms B was agreeable to this. The midwife asked Ms B to call if she felt worse.

At 2.30am, the midwife advised the on-call registrar "how [Ms B] is feeling". The registrar said that he should be called if Ms B's oxygen saturations fell below 93%.

At 4am, the midwife recorded that Ms B was "still uncomfortable but not feeling worse". The fetal movement was noted to be good.

The midwife recorded at 5.25am that Ms B was "not feeling well", and was now distressed. The midwife paged the on-call registrar.

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At 6.15am, the on-call registrar assessed Ms B. He noted that Ms B "can't get breath" and was "distressed". His impression was that Ms B was possibly in heart failure or suffering from asthma. He ordered an urgent chest X-ray, an ECG, frequent clinical observations, and requested a review by the medical registrar "as soon as possible".

At 6.25am, a medical registrar assessed Ms B. The registrar concluded that Ms B was in cardiac failure. The registrar prescribed further diuretic medication, increased her oxygen to 6 litres per minute, placed her on a strict fluid balance chart, and arranged for a blood test to be taken to ensure that there would be blood for transfusion should an operation be required. The medical registrar contacted Dr L at 7.55am.

At 8am, Dr L assessed Ms B.

She prescribed further diuretics and decided to review Ms B later in the morning. Dr M, consultant cardiologist on call that day, was contacted by Dr L at 8.15am.

Dr K was contacted by the on-call registrar at 8.15am and informed that Ms B's condition had deteriorated overnight and that she had heart failure.

At 8.50am, Dr K assessed Ms B. He recorded:

> "For [Caesarean section] when stable /ok with Cardiologists/Anaesthetists."

Dr M also reviewed Ms B and decided that although Ms B was breathless, she was not in heart failure. He contacted Dr N, the cardiac surgeon on call, who recalls that Dr M expressed the view that immediate surgery was not required. However, after Dr N had spoken to Dr K, who expressed the view that Ms B had deteriorated, Dr N decided to assess Ms B himself.

At 9am, Ms B was transferred to the delivery suite for closer observation. Her clinical readings were performed every 15 minutes. At 9.40am, Ms B was recorded as "feeling a bit better and more relaxed now", and at 10am "comfortable".

The consultant anaesthetist on call for maternity asked cardiac anaesthetist Dr O to attend owing to the complexity of the anaesthesia required.

At 11.15am, Dr N reviewed Ms B. He summarised her as looking "profoundly unwell". Having assessed her, Dr N felt that Ms B did require urgent surgery, and he contacted Dr C, as Ms B was "his patient". Dr N recorded:

> "Asked to see [about] possible deterioration.
>
> [Dr C] contacted as he [has] previously been involved and will take management of case. [Discussed with] [Dr M] who feels that cardiac condition is stable."

An echocardiogram was performed at 11.15am, and showed poor ventricular function and contractibility.

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Dr C arrived at midday to review Ms B. The cardiology, cardiothoracic surgery and obstetric medical staff jointly decided to proceed with a Caesarean section followed immediately by cardiac surgery if Ms B's condition would allow this. If her condition did not allow this, they planned to proceed directly with cardiac surgery. Preparations began for surgery, and to ensure an intensive care bed for Ms B after the surgery and a cot for the baby in the neonatal unit. Dr K discussed the plan with Ms B and her family and gained her consent. The midwives were unable to attach the fetal monitor owing to Ms B's distress, and so listened to the fetal heart intermittently.

At 1.15pm, Ms B's condition began to deteriorate rapidly. The fetal heart was heard at 170bpm. Ms B was immediately transferred to the cardiothoracic operating room by consultant anaesthetist on call for maternity and a midwife.

At that time, Dr O was preparing the cardiothoracic theatre for Ms B's arrival. He recalls that on her arrival Ms B was "extremely distressed, agitated and unable to cooperate with us". Two anaesthetic registrars worked with Dr O to put in the necessary intravenous and intra-arterial monitoring lines as quickly as possible. They had some difficulty maintaining arterial monitoring due to Ms B's condition. Ms B became unresponsive, though able to breathe on her own. The anaesthetic team supported her circulation with medication, although a blood test showed profound tissue hypoxia.[10]

Dr K recalls that a midwife attempted to monitor the fetal heart during the preparations but was advised by Dr K not to do so as it slowed the progress of the preparations. The surgeons decided to go ahead with a Caesarean section to relieve some of the pressure on Ms B's circulatory system and heart.

Dr K began the Caesarean section at 2.45pm. The baby was delivered at 2.47pm but was not breathing. Resuscitation attempts continued until 3.12pm, but were unsuccessful.

During the baby's resuscitation, Dr C and the cardiology team began aortic valve surgery. The anaesthetic team had some difficulties maintaining Ms B's blood pressure owing to her condition.

Following replacement of the aortic valve, the surgical and anaesthetic team took Ms B off bypass. Within 10 minutes her blood pressure dropped and the team needed to put her back on bypass. The surgical team re-opened her heart and her body was cooled to allow exploration for any blood clots. The team made a number of attempts to remove Ms B from the cardiac bypass system. Unfortunately, they were unsuccessful, and they stopped their attempts at 7.30pm, when Ms B was pronounced dead.

[10] Hypoxia: lack of oxygen.

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On hearing of Ms B's death, Dr K returned to the hospital to offer his support to the family. He explained the role of the Coroner and the investigative process on behalf of the hospital and Coroner that would follow.

In his statement to ACC,[11] Dr C said that the cardiac surgery was anticipated to be quite lengthy and carried significant risks. He stated:

> "On review of the literature [about this kind of surgery], you can verify that a redo surgery in a cardiac patient carries five to ten times higher risk, than the first time surgery."

On reflection, Dr C did not feel the outcome would have been different if the cardiac surgery had taken place before the Caesarean section.

Internal review
A serious event review was initiated by DHB2. (The findings and recommendations from that review, and progress to date, are set out in Appendix 1.) The account of the care provided on Friday and Saturday stated:

> "On cardiological review on [Friday] there was clinical suspicion of mildly increasing [heart failure]. Additional Frusemide was prescribed, with plans made for close observation and review the next day. This was 4 weeks after admission — 4 days prior to planned elective CS. Overnight there was further deterioration in maternal condition, with maternal distress, thirst and anxiety noted by the midwifery staff [2am]. Ms B initially declined a medical review. When later examined by the obstetric registrar [5.30am], she was [breathing fast] and anxious. The differential diagnosis included worsening [heart failure] — or possibly asthma. The medical registrar also promptly reviewed her. Urgently arranged investigations [included] blood gases and a [chest X-ray]. There was significant hypoxia. Suspected [heart failure] was correctly treated with oxygen, morphine and additional Frusemide.
>
> Ms B was transferred to delivery suite where more invasive support was feasible.
>
> The Senior Medical Staff on duty for the weekend (some of whom knew Ms B well and others had met her for the first time) were advised of the situation. In the ensuing hours, there was a lengthy process of clinical assessment and multi-disciplinary conferring by all the relevant disciplines. There were significant differences in specialist opinion regarding whether or not Ms B's condition had deteriorated enough to warrant proceeding acutely to theatre. The cardiology team initially concluded that she could safely [be] managed medically until the planned elective CS. Her cardiothoracic surgeon (not on-call) promptly came to review her when he was contacted about the situation. An echocardiogram was performed. Further deterioration in left ventricular function was evident. Agreement was

[11] A "medical misadventure" claim by Ms B's family was declined by ACC on 30 May 2005.

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reached to proceed to theatre for an urgent AVR [aortic valve replacement], and, if she was stable enough, a CS would be performed immediately prior to the AVR. Preparations were immediately activated.

There was then an unexpected, profound deterioration in Ms B's clinical condition — with hypoxia, metabolic acidosis, hypotension and hyperthermia. After rapid transfer to cardiac theatre, the essential preparations and maternal resuscitation the CS was performed."

A number of recommendations were made as a result of the internal review (see Appendix 1). They can be summarised as:

- the development of systems and guidelines by the maternal fetal medicine service to improve access for women with complex medical disorders for pre-pregnancy planning and early pregnancy assessment
- communication to staff of the key clinical lessons from the case
- the development of a process for the management of multi-disciplinary teams, including documentation of discussions held
- review the cardiology outpatient systems, including to ensure that pregnant women referred are scheduled as 'Urgent'.

Independent advice to Commissioner

Obstetric advice
The following expert advice was obtained from Dr Lesley McCowan, obstetrician and gynaecologist:

"**Report to HDC re [Ms B] Ref 05/13401**

a) I, Lesley McCowan have been asked to provide an opinion to the HDC on case number 05/13401. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

b) I am a specialist Obstetrician and Gynaecologist and sub-specialist in Maternal Fetal Medicine. For many years my clinical practice has involved caring for pregnant women with complex medical conditions including women with prosthetic heart valves like [Ms B]. I have co-authored a paper on pregnancy outcomes in a cohort of Auckland women with prosthetic heart valves (L Sadler, L McCowan, H White, A Stewart, M Bracken, and R. North. Pregnancy outcomes and cardiac complications in women with mechanical,

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bioprosthetic and homograft valves. British Journal of Obstetrics and Gynaecology 2000; 107:245–253).

[At this point Dr McCowan details the documentation sent to her, the background of the case, and the questions asked of her, which she repeats in the body of her report. For the sake of brevity, this portion of Dr McCowan's report has been omitted.]

I have reviewed the clinical records provided to me by the Commissioner.

Specific Questions

1. **Should a termination of pregnancy have been discussed? If so at what time and by what kind of health practitioner?**

In [November] 2003, some 5 months before [Ms B's] second pregnancy began, a cardiological review and echocardiography had been performed.

At that time [Ms B] had been assessed as having a 'moderate degree of aortic obstruction'. This information is contained in the letter from [Dr D] when he saw [Ms B] at 21 weeks' gestation. Presumably this information about the moderate severity of aortic stenosis in October 2003 would have been available to the general practitioner [Dr E] and should have also been made available to the obstetric specialist [Dr F] when he saw [Ms B] in early pregnancy (I did not have documentation to confirm whether this exchange of information did occur).[12]

Women with moderate aortic stenosis normally tolerate pregnancy well and discussion of termination of pregnancy would not have been necessary at this point. However early in pregnancy it is important to determine whether there has been any worsening of valvular heart disease since a prior assessment. A cardiological review would have been highly desirable in the first trimester, to determine whether there had been any progression in cardiac status. Had it been known that [Ms B] had severe aortic stenosis early in this pregnancy the risks and benefits of continuing the pregnancy should have been raised at that time by the obstetrician and a referral made to the Maternal Fetal Medicine team [at Hospital 2] for further assessment and multidisciplinary discussion.

At 21 weeks, [Dr D], cardiologist, reviewed [Ms B] and found that she had severe aortic stenosis. It was not [Dr D's] role to discuss the advisability of terminating the pregnancy. It does not appear from the documentation that I have been provided that discussion occurred about termination at this time. At this point, when it was apparent that [Ms B's] status had changed significantly, the Maternal Fetal Medicine team [at Hospital 2] should have been consulted semi-urgently so that they could have been involved in establishing an ongoing plan of management

[12] Commissioner's note: Dr F's letter dated May 2004, written following his first assessment of Ms B, makes reference to details of the assessment performed by the cardiology registrar on 13 November 2003 which he set out in his letter to Dr E.

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for [Ms B], in what was now a very high risk pregnancy. A multi disciplinary discussion, involving the Maternal Fetal Medicine team, the cardiac surgeons and the cardiologists and perhaps other professional groups (e.g. social worker) would also have been desirable at this time.

Had a referral been received by the maternal Fetal Medicine Service at this time (21 weeks) termination of pregnancy might have been discussed and also consideration given to valve replacement at that stage in pregnancy (before the fetus was viable). A further option (the one that occurred in this case) was to continue with medical management in the hope that the pregnancy could continue until fetal viability had been achieved. Had a range of options been discussed with [Ms B] and her family at 21 weeks they could have participated in decision making about what they considered was the optimum plan, after having had an opportunity to consider the risks and benefits of the available options.

An appropriate standard of care was not provided at 21 weeks (because of communication and systems issues) and I would consider this resulted in a 'moderate departure'.

2. **Were the antenatal obstetric services provided by [DHB1] and [DHB2] appropriate, adequate and timely?**

[District Health Board 2]

[Dr F], obstetrician, saw [Ms B] on 3 occasions in the first half of her pregnancy. These visits were timely and adequate. Most of the emphasis in these visits revolved around obstetric issues such as prenatal screening. [Dr F] did examine [Ms B's] cardiovascular system on 2 occasions [in May and July]. On the assessment [in] July [Dr F] commented that [Ms B] was 'somewhat short of breath'. He also noted that she had not yet had her cardiac review but that this was scheduled in early August (10 days' time). This recognition of the possible shortness of breath could have been an opportunity to try to expedite the cardiology review.

One of the issues that might have contributed to the adverse outcome in this case was that there were 3 caregivers involved in providing different aspects of maternity care in early pregnancy, the GP [Dr E], the midwife [Ms G] and the obstetrician [Dr F]. It seems that no-one took responsibility for ensuring that a timely cardiology review occurred — this should have been in the first trimester.

An appropriate standard of care did not result in view of the fact that an early cardiological review did not occur. Given the fact that [Ms B] had been reviewed by cardiology 5 months before her pregnancy and had moderate aortic stenosis at this time I would say that this is a 'mild departure'.

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[DHB2]
After [Ms B] saw [Dr D] at 21 weeks' gestation a letter was sent to [Dr F] Obstetrician [at Hospital 1] and copied to [Dr I] Maternal Fetal Medicine Specialist [at Hospital 2]. In that letter [Dr D] outlined that he considered that [Ms B] had a high risk pregnancy and that consultation with [Dr I] should occur. It is suggested that [Dr F] should initiate this consultation with [Dr I] (p39). I believe that a telephone call from [Dr D] at that consultation to [Dr F] and then to [Dr I] might have clarified responsibilities and have resulted in earlier transfer to the Maternal Fetal Medicine service [at Hospital 2].

In spite of this letter from [Dr D], it does not seem that [Ms B] had a consultation with the Maternal Fetal Medicine Team until she was admitted to the antenatal ward [when she was 25 weeks pregnant]. This was not timely. Ideally she should have been reviewed approximately one month earlier, as outlined above, when the severe aortic stenosis was first diagnosed at 21 weeks by [Dr D].

I cannot see any documentation in the obstetric records at [DHB2] that options other than expectant management were discussed with [Ms B] after her admission to the antenatal ward at 25 weeks.

In complex cases such as [Ms B's] it is helpful if all senior members of the multidisciplinary team know about the case and the plan for management.

I would have liked to have seen a plan documented in [Ms B's] notes as to what were considered the indications for urgent review and also a list of multidisciplinary team members to call to discuss a plan if [Ms B] were to deteriorate acutely. Had a plan of management in a range of possible scenarios been discussed and documented, in advance, this might have resulted in more expeditious surgery when [Ms B] deteriorated.

As a result of the above issues, an appropriate standard of care did not result. I would assess these issues as 'moderate departure'.

3. Monitoring on the antenatal ward
During her admission to the antenatal ward [Ms B] seems to have been carefully monitored and her observations are well documented in the clinical record by the midwifery staff.

She was regularly reviewed by the obstetric staff and was visited on a regular basis by the cardiology team. Her pulse, temperature, respiration rate, weight and oxygen saturation are recorded on a regular basis as well as her general sense of well being. The type and pattern of observations performed in the antenatal ward are unlikely to have been different had she been cared for on a cardiology or medical ward.

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The only aspect of care that caused me concern on the antenatal ward was when [Ms B] obviously deteriorated overnight on [Friday/Saturday]. Help should have been requested from medical staff more urgently (see comments below in 7).

I would consider this a 'mild departure' as the patient had requested to be left alone.

4. Care and observations in delivery unit on [Saturday]

At this stage, on [Saturday morning], when [Ms B] was critically unwell and hypoxic her safety should have been the first consideration. I believe she should have been monitored in an intensive care unit by intensive care staff while she was prepared for theatre as quickly as possible. Obstetric and midwifery staff can attend in such a setting to ensure that fetal safety is optimised but this should not be at the expense of maternal safety.

During the approximately 4 hours [Ms B] spent in the delivery suite, maternal observations are recorded on the observation record approximately every half hour. I cannot tell from the clinical records whether any continuous monitoring was performed to assess the maternal condition.

The fetal heart rate is documented in the clinical records on 3 occasions. At 1000 hrs there is a cardiotocograph which is brief but probably within normal limits for 29 weeks. At 1230 and 1315 the fetal heart rate is recorded in the notes. A continuous recording of the fetal heart would have been ideal during this 4 hour time period but from [Dr K's] comments after [Ms B's] death it seems that this was not possible as a lot of procedures were being carried out on [Ms B] at this time. There is no record as to whether the baby was noted to be moving during the morning.

There is no entry into the notes by medical staff between [Dr K's] entry at 0830 and cardiothoracic review at 1115 and it is unclear from the notes who was with [Ms B] during this time. I presume a midwife was in constant attendance but it is not possible to tell from the notes how frequently medical staff were in attendance. The overall documentation of discussions, who was present, views on optimum plan of management etc are suboptimal.

Given that this was an emergency situation with a lot of things going on at the same time I would consider this a 'moderate departure'.

5. Was the surgical care by the obstetric team adequate, appropriate and timely?

It seems that [Dr K], the obstetric consultant who knew [Ms B] well, recognised her critical situation when he reviewed her at 0830 on [Saturday]. He recommended that Caesarean section be performed as soon as possible after review by the cardiologist and anaesthetist.

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There are no further entries in the notes by medical specialists until 1115 when [Ms B] was reviewed by the cardiothoracic surgeon and cardiologist. It seems from the comments in the Serious Event Review that the specialists involved in her care spent considerable time discussing whether or not [Ms B] needed surgery at that time (p183).

Had the Caesarean section been carried out soon after 0830 when the decision was made then it would have been timely and it is likely that the baby would have been delivered alive. Unfortunately Caesarean section was not carried out until 6 hours later. Maternal blood pressure could not be recorded for approximately the first 30 minutes after intubation. Such an insult might be expected to result in fetal death and it would have been ideal to decide whether the baby was still alive before proceeding to Caesarean. Given the emergency situation this would have been very difficult and could have led to further delays.

Given the very critical maternal state (no BP recordable) I wonder whether consideration should have been given to proceeding straight to valve replacement so as not to further delay maternal treatment.

6. Serious Event review

Many of the issues I have raised in my comments above and in section 7 (see below) have also been addressed in the Serious Event review.

a) **Better MFM access for women with complex conditions pre and in early pregnancy**

The MFM specialists were to liaise with out of town specialists re early referrals to the service. A completion date is not entered so it is not clear if this has been completed. I would strongly endorse this as being a very good suggestion that had it been in place when [Ms B] became pregnant could have resulted in different management and outcome.

Follow up needs to occur to confirm that these processes are now clear.

b) **MFM team develops a process to facilitate multidisciplinary team meetings**

This has been completed. Again if this process is now in place communication and planning will be much improved in future complex cases.

c) **Documentation and Care Plans at MFM ward rounds**

A new template for a multidisciplinary care plan has been developed where an up to date plan of management can be documented in the clinical record. This will also simplify management and help to ensure that appropriate staff are called in timely fashion in future complex cases.

d) **Cardiology Clinic scheduling**

Changes have been made to ensure that pregnant women are reviewed urgently. However there still appears to be a problem with delays in

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echocardiograms which are essential to confirm the severity of a valvular lesion, in a timely fashion early in pregnancy. I would recommend that there is a facility available to perform urgent echocardiograms in pregnant women especially those coming for a consultation from out of town.

It is good that a mechanism has been developed by the Cardiology service to transfer care for complex patients when a cardiologist is on leave.

7. Comment on any aspect of care you feel was below the required standard

a) The registrar[13] who diagnosed worsening left ventricular failure on [Friday afternoon] should have communicated this to the specialist cardiologist and obstetrician who ideally should also have reviewed [Ms B] at this time. The registrar documented in the notes that she would discuss [Ms B] with [Dr D] but it is not clear from the notes if that discussion occurred.[14]

b) When [Ms B] became acutely unwell overnight she should have had a medical review. This did not occur until 4 hours after the midwife first documented her concern. [Ms B] initially expressed that she did not want to see anyone but this should have been over ruled given how sick she was. Advice could have been requested from a senior member of the nursing/midwifery team, for example a duty manager, so that the clinical midwife could have been supported to deal with this difficult situation. It appears from what is documented in the notes that extra support from midwifery colleagues was not requested.

c) When the obstetric registrar was phoned at 0230 on [Saturday] s/he did not attend in person after the first phone call. This may relate to the information given to her/him such that s/he was not unduly alarmed or other factors. It is not possible for me to determine this from the notes. The obstetric registrar attended when requested after the second phone call at 0615 and then also very appropriately called the medical registrar.

d) The documentation of discussions and events on [Saturday morning], which occurred over several hours, is unclear from the clinical record and much of this information was gleaned from what was written in the Serious Event Review. Systems need to be developed to improve documentation in any future complex emergency cases.

e) I believe that delivery suite was not an appropriate setting to monitor a woman who was this unwell. In situations such as this maternal safety is paramount and

[13] Commissioner's note: Following release of the final report, advice was received that on the afternoon of 1 October the medical registrar would not have been involved in Ms B's care, and that at this time it would have been the cardiology registrar.

[14] Commissioner's note: Dr D advised ACC that he was contacted by [Dr L] on Friday. He stated that "our initial strategy was to increase the dose of diuretic in expectation that [Ms B] would respond to this".

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the mother should be cared for in the environment which is safest for her. Midwifery and obstetric personnel can provide appropriate input in another setting if that is in the best interests of the mother.

8. Other Comments
Few New Zealand women experience cardiac disease of this severity in pregnancy. [Hospital 3] has the [most] experience in managing women with valvular heart disease in pregnancy and usually has one or two pregnant women each year who are discussed in multidisciplinary meetings where consideration is given to the advisability of performing valve replacement in pregnancy.

If [Hospital 2] has future complex cardiac cases in pregnant women consideration should be given to whether they should also be discussed at the [Hospital 3] multidisciplinary cardiac surgical meeting. This review could be arranged by the [Hospital 3] Maternal Fetal Medicine team if required.

In summary: As detailed in the clinical notes, the correspondence and the Serious Event Review Final Report, there was a whole cascade of events which began early in pregnancy and contributed to the tragic outcome in this very complex case. In my opinion there is no single individual or specific act or omission that was responsible for this adverse event.

Suboptimal communication between [DHB2] and between specialist groups at [DHB2] been identified as key areas that needed change. Most of those changes have already been implemented as a result of the Serious Event Review."

Cardiology review
The following expert advice was obtained from Dr Ian Crozier, cardiologist:

"I have been asked to provide an opinion to the Commissioner on Case Number 05/13401 and I have read and agreed the Commissioner's guideline for independent advisers.

My name is Ian George Crozier, MBChB 1978, MD, FRACP, FACC. I practise as a General Cardiologist and see pregnant patients with cardiac disease, though this is a small part of my practice. However most pregnant patients with cardiac disease are managed by cardiologists who are general cardiologists rather than cardiologists who specialise in maternal medicine in New Zealand.

I have been asked to assess the appropriateness and adequacy of the care and treatment provided by [DHB2] to [Ms B] [over a period of six months in] 2004.

I was provided with written documentation including case notes, investigation results, correspondence and the serious event findings and recommendations, reportable event number 76545, 52609 from [DHB2].

In the first instance I will briefly summarise the sequence of events as I see them.

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Case Summary

[Ms B] was born on the 30 May 1967. She had congenital aortic stenosis and because of a syncopal episode came forward to aortic valve replacement in 1996. This valve was a Carpenter Edwards tissue valve which at 21 mm was a smaller than normal valve size. She underwent a normal pregnancy in approximately 1999 without cardiac complications. She became pregnant again in [2004]. She saw her general practitioner [Dr E] [at 6 weeks of pregnancy] who referred her at this stage to [Dr F], Obstetrician and Gynaecologist at [Hospital 1] and referred her for cardiac assessment at [Hospital 2]. This letter for cardiac assessment was triaged [in] May 2004 by [Dr H] who did not see the patient but organised for her to be seen by her usual Cardiologist, [Dr D] at [Hospital 2] and for her to have a further echocardiogram to be scheduled within the next two months.

[Dr D] saw her [when she was 21 weeks pregnant]. At this stage it was clear that she had developed severe recurrent aortic stenosis and was symptomatic with dyspnoea. He clearly assessed that this was a high risk pregnancy and recommended close monitoring and management in a high risk obstetric clinic setting. He sent his report to [Dr F] (Obstetrician and Gynaecologist, [Hospital 1]), [Ms G] (Midwife, [Hospital 1]) and [Dr I] (Consultant Obstetrician, High Risk Antenatal [Hospital 2]) and as I understand [he] attempted to contact one of the local obstetricians by telephone. At this assessment the following comment was made:

> '[Ms B] was quite tearful with the news of the fact that her valvular problems had worsened over time and in particular expressed the wish that she could have considered a termination, although this certainly does not seem a possibility at this point in her pregnancy.'

[Ms B] was reviewed by [Dr F] [in] August 2004 who noted some shortness of breath, but felt she was stable. He proposed contacting the high risk team [at Hospital 2] after the next cardiac assessment. No mention of termination of pregnancy is made in his letter.

[Dr D] next saw [Ms B] [in] September 2004. At this stage she had clear symptoms of heart failure with orthopnoea and paroxysmal nocturnal dyspnoea with also some chest tightness. Chest X-ray confirmed heart failure and she was admitted acutely to the antenatal ward and commenced on heart failure treatment. He also discussed [Ms B's] case with [Dr J] [at Hospital 3].

Over the next few days her condition gradually stabilised and the heart failure appeared to be under control.

[Dr D] visited her on a regular basis on the Obstetric Ward and noted that after a few days her heart failure appeared to come under control. Doctors involved included [Dr D] (cardiologist), [Dr K] and [Dr I] (obstetricians), [Dr O] (anaesthetist) and [Dr C] (cardiac surgeon). Plans were made for an elective

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caesarean section and aortic valve replacement at approximately thirty weeks of pregnancy.

However during her hospital stay she had persisting dyspnoea on minimal exertion, paroxysmal nocturnal dyspnoea and a resting tachycardia of 90–100 beats per minute, suggesting she had little cardiac reserve, and possibly residual heart failure.

On [Friday], she developed increasing shortness of breath and by [Saturday] was severely unwell with overt heart failure. The records indicate that she had severe heart failure with marked respiratory distress and marked tachycardia up to 140 bpm, severe dyspnoea, metabolic acidosis, hyperthermia and hypotension. She proceeded to urgent surgery, the total time between her initial marked deterioration and surgery was 9 hours. At caesarean section the foetus was stillborn. She then proceeded directly to aortic valve replacement. Following replacement of the valve and weaning of cardiac pulmonary resuscitation she deteriorated again and bypass was resumed. A clot was found in the right atrium and evacuated but it was not possible to wean her off bypass and she was declared dead [at that time].

Specific Questions

1. **Should a termination of pregnancy have been discussed? If so at what time and by what kind of health practitioner?**

This was clearly a high risk pregnancy as was established by [Dr D's] assessment at 21 weeks' pregnancy and communicated to the patient and the other carers. The quoted maternal mortality in patients with severe aortic stenosis and heart failure of 5–15% in the [Hospital 2] review is in my opinion a reasonable estimate.

Therefore termination of pregnancy was an option to be considered, bearing in mind the patient's wishes.

Also termination of pregnancy and then elective cardiac surgery would have been in my opinion the lowest risk option for [Ms B].

The only mention of termination of pregnancy in the clinical record that I can find is in [Dr D's] letter [dated] August 2004.

> '*[Ms B] was quite tearful with the news of the fact that her valvular problems had worsened over time and in particular expressed the wish that she could have considered a termination, although this certainly does not seem a possibility at this point in her pregnancy.'*

The records do not indicate that termination of pregnancy was offered or discussed at any other time.

Normally this option would be considered by the multidisciplinary team, and then discussed with [Ms B] by one or more of this team.

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In my opinion termination of pregnancy would certainly be an option that should have been discussed with the patient in view of the high risk associated with continuing with the pregnancy.

It should be noted that in New Zealand, termination of pregnancy is legally allowable at any gestation, to save life or to prevent serious permanent injury to the patient's physical or mental health.

2. **Were the cardiology services provided by [DHB2] appropriate, adequate and timely?**

The Cardiac assessments by [Dr D] and his team were appropriate and provided an accurate assessment of the severity of [Ms B's] cardiac status and appropriate medical therapy.

However the delay of 15 weeks from referral until first cardiac review is longer than the Ministry of Health guidelines. (Ministry of Health guideline for first assessment, Cardiology;[15] Cardiac disease in pregnancy, recommended priority urgent, recommended assessment time 1 week. This is a guideline that would not be achievable in any cardiac unit in New Zealand, but is an indication that these patients need to be seen with priority.)

Also following [Dr D's] assessment at 21 weeks, and notification of other carers by post and attempted communication by phone, there was no combined discussion or formulation of a group management plan until after her acute admission at 25 weeks' pregnancy. If [Ms B] had received a cardiac assessment and then multidisciplinary assessment in a more timely fashion and certainly by 12–15 weeks of pregnancy, this would have greatly facilitated her management.

This would have allowed for more timely consideration of all the options to present to [Ms B].

These included:

- Termination of pregnancy with subsequent elective cardiac surgery, which would have been in my opinion the lowest risk option for [Ms B]. However this option would still have a surgical risk with the surgical mortality for elective repeat valve replacement being approximately 3–5%.
- Urgent cardiac surgery during pregnancy, which would have placed the foetus at considerable risk.
- Continuation of the pregnancy with careful monitoring of mother and foetus till the foetus was viable, which gave the foetus the best chance of survival, but was almost certainly the highest risk option for [Ms B].

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[15] See below, p40–41.

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3. Please confirm whether the antenatal ward provided adequate monitoring of [Ms B's] condition?

This appears to be adequate.

It is normal practice to monitor such patients on an antenatal ward, with care provided by a multidisciplinary team. The notes indicate that [Ms B] received regular and frequent cardiac review by [Dr D] and his team.

4. On [Saturday], were the care and observations provided on the delivery suite appropriate and adequate to [Ms B's] needs?

This appears to be adequate.

[Ms B] clearly deteriorated markedly overnight and was severely unwell on the [Saturday] morning.

She was reviewed by the obstetric registrar and shortly thereafter by the medical registrar who correctly diagnosed that she was in heart failure.

Following some improvement there was some debate about the best course of action, but following a further deterioration emergency [surgery] was performed (based on the account in the [DHB2] review).

The total time from initial deterioration to surgery was approximately 12 hours, however the time taken for initial assessment, assessment of response to medical treatment, multidisciplinary assessment and discussion, preparation for surgery, and further stabilisation of [Ms B] readily explain the time from initial deterioration to commencement of surgery.

5. Was the surgical care provided by the cardiac team adequate, appropriate and timely?

The cardiac surgery appears to have been conducted in an appropriate fashion.

On [Saturday], [Ms B] was extremely unwell with uncontrolled heart failure, metabolic acidosis, hypoxaemia and an unexplained fever. Emergency cardiac surgery was the only option that gave a chance of survival.

However this option carried a high risk of mortality of approximately 50% under these circumstances.

6. Please comment on the 'Reportable Event (Serious) Review' and whether you consider there are any issues which have not been effectively and frankly reviewed?

I believe the report provides a reasonable assessment of the medical issues.

Whilst it outlines the options for managing this case, including termination of pregnancy, I can find no evidence in the clinical notes provided that these options were fully discussed with the patient.

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It also concludes that there were delays in assessment, and implies that communication between specialities was less than ideal.

7. Please comment on any aspect of care you feel was below the required standard.

I cannot criticise the individual medical care provided by the cardiologist, the cardiac surgeon, and the obstetric team.

However the clinical records give no indication that termination of pregnancy was considered or discussed with the patient apart from with [Dr D] comment [in] August 2004.

Also the delay to first cardiac assessment, and lack of early multidisciplinary consultation following this, and prior to the acute admission are unsatisfactory.

These issues do not reflect on the individual carers, but do reflect on the institution and resources provided to services involved."

Responses to provisional opinion

General practitioner Dr E

Dr E stated:

"When I saw [Ms B] for the first time in her pregnancy it was I believe four days after she had seen the nurse for pregnancy confirmation. I saw her first [in] May 2004 when she was around six weeks pregnant.

[Ms B] was age 36 with a known cardiac history. The previous cardiology assessment had specifically addressed the issue of pregnancy and they were certainly pretty optimistic about a good outcome. Clearly her care would not be a straightforward situation and on that day I referred her on to the Obstetric team via [Dr F] and back to the [Hospital 2] cardiology service. I can say she wanted to proceed with the pregnancy … her heart and age were discussed and whilst she had concerns [about] her heart, she wanted to continue, hence the referrals as above rather than to the pregnancy counseling service/referral for [termination].

…

I next saw [Ms B] [just over two weeks later]. When I asked her about the cardiology appointment (she had already seen [Dr F]) I was surprised that no notification had been sent to her. As is my standard operating process I asked her to contact [Hospital 2] to find out what was going on and to let me know if there was a problem. When I saw her again [in] June she confirmed that [Hospital 2] had been in contact.

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As I am sure you are aware over the past year there has been a general dumping of patients from waiting lists throughout the country. There are few weeks that go by that I do not have referrals just returned without my patient ever having been seen. In this context to have confirmation that someone is to be actually seen is a real positive.

I had already made the appropriate referral to both the specialists in cardiology and obstetrics at the very earliest opportunity, there was a verbal plan for confirming with [Hospital 2] and by June they had already contacted her regarding an appointment. I had talked with her about her condition at 13 weeks and explained what to do/look for. By this stage there was already obstetric input, midwifery input [was] about to start and [Hospital 2] had contacted her.

[Ms B] was well known to [Hospital 2] cardiology services, they had previously seen and assessed her in relationship to a possible pregnancy and were notified of her being pregnant at the earliest opportunity that I could possibly have done so. …

I am always keen to critically review my practice to achieve better outcomes but as I suspect with most GPs find the current situation of hospitals delaying or not seeing patients that we have appropriately referred, frustrating to say the least. I had followed their advice, made the appropriate referral at the earliest time and referred on her case to the obstetric team."

Midwife Ms G
Ms G stated:

"The referral to the cardiology team was made by [Ms B's] GP [in] May 2004. This referral was responded to by [Dr H] who advised [Ms B's] GP that he had booked her into [Dr D's] clinic. … These events happened prior to my becoming [Ms B's] LMC [in] July 2004. As an LMC it is my usual practice to refer directly to an Obstetrician who would then in turn refer to another specialist especially at tertiary level. I was aware that the cardiology referral had been responded to by [DHB2] and had no reason to think that it would not be triaged as urgent given [Ms B's] age, pregnancy and cardiac history.

…

Again, as an LMC, I do not usually refer women directly to the high risk team. These referrals are achieved through an initial referral by myself to an Obstetrician. I note in [Dr F's] correspondence [of] August 2004 he stated he will contact the high risk team [at Hospital 2] once he received an update from the Cardiologist in 2 weeks' time.

…

At the time of my first contact with [Ms B], she had already been seen and assessed by her GP and [Dr F]. I was aware that [Ms B] had been seen at the Cardiology

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> Clinic in November 2003 and at that time there was no reason why she could not have another baby. At the time of my first contact with [Ms B] she was well, knitting baby clothes and really excited about her pregnancy. You state in your provisional opinion that I have documented that [Ms B] wished that her cardiac surgery could proceed without consideration to her pregnancy. Ms B made these comments after her August appointment with the Cardiologist and was clearly distressed that her valvular disease had returned. At no time did she express that she wished that she was not pregnant or that she wanted the pregnancy terminated so that her surgery could proceed. Both at that time and now it is my view that it would have been entirely inappropriate for me to discuss termination with [Ms B]."

Obstetrician Dr F

Dr F stated:

> "[Ms B] was seen by the high risk obstetric team [at Hospital 2] and managed by them from the time she began to suffer symptoms related to her worsening cardiac status.[16] Any earlier, useful, input by that team would have been dependent on an up-to-date assessment by the cardiology service which was not available before [August] 2004. After her assessment at the cardiology clinic she was referred to the high risk obstetric clinic. I would also note that the ante-natal assessment of [Ms B's] cardiac status as reported by [Dr H] was of 'some mild obstruction' … and not 'moderate aortic stenosis' as stated by Lesley McCowan … in her determination that failure of earlier cardiology review was a 'mild departure'. From a clinical point of view there is a great difference between these two grades of stenosis.[17]
>
> [Ms B] carefully planned her pregnancy. She was aware of her cardiac condition and that pregnancy was more risky for her than for most other women. That she had given careful thought to her pregnancy is evidenced by her pre-pregnancy consultation with her general practitioner. When she came to me she was pregnant with a planned, wanted, pregnancy and she was aware that she was at increased risk due to her cardiac condition. It is not my usual practice to offer termination to women who come seeking ante-natal care with planned pregnancies, even if they are at high risk, provided they are aware of that high risk. In fact I feel that to do so would be a breach of the patient's right to make an informed choice. Of course the situation would be very different if the pregnancy or if the woman appeared unaware of her increased risk. It was and still is my opinion that [Ms B] had made an informed decision and it was my place to support [Ms B] in that decision not to

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[16] Commissioner's note: Ms B was seen and managed by the high risk obstetric team from early September, about one month after Dr D first saw her, and identified significant stenosis.

[17] Commissioner's note: Cardiologist Dr D wrote to Ms B's health care team following her assessment [in] August 2004 (see page 6). Dr D stated: "[Ms B] was last reviewed by our Team in October of last year at which stage she was haemodynamically stable and echocardiographically had a *moderate* degree of aortic valve obstruction as previously noted." (Emphasis added.)

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try and sway her to consider termination of pregnancy. [Ms B] at no time suggested to me that she was considering termination of pregnancy.

Maternity care as envisioned by Section 88 involves a multidisciplinary approach to the pregnant woman, her unborn/newborn child and her family. It also envisages that the care provided is coordinated by a lead maternity carer. In [Ms B's home town] the practice was, and I believe still is, that in virtually all instances the lead maternity carer would be a midwife. This does not in any way imply that care for high risk patients was in any way compromised. Far from it. There was open communication and rapport between all members of the maternity 'team' and I believe women received more comprehensive and continuous care with this system than in a system where a woman is 'handed over' from one level of care to the next."

Cardiologist Dr D
Dr D stated:

"When I reviewed [Ms B] at 21 weeks she was upset with the news of the valvular deterioration and brought up the suggestion of a termination. The report implies that I discussed this with her when this is not the case. She was alone and unsupported by any family members and I did not see it as my role to discuss this further. My comments in the letter were to her maternity carers (which I ensured was typed and delivered as a matter of urgency), and displayed my lack of awareness that termination was an option at this stage in her pregnancy but I did not communicate to [Ms B] that termination was out of the question at that time. The comment (p34 para 2) that 'It is not disputed that [Dr D] provided at best inadequate information about the possibility of termination' is inaccurate.

The Commissioner draws specific attention to my role with regards to ongoing clinical responsibility after my review of [Ms B] at 21 weeks gestation. [Ms B] had informed me that she had an obstetrician and midwife in [her home town]. I advised in the letter that a referral should be made to the MFM team. I was not sure as to whether our MFM team provided a service to [her region] and attempted to contact [Dr I], an MFM specialist here [at Hospital 2] (and not [Dr F]) by phone to discuss [Ms B's] case. He was unobtainable and I therefore ensured that the detailed letter be sent out with a copy to go to the MFM team here [at Hospital 2] also. In hindsight one could say that further attempts at phone contact would have helped ensure that the MFM team was involved earlier but I felt that my letter had advised that.

[Ms B's] case, given its complexities, meant that a number of different specialties were involved in her care. The internal report and this report comment on improving interdisciplinary communication and the importance of multidisciplinary involvement. It is important to note that [Ms B's] case was discussed at our

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combined cardiology/cardiothoracic meeting with involvement of the cardiac anaesthetists.[18] I then discussed directly those recommendations with the MFM team and with [Ms B] herself. Concern is also raised that discussion with the [Hospital 3] team would have been advisable. I draw your attention to the fact that I did contact (by phone) one of the [Hospital 3] MFM specialists at the time of [Ms B's] admission to ask for advice and then ensured that a copy of the letter from the multidisciplinary meeting be sent to her to inform her of our strategy. No concerns were raised, following the forwarding of the strategy.

It is difficult to counter the contention that [Ms B] was not adequately appraised of all the options in terms of her care. It is documented that [Ms B] was regularly reviewed and management plans discussed but the content of such discussions clearly has not been formalised in the medical notes and [Ms B] died over two and half years ago. I can recall that I felt that I had established a good rapport with [Ms B] and that I had been open and honest in addressing her concerns as well as making myself available to any questions that [Ms B's] family may have had during her time in hospital. The retrospective impression of being pushed down one particular path of treatment without consideration of [Ms B's] wishes is distressing to me as I had no sense of that being the case at the time. My colleagues and I were trying to support and care for [Ms B] and her baby over that time.

The review makes some very valid points and I do not wish to argue against the tone of the report but do feel that it is important from a personal perspective that the above points are clarified."

DHB2

The Clinical Leader, Obstetrics, Women's Health Service responded for DHB2. She stated:

"**1. Comments on the provisional report**

The report has been considered by the Senior Clinicians involved in [Ms B's] care and the relevant Clinical Directors and Group Managers responsible for following through on the recommendations from both the internal Serious Event Review and the provisional report.

We consider that the provisional report is extensive and reflects well the complexity of challenges that arose in the provision of expert, appropriate and well-coordinated clinical care for [Ms B] in her pregnancy.

[Ms B] presented a rare, complex clinical scenario with a high mortality rate. [Hospital 2] acknowledges that there were shortcomings in care coordination, interdisciplinary communication and documentation. However, [Hospital 2] notes

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[18] Commissioner's note: I have noted that Ms B's situation was discussed at multidisciplinary meetings, with the MFM team.

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that [Ms B's] death and the stillbirth of her second baby was unexpected and occurred despite committed endeavours, intensive efforts and at times dedication 'beyond the call of duty' by caring, capable, highly qualified and experienced clinicians.

[DHB2] wishes to make a number of specific comments on the provisional report, and sets these out below:

a) [Ms B's] wishes regarding termination

It is distressing to [DHB2] and its clinicians that [Ms B's] family may be left with the view that [Ms B's] wishes for pregnancy termination to advance the date of cardiac surgery (as expressed to her family and documented in the midwifery notes) were either ignored or declined.

[DHB2] wishes to assure [Ms B's] family that there was never any intention that [Ms B's] life be placed in jeopardy for the sake of her baby. [DHB2] materno-fetal medicine clinicians are familiar with and do not avoid recommending that a pregnancy be aborted when prolonging the gestation poses a clear clinical risk to the mother.

[Dr D] has specifically addressed this issue by way of a separate response [see above].

b) Informed consent

The cardiologist, obstetricians and cardiac surgeon involved with [Ms B's] care wish to indicate they were all fully confident that [Ms B] was both informed and consented to the care given.

[DHB2] accepts that there was inadequate documentation by Senior Medical Staff with respect to their discussions with [Ms B] and her family regarding options of care and the evaluation of risks involved, and that this has made it difficult to subsequently determine what was discussed.

c) Reasoning behind care provided

[DHB2] is concerned that the description of care as 'expectant', and an absence of the reasoning behind her medical management in the provisional report may misrepresent the deliberate manner in which the lead clinicians approached [Ms B's] inpatient care, with extensive consultation and wide literature searches guiding decision-making.

[DHB2] considers that it would be appropriate if the following information clarifying the reasoning behind the clinical care provided to [Ms B] be included in the report:

> 'The caesarean section delivery and planned readiness for combining the delivery with cardiac surgery was postponed after admission until 28+ weeks gestation. The planned date for major intervention of elective caesarean section

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at 28 weeks gestation with possible emergency cardiac surgery at the time of the caesarean was schedule to both minimise risk of cerebral palsy from iatrogenic prematurity and optimise 'continuity of care/r' with both [Ms B's] obstetrician and her cardiac surgeon available at the scheduled time.

The reasons for not providing [Ms B] with the choice of pregnancy termination at 25 weeks were threefold — namely:

- the initial dramatic and then apparently sustained improvement to low-dose diuretic;
- the report of a similar case [at Hospital 3] being 'eked' through successfully to a viable gestation (near 30 weeks) with small incremental increases of medication in the preceding weeks; and
- the near viability of the healthy fetus.

In the context, the cardiologist was of the firm opinion that any clinical deterioration in condition would be effectively managed with an increase in medication, with opportunity to review and consider expediting surgery.'

d) [Ms B's] mounting anxiety

[DHB2] agrees that dismissal of mounting anxiety in a physically unwell person as an emotional state can result in failure to recognise true physiological decompensation. However, [DHB2] considers that in [Ms B's] case, the intense anxiety on the day of her death was not disregarded. The very senior and experienced clinicians made every effort to carefully evaluate her complex clinical picture, and to avoid an error of judgement. An emergency echocardiogram was performed in the delivery suite as promptly as was feasible to obtain the necessary objective cardiological assessment.

2. Recommendations

a) Internal review

On receipt of the provisional report, the recommendations of the Serious Event Review have been revisited by the Clinical Directors, Group Managers and Quality Facilitators. We enclose a schedule setting out the recommendations and action taken with respect to these for your reference.[19] In some instances we have been unable to supply documented supporting evidence as this was not obtained at the time the recommendations were completed. The issue is being addressed as part of the current [DHB2] *Serious and sentinel event* policy review.

Hindsight, reflection and clinical review have taught the clinicians and clinical services involved in [Ms B's] case a great deal. The case was presented, with appropriate confidentiality, in a number of different forums, involving all of the

[19] Appendix 1.

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relevant clinical departments (that is, anaesthesia, cardiology-cardiothoracic and obstetrics).

Additional learnings not picked up in the Serious Event Report, but which arose as a result of further clinical discussions included:

- The ability of younger (otherwise fit) obstetric patients to conceal loss of physiological reserve prior to profound, difficult to reverse collapse. This requires a high level of clinical vigilance in monitoring of the 'high risk' patient with well defined thresholds for interventive response.
- The practical challenges of initiating multiple subspecialty response teams and also secure access to a very high tech specialist facility in an acute emergency. This requires fore-thought and low threshold for earlier intervention to avoid 'vulnerability' to delayed/untimely response with the result being suboptimal care in the context of unexpected deterioration.

[DHB2] confirms that the Cardiology and Materno-fetal Medicine Services have changed their processes internally to ensure that the prioritisation of pregnant women with cardiac conditions (even minor flow murmurs) is now automatically urgent, that these women are seen by the Specialist Cardiologist (not delegated to the registrar) and the re-evaluation of women considering pregnancy at both the cardiology service and pre-pregnancy counselling clinic by the materno-fetal medicine specialist is now mandatory.

The Materno-fetal Medicine Service also confirms that for the past two years a system has been introduced into the notes that highlights (and formalises) each update on the clinical care plan for on-call clinicians to follow out of hours. This indicates whom to consult with (and when) for the rare/complex clinical cases. This has been working effectively. Obstetric registrars are regularly advised and reminded by Consultant staff to involve their seniors early with complex cases.

b) The provisional report

i) Apology

[DHB2] extends its sympathy to the [family] and encloses a formal written apology to [them].

ii) Arrangement of formal links

Consultation between clinicians in the various tertiary centres is standard accepted and expected practice and frequently occurs. For materno-fetal medicine, consultation regarding rare fetal conditions is regularly discussed with colleagues with particular expertise in [another large centre]. For patients with rare medical disorders (particularly cardiac), consultation is usually directed to [Hospital 3] colleagues known to have had relevant experience. If necessary, case material can be sent to [Hospital 3] for discussion. Developments in technology in recent years

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have helped to facilitate timely internal and external communication between sub-specialists.

iii) Typing turnaround and access to clinical records
Issues with typing turnaround after clinical dictation and the need for easy access to clinical files kept within the locations of the various subspecialties continue to be actively addressed."

Ms A
Responding for [Ms B's] family, [Ms A] stated:

> "We took turns as individual family members to stay in [the city] to be with [Ms B] from admission onwards. We stated our concerns on a daily basis about how rapidly we could see her deteriorating. From walking in at admission to being wheelchair confined with oxygen, not being able to walk for any distance to needing a shower chair as [she] was unable to stand in the shower. We talked with [Ms B], nursing staff and cardiac staff about the concerns [Ms B] and we had about the specialist staff deciding to 'grow' the baby at the risk of [Ms B's] health and safety.
>
> [Ms B] often 'pleaded' with them that 'you aren't having me be a baby incubator and then letting me die'. They said she needed to be calmer about this and that things were proceeding well to plan.
>
> [Ms B] was fearful that her breathing was deteriorating rapidly, and in fact was afraid to sleep as she often felt that she could not catch her breath. This appeared to be disregarded as 'they know best'.
>
> We let them know that [Ms B] was our first priority, and harsh as it may seem [the] baby had to take his chances. [Ms B] has a son who was five at the time, and was very much her main concern. However, despite this, the teams involved seemed to have decided that they wanted to give the baby the best chance possible and take some weeks to do this. This created extreme risk for [Ms B] and was in fact fatal as we have seen.
>
> [Ms B's] wishes have been overridden by the medical staff and minimized.
>
> …
>
> The Coroner's report states her death was from natural causes and that she had bronchial pneumonia. As a family we find this hard to accept as she had been in hospital for a number of weeks, supposedly being managed by specialists, and died due to their inability to act in a prompt and informed way. How could she have pneumonia during that time, and this was not picked up?

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We were impressed by [Dr K] and the midwives who attended [Ms B]. [Dr C] did what he could with the emergency situation he was presented with but we have grave concerns about the cardiac team and [Dr L] in particular.

[Ms B] would have taken the option of termination if this had been offered in a timely manner at her first consultation with [Dr D], as her [older] son was her first priority. When time progressed she had faith in [Dr D's] reassurances that they would manage her care, and would deliver the baby early to allow surgery to take place promptly. Too much time had passed for termination to be a safe option then.

[Ms B] left behind a grieving five-year-old son, partner, mother and family."

Code of Health and Disability Services Consumers' Rights

The following Rights in the Code of Health and Disability Services Consumers' Rights are applicable to this complaint:

RIGHT 4
Right to Services of an Appropriate Standard

…

(4) Every consumer has the right to have services provided in a manner that minimises the potential harm to … that consumer.

(5) Every consumer has the right to co-operation among providers to ensure quality and continuity of services.

Other relevant standards

Maternity Services Notice issued pursuant to section 88 of the New Zealand Public Health and Disability Act 2000

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"APPENDIX 1

GUIDELINES FOR CONSULTATION WITH OBSTETRIC AND RELATED SPECIALIST MEDICAL SERVICES

…

5.0 LEVELS OF REFERRAL

These guidelines define three levels of referral and consequent action:

…

Level 3
The Lead Maternity Carer must recommend to the woman … that the responsibility for her care be transferred to a specialist given that her pregnancy, labour, birth or puerperium (or the baby) is or may be affected by the condition. The decision regarding ongoing clinical roles/responsibilities must involve a three way discussion between the specialist, the Lead Maternity Carer and the woman concerned. …"

The Appendix includes a table of conditions, descriptions, and associated level. The relevant section of the table states "cardiac valve disease" as the condition, "mitral/aortic stenosis" as the description, and "level 3" as the associated level.

Cardiology Referral Guidelines and Prioritisation Criteria (Health Funding Authority, 9 April 2000):

"National Access Criteria for First Assessment (ACA)

Category Definitions: These are recommended guidelines for … specialists prioritizing referrals from primary care.

1. Immediate — admission to hospital within 24 hours
2. Urgent — within 1 week
3. Semi-urgent — within 4 weeks
4. Routine — within 16 weeks"

These guidelines include a table ("NATIONAL REFERRAL GUIDELINES: CARDIOLOGY / CARDIAC SURGERY") which sets out the category, the diagnosis, and the referral guidelines. Under the referral guidelines for "cardiac disease in pregnancy", the table has an associated "diagnosis" of "potential to save life", and the referral is categorised as "Urgent".

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Opinion: Breach — DHB2

Overview
Ms B became pregnant in early 2004. During her pregnancy she was cared for by a number of providers, including her GP, midwives, obstetricians, anaesthetists, cardiologists, cardiothoracic surgeons and social workers. She received care from DHB1 and DHB2. Tragically, her son was stillborn and she died during emergency surgery.

The question for determination is whether Ms B received services of an appropriate standard from DHB2. Under Right 4(4) of the Code of Health and Disability Services Consumers' Rights (the Code), Ms B (who was the consumer in this case) was entitled to services provided in a manner that minimised potential harm to her. She was also entitled (under Right 4(5) of the Code) to cooperation among providers to ensure quality and continuity of services. In my view, because of poor external and internal communications, and inadequate care planning, DHB2 breached the Code.

Ms B's case highlights a number of systemic weaknesses, notably the failure of the various clinical teams to work together effectively. At several points during Ms B's pregnancy, the communication between providers was suboptimal and resulted in poor integration and coordination of her care. There was no documented plan for the management of her care in a range of possible scenarios. I endorse my obstetric advisor Dr McCowan's view that "there was a whole cascade of events which began early in pregnancy and contributed to the tragic outcome in this very complex case".

I acknowledge Ms B's family's view that her care was managed without due consideration of her needs and wishes. In my view, a number of providers also failed to communicate adequately with Ms B. There were three options available to Ms B when the significance of her cardiac condition became known. Ms B was not adequately informed about two options — termination of pregnancy or earlier surgery. The third, most risky option of expectant management, appears to be the only option that was meaningfully discussed, and that was the path that was ultimately taken.

As a result, Ms B was effectively deprived of the opportunity to make informed choices about her care. The tragedy of this case is compounded by the fact that, had Ms B been provided with full and timely information, she may have survived. It seems probable that had Ms B been fully informed about the options available to her, she would have chosen a termination. She would then have been a significantly less risky candidate for cardiac surgery.

The primary focus of my report is on the care provided by DHB2. A number of studies have shown that most errors are made by well-trained people who are trying to do their job, but are caught in a faulty system that set them up to make a mistake.[20] The

[20] L Leape, "Preventing Medical Accidents: Is 'systems analysis' the answer?" (2001) 27 *American Journal of Law and Medicine* 145.

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key weakness in this case was that DHB2 did not have an effective system to ensure a coordinated approach to her care.

While I have not singled out any individual providers for investigation, several individual providers must also accept responsibility for their contribution to the overall poor standard of care that Ms B received.

Cardiology review

The system for the review of patients at Hospital 2, Cardiology Department was demonstrably inadequate at the time of these events.

In a previous case, I discussed the respective responsibilities of providers for the management of patients waiting for specialist assessment in the public system, and noted that the DHB, the specialist and the GP need to work together to ensure quality and continuity of care for patients.[21] DHB2 had an obligation to have systems and procedures in place to ensure an effective and adequate system for managing its waiting lists.

DHB2 needed to ensure that Ms B was appropriately prioritised and seen in accordance with that priority, and that Ms B and those responsible for her care were adequately informed about when she would be seen and any delays.

Within a week of finding out Ms B was pregnant, her GP made a referral to the cardiology team at Hospital 2. As noted by my obstetric advisor, it was imperative to determine whether or not Ms B had a worsening of her vascular disease early in the pregnancy. However, she was not reviewed by a cardiologist until 15 weeks later.

Although Dr Crozier advised that no cardiac unit achieves the Ministry of Health guideline of a single week for such a review (from referral to assessment), a delay of 15 weeks for a woman with known aortic valve disease is clearly unacceptable. I note that the triage of the referral resulted in Ms B being given a non-urgent priority, which appears to be inappropriate given her history and her pregnant status.

I am pleased to note that the DHB has since reviewed its process and now all cardiology consults of pregnant women are scheduled as urgent. DHB2 stated:

> "Cardiology and Materno-fetal Medicine Services have changed their processes internally to ensure that the prioritisation of pregnant women with cardiac conditions (even minor flow murmurs) is now automatically urgent, that these women are seen by the Specialist Cardiologist (not delegated to the registrar) and the re-evaluation of women considering pregnancy at both the cardiology service and pre-pregnancy counselling clinic by the materno-fetal medicine specialist is now mandatory."

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[21] See case 04HDC13909 (6 April 2006).
http://www.hdc.org.nz/files/hdc/opinions/04hdc13909urologist,dhb.pdf.

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However, I intend to bring to the attention of the Ministry of Health Dr Crozier's view that no cardiology unit in New Zealand currently achieves the recommended guidelines for the length of time within which urgent referrals are able to be seen.

Responsibility to follow up specialist referrals
The providers responsible for Ms B's maternity care also had a duty to follow up the referral. I note that none of these providers was employed by DHB2. Accordingly, DHB2 cannot be held responsible for their acts or omissions. However, for the sake of completeness, I discuss their responsibilities below.

My independent advisor, Dr McCowan, notes that it seems no one took responsibility for ensuring that a timely cardiology review occurred — "it should have been in the first trimester". It seems that both Dr E and Dr F were concerned about the delay in Ms B being seen by a cardiologist. However, there is no evidence that attempts were made to expedite the referral. Dr McCowan advised that Dr F should have tried to expedite the review when he noted Ms B's shortness of breath.

In his response to the provisional opinion, Dr E stated that in May he was concerned that Ms B had not received a cardiology appointment, and asked her to contact Hospital 2 herself, and to let him know "if there was a problem" (although there is no record of this advice). I have noted Dr E's comments about waiting lists and the delays.

It is true the DHB had an obligation to have systems to ensure an effective system for managing its waiting lists. However, the referring providers also had a responsibility to take reasonable steps to expedite Ms B's cardiology review, given her history, pregnant status and increasing symptoms of breathlessness. In my view, the cardiology department should have been contacted for an earlier appointment given the time that had elapsed and the suspected deterioration in Ms B's condition. Clearly time was of the essence.[22] A simple telephone call or fax to the cardiology department would have been appropriate.

Communication between providers
The section 88 Maternity Services Notice provides guidelines for consultation with obstetric and related specialist medical services.[23] The guidelines provide that, where a woman has aortic stenosis, it is a level three referral. This means that the lead maternity carer (LMC) must recommend that the responsibility for a woman's care is transferred to a specialist given that her pregnancy is or may be affected by the condition.

The decision regarding ongoing clinical roles and responsibilities must involve a three-way discussion between the specialist, the LMC and the woman concerned. In most

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[22] Cf *Purdie v Harper* (District Court, Palmerston North, No. 129/04, 27 April 2004, Judge Beattie).

[23] Maternity Services Notice issued pursuant to section 88 of the New Zealand Public Health and Disability Act 2000 (effective from 1 July 2002; since updated).

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circumstances the specialist will assume ongoing responsibility with a level three referral. The role of the primary practitioner will be agreed between those involved.

Ms B's GP, Dr E, attended to her care early in her pregnancy. He appropriately referred her to an obstetrician and cardiologist for assessment. Her obstetrician, Dr F, encouraged her to find an LMC. In May she contacted Ms G, who became her LMC in July.

In August, Ms B was reviewed by cardiologist Dr D. He found that Ms B had severe aortic stenosis. His report, copied to Ms G, Dr E, Dr F, and a maternal fetal medicine specialist, described a worsening cardiac condition, and suggested referral to the high-risk team. Dr D endeavoured to contact Dr I by phone to discuss this. In a post-script to Dr F, Dr D suggested the possibility of involving Dr I in Ms B's management.

Dr D did not make further attempts to contact Dr I by telephone, and did not telephone Dr F. Dr McCowan noted that such contact "might have clarified responsibilities and have resulted in an earlier transfer to the Maternal Fetal Medicine Service [at Hospital 2]". Dr D accepts that "in hindsight … further attempts at phone contact would have helped ensure that the MFM team was involved earlier", but he felt that his letter covered the situation.

It is not clear whether Dr D's report resulted in any discussion regarding ongoing clinical roles and responsibilities. It appears that Ms G assumed that Dr D was going to formally refer Ms B to the high-risk team. Dr F thought that he would continue to manage Ms B and consult with the high-risk team after her next cardiac assessment. What is clear is that no one referred Ms B to the high-risk team prior to September.

Dr McCowan advised:

> "At this point [early August], when it was apparent that [Ms B's] status had changed significantly, the Maternal Fetal Medicine team [at Hospital 2] should have been consulted semi-urgently so that they could have been involved in establishing an ongoing plan of management for [Ms B], in what was now a very high risk pregnancy. A multi disciplinary discussion, involving the Maternal Fetal Medicine team, the cardiac surgeons and the cardiologists and perhaps other professional groups (e.g. social worker) would also have been desirable at this time."

In my view, Ms B should have been immediately referred to the DHB2 maternal fetal medicine team to assist with the management of her care. At the least, there should have been a multidisciplinary discussion. However, because of ineffective communication between providers involved in her care, no such referral ensued.

Referral to the maternal fetal medicine team occurred only after Ms B's admission when she was 25 weeks pregnant. At that stage, Dr D arranged her urgent admission to hospital.

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Communication of management options

The concept of informed consent is central to health care. It is a fundamental requirement that such consent be obtained prior to treatment. Informed consent is a process that is embodied in three essential elements under the Code — effective communication (Right 5), disclosure of adequate information (Right 6) and, subject to certain exceptions, a voluntary decision by a competent consumer (Right 7).

A DHB has a responsibility to ensure that systems and policies are in place that allow its employees to meet these obligations.[24] In my view, Ms B was not properly informed about her management options, including the termination of her pregnancy or earlier surgery. Expectant management was the only option that was fully discussed with Ms B.

Options at 21 weeks

At Ms B's first cardiac assessment at 21 weeks, it became apparent that she had significant aortic stenosis. She was understandably very upset to learn that her condition had worsened and raised the possibility of having a termination. Dr D stated in his letter that Ms B "expressed the wish that she could have considered a termination, *although this certainly does not seem a possibility at this point in her pregnancy*" (emphasis added). This report was copied to the various providers involved in Ms B's care and to Ms B. Ms B discussed her management with her midwife and her obstetrician. However, neither discussed the option of terminating the pregnancy with her.

The letter from Dr D clearly records Ms B's wish at that time: to consider terminating the pregnancy. Dr D's letter effectively put Ms B's maternity care providers (her midwife and obstetrician) on notice; it should have acted as a clear flag of her wish to explore the option of termination. The maternity care providers should have realised that Dr D's comment about the feasibility of this option did not accurately reflect the legal situation, which permits a termination of pregnancy after 20 weeks' gestation to save the woman's life, or to prevent serious permanent injury to her physical or mental health.[25] It is of concern that the contents of the letter did not trigger any further discussion by any of her maternity carers.

I note Dr McCowan's advice that it was not the cardiologist's responsibility to discuss the possibility of termination. She also stated:

> "Had a referral been received by the Maternal Fetal Medicine Service at [21 weeks] termination of pregnancy might have been discussed and also consideration given to valve replacement at that stage in pregnancy (before the fetus was viable). A further option (the one that occurred in this case) was to continue with medical management in the hope that the pregnancy could continue until fetal viability had

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[24] Case 05HDC07699 (31 August 2006).

[25] Crimes Act 1961, s 187A(3).

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been achieved. Had a range of options been discussed with Ms B and her family at 21 weeks they could have participated in decision making about what they considered was the optimum plan, after having had an opportunity to consider the risks and benefits of the available options."

Dr Crozier advised:

"If [Ms B] had received a cardiac assessment and then multidisciplinary assessment in a more timely fashion … this would have greatly facilitated her management.

This would have allowed for more timely consideration of all the options to present to [Ms B].

These included:

- Termination of pregnancy with subsequent elective cardiac surgery, which would have been in my opinion the lowest risk option for [Ms B]. However this option would still have a surgical risk with the surgical mortality for elective repeat valve replacement being approximately 3–5%.
- Urgent cardiac surgery during pregnancy, which would have placed the foetus at considerable risk.
- Continuation of the pregnancy with careful monitoring of mother and foetus till the foetus was viable, which gave the foetus the best chance if survival, but was almost certainly the highest risk option for [Ms B].

There were thus three clear options available to Ms B when the significance of her cardiac condition became known. Termination of pregnancy was the lowest risk option available for Ms B's health and well-being. This option was not properly explored with Ms B by any of her providers.

In justification for not discussing termination, Dr F stated:

"It is not my usual practice to offer termination to women who come seeking ante-natal care with planned pregnancies, even if they are at high risk, provided they are aware of that high risk. In fact I feel that to do so would be a breach of the patient's right to make an informed choice. Of course the situation would be very different if the pregnancy or if the woman appeared unaware of her increased risk. It was and still is my opinion that [Ms B] had made an informed decision and it was my place to support [Ms B] in that decision not to try and sway her to consider termination of pregnancy. [Ms B] at no time suggested to me that she was considering termination of pregnancy."

Ms G justified her silence on the issue of termination as follows:

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> "At the time of my first contact with [Ms B] she was well, knitting baby clothes and really excited about her pregnancy. You state in your provisional opinion that I have documented that [Ms B] wished that her cardiac surgery could proceed without consideration to her pregnancy. [Ms B] made these comments after her August appointment with the Cardiologist and was clearly distressed that her valvular disease had returned. At no time did she express that she wished that she was not pregnant or that she wanted the pregnancy terminated so that her surgery could proceed. Both at that time and now it is my view that it would have been entirely inappropriate for me to discuss termination with [Ms B]."

I am concerned that Dr F and Ms G believed it inappropriate to raise the option of terminating the pregnancy with Ms B — even after they had received notice of Ms B's declared interest in termination and the misinformation about it in the report of 3 August from Dr D.

While I accept that initially Ms B wished to proceed with her pregnancy, it is clear that her condition and wishes changed during the course of her pregnancy as her condition deteriorated. By early August, she was found to have significant stenosis and expressed an interest in terminating the pregnancy. This was communicated to the relevant providers. At that stage, it was a clear management option, and her providers had a duty to inform her of it. In delicately sidestepping an awkward issue and focussing only on a positive outcome, Dr F and Ms G left Ms B in the dark and deprived her of an opportunity to consider a termination.

Options from 25 weeks

Ms B's family consider that there was inadequate discussion of any option other than expectant management, and in relation to the risk of continuing the pregnancy. They believe that Ms B's wishes were overridden and minimized by the cardiac staff in particular. Despite being in hospital for a significant period of time, there is no record that any option other than expectant delivery was planned for or discussed with Ms B.

In its response to the provisional opinion, DHB2 stated that, although the clinical staff involved in Ms B's care "were all fully confident that [Ms B] was both informed and consented to the care given", it accepted that the documentation relating to these discussions regarding the options of care and the evaluation of risk involved was "inadequate".

In my view, there were inadequate systems and policies in place to facilitate effective communication — including documentation — in a situation where multidisciplinary involvement was essential. It does not appear that the risks and benefits of any other management options for Ms B were fully discussed. Again, Ms B appears to have been effectively deprived of the opportunity to make fully informed choices about her care.

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Management and coordination of care

Overall, the standard of care provided to Ms B following her admission to Hospital 2 was good. Ms B was closely monitored, observations were frequently taken and well recorded. She was regularly reviewed by the high-risk team and cardiology team. The cardiothoracic and anaesthetic teams were involved in her management plan.

However, while the plan in the event of "all going well" was well documented and coordinated, there was no clear plan in place to guide Ms B's care in the event of her deterioration. It was not clear what observations were needed to spot deterioration (other than her saturation levels), and who to call.

With such a complex scenario, involving cardiothoracic surgeons, anaesthetists, cardiologists, maternal fetal medicine specialists, obstetricians and midwives (supported by on-call teams who might not know Ms B), in my view it was vital for there to be a formal management plan for staff to refer to.

Dr McCowan advised:

> "In complex cases such as [Ms B's] it is helpful if all senior members of the multidisciplinary team know about the case and the plan for management.
>
> I would have liked to have seen a plan documented in [Ms B's] notes as to what were considered the indications for urgent review and also a list of multidisciplinary team members to call to discuss a plan if [Ms B] were to deteriorate acutely. Had a plan of management in a range of possible scenarios been discussed and documented, in advance, this might have resulted in more expeditious surgery when [Ms B] deteriorated."

It seems clear that, if there was any deterioration, a more urgent plan of action for delivery was to be adopted. However, the manner in which this would be carried out, and clinical staff who would be involved in the plan, was far from clear. This made Ms B vulnerable to unsafe care.

I am also concerned that although a number of specialists were involved in Ms B's care, it is unclear from the clinical record who, if anyone, was taking the lead. In my view, this person (whether obstetrician or cardiologist) would have been pivotal in ensuring that there was a recognised management plan.

I also note that on the morning of Ms B's operation, while she was receiving a great deal of attention from a number of clinicians, there was no entry in the medical notes from 8.30am until 11.15am. As noted by Dr McCowan, "The overall documentation of discussions, who was present, views on optimum plan of management etc, are suboptimal."

Patient distress

There are a number of references to Ms B's increasing anxiety, not only on that date, but also prior to that date. I note the finding in the reportable event review, "patient

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anxiety may in itself [be] a significant clinical sign of deterioration" (Appendix 1). I have noted the DHB's response that Ms B's anxiety on the day she died was not disregarded, and her family's contrary view. I remind DHB2 of the need for staff to be educated about this point.

Summary
The care Ms B received was adversely affected by poor communication between clinical teams throughout her pregnancy. This resulted in a lack of coordinated care for a patient with a rare and complex diagnosis that was life-threatening for mother and baby. Ms B's condition deteriorated on a Sunday morning, and some of the on-call medical staff responsible for critical clinical decisions had little or no knowledge of her care. They had to respond to a crisis situation without any documented management plan to refer to.

Tragically, both Ms B and her baby died. In my view, her care was jeopardised by the failure of the clinical teams to plan and coordinate her treatment. Corporate responsibility for this failure lies with DHB2. Accordingly, by its omissions DHB2 breached Rights 4(4) and 4(5) of the Code.

Other matters

Care on antenatal ward
Dr Crozier advised that the care and treatment Ms B received on the antenatal ward was appropriate. Dr McCowan stated that the monitoring that Ms B received on the antenatal ward was appropriate. However, Dr McCowan advised that when Ms B became unwell "she should have been monitored in an intensive care unit … while she was prepared for theatre".

Overall, I accept that it was appropriate for Ms B to be cared for on the antenatal ward until her deterioration.

Discussion with [Hospital 3] Maternal Fetal Medicine Department
At the time of Ms B's admission to the antenatal ward, the cardiologist contacted a maternal fetal medicine specialist at Hospital 3 and copied the management plan to her. However, there is no evidence of any other contact with specialists at Hospital 3. I note Dr McCowan's recommendation:

> "Few New Zealand women experience cardiac disease of this severity in pregnancy. [Hospital 3] has the [most] experience in managing women with valvular heart disease in pregnancy and usually has one or two pregnant women each year who are discussed in multidisciplinary meetings where consideration is given to the advisability of performing valve replacement in pregnancy.

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> If [Hospital 2] has future complex cardiac cases in pregnant women consideration should be given to whether they should also be discussed at the [Hospital 3] multidisciplinary cardiac surgical meeting. This review could be arranged by the [Hospital 3] Maternal Fetal Medicine team if required."

In a country the size of New Zealand, it is important that subspecialists consult their colleagues in other parts of the country, particularly those in centres with a greater caseload and experience. I am pleased to note that recent technological developments have facilitated improved discussions.

Timing of surgery
Dr McCowan advised that, had the Caesarean section been performed earlier, Ms B's baby may have been born alive. However, the decision about when to operate was complicated by the need to also perform aortic valve surgery on Ms B, and for this to occur, much organisation needed to take place. Dr Crozier advised:

> "The total time from initial deterioration to surgery was approximately 12 hours, however the time taken for initial assessment, assessment of response to medical treatment, multidisciplinary assessment and discussion, preparation for surgery, and further stabilisation of [Ms B], readily explain the time from initial deterioration to commencement of surgery."

I accept that, with the benefit of hindsight, different decisions may have been made in Ms B's treatment, including when to operate. However, the delay in surgery appears reasonable in light of the complex situation, the need for organisation of resources, and the need to consult broadly.

Follow-up actions

- A copy of this report will be sent to the Medical Council of New Zealand and the Midwifery Council of New Zealand.
- A copy of this report, with details identifying the parties removed,[26] will be sent to the Coroner, the Accident Compensation Corporation, the Abortion Supervisory Committee, the Ministry of Health, the Perinatal and Maternal Mortality Review Committee, the Royal Australasian College of Obstetricians and Gynaecologists, the Royal Australasian College of Surgeons, the New Zealand Cardiac Society, the Royal New Zealand College of General Practitioners, the New Zealand College of Midwives, the Federation of Women's Health Councils Aotearoa, and the

[26] I am concerned that identifying the hospitals involved in this case may inadvertently lead to identification of the individual consumer and individual providers, and in my view their privacy interests outweigh the public interest in revealing which hospitals were involved.

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Maternity Services Consumer Council, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

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Appendix 1

DHB2 Serious Event Review Report

General Findings and Recommendations from the Reportable Event (Serious) Review –

KEY RECOMMENDATIONS	ACTIONS / OUTCOMES	BY WHOM	BY WHEN	PROGRESSS / COMMENTS/ NEW ACTIONS	DATE COMPLETED
1. Maternal fetal medicine (MFM) service develop systems and guidelines to improve MFM access for women with complex medical disorders for pre-pregnancy planning and early pregnancy assessment	MFM specialists to liaise with out of region colleagues re: early referrals to the service	CL MFM	Ongoing	7/06/07: CL MFM update – There is a free-phone number through which referrals to MFM can be made 24/7. MFM specialists do liaise with out of region colleagues regarding referrals.	Completed & ongoing
				Further Action (CF) *8/06/07: Discuss current intranet and internet contact and referral information at QF meeting to determine if any further organisation-wide action needed(refer QF meeting minutes for further progress on this)*	Pending
				Further Action (WHS QF) *11/06/07: Discuss where MFM free-phone number is advertised/published at next WHS Management Team(MT) Meeting and decide if any further action needed (Refer WHS MT minutes for further progress on this)*	Pending
2. Communicate the key clinical lesions from this case Young patients with significant cardiovascular challenges can compensate strongly, and be deceptively 'stable', but then have sudden deterioration that may not be amendable to effective resuscitation. patient anxiety may in itself by a	Disseminate key clinical lessons from this case to each clinical area	CDs		2005: Discussed at clinical SMO meeting (WHS) 30/05/07: Confirmed by WHS GM that discussions took place	Completed

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significant clinical sign of deterioration it is preferable to intervene in an elective setting if this will avoid an emergency particularly when patient needs are very complex and specialised				10/10/05: This serious event has been discussed at the Anaesthetic Department Quality Assurance meeting	Completed
3. Communication MFM dedevelop a process to facilitate regular multi-disciplinary meetings where all relevant clinical specialties and cisciplines can actively contribute (face to face) to the management plan of complex maternity cases. (eg. cardiac anaesthesia neonatologists, midwifery, social worker)	Review of existing multidisciplinary meetings membership, timing and process within meetings to be undertaken Outcome: greater involvement with genetics, NICU identified as required.	CL MFM	Nov 05	30/05/07: Regular Fetal Monitoring meetings have been established to discuss fetal issues. They occur four times a month on varying days and times to allow good attendance. 31/05/07: The Monthly Perinatal Mortality Meetings are educational sessions open to staff from WHS and CHS. Provides opportunities to present feedback from Coroner and multidisciplinary team regarding specific Perinatal cases IPQAA)	Completed
An improvement in communication systems between the After-hours services and Morgue staff. After-hours service and Morgue to agree and implement a standard level of communication when Morgue technician called in: information to include details of the deceased, first and surname, ward, status of deceased ie coroner's case etc. Install phones in all bereavement rooms	After hours management to liaise with Mortuary staff and review communications required and review necessity for installation of phones in bereavement rooms	Manager PSCU	Feb 06	08/07/06: Update from TL Laboratory Services: Phones have been installed in bereavement suites. The routine practice is that for night viewing involving coronial cased, the mortuary staff will come in to set up. Viewing at night for non-coronial cases is arranged between the After hours management, the family, the orderlies and the ward.	Completed

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4. **Documentation**					
MFM multidisciplinary ward rounds should be documented to a higher standard– so that up to date information is available for all clinical staff on duty afterhours. Consideration should be given to introduction of a dictation process and whereby the write-up is entered by typists into the clinical notes before the end of the working day (as is already achieved on a daily basis with elective gynaecology surgery).	Documentation of MFM ward rounds and care plans to be discussed at SMO clinical meeting and agreement to be reached on how best to ensure information available out of hours to other practitioners	CD – initial discussion	Nov 05	30/05/07: Documentation addressed through implementation in May 2006 of a yellow MFM Ward Round form (attached)	Completed
	Outcome: Discussion occurred and agreement to implement using a new template and the multidisciplinary maternity care plan	CL - Implement ation		30/05/07: Maternity care plan implemented late 2005 is due for two yearly review as part of standard controlled document review process.	Completed
	Dictation option not implemented due to typing delays			30/05/07: Dictation issue raised again at May 07 WHS Quality Forum. Currently clinic letters and patient reports are typed within 24 hours and there is no additional resource available for typing MFM ward round notes into the clinical notes.	Completed

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5. Anaesthetic services review pre-operative preparation routines for cardiothoracic / complex patients: promoting a more proactive approach where this is practicable.	We have a well established Obstetric Pre-anaesthesia Assessment Clinic – held every afternoon, it always has a Cardiac Anaesthetist as the consultant running the clinic. Works well in relation to seeing high risk and complex Obstetric cases We also run a Cardiac surgery pre-assessment clinic for truly elective patients. Pre-anaesthesia service depends upon Cardiothoracic Surgeons referring patients to the service			10/10/05: Update from CD Anaes This serious event was discussed at the Anaesthetic Department QA meeting. Despite pre-anaesthesia assessment at the high risk obstetric clinic and formulation and dissemination of a management plan, additional assessment by a cardiac anaesthetist at the cardiothoracic pre-anaesthesia assessment clinic did not occur. Such assessment may have contributed to avoiding the tragic outcome. The severity of the patient's cardiac problem was not appreciated – not flagged by Cardiac/Cardio-thoracic services as being very high risk. ***Outcome Actions (all specialist cardiac and obstetric anaesthetists)*** *Planned – if any pregnant patients with aortic stenosis are planned for c-section, the Anaesthetic Department will provide a cardiac anaesthetic workup as well as an obstetric workup pre-delivery* 10/10/05: CD Anaes has confirmed that actions taken by anaesthetic staff to ensure appropriate assessment.	Completed Nov 05

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	Discuss with Obstetric Anaesthetist re: if there is anything else we can implement	CD Anaes		6/06/07: Further consultation with Obstetric Anaesthetist who questions whether an assessment by the cardiothoracic anaesthetist would have contributed to avoiding outcome as the estimated mortality in these circumstances is 50%. Local discussions amongst anaesthetists had concluded that developing a referral protocol specifically for a patient who was planned for c-section and had aortic stenosis was too narrow in parameters to be practical, but that instead an action plan would be needed for a pregnant patient with any compromised cardiac condition. Patients can be referred to the Anaesthetic Clinic at the Women's Outpatients Department for assessment following which a case conference can be called if appropriate. This position is supported by the *"Position Statement on the Provision of Obstetric Anaesthesia and the Analgesia Services". Statement No. WPI 14*, issued as a multi-college document by RANSCOG/ANZCA/RACGP/ACRRM in March 2007, addressing related issues. (Copy attached).	Completed
6. **Work Environment/Scheduling**	Clerical staff process mapping project to be commenced week of 15 August 2005 which will include:	Cardiology DM, CL, Admin Coordinator & Cardiology OF			Sept 2005

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• Cardiology Clinics: Cardiology services review mechanism for booking of urgent appointments.	• Reviewing the mechanism for booking of urgent appointments			19/12/05: Process mapping project completed Sept 05) Limited scope for improvement in processes as already an efficient process, demand greater than resources. ***Outcome Action – proposal for service review (Cardiology CL)*** *External consultant has reviewed current Cardiac services and made recommendations in relation to future service planning* 7/06/07: Following the above work with the external consultant issues Cardiology identified issues and actions which are included in the *Cardiology Development Action Plan Immediate Actions* – July 06 (attached)	Sept 05
• Cardiology outpatient scheduling to ensure that specialists are not overbooked/overburdened and registrars are always adequately supervised.	• Reviewing clinical appointments to ensure that specialist are not overbooked (see below for update)			19/12/05: Review of waiting lists completed by SMOs and Clinical Leader Outcome – the majority of patients on waiting list all appropriate to be there. No reduction in wait list numbers. Cardiologists working to capacity and unable to reduce waiting lists ***Outcome Actions (BM MSS, CL Cardiology):*** 19/12/05: Business cases written for increased technical and nursing staff with echo and pacemaker experience, and increased RMO, to increase registrar clinics and thereby more diagnostics	Completed

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				22/05/07: Business Cases for additional 1.6FTE Cardiac Tech approved Jan 06. Subcontracted echos to private sector in interim to manage waiting list whilst recruiting. EP Physician resigned March 06. Locum cardiologist appointed to assist with managing general cardiology workload. Re-establishment of EP Service confirmed following outcome of regional cardiology review. Business case for one additional SMO completed as part of reestablishment of EP service 706/07: Verified that we are currently down 0.4 on Cardiac Tech FTE. The 0.4 Tech is on parental leave and returns July 07. SMO business case approved in principle Apr 07	
• Cardiology consultations of pregnant women to be scheduled as 'urgent'.	• Urgent classifications (pregnant women)			24/12/05: Cardiology consultations of pregnant women to be scheduled as 'urgent' – the department has amended its processes in relation to pregnant women. It is recorded on the sheet (copy attached) that is returned by the cardiologists to the clerks who then book further appointments and tests accordingly in the next 2-3 weeks.	Dec 05
• Encourage a culture whereby senior clinicians formally and effectively handover clinical responsibility to appropriate senior colleagues when they are on leave.	Leave management and handover mechanisms for consultants documented by CL			7/06/07: Update from CL Cardiology: Cardiologists confident in internal process. No formal documentation	Completed

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7. **Policies/Procedures/Guidelines** • RMO Generic and service Orientation programmes to include access to policies, Coroner's Policy (including death pack documentation and Coroner notification processes), Deceased Persons' Policy, Reportable event policy. • Review policy to ensure ability to contact the coroner after hours should be clear.	WHS RMO orientation programme reviewed and updated	(QF WHS)		30/05/07: WHS RMO Orientation programme and evaluation documentation is available via G: drive (shared drive) from 2003 onwards 31/05/07: RMO Unit Training Advisor to discuss recommendations at RMO Unit meeting 5/06/07. 7/06/07: RMO Orientation currently being reviewed with the recently appointed CD of Training and Research 6/06/07: CF has confirmed with QIU Policy Facilitator that this has been completed as part of current reviews of the *Coroner's* and *Death of an adult in hospital* (previously *Deceased Persons*) policies. These policies are to be presented to the Quality Improvement Group for authorisation on 20/06/07	Completed Pending Pending Pending

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8. Safety Mechanisms					
• Cardiology department develop a system/process to ensure timely reporting of all echocardiograms by qualified practitioners.	Business case being written which encompasses increasing Echo trained technical staff which will increase the use of all the available time slots for performing echos Document Cardiotech process for review of echos which includes prioritisation system based on guidelines from Cardiac society of Australia/New Zealand	Cardiology DM	31 Aug 05	19/12/05: Business Case with COO 1/02/06: Business Case approved 19/12/05: Unable to manage echo workload at this time. Strict prioritisation guidelines have been introduced by the department whereby referrals are only accepted from Cardiologists. Referrals from other serv ces have to be assessed and prioritised before being placed on waiting list. Sub-contract in place with private provider to reduce waiting times whiles recruiting additional staff. 7/06/07: Cardiac Tech vacancies have reduced with 0.4 Tech vacancy which will be filled when staff member returns from parental leave.	

Positions Key

BM = Business Manager
CD = Clinical Director
CF = Complaints Facilitator
CL = Clinical Leader
COO = Chief Operating Office
DM = Divisional Manager

EP = Electrophysiologist
GM = Group Manager
QF = Quality Facilitator
RMO = Registered Medical Officer
SMO = Senior Medical Officer
TL = Team Leader

Services Key

Anaes = Anaesthetics
CHS = Child Health Service
MFM = Maternal Fetal Medicine
MSS = Medical Surgical Services
NICU = Neontal Intensive Care Unit
PSCU = Patient Services Coordination Unit
QIU = Quality Improvement Unit
WHS = Women's Health Service

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