Midwife, Ms B

A Report by the

Health and Disability Commissioner

(Case 13HDC01430)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. Mrs A was pregnant with her first child, and engaged a self-employed community-based midwife, Ms B, as her Lead Maternity Carer (LMC).

2. In 2013, at 7.31am, when Mrs A was 40+4 weeks' gestation, she contacted Ms B by text message complaining of lower abdominal pressure for the previous three days. Ms B arranged to meet Mrs A at the delivery unit at the public hospital (the Hospital) to assess her. Following her assessment, Ms B did not consider Mrs A to be in labour, and sent her home to await the onset of labour.

3. The following day, at about 4pm, Mrs A began feeling contractions. She contacted Ms B, who met her at the delivery unit at 11.15pm. Upon assessment, Ms B noted that Mrs A was experiencing contractions at a rate of three every ten minutes and that, on vaginal examination, the cervical opening could not be reached. Ms B also noted that the fetal heart rate (FHR) was 160 beats per minute (bpm).

4. Ms B commenced a cardiotocograph (CTG) and documented that it was showing a baseline FHR of 165bpm but no other non-reassuring features.

5. At 12.05am, Ms B noted an "apparent" FHR deceleration down to 130bpm, which returned to a baseline of 155bpm within one minute.

6. At 12.15am, Ms B repeated the vaginal examination and found the cervix to be 2cm dilated.

7. At 12.45am, Mrs A was given 100mg of pethidine and 2.5mg of Droleptan.

8. At 12.50am, Ms B noted a prolonged deceleration down to 60bpm and, at 12.55am, she called the on-call locum obstetric consultant, Dr C, as she was no longer able to detect a fetal heartbeat. Dr C arrived at 1.15am.

9. Dr C carried out an assessment, which confirmed the absence of a fetal heartbeat. Dr C then made the decision to perform a Caesarean section, on the basis that a fetal heartbeat had been present within the previous 20 minutes.

10. A Caesarean section was performed at 1.55am. Baby A was born floppy and not breathing. Resuscitation was commenced but, sadly, Baby A was pronounced stillborn at 2.45am.

Decision

11. By failing to interpret the CTG trace correctly and, as a result, to contact the on-call obstetrician early enough, Ms B failed to provide Mrs A with services with reasonable care and skill and, accordingly, breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[1]

12. Adverse comment is also made about Dr C's decision to proceed with a Caesarean section in the circumstances.

[1] Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."

Complaint and investigation

13. The Commissioner received a complaint from Mrs A about the services provided to her by midwife Ms B. The following issue was identified for investigation:

The appropriateness of the care provided to Mrs A by Ms B in 2013.

14. An investigation was commenced on 27 March 2014.

15. The parties directly involved in the investigation were:

Mrs A	Consumer/complainant
Ms B	Provider/community-based midwife
The District Health Board	Provider
Dr C	Provider/obstetrician

16. Independent expert advice was obtained from midwife Mary Wood (**Appendix A**) and obstetrician and gynaecologist Dr Jenny Westgate (**Appendix B**).

Information gathered during investigation

Background

17. Mrs A, aged 34 years, was pregnant with her first child. Mrs A engaged a self-employed community-based midwife, Ms B, as her Lead Maternity Carer (LMC).

Ms B

18. Ms B has been a registered midwife for many years, and has worked as a self-employed community-based midwife since 2009.

Antenatal care

19. Mrs A first saw Ms B when she was 14+3 weeks' gestation.

20. Mrs A's pregnancy progressed normally, and Ms B saw her regularly throughout the antenatal period.

21. Two months later, Mrs A experienced some vaginal blood loss, so she contacted Ms B's back-up midwife. Mrs A was given a prophylactic anti-D intramuscular injection[2] and experienced no further bleeding during her pregnancy.

22. When Mrs A was 40+4 weeks' gestation, she contacted Ms B by text message at 7.31am complaining of lower abdominal pressure for the previous three days. Ms B arranged to meet Mrs A at the delivery unit at the Hospital for assessment.

[2] A routine prophylactic treatment for women whose blood group is Rh negative, following any antenatal bleeding, to prevent rhesus antibodies developing.

23. At 12.10pm, Mrs A met Ms B at the delivery unit. Ms B noted that the baby was in a cephalic position.[3] Ms B performed a vaginal examination, noting that the fetal head was at station –2,[4] with two-fifths of the head palpable abdominally. Mrs A's membranes were intact and the cervix 60–70% effaced.[5]

24. Ms B noted Mrs A's observations, including a blood pressure (BP) of 120/80mmHg and a pulse rate of 80bpm. The baby was noted to be "moving well". Cardiotocograph monitoring (CTG)[6] was commenced, and the FHR was recorded as 145bpm with variability[7] of 5–10bpm with accelerations[8] and no decelerations,[9] which Ms B considered to be reassuring overall. Ms B documented that Mrs A was experiencing one to two tightenings every ten minutes.

25. Following her assessment, Ms B did not consider that Mrs A was in labour, and sent her home to await the onset of labour.

26. In a statement to HDC, Ms B commented that lower abdominal pressure is consistent with the latter stages of pregnancy. Ms B advised that following her assessment she did "not consider that there was any clinical reason to admit Mrs A to the maternity unit for further observation".

27. The following day, at 6.19pm, Mrs A called Ms B advising that since 4pm she had been experiencing contractions that were currently two every ten minutes and 50 seconds in duration. There is no documentation about what was discussed at that stage.

28. At 9.19pm, Mrs A again contacted Ms B by telephone advising that the contractions were three and a half to four minutes apart and lasting up to 50 seconds. Ms B arranged to meet Mr and Mrs A at the delivery unit when they were ready.

29. At 10.24pm, Mrs A sent a text message to Ms B advising that she and her husband were on their way to the delivery unit.

11.15pm

30. Mrs A arrived at the delivery unit at the Hospital at 11.15pm. Ms B noted that on arrival Mrs A was experiencing contractions at a rate of three every ten minutes and lasting 60 seconds. Ms B documented that the FHR was 160bpm, measured using a hand-held Doppler.[10] Ms B advised HDC that this was at the higher end of normal.

[3] Head down.
[4] Fetal station describes the position of the baby's presenting part (usually the head) in relation to the ischial spines in the outlet of the pelvis. Station 0 means that the presenting part is in line with the ischial spines, –2 means that the presenting part is 2cm above the ischial spines.
[5] As the cervix prepares for delivery it dilates and shortens (effaces).
[6] Monitoring that continuously measures the FHR and the woman's contractions.
[7] Variability of the baseline FHR from one beat to the next. Normal variability is between 6–25bpm.
[8] Increase in the baseline FHR.
[9] Decrease in the baseline FHR.
[10] A hand-held ultrasound transducer used to measure the FHR.

31. Ms B then carried out a vaginal examination, noting that the fetus was at station –3 and in a vertex presentation.[11] The cervix was noted to be "moderately firm", and the cervical os[12] could not be located.

32. Ms B told HDC that many midwives in that situation would have monitored the FHR using a hand-held Doppler or Pinard[13] and asked the woman to return home to await the onset of labour, but Ms B stated:

> "I chose to monitor [Mrs A] via CTG as she was apparently experiencing strong contractions with no discernible change in the cervix from the examination the previous day, despite reporting contractions for some 5 hours before her arrival at the maternity unit. I was not reassured by the apparent lack of accelerations, so decided to leave it in progress although I did not consider [Mrs A] to be in established labour."

33. At 11.20pm, Ms B documented that Mrs A's BP was 130/80mmHg, her temperature was 36°C, and her pulse was 90bpm, and that the FHR baseline on the CTG was 165bpm.[14]

34. Ms B stated:

> "The initial fetal heart rate on admission was at the higher end of normal at 160 by Doppler then, subsequently 'abnormal' by CTG trace as defined by the guideline [2014 Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)Intrapartum Fetal Surveillance Guidelines][15] — in that the fetal heart rate was tachycardic at >160 (165). There were no other non-reassuring features present."

35. Ms B said that, with reference to the 2014 RANZCOG Intrapartum Fetal Surveillance Guidelines (the RANZCOG Guidelines), the FHR recording of 165bpm "warranted maintenance or continuation of CTG monitoring, which [she] carried out thereafter".

36. At 11.30pm, Ms B documented in the clinical records: "CTG continuous as baseline slightly elevated."

37. At 11.50pm, Ms B noted that there had been a loss of contact by the CTG transducer while she was out of the room and, as a result, the FHR could not be detected, but that Mrs A's husband had repositioned it and contact with the FHR had resumed. Ms B documented that the FHR baseline was now 160bpm.

[11] Vertex refers to the top of the head descending first, which is considered normal.
[12] Opening of the cervix.
[13] A trumpet-like stethoscope.
[14] A normal FHR is 110–160bpm.
[15] In her response, Ms B refers to the 2014 version of these guidelines. While this version was not current at the time of these events, I note that, in relation to those parts of the guidelines referred to by Ms B, there is no difference between the 2014 version and the 2006 version that was current at the time of these events.

Deceleration

38. At 12.05am, Ms B documented that there had been an "[a]pparent" FHR deceleration down to 130bpm but that it had returned to a baseline of 155bpm within one minute. In a statement to HDC, Ms B said:

> "There was one shallow deceleration shortly after midnight and thereafter the baseline then returned to normal range at 155[bpm]. There were no repeat decelerations."

39. Further to this, Ms B stated, with reference to the RANZCOG Guidelines: "My interpretation was that the [CTG] trace was abnormal, but there was reassuring variability. The trace was not sinusoidal and warranted continued observation …"[16]

Ongoing monitoring

40. At 12.15am, Ms B carried out a further vaginal examination and noted that the fetal presenting part was in a vertex position, and that the cervix was 2cm dilated and "remain[ed] moderately firm".

41. At 12.30am, Ms B documented that Mrs A was experiencing contractions at a rate of four in ten minutes, lasting up to 60 seconds.

42. At 12.45am, Mrs A was given 100mg pethidine[17] intramuscularly to help her to sleep, and 2.5mg Droleptan[18] to reduce the nausea often associated with pethidine. Ms B documented that the FHR was 150bpm.

Deceleration — 12.50am

43. At 12.50am, Ms B documented: "Apparent deceleration ↓60bpm."

44. At 12.55am, Ms B called the on-call obstetrician, Dr C,[19] requesting him to attend "re inability to detect F.H. Rate on CTG".

45. At 1am, Ms B documented that she made an unsuccessful attempt to insert an IV line. She then called the on-call obstetrics house officer[20] to assist in inserting the line. Ms B also called the Delivery Suite Coordinator "in view of absent fetal heart rate".

46. At 1.05am, the house officer was present and, at 1.10am, the Delivery Suite Coordinator was present.

47. At 1.15am, Dr C arrived.

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[16] A sinusoidal trace is defined in the 2006 and 2014 RANZCOG Guidelines as: "A regular oscillation of the baseline FHR resembling a sine wave. This smooth, undulating pattern is persistent, has a relatively fixed period of 2–5 cycles per minute and an amplitude of 5–15 bpm above and below the baseline. Baseline variability is absent and there are no accelerations."

[17] An analgesic.

[18] A sedative with an antiemetic effect (to reduce nausea).

[19] Dr C was a locum obstetric and gynecology consultant.

[20] Name not documented.

Assessment by Dr C

48. In a retrospective record documented at 2.45am, Dr C noted that upon arrival Mrs A's observations were stable. On abdominal palpation he noted that the uterus was firm and the fetus was in a cephalic position, and that no FHR was recorded on the CTG. Dr C then carried out a bedside ultrasound scan and confirmed that no FHR was present.

49. Dr C documented that he carried out a vaginal examination, noting that the cervix was thick and 2cm dilated with membranes present, and that the fetal head was positioned high.

Decision for a Caesarean section

50. Dr C noted that the FHR had been recorded as 150bpm at 12.45am. He documented:

> "Based on fetal heart being present in the last 20 minutes at the time of my examination — I decided on an urgent [Caesarean section] to have a chance for the survival of the baby."

51. In the incident review report carried out by the DHB, the review team noted:

> "The decision for caesarean section was based on a slim chance of resuscitating the baby and also influenced by the early stage of labour and high head with the prospect of a prolonged labour and possible need for later intervention. With the demonstration of no fetal cardiac activity and without instant delivery, the prospect of resuscitation was very low."

Caesarean section

52. An emergency Caesarean section was subsequently carried out. Baby A was delivered at 1.55am, floppy and not breathing.

53. Resuscitation was attempted, but at 2.45am, after 45–50 minutes of CPR, resuscitation attempts were discontinued. A heartbeat was not detected, and Baby A was pronounced stillborn.

Comment from Ms B

54. In a statement to HDC, Ms B said:

> "In evaluating the CTG for [Mrs A] I recognised the apparent lack of significant accelerations, although I was reassured that the variability was greater than 5 beats per minute. I was further reassured to note that there were no signification decelerations after [Mrs A] had been up to the toilet thereby changing position, which often results in an improvement in a CTG tracing."

Post mortem report

55. The post mortem found thick meconium, which had been present for at least a few hours. The internal organs indicated that there had been a decreased oxygen supply. Inflammation was observed in the umbilical cord vessels, suggesting a possible ascending infection. The umbilical cord was found to be wrapped loosely around

Baby A's neck. The report notes that this is a common occurrence, and "usually without complication. Problems may arise during descent if the cord becomes trapped between 2 firm surfaces." It was noted that the cord "matrix" was thin, which means that it was more vulnerable to compression. The report concludes: "This was a completely unexpected outcome for all those involved, and even after full investigation remains difficult to explain." In summary, the report states that "the significant pathologies were found in the umbilical cord — the other findings were secondary to antepartum asphyxia".

Root Cause Analysis (RCA)

56. The DHB's RCA report states:

> "On admission the CTG was abnormal (non-reassuring) but the abnormal features were mild and in the clinical context demanded careful fetal monitoring and assessment of the progress of labour, both of which were undertaken (continuous CTG and repeat cervical assessment). Early Specialist assessment would probably not have substantially changed the management at that point or the ultimate bad outcome. The sudden, profound bradycardia[21] was entirely unexpected in the circumstances."

57. The RCA also stated that Dr C was "[c]ritical that he was not called earlier given that the CTG was non-reassuring at 2350".

58. In relation to the decision to proceed with a Caesarean section, the RCA states that Dr C "[w]as aware that the outcome for the baby was very poor but on discussion with the patient's husband decided that urgent delivery offered the only possible hope for the baby".

59. Further to this, Dr C told HDC that this was a very stressful situation, where Mr and Mrs A "held out a very slim chance of baby's survival" and decided that Caesarean section was the only solution available. Dr C said that he made it very clear to Mr and Mrs A that "they may not have the outcome expected".

DHB policies and procedures

60. The DHB "CTG — Recording" policy in place at the time of these events stated:

> "All practitioners referring to CTGs should be competent in the recording methodology and basic interpretation.
>
> Be familiar with RANZCOG Clinical guidelines for intrapartum fetal surveillance.
>
> Consult with more experienced staff if there is uncertainty or cause for concern."

61. Appendix 3 of the policy — "Summary of interpretation of FHR patterns" — classifies a "non-reassuring" pattern as: "moderate tachycardia, normal variability, mild variable deceleration pattern, early deceleration pattern, reduced variability ≥ 45 minutes".

[21] Slow FHR.

62. A "suspicious" pattern is defined as "severe tachycardia, moderate tachycardia, reduced variability, moderate bradycardia, reduced variability, minimal variability, normal FHR, moderate variable deceleration pattern".

63. An "ominous" pattern is defined as: "severe tachycardia, reduced variability, prolonged deceleration, severe bradycardia, later decelerations, severe variable decelerations".

64. In relation to the DHB's procedures for managing a fetal bradycardia, the policy stated:

> "In the situation of a fetal bradycardia without any other factors i.e. cord prolapsed, significant APH [ante-partum haemorrhage], or footling breech, expectation of normal practice would be to ring the emergency bell to summon for core staff help, contact the on call obstetrician and request immediate attendance. This would be in accordance with code 5011 — fetal heart rate abnormalities (Guidelines for Consultation with Obstetric and Related Medical Services, MOH 2012)."

65. Furthermore, the DHB stated that whilst waiting for the obstetrician to arrive, expected practice would be maternal change of position, facial O_2, and the insertion of an IV line, and for bloods to be obtained in preparation for theatre.

66. The DHB stated in relation to the care provided by Ms B: "It is our opinion that all measures were carried out by [Ms B] …"

67. When asked to confirm what the expected management would be in a situation where the FHR could no longer be heard, the DHB confirmed that "the response to no fetal heart rate would be to contact the obstetrician immediately".

Ongoing support

68. In her complaint, Mrs A said that following the death of Baby A she did not want any more input from Ms B, but that after she was discharged the only follow-up she received was from Ms B.

69. Ms B told HDC that she visited Mrs A a number of times while Mrs A was still in hospital. Ms B said that she offered to withdraw herself from Mrs A's care, but that Mrs and Mr A both agreed for Ms B to continue to provide ongoing support to them. There is nothing documented regarding Mrs and Mr A being unhappy with the ongoing input from Ms B.

70. Mrs A was visited by a hospital social worker and provided with information about ongoing support.

71. Mrs A was discharged from hospital the following day.

72. Ms B visited Mrs and Mr A at home following Mrs A's discharge from hospital, and provided them with information about a stillbirth support group.

73. Ms B told HDC that Mrs A and Mr A never expressed concern about her ongoing involvement in Mrs A's care.

RANZCOG Intrapartum Fetal Surveillance Guidelines

74. The RANZCOG *Intrapartum Fetal Surveillance, Clinical Guidelines — Second Edition* (2006),[22] which were relevant in 2013, state:

> "Management of fetal heart rate patterns considered suggestive of fetal compromise
>
> …
>
> Guideline 11
> In clinical situations where the FHR pattern is considered abnormal, immediate management includes:
>
> - Identification of any reversible cause of the abnormality and initiation of appropriate action …
> - Initiation or maintenance of continuous EFM.[23]
> - Consideration of further fetal evaluation or delivery if a significant abnormality persists. …
>
> Good Practice Note
> The normal CTG is associated with a low probability of fetal compromise and has the following features:
>
> - Baseline rate 110–160
> - Baseline variability of 5–25 bpm
> - Accelerations 15bpm for 15 seconds
> - No decelerations.
>
> All other CTGs are by this definition abnormal and require further evaluation taking into account the full clinical picture. …
>
> The following features are unlikely to be associated with significant fetal compromise when occurring in isolation:
>
> - Baseline rate 100–109
> - Absence of accelerations
> - Early decelerations
> - Variable decelerations without complicating features.
>
> The following features may be associated with significant fetal compromise and require further action …
>
> - Fetal tachycardia
> - Reduced baseline variability
> - Complicated variable decelerations

[22] The content of this version is very similar to the 2014 version (referred to by Ms B in her response to HDC).
[23] Electronic fetal monitoring.

- Late decelerations
- Prolonged decelerations.

The following features are very likely to be associated with significant fetal compromise and require immediate management, which may include urgent delivery:

- Prolonged bradycardia (≤100 bpm for ≥5 minutes)
- Absent baseline variability
- Sinusoidal pattern
- Complicated variable decelerations with reduced baseline variability
- Late decelerations with reduced variability.

…"

Response to provisional opinion

Ms B

75. Ms B did not wish to make any further comment in response to the provisional opinion.

Dr C

76. Dr C advised that he "welcomes the comments by Dr Westgate and will incorporate the suggestions into his future practice".

Opinion: Ms B

Initial assessment — No breach

77. Mrs A contacted Ms B complaining of abdominal pressure for the previous three days. Ms B appropriately arranged to meet Mrs A at the delivery unit to assess her.

78. Following Ms B's assessment she concluded that Mrs A was not in established labour, and that there was no clinical reason to admit her to hospital, and sent her home.

79. I accept the advice of my independent midwifery advisor, Mary Wood, that Ms B's assessment findings at that time indicated that Mrs A was not in established labour, and that the CTG trace at that time was "normal and demonstrated an apparently healthy baby". Ms Wood advised that Ms B carried out a thorough and comprehensive midwifery assessment, and that it was normal practice for Mrs A to be sent home to establish into labour at that time. Accordingly, I am satisfied that Ms B's decision to send Mrs A home to await the onset of labour was appropriate in the circumstances.

CTG interpretation — Breach

80. The following day, Mrs A began feeling contractions. Mrs A contacted Ms B, who met Mr and Mrs A at the delivery unit at 11.15pm. At that time Ms B noted that Mrs A was experiencing contractions at a rate of three every ten minutes. Ms B recorded that the FHR was 160bpm using a hand-held Doppler.

81. Because the FHR was "at the higher end of normal", Ms B made the decision to commence a CTG, which was started at 11.20pm. According to Ms Wood, that was appropriate. However, I have concerns about Ms B's subsequent interpretation of the CTG trace.

82. Ms B told HDC that her interpretation of the CTG trace immediately following its commencement was that the baseline FHR was "abnormal" in that the FHR was tachycardic at 165, but that "[t]here were no other non-reassuring features present".

83. At 12.05am, Ms B noted one "shallow deceleration" that returned to a normal baseline of 155bpm. Ms B told HDC that her interpretation of the CTG trace with reference to the 2014 RANZCOG Guidelines was that "the trace was abnormal, but there was reassuring variability. The trace was not sinusoidal and warranted continued observation until the bradycardia … [at 12.50am]."

84. In contrast, according to Ms Wood, the CTG trace from 11.40pm was suggestive of a sinusoidal pattern that is associated with "severe fetal compromise". Ms Wood explained, with reference to the 2006 RANZCOG Guidelines, that a sinusoidal trace is when "there is a regular oscillation of the baseline FHR resembling a sine wave". The 2006 RANZCOG Guidelines further state: "This smooth, undulating pattern is persistent, has a relatively fixed period of 2–5 cycles per minute and an amplitude of 5–15bpm above and below the baseline. Baseline variability is absent and there are no accelerations."

85. Ms B disagrees with Ms Wood's interpretation of the CTG, arguing that, in accordance with the 2014 RANZCOG Guidelines,[24] for the trace to be classified as sinusoidal, there must be an absence of variability. Ms B considered that there was a reassuring variability of more than 5bpm present throughout the trace.

86. The DHB's RCA report states: "[At 11.50pm] CTG non-reassuring: Mild baseline tachycardia with shallow late variable decelerations. Variability normal."

87. In Ms Wood's view, Mrs A's CTG trace demonstrated a variability that was less than 5bpm throughout the trace. Ms Wood also considers that there was a lack of accelerations, shallow decelerations, and a persistent high baseline. She explained that she reached her view that the trace was suggestive of a sinusoidal pattern because of the "regularity and uniformity of the oscillations, and the fact that they persist throughout the entire 80 minutes of the CTG …". Ms Wood accepts that it may not be interpreted as a true sinusoidal trace, but she considers that it had sinusoidal features and was non-reassuring. Ms Wood stated: "[T]his [Ms A's] CTG pattern is more suggestive of a sinusoidal pattern than a normal variable trace."

[24] The definition of a sinusoidal trace in both the 2006 and 2014 guidelines is the same.

88. In Ms Wood's view, Ms B should have consulted an obstetrician no later than 12am. I note that the RCA also comments that Dr C was critical that he was not called earlier "given that the CTG was non-reassuring at 11.50pm".

Conclusion

89. Ms B had a responsibility to provide care of an appropriate standard. Standard seven of the New Zealand Midwifery Council's *Standards of Midwifery Practice* provides that "[t]he midwife identifies deviations from the normal, and … consults and refers as appropriate".

90. A midwife is also required to identify factors in the woman or her baby during labour and birth "which indicate the necessity for consultation with, or referral to, another midwife or a specialist medical practitioner".[25]

91. Furthermore, the DHB's "CTG — Recording" policy requires practitioners to "[b]e familiar with RANZCOG Clinical guidelines for intrapartum fetal surveillance". Those RANZCOG guidelines state that where the pattern is considered abnormal, immediate management includes identification of any reversible cause of the abnormality and initiation of appropriate action, initiation or maintenance of CTG, and consideration of further fetal evaluation or delivery if a significant abnormality persists.

92. There is no dispute that there were abnormal features on this CTG trace.

93. Ms B considered that the abnormal features warranted ongoing CTG monitoring, which she did. Similarly, this was the conclusion reached in the DHB RCA. However, in Ms Wood's opinion there were other concerning features on the trace that warranted additional steps being taken. In Ms Wood's opinion, the CTG trace was suggestive of a sinusoidal pattern and had a number of non-reassuring features, which warranted consultation with the on-call obstetrician no later than 12am. Those features were a lack of accelerations, shallow late decelerations, and a persistent high baseline. In reaching this conclusion, Ms Wood refers to the following definition of a pathological CTG: "A CTG is categorized as pathological if two or more of its features fall into a non-reassuring category or one or more abnormal categories" (Pairman et al, 2008; NICE Guidelines, 2001).

94. Ms Wood acknowledged that "CTG interpretation can be challenging and complex", and said that the pattern on this CTG trace was unusual and difficult to interpret. Nonetheless, Ms Wood considered that Ms B should have identified the other non-reassuring features of this trace.

95. I am also concerned about Ms B's decision to administer pethidine in these circumstances.

96. Overall, while I acknowledge that this is a difficult CTG to interpret, I accept Ms Wood's advice that Ms B failed to fully recognise the non-reassuring features of the CTG trace. As a result, Ms B failed to identify the possibility of fetal compromise and

[25] Competency 2.6 in the *Midwives Handbook for Practice* (2008), New Zealand College of Midwives.

did not contact the on-call obstetrician in a timely manner. I accept Ms Wood's view that Ms B's failure to interpret the CTG trace correctly from 11.40pm would be viewed as a moderate departure from expected standards.

97. Overall, I conclude that by interpreting the CTG trace incorrectly and, as a result, not contacting the on-call obstetrician in a timely manner, Ms B failed to provide Mrs A with services with reasonable care and skill and, accordingly, breached Right 4(1) of the Code.

Management of bradycardia — No breach

98. At 12.50am, Ms B documented: "Apparent deceleration ↓60bpm." Following this Ms B urgently called the on-call obstetrician and advised him that she could no longer find the FHR. Dr C attended at 1.15am.

99. Ms B's actions following the loss of the FHR at 12.55am were in accordance with the expected practice at the DHB. I note my expert's advice that the decision to perform a Caesarean section is an obstetric one, and it was appropriate for Ms B to contact the on-call obstetrician when the bradycardia was observed and the FHR was lost. It was the responsibility of the obstetrician to make a decision about the ongoing management at that point. I am therefore satisfied that Ms B's management once the fetal heart could no longer be detected was appropriate in the circumstances.

Opinion: Dr C — Adverse comment

100. Dr C, the on-call locum obstetrics consultant, was called by Ms B at 12.55am. Ms B advised Dr C that she could no longer find the FHR. Dr C attended at 1.15am.

101. Following his assessment, Dr C made the decision to proceed with a Caesarean section "to have a chance for the survival of the baby".

102. Dr C told HDC that while he was aware of the likely poor outcome, this was a very stressful situation where Mr and Mrs A "held out a very slim chance of baby's survival". In light of this, he decided that Caesarean section was the only solution available. Dr C said that he made it very clear to Mr and Mrs A that "they may not have the outcome expected".

103. I note the advice of my obstetrics advisor, Dr Jenny Westgate, that in the circumstances the appropriate action would have been for Dr C to "advise the parents of the sad demise of their daughter and explain that the passage of time since the FHR was last heard was now too great to allow successful resuscitation even if the baby could be delivered immediately, without any delay".

104. Dr Westgate acknowledged that this was a "terrible and immensely stressful scenario for the parents and staff alike". She also notes that Mr and Mrs A remain satisfied with the decision to proceed with a Caesarean section. However, Dr Westgate advised that "by the time [Dr C] had completed his bedside scan, the FHR had been absent for

30 minutes and the chance of successful resuscitation of the baby at that point in time was virtually nil". Dr Westgate considered that the addition of the further 20 to 30 minutes required to perform an urgent Caesarean section completely removed any possibility of resuscitation. In Dr Westgate's opinion, in light of these factors and the long-term effects associated with Caesarean section delivery, "the decision to deliver by emergency [Caesarean section] was not appropriate". I accept Dr Westgate's advice. I note that Dr C has reflected on these criticisms and advised that they will be taken into account in his future practice.

Recommendations

105. In accordance with the recommendations of my provisional opinion, Ms B has agreed to the following recommendations:

- Apologise to Mrs A for her breach of the Code. The apology should be provided to this Office for forwarding to Mrs A within three weeks of the date of this report.

- Undertake further training in relation to CTG interpretation. Ms B should provide confirmation of her attendance at, or enrolment in, a relevant workshop or training course within three months of the date of this report.

Follow-up actions

106. - A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be sent to the Midwifery Council of New Zealand, and it will be advised of Ms B's name.

- A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

- A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be sent to the New Zealand College of Midwives and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists.

Appendix A — Independent midwifery advice

The following expert advice was obtained from a midwife, Mary Wood:

"***[Ms B] and [the] District Health Board Ref: C13HDCO143O***

My name is Mary Wood. After completing a diploma in Comprehensive Nursing at Carrington Polytechnic (now Unitec) in 1989 I completed a diploma in midwifery at AUT in 1990. I then completed a Bachelor of Health Science Midwifery at AUT in 2001. 1 worked as a midwife in the delivery unit of North Shore Hospital from Jan 1991 until September 1991, after which I began working as an independent midwife on the North Shore in Auckland. I worked as a full time self employed midwife on the North Shore until 2013. In April 2013 I began working part time as an Associate Clinical Charge Midwife in the birthing suite of North Shore Hospital, where I am responsible for the management of the labour ward, co-ordinating, teaching and supporting staff and responding to emergency situations. Currently I combine a part time self employed caseload with my part time work at the hospital. As a self employed midwife, I work in a practice of (currently) 12 midwives, each of whom carry their own caseloads. I provide midwifery care for women throughout pregnancy, from positive pregnancy test through until six weeks after the birth of the baby, delivering either at home or North Shore hospital. I provide midwifery care for women in low, moderate and high risk pregnancies.

You have asked me to provide advice regarding the midwifery care provided to [Mrs A] by midwife [Ms B] and [the] District Health Board [in] 2013, which was prior to and during [Mrs A's] labour and birth of Baby A.

This was [Mrs A's] first pregnancy, her due date being [date]. The antenatal notes included in the documentation record that there were no significant risk factors present in her pregnancy prior to her admission in early labour.

[Mrs A's] complaint begins with her concern about the midwifery assessment done [when] she was 40 weeks 4 days and was experiencing pressure and pelvic discomfort. She was assessed by midwife [Ms B] at the hospital, and a CTG (cardiotocograph) was performed to assess fetal wellbeing. At this time all of her recordings were normal. The baby was in a head down position with the fetal head being 2/5 engaged into the pelvis.

A CTG trace records the rate and pattern of a baby's heart beat, as well as uterine activity and fetal movements. A baseline rate between 110 and 160 beats per minute is considered normal, together with a beat to beat variability of 5 to 25 beats per minute, and the presence of accelerations of the fetal heart rate when the baby moves, which is known as the reactivity of the baby. It is also used to detect any decelerations of the fetal heart. A deceleration is described as 'a transient slowing of the FHR below the baseline level of more that 15 BPM and lasting longer than 15 seconds' [RANZCOG IntelliLearn: Features of the CTG]. There are several classifications of decelerations of the FHR. Decelerations are also seen antenatally at times. A CTG with normal baseline, beat to beat variability, reactivity to fetal movements and with no decelerations of the fetal heart over a period of 20 to 30 minutes would be considered reassuring that the baby was in

good condition at that time. [Mrs A] expressed concern about the baby's heartbeat varying between 145 and 160 at this time and that the baby was moving frequently. In fact these are reassuring signs that the baby was well at that time. The CTG performed [at 40+4 weeks' gestation] was normal and demonstrated an apparently healthy baby at this time.

[Mrs A] expressed concern about the pelvic discomfort she was experiencing at that time, but all indications were that she was in the early (latent) phase of labour, (the time when her cervix is softening and thinning) and this discomfort was entirely normal. This was a thorough and comprehensive midwifery assessment and it was normal practice for her to be sent home to establish into labour at this time. Induction of labour involves considerable intervention as is not offered in my experience, in situations such as this. At Waitemata Health where I work, induction for maternal discomfort would not normally be considered or approved by an obstetrician.

[Mrs A] was admitted to the labour ward [at 2315]. At this time she was in early labour, having painful contractions every three minutes. The fetal heart was noted to be 160 beats per minute on admission. A vaginal examination was performed following admission and it was found that the presenting part (the baby's head) was still high and the cervix was closed. The blood pressure, temperature and maternal pulse were all normal. At 2320 a CTG was commenced, which was continued until [Mrs A] was transferred to Theatre at around 0130.

The CTG recording throughout this time demonstrates a baseline heart rate of 160 BPM, no accelerations of the fetal heart (non reactive) and the presence of shallow late decelerations. I do not agree with [the DHB's] description of the beat to beat variability of this CTG as being normal. I consider that particularly from 2340, the CTG recording was more suggestive of sinusoidal pattern, which is associated with severe fetal compromise. This pattern is not commonly seen and is sometimes referred to as 'sawtooth' in appearance. *'A trace may be said to be sinusoidal if there is a regular oscillation of the baseline FHR resembling a sine wave.'* Ranzcog IntelliLlearn Fetal Heart Monitoring.

Within a normal CTG tracing, it is not uncommon to see short periods of trace that could be interpreted as abnormal, especially as regards the beat to beat variability, and even episodes that appear to be sinusoidal in appearance. The difference is in the absence of other non reassuring signs such as decelerations, and the presence of other reassuring features, such as normal baseline and accelerations. In a CTG such as this, the section of apparently abnormal pattern would not continue longer than 20 minutes.

See appendix 1 for examples of normal beat to beat variability and sinusoidal pattern.

It is my opinion that the CTG in this case was non-reassuring for most of the 1 hour 20 mins, from the onset until the fetal heart bradycardia occurred at 0050. I consider the failure to recognize this as a serious departure from accepted practice. It would be particularly important in a setting where specialist back up is not on site during the night, that abnormalities in a fetal heart trace are identified early in order to have the necessary secondary care back up available.

Midwifery Standards of Practice: Standard 6

The midwife identifies deviations from the normal, and after discussion with the woman, consults and refers as appropriate.

Competency Two: 2.6 the midwife identifies factors in the woman/wahine or her baby/tamaiti during labour and birth which indicate the necessity for consultation with, or referral to another midwife or specialist medical practitioner.

In preparing this report I did consider seriously whether knowing the outcome of this case biased my opinion about the CTG. To this end I showed the first part of the CTG tracing, up until just prior to the loss of the fetal heart, to three midwifery colleagues. All three identified it as a non-reassuring trace, including the decelerations, the lack of accelerations, the high baseline and all three expressed concern that the pattern was sinusoidal.

Just prior to 0050 there was a sudden and profound bradycardia (slow heart rate) recorded on the CTG, with the fetal heart rate dropping to 60 BPM, from which it did not recover. There appears to be fetal heart rate recorded on the CTG until 0115. The maternal heart rate was noted to be 90 at 2320. There is a 2 to 3 minute recording of the maternal heart rate showing on the CTG at 0040, which also shows the rate to be around 80. The heart rate recorded on the CTG appears to be the terminal bradycardia of the baby rather than the maternal heart rate.

At 0055 an emergency call to the on call obstetrician was made as the midwife was unable to detect the fetal heart with a hand held doppler. An unsuccessful attempt to site an IV line was made, and a call was made to the coordinating midwife at this time. The House Surgeon on call was also summoned and several further attempts to site an IV line were made. According to the notations on the CTG the obstetrician was present at 0115 and proceeded to perform an ultrasound, which found no fetal cardiac activity at that time. An emergency caesarean section was decided on and the baby was delivered at 0155, with 1 minute apgars of 0, which did not change despite extensive attempts to resuscitate her. The stillbirth was called at 0240.

[Mrs A] complained that [Ms B] was unable to site the IV line. [Ms B] had one attempt to site the IV then deferred to the house surgeon, and there were then several unsuccessful attempts to site the IV. IV cannulation can be difficult sometimes, even for expert practitioners, and it is not uncommon for more than one attempt to be necessary. As a charge midwife I frequently am asked to site IV lines when a practitioner has had one or two unsuccessful attempts. It can be more difficult in a woman with a high BMI. [Mrs A's] BMI was 37, which may have contributed to the difficulty. The stress of the situation at that time may also have had a bearing on the difficulty in siting the IV. I would not consider this a departure from expected midwifery standards given the situation.

The administration of oxygen to a woman in a situation such as this is considered to be of no use, as giving oxygen to someone who is fully oxygenated will make no difference. *'Prolonged use of maternal facial oxygen therapy may be harmful to the baby and should be avoided. There is no research evidence evaluating the benefits or risks associated with the short-term use of maternal facial oxygen therapy in cases of suspected fetal compromise.'* (NICE Guidelines 2007)

It would appear from the notations on the CTG that a lot of time was spent on the IV attempts, giving oxygen to [Mrs A] and monitoring her oxygenation saturation levels. At the time the fetal heart dropped to 60 and then became undetectable this became an obstetric emergency and as such priority should have been immediate delivery of the baby. However in a setting where the obstetric specialist, anaesthetist, paediatrician and theatre staff have to be called in from home, delay would have been inevitable. The delay of more than an hour from the bradycardia occurring however, seems excessive. The documentation I reviewed includes a detailed timeline, which documents that the theatre team was not called until 0126, some 36 minutes after the onset of the bradycardia, whereas the obstetrician was present at 0115. I would question why the entire team wasn't called at the same time as the obstetrician, given the seriousness of the situation.

[Mrs A] also complained that [Ms B] very forcefully inserted a urinary catheter, which has caused her ongoing pain. Foley's urinary catheters are made from soft very pliable rubber. Trying to insert one into a woman's urethra with force would be counter productive as it would result in the catheter bending.

There was also concern expressed by [Mrs A] about the dynamics in the room after the bradycardia happened, and [Ms B's] level of skill in appropriately dealing with the emergency. I cannot comment on this as each give different descriptions of the events and there is no documentation included from other people present during this time.

Summary:

You have asked me to provide a midwifery opinion as to whether there are any concerns about the care provided by [Ms B] and [the] District Health Board in the care provided to [Mrs A] in [2013].

As I have discussed above, I do have concerns about the interpretation of the CTG tracing prior to the bradycardia and loss of the fetal heart. It is my opinion that the obstetrician should have been notified of the non-reassuring CTG and called in to review the CTG earlier, although I cannot comment on whether the outcome for the baby would have been different had she been delivered earlier, as there is no way of knowing how long she had been compromised. A sample of the cord blood taken at the delivery could have been helpful in determining whether this was an acute event or the result of a long term process. The CTG and the autopsy result would both suggest that the baby had been compromised for a considerable length of time. A cord blood sample was not taken at the time of the delivery as it was not requested by the obstetrician nor the paediatrician. It may have been impossible to obtain blood from the cord given the circumstances, but in my experience it is expected practice to collect cord blood samples for testing in situations such as this.

I do not know if the obstetrician would have made the decision to deliver the baby earlier had he been present. Normally if there is doubt about a baby's well being from an abnormal CTG a fetal blood sample is taken to test the baby's lactate level, which is an indication of the baby's condition at that time. This in turn can determine whether immediate delivery is required or further close monitoring is required. In this case [Mrs A] was not advanced enough in her labour for this to

have been done, so any decision made by the obstetrician about delivering the baby would have been on the CTG trace, the presence of meconium stained liquor had the membranes been ruptured and the progress of [Mrs A's] labour at that time.

I do not agree that the non-reassuring features of the CTG were mild as described in the [DHB's] review document, as there were no reassuring features present. 'A CTG is categorized as pathological if two or more of its features fall into a non-reassuring category or one or more abnormal categories' *(Pairman et al 2008 NICE Guidelines 2001*). In this case there were shallow late decelerations and a sinusoidal pattern present, both of which are abnormal.

References:

Gauge S. M. Henderson C. 2005 CTG Made Easy Third Edition Elsevier Churchill Livingstone Sydney

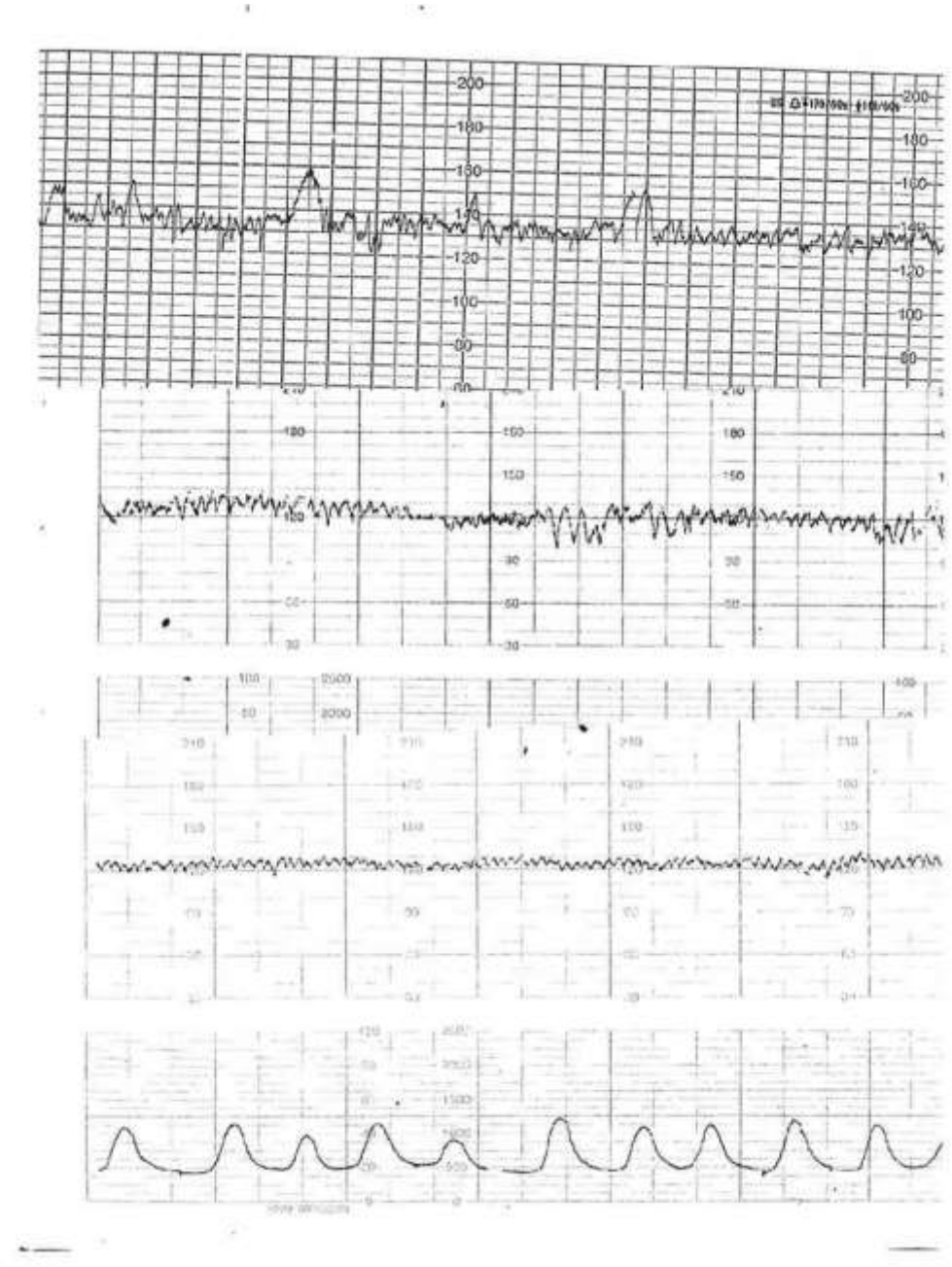
Intellilearn Electronic Fetal Monitoring (Based on RANZCOG Guidelines) http://test.response-onhine.com/moodle/myAdv/

Midwives Handbook for Practice NZ College of Midwives 2008

New Zealand College of Midwives Consensus Statement 2012
Assessment of fetal wellbeing during pregnancy

Pairman Sally, Tracy Sally, Thorogood Carol, Pincombe Jan 2010
Midwifery Preparation for Practice Second Ed.
Elsevier Australia

Appendix 1



The first CTG tracing shows a normal reassuring trace with normal beat to beat variability of 5 to 20 BPM, accelerations, baseline of 130.

The second and third tracings show sinusoidal fetal heart patterns.
(CTG Made Easy)"

Further advice

The following advice was obtained from Ms Wood following receipt of [Ms B's] response to Ms Wood's original advice:

"…

You have asked me if, having reviewed all the information collected to date I would amend my original advice, and to answer the following questions, including the reasons I base my opinion upon.

The documentation I have reviewed includes:

1. Statement from [Ms B] dated 16 December 2013
2. Statement from [Ms B] dated 29 April 2014, including statement from [a hospital midwife] dated 30 April 2014
3. Statement from [the DHB] dated 19 November 2013
4. Statement from [the DHB] dated 16 April 2014
5. Copy of complaint
6. Copy of midwifery notes, including copy of CTG trace
7. Copy of DHB clinical records.

Expert Advice Required:

If having reviewed all the information collected to date you consider your original advice has changed please re-issue your report adding to, or making, any relevant amendments, as appropriate. In addition, if not already answered please answer the following, giving reasons for your view:

1. [Ms B's] interpretation of the CTG trace after [Mrs A's] admission to the delivery unit at 11.15pm.

[Ms B's] interpretation of the CTG from 2324 is that other than the mild tachycardia, (high baseline heart rate) there were no other non-reassuring features present.

I stand by my original opinion that this CTG pattern is more suggestive of a sinusoidal pattern than a normal variable trace. It is my interpretation that the variability is less than 5 throughout, and this is revealed in the small spaces between the oscillations. Accurate variability would only have been revealed by using a fetal scalp electrode but this would not have been possible at this stage in [Mrs A's] labour.

What leads me to my overall impression that this trace is suggestive of a sinusoidal pattern, is the regularity and uniformity of the oscillations, and the fact that they persist throughout the entire 80 minutes of the CTG until the onset of the terminal bradycardia at around 0050. In a pseudo sinusoidal trace, the pattern would be transient and not on going, and would be preceded by and followed with normal CTG. In addition, there are no accelerations present during the entire 80 minutes of trace, there are shallow late decelerations present until 15 minutes prior to the bradycardia and there is a persistent mild baseline tachycardia.

[Ms B] has expressed concern that I consulted three senior midwives about the portion of CTG prior to the bradycardia, in the course of preparing my preliminary report.

To this end, I have consulted with [another] Expert Midwifery Advisor and asked for her opinion and interpretation of the CTG trace. She initially reviewed the CTG trace from the onset until just prior to the bradycardia. I did not discuss my impression of the CTG with her until after she had expressed her opinion.

[That advisor's] opinion is completely in keeping with my opinion. She was particularly concerned about the lack of accelerations, the shallow decelerations, the high baseline and she also expressed concern that this was overall suggestive to her of a sinusoidal pattern. She also expressed concern about the administration of intramuscular pethidine, given that she considered this a pathological CTG.

[Ms B] has referred to the [2014] RANZCOG Guidelines for Intrapartum Fetal Surveillance (Section 8) in her letter.

In clinical situations where the fetal heart rate pattern is considered abnormal, immediate management should include:

- *Identification of any reversible cause of the abnormality and initiation of appropriate action (e.g. maternal repositioning, correction of maternal hypotension, rehydration with intravenous fluid, cessation of oxytocin and/or tocolysis for excessive uterine activity) and initiation or maintenance of continuous CTG.*
- *Consideration of further fetal evaluation or delivery if a significant abnormality persists.*
- *Escalation of care if necessary to a more experienced practitioner.*

[Ms B] identified that the CTG baseline heart rate was abnormal and correctly continued the CTG. However, she did not attempt to reverse the abnormality with IV fluids, nor did she consult when the fetal tachycardia persisted. She did not recognize the lack of accelerations nor the presence of the decelerations as being significant.

2. Should the on-call obstetrician have been called earlier than 1255am? If so, please outline what indications there were for earlier consultation.

It is my opinion that the on-call obstetrician should have been consulted by 2400 at the latest. The indications for earlier consultation are those I have discussed above, the persistent tachycardia, lack of accelerations and presence of shallow decelerations. Although in general, decelerations are characterized by a drop in heart rate of at least 15 beats per minute, in a non-accelerative trace with reduced baseline variability, decelerations of less that 15 are considered significant.

3. [Ms B's] management of the bradycardia at 1250am, including [Ms B's] decision to call only the on-call obstetrician, rather than the entire emergency team.

As I discussed in my preliminary report, the unresolving severe bradycardia was an obstetric emergency, and as such it is my opinion that the emergency protocols (emergency response team) at the hospital should have been called into action.

[Ms B] has stated in her letter that at [the] Hospital, the 777 emergency call is used only for maternal collapse, and that for a fetal bradycardia it is expected that the midwife calls only the obstetrician, who in turn makes the decision about management of the emergency. [Ms B] is correct in her assertion that it is the decision of the obstetrician to proceed to caesarean in emergency situations, but there are a number of situations where calling *only* the obstetrician would lead to significant delay in providing appropriate emergency care, for example in a cord prolapse, placental abruption, or severe shoulder dystocia. In light of this policy it is my opinion that [Ms B] and the other staff present managed the emergency as well as possible.

4. Any other comment you wish to make.
I would amend my original finding of serious departure from accepted practice to moderate departure from accepted practice as regards the interpretation of the CTG in this situation. Although the outcome was serious, [Ms B] did provide continuous care in a difficult situation and responded appropriately to the emergency. CTG interpretation can be challenging and complex. Working in a larger unit as I do, there is always other staff available, including other senior midwives and obstetric registrars, to ask to review CTG traces that cause concern. In smaller units, especially if the consultant is not on site during the night, there is not always the back up immediately available for midwives to call on for advice or discussion when there are concerns.

Reference:
RANZCOG Intrapartum Fetal Surveillance Clinical Guidelines — [Second Edition 2006]"

Further advice from Ms Wood

Ms Wood was asked to comment on her interpretation of the CTG trace with regard to whether it was a sinusoidal trace and whether a reasonable midwife would have been able to identify this.

Ms Wood said that the CTG trace was difficult to interpret. She said that it is not a "true" sinusoidal trace but had sinusoidal features. Ms Wood felt that it was a tricky CTG trace but that when you looked at the big picture it was abnormal. In Ms Wood's view, the first things that [Ms B] should have tried were maternal repositioning and IV fluids and, if the CTG didn't improve, she should have consulted the obstetrician. Ms Wood considered that the trace was sufficiently concerning that calling the on-call obstetrician was warranted.

Ms Wood was asked to comment on the fact that at the time of these events the RANZCOG Guidelines were not endorsed by NZCOM. Ms Wood said that they may not have been endorsed, but that they were accepted standards, and would have been accepted standards in 2013.

Ms Wood was also asked to comment on the decision to give pethidine. Ms Wood said that, in her view, the issue is that the CTG was abnormal, and that an obstetrician should have been called. In these circumstances, pethidine should not have been given.

Appendix B — Independent obstetrics advice

The following expert advice was obtained from Honorary Associate Professor in Obstetrics and Gynaecology Dr Jenny Westgate:

"**Complaint: [Mrs A], Your Ref: 13HDC01430**

Thank you for asking me for an opinion on this case. I have read your letter of instruction and the five documents you sent me. You have asked me to provide advice on the actions of the obstetrician after he was called by the LMC midwife and advised that the fetal heart rate (FHR) could not be detected. You specifically requested a comment on whether it was appropriate to proceed to an emergency caesarean section (CS) following his assessment of [Mrs A].

The relevant time line is as follows:

[Date]

0050 sudden loss of the FHR

0055 Obstetrician called by LMC

0115 Obstetrician arrives, performs a bedside scan with a portable ultrasound machine and is unable to detect a fetal heart beating. Decision made to perform an emergency CS.

0126 Theatre team called for Code 1 emergency CS

0155 Baby delivered.

[Dr C], a locum obstetrician, indicated that he decided to proceed to an urgent CS as the FHR had been present 20 minutes before his arrival and he believed a CS offered the best chance for the baby to survive. He also advised the [DHB's] Investigation team that he discussed this with 'the husband' who agreed that urgent delivery was the only hope for the baby.

Opinion

First of all, I acknowledge that this was a terrible and immensely stressful scenario for the parents and staff alike. [Dr C] would not have been immune to the emotional stress of the situation and was clearly motivated by the desire to do everything possible to try to save the baby. It is worth noting that the parents are described as being 'satisfied' with the obstetric management and the choice of CS. This is understandable as it removes any doubts that there was anything additional that could have been done to save their daughter's life.

[Dr C's] actions on arrival were appropriate, a quick assessment of [Mrs A's] condition, palpation of her abdomen and a look at the CTG followed by performing the bed-side ultrasound scan. On occasion it can be difficult for the 'part-time' scanner to detect a fetal heart beat in a high pressure situation, particularly if the mother is large, the baby is posterior and/or the ultrasound machine is old or not working well. [Dr C] did not mention any technical difficulties in the notes or the subsequent interview with the DHB Investigation.

He seems to have been very certain that the FHR was absent upon completion of his bedside scan.

[Dr C] is likely to have completed the bedside scan by around 0120 or so. By this time the FHR had been absent for 30 minutes. [Dr C] should have been aware that it would take a further 20 to 30 minutes to effect delivery of the baby by CS as the theatre and anaesthetic staff had to be called in from home. There was, in reality, no chance of the baby being able to be resuscitated after that time-frame. As an obstetrician, [Dr C] will be aware of both the short and long-term risks of CS delivery which include complications that preclude or jeopardise further pregnancy.

In view of these facts, notwithstanding the high stress of the moment, the appropriate action would have been to advise the parents of the sad demise of their daughter and explain that the passage of time since the FHR was last heard was now too great to allow successful resuscitation even if the baby could be delivered immediately, without any delay. As there was no other indication that delivery by CS was or would be required subsequently, [Mrs A's] labour could have continued with the expectation of a vaginal delivery with the provision of the analgesia available locally in those circumstances and support from caregivers and other family members and friends.

In summary, by the time [Dr C] had completed his bedside scan, the FHR had been absent for 30 minutes and the chance of successful resuscitation of the baby at that point in time was virtually nil. The addition of a further 20 to 30 minutes required to perform an urgent CS completely removed any possibility of resuscitation. In view of this and the short and long-term risks associated with CS delivery, the decision to deliver by emergency CS was not appropriate."