

Hawke's Bay District Health Board

**A Report by the
Deputy Health and Disability Commissioner**

(Case 20HDC00513)

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Executive summary

1. This report concerns the care provided to a woman by a district health board during her pregnancy and birth. The case highlights the importance of all team members having situational awareness of an evolving picture of a baby in distress, and knowing when to halt the labour, and call in further assistance. The woman went into labour and was admitted to the hospital's primary care maternity unit the following morning, and then to the labour ward that evening. Overnight, the woman and baby were monitored by hospital midwives and an obstetric registrar.
2. Following an increased fetal heart rate, the woman underwent an emergency Caesarean section. Her baby was born in poor condition, not breathing, and required CPR. He had a seizure at six hours of age and was transferred to the neonatal intensive care unit (NICU) at another hospital. He was diagnosed with moderate neonatal encephalopathy, neonatal seizures, and a stroke.
3. The DHB conducted a formal review into the care provided, which determined that there were a number of points at which the care should or could have been escalated to the obstetric consultant and the birth expedited. The review found that the busyness of the labour ward at the time affected the care received.
4. Important learnings must be taken from this difficult case. Not only are the DHB review findings of significance, but the woman's response to the provisional decision suggests that health professionals' communication with her could have been better. She did not appreciate that her labour was not progressing as planned. Understandably, she was preoccupied by the labour process, and, as it progressed, her baby was becoming increasingly compromised and required urgent delivery. Substantive discussion about the delivery options available to her, including an assessment of the expected risks, should have been shared with her and her partner as part of the development of the woman's birth plan and throughout her pregnancy. The potential for this woman to require secondary intervention and a possible Caesarean section should have been discussed well ahead of the birthing event. As HDC's expert advisor identified, a patient with a high BMI will be more likely to labour less efficiently. In light of her high BMI, this woman should have been made aware of the risks she faced. The expert advisor also highlighted the problems of a dysfunctional or obstructed, and therefore prolonged, labour in a woman having her first baby, and he noted that these circumstances should be well recognised by obstetricians and midwives alike, and anticipated and planned for, because the birth can become an extremely complicated and risky procedure, with junior staff in an after-hours situation facing difficult anaesthesia and surgery.
5. While not suggesting that a normal delivery should not have been planned for, the Deputy Commissioner's view is that there should have been a discussion and an agreed strategy for managing the problems that developed as this woman's labour progressed.

6. The issues raised in this report are indicative of the impact that delayed access to theatres and a lack of senior clinician oversight after hours can have on patient safety. These issues are seen across complaints about regional obstetric units, and raise concerns about variation in care and geographical inequities in access to, and quality of, maternity services. Therefore, the Deputy Commissioner will send this report to the Ministry of Health and interim Health New Zealand to highlight these concerns.

Findings

7. The Deputy Commissioner found that the DHB did not provide the woman services with reasonable care and skill, in breach of Right 4(1) of the Code.
8. The Deputy Commissioner considered there to have been missed opportunities to review the appropriateness of continuing the woman's labour, and that the poor outcomes for the woman and her baby were not the result of failings by any individuals, but rather the combination of factors within the DHB's system that resulted in the Caesarean section being delayed.

Recommendations

9. The Deputy Commissioner recommended that the DHB provide a written apology to the woman for the issues identified in this report, and provide feedback on the results of its audit of partogram use and details of steps taken to remedy any shortfalls found in the audit.
10. The Deputy Commissioner also recommended that the DHB update its policy on fetal surveillance, and use this case as an anonymised case study for its current obstetrics department and midwifery staff, as well as for each new intake of obstetrics and gynaecology registrars. The Deputy Commissioner recommended that the case be used for educational purposes to highlight the importance of careful planning and management of labour that is failing to progress in a primiparous woman with a raised BMI.
11. The Deputy Commissioner will use this case to remind the Midwifery Council of the importance of discussion between a midwife and her client about the delivery options available to the woman. An assessment of expected risks should be discussed with the woman as part of the development of her birth plan, and over the course of her pregnancy, to ensure that she is well informed and in a position to make an informed choice. The potential for a pregnant woman to require secondary intervention and a possible Caesarean section should be discussed well ahead of the birthing event.

Complaint and investigation

12. The Health and Disability Commissioner (HDC) received a complaint from Mrs A about the services provided to her by the Hawke's Bay District Health Board (HBDHB) during her pregnancy and birth, and in relation to the timeliness of review of the events surrounding the birth. The following issue was identified for investigation:

- *Whether Hawke's Bay District Health Board provided Mrs A with an appropriate standard of care in 2019.*

13. This report is the opinion of Deputy Commissioner Rose Wall, and is made in accordance with the power delegated to her by the Commissioner.

14. The parties directly involved in the investigation were:

Mrs A	Consumer
HBDHB	Provider

15. Further information was received from:

Dr B	Consultant anaesthetist
Dr C	Obstetrics and gynaecology registrar
Dr D	Consultant obstetrician and gynaecologist
Registered Midwife (RM) E	Registered midwife
RM F	Registered midwife
RM G	Registered midwife
RM H	Registered midwife
Dr I	Obstetrics and gynaecology registrar

16. Anaesthetic registrar Dr J is also mentioned in this report.

17. Independent expert advice was obtained from:

RM Nicky Emerson	Appendix A
Obstetrician Prof Peter Stone	Appendix B
Anaesthetist Dr David Jones	Appendix C
Paediatrician Dr Simon Rowley	Appendix D

Information gathered during investigation

Mrs A's pregnancy

18. Mrs A became pregnant with a due date in late Month1.¹ Her Lead Maternity Carer (LMC) was RM G, and RM G's practice partner was RM E.
19. Mrs A had had one previous pregnancy, which was ectopic² and required surgical removal of her fallopian tube.
20. RM G and RM E discussed referral to, or consultation with, a specialist on several occasions during Mrs A's current pregnancy (when Mrs A was 24, 27, and 29 weeks pregnant) in light of her high body mass index (BMI).³ RM E commenced fetal growth scanning at 27 weeks due to Mrs A's BMI, and RM E also tested for gestational diabetes with negative results.
21. At 29 weeks' gestation, RM E referred Mrs A to HBDHB's specialist maternity facility, owing to asymmetric growth showing between measurements of the baby's head and abdominal circumferences. Two weeks later, Mrs A attended an antenatal clinic at the specialist maternity facility. The assessment notes her BMI, and the follow-up letter states that the pregnancy was going well. The follow-up from the clinic notes that the discrepancy in fetal growth had resolved.
22. RM G again referred Mrs A to the specialist maternity facility (37+4 weeks' gestation) owing to high blood pressure and to confirm the baby's position, as RM G suspected that it was breech (head up). An ultrasound scan showed that the baby was positioned head down, and the registrar's impression was that Mrs A was clinically well, and she was discharged home. Whilst Mrs A's BMI was noted at this assessment, there was no recommendation that she have the birth in the specialist maternity facility.

Mrs A's labour

23. Mrs A was booked into a birthing unit to give birth. The birthing unit is HBDHB's primary care midwifery unit, and, whilst it is situated alongside the specialist maternity facility at Hawke's Bay Fallen Soldiers' Memorial Hospital, it is a midwife-led facility.
24. On 2 Month2 (40 weeks' gestation), Mrs A called RM G to tell her that she had been "niggling" since 6am, and that the contractions were irregular and short. RM G advised Mrs A to rest at home, and to contact her later on, once the contractions had become more intense. RM G anticipated doing a full assessment that evening.

¹ Relevant months are referred to as Months 1–2 to protect privacy.

² A pregnancy where the fertilised egg implants outside the uterus, often in the fallopian tube.

³ Mrs A had a Body Mass Index (BMI) of 38 when she was pregnant, rising to over 40 at the time she gave birth. The Guidelines for Consultation with Obstetric and Related Medical Services state that where a pregnant person's BMI is greater than 35, the midwife should advise or recommend that consultation should occur. See: <https://www.health.govt.nz/system/files/documents/publications/referral-guidelines-jan12.pdf>.

25. At around 8.45pm, RM G saw Mrs A at the birthing unit. RM G undertook a full assessment, and noted that she could feel that Mrs A's membranes were intact.⁴ A plan was made to send Mrs A home, and, if the contractions had not become more regular, to review her the next morning.
26. At 9am the next morning (3 Month2), RM G contacted Mrs A and arranged to assess her at the birthing unit. During this assessment, which occurred at around 11am, no membranes could be felt during a stretch and sweep.⁵ The notes from the assessment query whether the membranes had ruptured spontaneously. A vaginal swab was done in response to this and sent to the laboratory. It was recorded that Mrs A had observed vaginal discharge that was "a little bit green". At 11.40am, Mrs A was noted to be 4cm dilated.
27. At 11.45am, RM G asked the registrar on call to provide her with a plan in light of the prolonged latent labour phase (the fact of the prolonged latent labour phase was documented). The recorded plan was for Mrs A to have pethidine⁶ and rest in the birthing unit for 4–6 hours. If she did not progress to normal labour by the end of that period, she would be sent home to return the next day to have labour induced. A cardiotocograph (CTG), which is used to monitor fetal heart rate, was commenced, and care was handed over to an HBDHB midwife at 1pm.
28. RM E took over as Mrs A's back-up LMC at 4pm. At 6.40pm, the CTG recorded two decelerations.⁷ The HBDHB midwife spoke with a midwifery colleague, and RM E was called to undertake an assessment.
29. After a full assessment at 7pm, RM E documented that no membranes could be felt and that Mrs A was 4cm dilated, and she sought Mrs A's and her husband's views on requesting secondary input. They agreed, and, following a discussion with obstetric registrar Dr I, Mrs A was transferred to the specialist maternity facility for review and augmentation of her labour.

Overnight 3–4 Month2

30. Three midwives were working overnight in the labour and birthing suite, as well as one registrar (Dr I, who then handed over to Dr C at approximately 9pm), one consultant on call (Dr D), and one house officer. The DHB said that all of the midwives on shift were senior, but no particular midwife was employed in a position of overall responsibility and oversight.
31. At 8pm, Dr I documented that there had been no prelabour rupture of membranes. She proceeded to do an artificial rupture of membranes and found that clear liquor drained as a result. The DHB states that this suggests that Dr I was not aware of the history of ruptured membranes, or believed that this had been disproved.

⁴ This suggests that her waters had not yet broken.

⁵ A process used to try to initiate labour.

⁶ An opioid pain relief medication.

⁷ Where the heartbeat slows down.

32. Dr I noted that the CTG was abnormal, but she was reassured by the clear liquor and a period of normal CTG activity. Dr I recorded that Mrs A was 4cm dilated, and recommended epidural analgesia, Syntocinon augmentation to progress labour, and continuous fetal monitoring. Dr I discussed this with the on-call consultant, Dr D (who was off site and did not view the CTG).
33. Dr D said that during the telephone call with Dr I, he was was unaware that Mrs A was thought to have had a long labour.
34. At 8pm, a partogram was commenced.⁸ Just after 8.50pm, the CTG showing the fetal heart rate changed from having a baseline of 135bpm to 85–90bpm. There is nothing in the clinical notes in relation to this change.
35. At 9.30pm, an epidural was sited, and shortly afterwards the Syntocinon infusion commenced.
36. At about 9.50pm, there was another deceleration on the CTG. RM E halted the Syntocinon augmentation until she could discuss the care with the registrar, Dr C. Dr C reviewed Mrs A at 10.30pm and noted that she had been 4cm dilated at 8.30pm. Dr C stated:
- “I reviewed the CTG — the baseline rate was 130–135, there was normal variability, I noted there had been one prolonged deceleration at 2140 but accelerations were also present (i.e. it had recovered). Since there were no further decelerations with contractions, and accelerations were present, my impression was that this CTG was not in keeping with fetal hypoxia ... I asked to be contacted if any concerns arose with the CTG.”
37. The Syntocinon was recommenced, with a plan to have a further assessment of dilation four hours after it had begun.
38. At 10.50pm, a “normal trace” on the CTG was documented by DHB midwife RM H, who had taken over care from RM E at 10.40pm.⁹ DHB midwife RM F then commenced care of Mrs A at 11.30pm and assessed her.
39. RM H stated:
- “[Mrs A’s] CTG was reviewed by [Dr C] at 2240 as I took over care. I agree during my period of care the CTG showed [a] period of reduced variability and was non-accelerative. Prior to my care at 2240 the trace had been accelerative. This may be attributed to a ‘sleep phase’. However, if this had continued for longer than 40 minutes concerns should be escalated and I would have done so. The baseline had not risen during this time.”

⁸ A partogram is a documentation tool used to monitor labour and prevent prolonged or obstructed labour.

⁹ Due to the acuity (busyness/complexity of patients) on the ward, RM E was not able to hand over care to the DHB midwives until 10.40pm.

40. The DHB agreed that in the context of the previous CTG trace, this was able to be interpreted as a sleep trace, which if it continued for more than 40 minutes would require escalation.
41. At midnight there was one large variable deceleration on the CTG. At 12.10am (4 Month2), Dr C was asked to review Mrs A, and a fetal scalp electrode was placed to assist in monitoring. Dr C instructed RM F to increase the Syntocinon as needed.
42. At 12.55am, RM F recorded a “widely variable fetal heart rate”. Dr C was called again to assess Mrs A. Dr C reduced the Syntocinon dose and directed that Mrs A be repositioned to allow the baby to recover and oxygenate.
43. Between 1.00am and about 1.03am there was increased variability. Dr C explained:
- “On my review of the CTG at this point, my impression was that the CTG was abnormal but not in keeping with fetal hypoxia given variable decelerations were present but not with every contraction and variability was normal.
- [Mrs A] had expressed multiple times that she was very keen on a vaginal delivery and wanted as far as possible to avoid a caesarean section ... The plan to increase Syntocinon was to give her the best chance for a vaginal delivery. Taking into account the entire clinical picture — namely infrequent contractions, the variable decelerations that did not occur with every contraction and normal variability on the CTG, my plan was to continue to monitor for changes in the CTG whilst trialing an increase in the Syntocinon to help achieve normal delivery. If there had been any worsening with the CTG when the Syntocinon was increased, I would have stopped the Syntocinon immediately (as I later did).”
44. From then until 1.46am, there was reduced variability with a baseline between 155 and 160bpm and variable decelerations. This is not recorded in the notes made by staff.
45. At 1.20am, the fetal scalp electrode displaced and was replaced by Dr C as requested. At 1.54am, Dr C reviewed and signed the CTG. Dr C told HDC that at this time she indicated to Mrs A that a Caesarean section might be indicated, but Mrs A strongly expressed that she wanted a vaginal delivery. The documentation does not reflect this discussion.
46. The CTG showed a prolonged deceleration from 2.30 to 2.33am. RM F documented the changes in heart rate, and that she had had some difficulties in topping up the epidural. The anaesthetic registrar, Dr J, attended to assist with the epidural, and was able to administer further medication once she had moved the tube slightly.
47. Dr C reviewed Mrs A at 3am, and the Syntocinon was stopped shortly afterwards. Dr C documented that if Mrs A was still only 4cm dilated at 5.30am, she would be taken for a Caesarean section. What was not documented is that Dr C then had to perform a more urgent Caesarean section on another patient, and that had that not been the case, she would have recommended a Caesarean section at that point. Dr C explained:

“I recognised throughout the night of 3 and 4 [Month2] that there were aspects of the CTG that were abnormal. I directed standard ‘intrauterine resuscitating’ actions — such as repositioning the patient and adjusting the Syntocinon dose — in an effort to correct the abnormalities. The CTG responded well to these measures, which I was reassured by. I believed [Mrs A] and the baby would remain at low risk through the few hours I was operating. Stopping the Syntocinon infusion was a measure taken to ensure this, as was instructing the midwife to contact me in theatre if required.

With the benefit of hindsight, and having thought deeply about this case, I appreciate that I should have sought consultant review of the CTG at 0300. The consultant then could have considered whether the circumstances warranted a second theatre and theatre team being established — since the acuity of the delivery suite at that point meant that I was required in another operation.

It is possible at Hawke’s Bay Hospital for two theatres to run concurrently but this would require calling in a second theatre team — which is not usual practice unless posed with a life threatening scenario. This would take approximately 30–40 minutes to assemble, and by which time, it was possible we would have nearly completed the more urgent emergency [Caesarean] and progressed on to the [Caesarean] for [Mrs A].”

48. Dr D was not consulted at that time.

49. The DHB stated that overnight, one obstetric registrar and one obstetric consultant are the on-call obstetric team, with a house officer as well as one acute theatre team. Dr D was required to assist Dr C with the other complex Caesarean section. The DHB said that in this instance, in addition to calling in a second theatre team, it is likely that a second anaesthetic consultant would have been required. The DHB stated:

“There were significant and unanticipated delays in the Caesarean Section for the other woman both in cross matching the blood for transfusion and insertion of spinal anaesthetic which if [Dr C] had known about in advance may have altered the decision making around the need for a second theatre.”

50. Shortly after 3am, Dr C was called into theatre to perform the other Caesarean section. She said that at 4.15am, whilst she was in surgery, she discussed Mrs A with the consultant, Dr D, who was assisting with the surgery. Dr C said that Dr D was aware of the initial abnormality of the CTG, which had improved, and the plan for the patient, and did not suggest any changes. Dr D stated:

“[During the surgery] I was not aware of any further concerns regarding [Mrs A’s] labour although I was aware that [Dr C] intended to reassess her immediately once we had completed our case.”

51. From 3.53 to 3.56am, there was a period of increased abnormal variability on Mrs A’s CTG.

52. At 5.30am, RM F documented that there was a rising baseline noted with reduced variability. Dr C, who was still in theatre, was called, and she requested that RM F undertake a vaginal examination. Dr C was advised that Mrs A had progressed to 7–8cm dilation, and that variability on the CTG had improved after the vaginal examination.
53. At 6am, there were variable decelerations and an unstable baseline, and at 6.10am a complicated baseline tachycardia.¹⁰ At 6.20am, when Dr C left the other surgery, she reviewed Mrs A. The CTG was abnormal, and at some point (it is not documented when) a fetal scalp lactate was performed and showed fetal acidaemia,¹¹ which requires urgent delivery. A Caesarean section was recommended at 6.34am.
54. Dr C stated:
- “The CTG was difficult to interpret as it would fluctuate between an abnormal CTG concerning for fetal hypoxia, back to features of the CTG such as normal variability without decelerations that would be reassuring for fetal wellbeing. Because of this I appreciate now that I should have sought my consultant’s opinion earlier in the way of fax or photo. In hindsight, knowing the outcome for [Baby A], I would agree that the CTG interpretation was inadequate, particularly from 0340.”
55. RM F considered that she had escalated the CTG concerns adequately, and noted that Dr C had reviewed the CTG five times between 12am and 3am.

Birth of Baby A

56. In the preoperative area, Mrs A informed the medical staff that she had had issues with anaesthesia during previous surgery for an ectopic pregnancy. There was no documentation of this aspect of her medical history in her maternity records, and there was not time to access her medical records from her previous surgery.
57. Mrs A was placed under general anaesthetic, rather than relying on her epidural, as she had received minimal relief from the epidural top-up at 4.50am. Dr C stated that with fetal hypoxia evident, immediate delivery was required, and the quickest way to ensure that Mrs A had adequate analgesia was to perform the Caesarean section under a general anaesthetic. Dr C said that the surgery was performed in a left lateral tilt position, which is standard for Caesarean sections.
58. Consultant anaesthetist Dr B was assisted by Dr J when anaesthetising Mrs A. Dr B stated:
- “I believed that it was in the best interests of the patient and her baby that we proceed with a General Anaesthetic, based on her reassuring airway examination from an anatomical perspective, and recognizing the additional physiological difficulty that we may encounter due to her pregnancy and obesity. I discussed the risks of General Anaesthesia with [Mrs A]. I remember mentioning that it was difficult to know what

¹⁰ Rapid heart rate.

¹¹ High amounts of acid levels in an unborn baby’s blood. The result was 11mmol/L.

degree of risk the previous anaesthetic problem posed, but that we did not have time to get her previous notes due to the condition of her baby.¹² She agreed to proceed.”

59. Difficulties with ventilation were encountered as the operation commenced. Mrs A’s oxygen levels dropped rapidly for a period of approximately two minutes. The oxygen monitor shows that Mrs A’s oxygen saturations were between 97% at 6.56am and 86% at 6.58am, and Dr B recalls that this dropped “into the 70s” in between. Approximately four minutes after the birth, Mrs A’s oxygen saturation recovered to 97%.

Care of Baby A

60. Baby A was born in a poor condition. He was floppy, pale, and not breathing, and thick meconium was present. He was resuscitated and treated in the Special Care Baby Unit. It was decided not to cool him actively¹³ because he had normal tone and movements at that time.
61. However, at 6 hours of age, Baby A experienced a seizure accompanied by a drop in oxygen saturation and heart rate. He was given medication for the seizure, and in consultation with the Neonatal Intensive Care Team at a main centre hospital (DHB2) it was agreed to cool him actively. He was transferred and treated in the Neonatal Intensive Care Unit for 20 days. He was diagnosed with moderate neonatal encephalopathy, neonatal seizures, and a stroke.

Internal review of events

62. An internal review (SAC 2)¹⁴ was undertaken by HBDHB, and this was completed in November 2019. HBDHB said that unfortunately, owing to a number of factors such as staff secondments, changes in roles, and a higher than normal number of SAC reviews, the review was not completed in a timely fashion and was well outside expected timeframes.
63. The review highlighted that there were a number of points at which Mrs A’s care could or should have been escalated to Dr D and the birth expedited.
64. A number of contributory factors were identified, including suboptimal interpretation of the CTG, a fetal scalp lactate not being performed earlier in the labour, Dr C being in theatre with another difficult Caesarean, a high acuity in the specialist maternity facility resulting in inappropriate caseloads,¹⁵ a lack of senior midwifery coordination after hours to support clinical oversight, and not recognising a long latent phase as a risk factor.

¹² Dr B estimated that it would take at least half an hour to retrieve the previous anaesthetic records.

¹³ Therapeutic hypothermia (active cooling) is the standard of care for infants greater than or at 36 weeks’ gestational age who have moderate to severe hypoxic ischaemic encephalopathy (brain injury secondary to inadequate oxygen delivery).

¹⁴ The Severity Assessment Code (SAC) is a numerical rating that defines the severity of an adverse event and, as a consequence, the required level of reporting and investigation to be undertaken for the event. A SAC 2 event is defined as a major permanent or temporary loss of function not related to the natural course of the illness, and is reportable to the Health Quality & Safety Commission.

¹⁵ The bed occupancy was at 112% for the inpatient ward, 71% for the labour ward, and 112% for the birthing unit.

65. A number of recommendations and service changes were made as a part of the review. These are detailed below in the “changes made since events” section of the report.

ACC claim delay

66. Mrs A expressed concern at the time it took for the DHB to send the forms for a claim to ACC in relation to Baby A’s birth injuries. She followed this up at a meeting with Dr D on 9 October 2019, and then in the family meeting to discuss the internal review, and understood that the forms had been completed. Mrs A then asked a Child Development Service social worker to follow up with the DHB on her behalf, as she had not heard from ACC, and at that time (February 2020) the omission was realised and the paperwork completed.

Apology

67. HBDHB stated:

“In summary, a review of the care provided to [Mrs A] during her stay highlighted some areas of improvement within our Maternity Unit at HBDHB, which we have undertaken to address to ensure that a high standard of care is provided at all times.

We apologise that these gaps have impacted on the health and development of [Baby A].

However, we recognise that what has not been captured as part of the review is the effect that the HBDHB’s poor communication and prolonged processes have had on this family.

The case review took nearly four months to be completed and signed off and it required another month and a complaint before we met with [Mr and Mrs A] to talk through what happened during their labour.

The ACC form that could and should have been completed by multiple people within the HBDHB during their interactions with us, took seven months to be completed.

This has caused ongoing stress and distress to [Mr and Mrs A], well above the impact of the birth and for which we would like to apologise unreservedly.”

Policies and guidelines

68. The HBDHB Body Mass Index In Pregnancy policy (October 2016) states: “Women with a BMI of ≥ 35 should be advised to give birth in a secondary care obstetric unit.”
69. The HBDHB Clinical Risk Assessment for Place of Birth guideline (which has since been replaced) also described a BMI of over 35 as a relative, but not absolute, contraindication to birthing in the birthing unit.
70. The Hawke’s Bay Maternity Primary/Secondary Interface states that care should be transferred from primary to secondary care (ie, from the birthing unit to the specialist maternity facility) on admission if the patient has a BMI of over 40 in labour.

Responses to provisional opinion

71. HBDHB was given the opportunity to respond to the provisional opinion. The DHB noted that it agreed with the Deputy Commissioner's proposed recommendations and did not have any further comments. HBDHB confirmed that Dr C, Dr B, Dr D, Dr I, RM H, RM F, RM G, and RM E had no comments on the provisional opinion.
72. Mrs A was provided with an opportunity to respond to the "information gathered" section of the provisional opinion. She reiterated her concerns about the poor communication she experienced regarding the progress of her labour. She stated:

"At no stage during our time in the specialist maternity facility did anyone communicate their concerns ... Had they done so we absolutely would have been advocating for better monitoring and earlier intervention. As far as we were aware everything was fine with [Baby A], I was simply progressing slowly."

73. Mrs A stated:

"[If] they had communicated their concerns and made a recommendation for a caesarean section, we absolutely would have considered this and likely proceeded. In our opinion, they did not provide us with effective communication and we were not fully informed."

Opinion

Introduction

74. Baby A was born in a poor condition following Mrs A's prolonged labour. As HBDHB's internal review identified, multiple factors contributed to the birth not occurring earlier than it did. This case highlights the importance of all team members having situational awareness of an evolving picture of a baby in distress, and knowing when to halt the labour, and call in further assistance.
75. I do not consider that the poor outcome for Baby A or Mrs A was the result of the failings of any individuals; rather, it was the combination of factors within HBDHB's system that night that meant that the Caesarean section was delayed.
76. I note the comments from my expert advisor, obstetrician and gynaecologist Professor Peter Stone, that this case illustrates the problems of a dysfunctional or obstructed, and therefore prolonged, labour in a woman having her first baby. He stated:

"[This] will be more likely in obese patients who labour less efficiently. So, in these circumstances by the time labour progresses, not infrequently the baby is compromised and requires urgent delivery."

77. Prof Stone noted that these circumstances should be well recognised by obstetricians and midwives alike, and anticipated and planned for, because the birth can become an extremely complicated and risky procedure, with junior staff in an after-hours situation facing difficult anaesthesia and surgery.
78. I have considered the care provided to Mrs A and Baby A during the labour and birth, and my opinion is informed by expert advisors RM Nicky Emerson, Prof Stone, anaesthetist Dr David Jones, and paediatrician Dr Simon Rowley.
79. I would like to express my sympathy to Mr and Mrs A for their difficult experience.

Community midwifery care

80. I asked RM Emerson to consider the care provided by RM E and RM G to Mrs A during her pregnancy. RM Emerson advised:

“In my opinion the care provided by [RM E] and [RM G] is cognisant at all times of the risk posed by [Mrs A’s] raised BMI and the timely appropriate assessment, consultation and referral is in keeping with accepted midwifery practice with no departures.”

81. RM Emerson also advised that during the labour, RM E and RM G responded and acted in accordance with accepted midwifery practice. RM Emerson noted that RM E and RM G proactively sought obstetric review three times in a 12-hour period on 3 Month2. RM Emerson stated that RM E escalated concerns with the CTG immediately and initiated a clinical response (swab, change of maternal position, and turning off augmentation) prior to receiving a plan from Dr C, before handing over care to the HBDHB midwifery staff at 10.40pm on 3 Month2.
82. I accept RM Emerson’s advice, and I am therefore satisfied that RM E and RM G provided appropriate midwifery care in the circumstances.

Decision to birth in the birthing unit

83. Prof Stone said that the initial plan to deliver in the birthing unit may be seriously questioned given the risk factor of obesity and known associations with complex labour. He stated that Mrs A met all the criteria to be managed in the specialist maternity facility. Prof Stone noted, however, that it was recognised in the birthing unit that Mrs A was not labouring in a normal or expected way, and the “prudent decision” was made to seek advice from the specialist maternity facility and transfer Mrs A there.
84. HBDHB’s policies were not definitive that a BMI of over 35 was an absolute contraindication to birthing in the birthing unit. However, the Hawke’s Bay Maternity Primary/Secondary interface is clear that on admission to the birthing unit, care should be transferred to the specialist maternity facility if the patient’s BMI is over 40 in labour, which Mrs A’s was.
85. In these circumstances, on Mrs A’s admission, there was a missed opportunity for Mrs A to be referred straight to the specialist maternity facility for secondary care. There was also a missed opportunity to review the appropriateness of the plan to birth at the birthing unit

when Mrs A attended the clinic appointment at the specialist maternity facility on 11 Month1.

86. My comments in this regard are relevant to both HBDHB and LMC midwives RM G and RM E.

Care provided by HBDHB — breach

Management of labour

87. Prof Stone reviewed the CTG recordings and noted multiple occasions on which the CTG was consistent with the baby being hypoxic or recovering from a period of hypoxia. He stated: “It is noted that a healthy fetus has reserves and may recover from a hypoxic period, but this has to be taken into the overall clinical context.” RM Emerson also stated: “In my opinion there had been a long period of decelerations that were at times variable and at times prolonged.”

88. Prof Stone noted that whilst the concerns with abnormalities in the CTG were escalated to Dr C on five occasions, it is apparent that the abnormal CTG was considered but not in terms of overall context. He advised:

“It was also recognised that there were abnormalities on the fetal heart rate tracing and as such there was the difficulty of getting sufficient adequate uterine contractions to progress labour whilst not compromising fetal welfare. This is not an infrequent situation, but it requires the clinicians to step back — undertake a reassessment of the whole situation and seek as much objective evidence about fetal welfare as possible. Sometimes it has to be recognised that this is difficult or not possible and the delivery plan needs to be revised.”

89. Prof Stone said that there were abnormalities on the CTG that presented a missed opportunity to step back and reassess. He commented that the nature of the CTG abnormalities was such that a definitive decision involving the specialist needed to be made earlier than 6am as to whether it was reasonable to continue the labour. He noted that given the training undertaken by registrars and midwives on fetal monitoring, “it would be fair to conclude that the interpretation of the CTG, but more importantly the labour care that followed fell below what would be good practice nowadays”.

90. Prof Stone concluded:

“This is viewed as a system failure and given that in the view of the advisor, not only was the trace clearly abnormal but that the staff also had raised concerns, this is a departure from accepted practice and that this departure is of at least moderate severity. This is because of system and clinical cultural issues.”

91. Prof Stone also discussed whether a fetal scalp lactate should have been taken earlier. He noted that this is difficult to perform when the cervical dilation is 4cm or less, so in reality this could have been performed only after 3.15am. He advised:

“Therefore ... a review of the whole case and a decision as to whether it was reasonable to continue with the labour was really the issue. What is agreed by most clinicians, is that if it is thought there is a reason to do a fetal blood sample and then this becomes not possible, delivery has to be expedited on the basis that it is considered possible that the baby is truly acidaemic. The CTG was already abnormal in the latent phase or early active phase of labour, such that it is likely that the baby will not tolerate continuing the labour unless the delivery is likely to be very soon.”

92. I accept Prof Stone’s advice, and I agree that in the face of the persistently abnormal CTG, there was a missed opportunity to formally review the appropriateness of continuing Mrs A’s labour. As I discuss below, situational factors contributed to the late decision to proceed to a Caesarean section. As such, I consider that the failure to step back and appreciate the ongoing CTG abnormalities in the context of Mrs A’s risk factors, and expedite the delivery, was a systemic problem, rather than the responsibility of one individual clinician in this case.
93. I acknowledge that other factors influenced the decision-making around the timing of Mrs A’s Caesarean section. In particular, these were the acuity of the specialist maternity facility, which was noted to have increased at around 1am and contributed to high caseloads, and the other complex Caesarean section that Dr C and Dr D attended before Mrs A’s surgery. I accept that in these circumstances, all staff, but particularly Dr C, would have been challenged with which patients to prioritise.
94. With the benefit of hindsight, it is easy to suggest that this should have been done differently, or another theatre team called in to take Mrs A to theatre sooner. However, I appreciate the challenging circumstances under which the team at the specialist maternity facility found themselves, and it would not be fair for me to criticise the prioritising assigned in the circumstances of an unusually busy labour ward.
95. What I am critical of, however, is that at the time of this event, HBDHB did not have in place a senior midwifery role after hours to support clinical oversight, particularly when Dr C was in theatre with the other Caesarean section. I consider that this would have been particularly helpful in the context of Mrs A’s care, as it would have provided another avenue for escalation of concerns about the CTG, and an opportunity for a “fresh-eyes” review of the CTG and the labour overall. RM Emerson advised:

“Given the continued dialogue with [Dr C], consideration of unit acuity and finite practitioner resource available I do not consider that [RM H] or [RM F] have departed from accepted Midwifery care. I note that there was no Midwifery leader on the unit at that time.”

96. RM Emerson also advised:

“Whilst my previous advice raised concerns regarding the possibility that [RM F] could have escalated care I am now satisfied that the resources and acuity at the time limited her ability to do so.”

97. I accept this advice. In my view, the lack of senior midwifery oversight after hours is a problem for which HBDHB is responsible. I am pleased that HBDHB has taken steps to ensure that there is now senior midwifery oversight on every shift.
98. I do not underestimate the complex decisions midwives, obstetricians, and other health professionals are making on a day-to-day basis as they support women through their pregnancy and ensure that safe, quality care is provided. I am mindful that decision-making has the further added complexity in those evolving circumstances where services are limited and the health professional responsible for managing a woman's labour and birth must anticipate the immediacy of access to such resources as an operating theatre or additional specialist expertise as they monitor progress, weigh up options, and determine whether additional intervention is needed. I acknowledge that there are situations in which the health professional needs to gauge relative priorities. They are determining whether a woman or her baby's wellbeing is becoming increasingly compromised and emergency intervention in the form of a Caesarean section may be warranted, and in consultation with the woman and her family, they then need to decide how and when this should occur.

Documentation issues

99. Prof Stone identified two main issues relating to the quality of the clinical documentation recorded in this case. First, he advised:
- “The continuance of the labour in the face of a consistently abnormal CTG (because the patterns were unchanged for some considerable periods ...) without clear reasons being written in the notes would fall below a good standard of care.”
100. Prof Stone gave an example that at 9.40pm,¹⁶ it was acknowledged by the staff that the CTG was abnormal, but the explanations in the midwifery and medical notes do not state why it was thought to be abnormal and what action should be taken.
101. Secondly, Prof Stone expressed concern that a partogram was not started until 8pm on 3 Month2, by which time Mrs A had been at 4cm dilation for over ten hours. He stated that “action lines” should have been drawn on the partogram at 8pm, and then at 3am, and it would have then been clear that Mrs A's progress fell outside of expected and accepted norms, and the decision for Caesarean section would have been indicated. He also submitted that at 8pm, knowing the events of 2 and 3 Month2 and that obesity may affect the efficiency in the first stage of labour, it could have been anticipated that the labour progress was likely to be poor.
102. I accept this advice and I agree that there should have been better documentation of the reasoning for continuing labour despite a persistently abnormal CTG. I also accept that earlier use of a partogram would have given additional context to Mrs A's prolonged labour and been an aid in decision-making.

¹⁶ It was confirmed that the timing of this documentation entry was incorrect.

Missed opportunities to gather information about previous anaesthetic difficulties

103. I consider that during Mrs A's antenatal care in the community, there was a missed opportunity to gather information about her previous anaesthetic difficulties. In the context of Mrs A's raised BMI, it would have been prudent to consider the possibility of her birth resulting in a Caesarean section and, accordingly, to have assessed her anaesthetic risk.
104. During Mrs A's labour at both the birthing unit and the specialist maternity facility, there were also missed opportunities to gather information about the difficulties encountered during her previous anaesthetic. It should not have been left until she was in the preoperative area to try to elicit this information from Mrs A herself, who by that time would have been exhausted, and it was too late to obtain her previous notes.
105. In my view, an appropriate time to request this information, if not during Mrs A's antenatal care, would have been on her transfer to the specialist maternity facility — at that time it was evident that her labour was not progressing normally. Whilst a Caesarean section was not planned at that point, it was not an unlikely possibility.
106. My comments in this regard are relevant to HBDHB and LMC midwives RM G and RM E.

Conclusion

107. HBDHB had a responsibility to provide Mrs A services with reasonable care and skill. For the reasons I have discussed, I consider that HBDHB did not do this. I note Prof Stone's comments that "system issues, a culture of non-intervention, [and] an expectation that the labour was going to be normal may all have contributed to the late actions in this case".
108. I find that HBDHB breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code)¹⁷ for the following reasons:
- There were missed opportunities for Mrs A's labour care to be provided in the specialist maternity facility from the outset;
 - In the face of the persistently abnormal CTG in the context of Mrs A's risk factors and prolonged labour, there were missed opportunities to review the appropriateness of continuing Mrs A's labour;
 - There was a lack of senior midwifery oversight after hours;
 - There should have been better documentation of the reasoning for continuing labour despite the persistently abnormal CTG;
 - Earlier use of a partogram would have given additional context to Mrs A's prolonged labour; and
 - There were missed opportunities to gather information about the difficulties encountered during Mrs A's previous anaesthetic.

¹⁷ Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."

Late referral to ACC and delay in undertaking internal review — adverse comment

109. Mrs A expressed in her complaint her concern about the delays experienced in the internal review being undertaken, and having the paperwork for an ACC treatment injury carried out. HBDHB has acknowledged these delays, accepted that the concerns are justified, and apologised for them. Prof Stone stated:

“I would consider that in 2020 such delays are not acceptable as these add to the complainant’s distress. It has long been acknowledged that timely open disclosure is the principle by which adverse outcomes should be dealt with. As such, I do consider this to be a serious issue, not the least because not only is it below an acceptable standard of care but it only exacerbates potential harm to the complainant as that person (and family) are having to come to terms with what happened. It would or should be an expectation that all DHBs in New Zealand have good systems in place and people take responsibility for ensuring that timely follow up is achieved.”

110. I agree with Prof Stone, and I am critical of the delays experienced in reviewing the events of Mrs A’s birth, and completing the paperwork for the ACC treatment injury claim. I agree with HBDHB that this would have contributed to ongoing stress and distress for Mr and Mrs A. It is also very apparent that Mrs A, Baby A, and their extended family would have benefited from the additional support they were entitled to from ACC had it been available to them sooner.

Care provided by HBDHB — no breach

Delivery and anaesthetic care

111. Prof Stone advised that at the time an urgent Caesarean section was called, this was the only appropriate action available. He said that the time from the decision to perform a Caesarean section until the operation beginning, and then delivery of Baby A, was acceptable.
112. I asked Dr Jones to consider whether the anaesthetic care provided to Mrs A for her Caesarean section surgery on 4 Month² was reasonable in the circumstances. His answer was “yes”. Dr Jones commented that in the circumstances of a poorly functional epidural and urgency being required, “general anaesthetic ... would be the choice of most anaesthetists”.
113. In relation to the management of Mrs A’s oxygen desaturation event, Dr Jones considered that in the circumstances in which the anaesthetic team found themselves, “the anaesthesia teamwork and care was of an excellent standard”.
114. I am reassured by the comments of Prof Stone and Dr Jones about the delivery and anaesthetic care provided to Mrs A, and I find that this part of Mrs A’s care was in accordance with accepted standards. In my view, the anaesthetic team were confronted with a challenging set of circumstances not helped by the absence of detail about Mrs A’s anaesthetic history, including information about the nature and extent of difficulty she had experienced with ventilation at the time of her ectopic pregnancy.

Care of Baby A

115. Dr Rowley considered the care provided to Baby A. Dr Rowley advised:

“[Baby A] had low Apgar scores indicating some degree of asphyxia, was successfully resuscitated and observed appropriately for any development of moderate or severe encephalopathy. When he developed seizures at six hours of age indicating worsening encephalopathy a decision was made for therapeutic hypothermia in conjunction with the nearest NICU team. He was passively cooled and transferred to the [DHB2] NICU for completion of cooling. He seems to have done well and the prognosis is guarded but hopeful. At all points in his management I believe he had an appropriate standard of care.”

116. I accept Dr Rowley’s advice, and I am therefore satisfied that once Baby A was born, he received care of an appropriate standard.

Changes made since events

HBDHB

117. All HBDHB midwives and medical staff were instructed to complete the RANZCOG¹⁸ online fetal surveillance training (FSEP) after this incident. This had been a recommended yearly requirement, but is now a mandatory yearly requirement for HBDHB midwives and medical staff. The local LMC workforce were also strongly recommended to complete this training.
118. While a plan is finalised to have an HBDHB Clinical Midwife Coordinator (CMC) available 24/7,¹⁹ a recognised shift leader position has been created so that there is a senior midwife available for escalation 24/7. There is an expectation that this role will provide oversight of all CTGs in the labour and birthing suite, regardless of whether the care is being provided by an LMC or an HBDHB midwife. The role of the CMC or shift leader includes providing a “fresh eyes” review two hourly for any woman who is receiving continuous CTG monitoring.
119. There has been reinforcement to midwives of the escalation pathway to the obstetric consultant if there is any delay in review by the obstetric registrar.
120. The CTG sticker, which is used to aid in documentation of CTG interpretation, has been updated to align with FSEP terminology.
121. The Clinical Risk Assessment for Place of Birth policy has been reviewed and renamed as the birthing unit Policy. As part of this review, the policy changed so that a BMI of between 30 and 40 is no longer a relative contraindication to birth at the birthing unit. Women with a

¹⁸ Royal Australian and New Zealand College of Obstetricians and Gynaecologists.

¹⁹ Currently this role is present only from 7am–11.30pm Monday to Friday.

BMI of between 30 and 40 are able to birth in the birthing unit only if they meet the following criteria:

- a) They have no other risk factors.
- b) They have a consultation in the antenatal clinic during pregnancy.
- c) They are discussed with the on-call obstetrics and gynaecology team on admission.
- d) They have full observations on admission and two-hourly observations during labour.
- e) They have established IV access.
- f) They have an active third stage of labour.

- 122. There was a presentation at the Perinatal, Mortality and Morbidity Review Committee meeting and at the LMC/HBDHB meeting regarding a case with similar themes to Mrs A's, to highlight the need for fetal surveillance training, appropriate escalation, and a "fresh eyes" approach.
- 123. Partogram use was to be audited as part of the 2021 HBDHB maternity monthly audit programme.
- 124. There has been a "Safety First" campaign, including education sessions at multi-disciplinary meetings around cases such as Mrs A's, with emphasis on expectations around CTG interpretation and documentation, "fresh eyes" reviews, consistent use of partograms, MEWS and Sepsis bundles, escalation pathways, and fetal blood sampling. In November 2019, a memo as part of this campaign was distributed to all HBDHB midwives, LMCs, and obstetric medical staff.
- 125. The Special Care Baby Unit now has the capacity to cool babies actively. This would occur in consultation with a tertiary neonatal unit, before transfer of the baby there for treatment.
- 126. Dr B submitted Mrs A's case for presentation at the Anaesthetic Department Morbidity and Mortality meeting in October 2019. There was discussion and a departmental consensus that a general anaesthetic was the most appropriate course of action in the circumstances.

Mrs A

- 127. Dr B organised for Mrs A to have an alert placed on her electronic record to ensure that anaesthetists are able to easily access information regarding the difficulties presented with ventilation at the time of her ectopic pregnancy and Caesarean section. Mrs A has also been provided with a letter outlining these difficulties.

RM G

- 128. RM G told HDC that since this case, she has made a point of ensuring that she asks all clients whether they have a history of any anaesthetic complications, and she documents their response.

Dr C

129. Dr C advised that since this incident she has made a number of changes to her practice. She takes time to document every interaction with patients, even during a busy shift; she takes a fetal lactate if she is able to when she encounters a CTG that is difficult to interpret; and she seeks input from her consultants earlier if the CTG is difficult to interpret, and particularly if there are multiple cases requiring theatre.

Recommendations

130. I recommend that HBDHB provide a written apology to Mrs A for the issues identified in this report. The apology should be sent to HDC within three weeks of the date of this report, for forwarding to Mrs A.
131. I recommend that within three months of the date of this report, HBDHB provide HDC with an update on the progress of actions taken in response to the recommendations made in the internal review. In particular:
- a) That “fresh eyes” interpretation of CTGs is occurring every two hours, with overview of the whole CTG by the shift leader or CMC.
 - b) That all clinicians involved in this case have undertaken the FSEP training in the last 12 months.
 - c) That the Fetal Surveillance and Fetal Blood Sampling Intrapartum guideline has been recirculated to maternity staff to ensure that lactate testing occurs as per recommended best practice.
 - d) That CMC hours will be increased to 24/7.
 - e) That all women admitted to the birthing unit must be in compliance with the birthing unit policy.
 - f) That the booking history and ongoing history assessments must include all relevant clinical documentation and any previous births or surgical history.
 - g) That all opportunities to elicit difficult anaesthetic history are utilised prior to requiring an emergency anaesthetic.
132. I recommend that within three months of the date of this opinion, HBDHB provide feedback to HDC on the results of its audit of partogram use and details of steps taken to remedy any shortfalls found in the audit.
133. I recommend that within three months of the date of this opinion, HBDHB update its policy on fetal surveillance to reflect normal variability as being 6–25bpm (rather than 5–25bpm), in line with the comments made by RM Emerson.

134. I recommend that HBDHB use this case as an anonymised case study for its current obstetric department and midwifery staff, as well as for each new intake of obstetrics and gynaecology registrars. The case should be used for educational purposes to highlight the importance of carefully planning for and managing labour that is failing to progress in a primiparous woman with a raised BMI.
 135. I recommend that for educational purposes, RM G and RM E review the findings in this case, along with the requirements in the birthing unit Policy and the Hawke's Bay Maternity Primary/Secondary Interface.
 136. I support the work of the Neonatal Encephalopathy Task Force Fetal Heart Monitoring working group in implementing a nationally consistent multidisciplinary fetal heart monitoring training programme.
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Follow-up actions

137. A copy of this report with details identifying the parties removed, except Hawke's Bay District Health Board and Hawke's Bay Fallen Soldiers' Memorial Hospital and the experts who advised on this case, will be sent to the Royal Australian and New Zealand College of Obstetricians and Gynaecologists, the New Zealand College of Midwives, and the Australian and New Zealand College of Anaesthetists, for educational purposes.
138. A copy of this report with details identifying the parties removed, except Hawke's Bay District Health Board and Hawke's Bay Fallen Soldiers' Memorial Hospital, will be sent to the Midwifery Council of New Zealand and the Neonatal Encephalopathy Taskforce at the Health Quality & Safety Commission, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.
139. A copy of this report with details identifying the parties removed, except Hawke's Bay District Health Board and Hawke's Bay Fallen Soldiers' Memorial Hospital and the experts who advised on this case, will be sent to the Ministry of Health to highlight the challenging circumstances health professionals face when there are issues relating to the immediacy of access to such resources as an operating theatre or additional specialist expertise.

Appendix A: Independent clinical advice to Commissioner

The following expert advice was obtained from RM Nicky Emerson:

“1. Thank you for the request that I provide clinical advice in relation to the complaint about the care provided by Midwives [RM G], [RM E] and Hawkes Bay Core Midwives to [Mrs A]. In preparing the advice on this case to the best of my knowledge I have no personal or professional conflict of interest. I agree to follow the Commissioner’s Guidelines for Independent Advisors.

2. I have reviewed the documentation on file: Complaint from [Mrs A] 13 March 2020, Complaint response LMC Midwife [RM E] 26 May 2020, Complaint response LMC [RM G] 01 April 2020 including antenatal, postnatal, text records, referrals, lab results; Hawkes Bay DHB notes including antenatal, intrapartum and postnatal notes.

3. **Background:** [Mrs A], [in her thirties] was in her first ongoing pregnancy. Obstetric history included a salpingectomy for an ectopic pregnancy. Medical history included grommets. BMI was raised at 38. [Mrs A] had been well during her pregnancy. There was an appropriate Midwifery referral for discordant fetal growth which resolved during the pregnancy. Latent labour commenced on 2 [Month2]. Progress during the labour was slow and culminated in an emergency caesarean for fetal distress. There were problems with maternal ventilation during the anaesthetic and [Baby A] required resuscitation and transfer to [DHB2].

4. **Advice request:** I have been asked to provide advice on the Midwifery care received by [Mrs A], in particular:

1. The adequacy of CTG interpretation and assessments by [RM E] and [RM G] between 2–3 [Month2];
2. The timeliness of [RM E] and [RM G’s] consultation with an obstetrician on 3 [Month2];
3. The adequacy of CTG interpretation by secondary care midwives from 2 [Month2]–4 [Month2];
4. The timeliness of [RM B’s] escalation of care to an obstetrician on the morning of 4 Jul 2019;
5. If [RM B] could not get in touch with the obstetric registrar on-call, what else could have been done?
6. Whether fetal scalp lactate should have been done earlier;
7. Whether a senior midwife should have had oversight of the care provided to [Mrs A], and other consumers overnight on a secondary care delivery unit;
8. Whether [Mrs A’s] history of difficulty with anaesthesia/intubation should have been identified prior to the pre-op area for a LSCS, and if so, who should have done this?

1. The adequacy of CTG interpretation and assessments by [RM E] and [RM G] between 2–3 [Month2]

I have reviewed the CTGs and accompanying clinical notes as outlined below.

- On initial assessment, 2 [Month2] at [the birthing unit] (primary birthing centre) [RM G] attached a CTG as part of her assessment. [Mrs A] had reported contracting irregularly since 6am that morning. In my opinion the CTG was normal at that time. After this initial assessment [Mrs A] was sent home to establish in labour. In my opinion all assessments were reassuring and [Mrs A] had not yet established in labour and was still in the latent phase of labour. She was contracting irregularly and she was 2–3cms dilated on assessment. [Mrs A] was advised that she could contact [RM G] overnight if the situation changed.

Latent phase of labour

The complaint submitted expresses concern regarding being left at home prior to hospital admission. In my opinion [Mrs A] was in latent labour. Latent labour is described as a phase of labour up to 4cm (and by some definitions 6cm). In this period the cervix is effacing and dilation is beginning.

1. NICE (2007) recommend the following definition of latent phase — *a period of time, not necessarily continuous, when there are painful contractions and there is some cervical change, including cervical effacement and dilatation up to 4cm and the onset of active labour when there are regular painful contractions and there is progressive cervical dilatation from 4cm.*
2. **DIAGNOSIS OF PROLONGED LATENT PHASE** — There is no uniformly accepted definition for a prolonged latent phase. It had been defined by Friedman as *a nullipara who has not entered the active phase by 20 hours after the onset of the latent phase and a multipara who has not entered the active phase by 14 hours after the onset of the latent phase (up to date Literature review current through: Jun 2018.)*
3. Further definitions include prolonged latent labour as defined by a period of 2–3 days.
4. *Diagnosis of the latent phase is not an exact science. The overall condition of the woman must be considered including her hydration and ability to cope with pain. If prolonged latent phase is suspected, the case should be discussed with the on call registrar. In some cases, particularly if the gestation is post mature, it may be appropriate to induce labour. (Middle Essex Hospital NHS; reference to NICE Guidelines.)*

At 8.47pm on [Month2] 2 [Mrs A] was assessed by [RM G] as being in the latent phase of labour with reassuring clinical assessment. In my opinion it was reasonable to send

her home to establish in labour overnight. [Mrs A] had reported contractions since 6.00am and initial assessment occurred the same evening.

The following morning [RM G] contacted [Mrs A] at 09.00am and arranged to assess her again at [the birthing unit].

At 11.00am [Mrs A] was reassessed and clinical notes report that she had slept overnight. At this assessment, no membranes were felt and the possibility of ruptured membranes overnight was considered as membranes had been felt the previous evening. [Mrs A] was now 4cm dilated.

A prolonged latent phase (now 26 hours) is documented in the clinical notes along with discussion at 11.45am with the registrar on call requesting a further management plan.

Following discussion with the registrar, 100mg Intramuscular Pethidine was advised and a rest 4–6 hours. The registrar advised that if labour had not established after the period of rest [Mrs A] could go home and have her labour augmented the following day.

A High Vaginal Swab was sent to the lab (in response to the ruptured membranes and a vaginal discharge described) and care was handed to [a staff midwife] at 1.00pm.

The LMC changed (between partners [RM G] and [RM E]) and [RM E] visited [Mrs A] at 2.00pm to advise she would be taking over care from [RM G] at 4.00pm.

Following a period of rest, a further CTG was attached at 6.40pm by [a staff midwife].

2 decelerations were noted on the CTG and LMC [RM E] was asked to return.

After a full assessment at 7.00pm, and following a discussion with Registrar [Dr I] (and in consultation with [Mrs A] and her partner [Mr A]) the decision was made to transfer to [the specialist maternity facility] (the secondary care facility) to review and augment labour.

At 8.00pm [Dr I] was present at [the specialist maternity facility], assessed and documented a plan for [Mrs A]. Early decelerations are noted by [Dr I] and thought to be a sleep trace.

By 10.00pm [RM E] has been unable to hand over to core staff due to acuity and staffing shortage. A deceleration is noted on the CTG and [RM E] has stopped the augmentation of labour by turning off the drip (syntocinon-oxytocin). [Dr I] is documented as present in the room. Management plan is discussed with Registrar [Dr C]. The plan is to recommence the 'synto' and re-examine after 4 hours of regular contractions.

At 10.40pm [RM E] is able to hand over to DHB midwife [RM H].

Summary

I have been asked to advise on the adequacy of assessment of the CTGs by [RM G] and [RM E] on [Month2] 2 and 3.

Initial CTG was normal and [Mrs A] was sent home to establish in labour.

The CTG the following morning was also normal however labour was not yet established so a plan was made in consultation with the on call registrar. Care was handed to core staff.

At 6.40pm a deceleration was noted on the CTG by a staff midwife and as requested [RM E] returned to [the birthing unit]. Following a discussion with the registrar, transfer of care to secondary services was arranged and [Mrs A] arrived and was assessed at [the specialist maternity facility].

There are no clinical notes between 8.00pm and 10pm however there is a completed labour Partogram in that time which reports progress. In response to a deceleration on the CTG at 10.00pm the augmentation is stopped by [RM E] and the Registrar is contacted.

[RM E] is able to hand over to core staff at 10.40pm.

In considering the above, it is my opinion that both [RM E] and [RM G] have responded and acted in accordance with accepted Midwifery practice by escalating concerns immediately, initiating clinical response prior to receiving a plan (swab, change of maternal position and turning off augmentation). In my opinion there are no departures from accepted Midwifery practice in the interpreting of the CTGs from 2 [Month2] till hand over on 3rd [Month2] at 10.40pm.

2. The timeliness of [RM E] and [RM G's] consultation with an obstetrician on 3 [Month2]

On [Month2] 3 obstetric opinion was sought by [RM G] and [RM E] 3 times between 11am and 10.40pm.

[RM G] requested an obstetric plan at 11.45am on [Month2] 3. [Mrs A] had been in a prolonged latent phase of labour commencing the previous morning. A plan was made and commenced following consultation with the registrar on call. Care was handed to core staff at 1.00pm.

[RM E] was called to return to [the birthing unit] at 5.00pm. On arrival she completed a primary assessment and following discussion transferred [Mrs A] to secondary care at [the specialist maternity facility]. At 8.00pm, care had been transferred to [the specialist maternity facility] and the Registrar was in attendance at 8.00pm. Unfortunately [RM E] was unable to leave due to the unit acuity and staffing shortage. She remained until she was able to hand over at 10.40pm.

Further consultation was sought by [RM E] at 10.00pm when there was a deceleration on the CTG. In addition she responded by turning [Mrs A] into left lateral position and stopping the infusion until receiving further advice.

The above actions of proactively consulting 3 times in a 12 hour period, in my opinion are in keeping with accepted Midwifery practice with no departures.

3. The adequacy of CTG interpretation by secondary care midwives from 2 [Month2]–4 [Month2]

Secondary midwifery care was commenced at 10.40pm on 3 [Month2] when care was handed over from [RM E] to staff midwife [RM H]. An epidural was in place and labour augmentation had recommenced at 10.30pm under instruction from [Dr C] who later documented (10.40pm) in the clinical notes.

A normal trace is documented by [RM H] at 10.50pm. In my opinion the trace at that time was not normal and demonstrated reduced variability but was acceptable if further monitored.

At 11.30pm care was handed to [RM F] who documents a previous 'sleep phase' on the CTG which, in my opinion is a possible interpretation for the earlier reduced variability. Increased variability is now noted. Comprehensive assessment and notes follow.

At 12.10pm [Dr C] placed a fetal scalp electrode (FSE) on baby and external Fetal Heart (FH) transducer of the CTG is now replaced by the scalp electrode.

Instructions were left by [Dr C] to increase syntocinon as needed. Epidural is topped up.

At 12.55pm a *wildly variable fetal heart* rate is documented by [RM F] and the syntocinon is decreased. [Dr C] is documented as having viewed the CTG.

At 1.20pm the FSE is replaced by [Dr C] as it has come off.

At 02.25am there is difficulty advancing the epidural top up and the anaesthetist is called and restores epidural integrity (kink in catheter).

At 0.300am the CTG is reviewed by [Dr C]. There have been 3 decelerations in the previous 30 minutes. The plan from [Dr C] is to turn off the syntocinon, carry on and reassess at 05.00am or earlier if need be.

At 03.45am variable decelerations are noted to be *persistent but not consistent*.

At 04.20am variable decelerations are noted — But no longer with any depth to them — *good return to baseline a normal variability*.

At 05.30am a rising baseline is noted with reduced variability. [Dr C] is phoned and is currently in theatre, [Dr C] requests a vaginal examination (VE) to be performed.

Results phoned to O&G registrar.

06.00am LMC [RM E] notified to come in.

06.10am Variable decelerations noted.

06.34am Category 1 caesarean called by [Dr C].

In considering the adequacy of CTG interpretation by secondary care midwives I have reviewed the following documents: *RANZCOG Intrapartum Fetal Surveillance Guideline* third edition (2014) and fourth addition (Nov 2019), Hawkes Bay DHB Fetal Surveillance and Fetal Blood sampling/Lactate — Intrapartum policy 2016.

In summary, in response to CTG features there was consultation with an Obstetrician 12.10am, 12.55am, 1.20am, 0.300am, and 05.30am.

Between 03.45am and 05.30am continuing decelerations are noted twice along with a rising baseline and reduced variability.

In my opinion there had been a long period of decelerations that were at times variable and at times prolonged.

The normal CTG is associated with a low probability of fetal compromise and has the following features (*RANZCOG Intrapartum Fetal Surveillance Clinical Guideline 2014*)

Baseline 110–160bpm

Variability 6–25bpm

Accelerations 15bpm for 15 seconds (note that absent accelerations in the presence of otherwise reassuring CTG is of unknown significance in labour)

Decelerations none

I am critical that care was not further escalated earlier or when [Dr C] was in theatre at 05.30am however I am unclear whether there was an avenue to escalate concerns.

In considering the above I am unable to determine whether the acuity and staff shortage had persisted throughout the night, whether a senior Midwife or colleague was available to discuss deteriorating CTG, rising maternal temperature, history of long latent phase of labour and raised maternal BMI. I am also unable to determine whether there was an alternative registrar or consultant to escalate concerns to.

For the reasons above I am unable to comment further regarding the adequacy of CTG interpretation by secondary care midwives.

4. The timeliness of [RM B's] escalation of care to an obstetrician on the morning of 4 Jul 2019;

a. If [RM B] could not get in touch with the obstetric registrar on-call, what else could have been done?

I have covered this question in my response to question 3 above.

5. Whether fetal scalp lactate should have been done earlier;

In my opinion an earlier lactate may have been advisable however this is an Obstetric role, both decision making and undertaking the procedure.

It may have been prudent for the midwife to suggest a lactate earlier in response to the CTG however this is ultimately an Obstetrician decision and undertaking.

6. Whether a senior midwife should have had oversight of the care provided to [Mrs A], and other consumers overnight on a secondary care delivery unit;

As outlined above (question 3) I am unable to determine the seniority of [RM F] or whether there was a senior Midwife available for her to consult with. I am not able to comment on Trend care in the unit or whether it is usual practice to have a senior midwife in the unit overnight. In my opinion the presence of a senior Midwife is an important component of patient/staff safety overnight to co-ordinate and prioritise in accordance with acuity, supporting core staff and LMC midwives.

That said, the availability of senior Midwives will determine whether this is a viable option.

7. Whether [Mrs A's] history of difficulty with anaesthesia/intubation should have been identified prior to the pre-op area for a LSCS, and if so, who should have done this?

[Mrs A's] caesarean was complicated by anaesthetic/ventilation difficulties that were not identified until just prior to anaesthesia; and in an emergency situation.

It would appear that opportunities were missed in regards to eliciting this crucial information from [Mrs A] prior to the emergency when anaesthetic options were reduced.

In my opinion the responsibility for eliciting this information does not rest with one clinician.

From a Midwifery perspective, antenatal notes contain a comprehensive history including standard referral to secondary services. The referral does list previous surgery but does not document previous anaesthetic problems and there is a space for *other anaesthetic complications*. Whether the question was specifically raised with [Mrs A], I am unable to say.

I note Obstetric correspondence to the LMC on 27 [Month1] outlines a comprehensive medical and surgical history but does not mention previous anaesthetic complications.

This information was not elicited at the time of epidural insertion by the anaesthetist.

In considering the above I can only comment on the information obtained by LMC [RM E] who completed the booking. The booking is comprehensive however I cannot determine whether [Mrs A] was asked specifically regarding previous anaesthetic complications as the box is neither ticked nor crossed.

Further comments regarding Fetal Surveillance

I have considered the reported variability on the CTG and note that the Hawkes Bay DHB Fetal Surveillance and Fetal Blood Sampling Policy 2016 (Appendix 3) states that Normal Baseline variability is 5–25bpm and reduced variability is 3–5bpm. In my opinion this is misleading for the following reasons:

6–25bpm is considered normal variability

Previously 5–25bpm was recognised as normal variability, however current guidelines consider 3–5bpm as reduced variability.

As 5bpm cannot be both reduced and normal, current definitions have raised normal variability from 5 to 6–25bpm.

The above is an observation but I do not consider it has impacted on the care received in this case as normal variability in the clinical notes is consistently documented as >5bpm.

Further Education

Of note, fetal surveillance education is expected from every midwife however it is not mandatory currently.

The Ministry of Health (MOH), Health Quality and Safety Commission (HQSC) and Accident Compensation Corporation (ACC) agreed to work together on a Neonatal Encephalopathy Task Force. As part of the Neonatal Encephalopathy Task Force there is a dedicated Fetal Heart Monitoring working group. The group is comprised of representatives from both Midwifery and Obstetric professional bodies (NZCOM & RANZCOG) and the group also has consumer representation.

The working group role is to agree and implement a nationally driven and nationally consistent multidisciplinary fetal heart monitoring training programme for both midwives and obstetricians to attend.

Support the development and implementation of a regular standardised interdisciplinary training programme on fetal surveillance for all health professionals involved in intrapartum care by evaluating the:

- extent of fetal surveillance education programmes in New Zealand;
- effectiveness of training programmes on fetal surveillance for all health professionals involved in intrapartum care in New Zealand; and
- logistics of rolling out a national fetal surveillance education programme to all health care professionals involved in intrapartum care.

Note: Neonatal Encephalopathy (NE) is an umbrella term and hypoxic-ischemic encephalopathy (HIE) is a sub group of NE; however the terms are often used interchangeably and for the purpose of this report and the working group the NE taskforce addresses HIE.

Summary

I have been asked to provide an opinion on the midwifery care provided to [Mrs A] during her labour. In my opinion the LMC care from [RM G] and [RM E] is in keeping with accepted midwifery practice. Further clarification regarding history taking in regards to previous anaesthesia may be useful.

I have considered the care provided by the staff midwives for [Mrs A] and in my opinion it meets the accepted midwifery standard. My reasons are that consultation was sought throughout the labour and care was guided by the resulting plans.

However I am critical of the lack of escalation of the deteriorating CTG at 05.30am but I am unclear whether there was any alternative avenue for escalation as the registrar was in theatre. In addition, in my opinion a midwifery action of suggesting a lactate earlier may have been prudent.

Finally I acknowledge that this is a complex complaint which expresses concern regarding delay in ACC and DHB follow up. I am only able to comment on the midwifery care.

I extend my heartfelt condolences to [Mr and Mrs A] for the complexity of their complaint. I wish them the best in the ongoing care of their precious baby. I hope I have been able to address some of their remaining questions.

Nicky Emerson BHSc-Midwifery
Midwifery Advisor
 Health and Disability Commissioner"

The following further advice was received from RM Emerson:

"Thank you for the request that I provide further clinical advice in relation to the complaint from [Mrs A] about the antenatal care provided by LMC Midwives [RM G] and [RM E]. In preparing the advice on this case, to the best of my knowledge I have no

personal or professional conflict of interest. I agree to follow the Commissioner's Guidelines for Independent Advisors.

1. I have reviewed the documentation on file: A copy of my previous advice 23 June 2020, Antenatal documentation from [RM G] and [RM E] [dates]. Postnatal notes from [RM G], Complaint response received from [RM G] and further notes 2 April 2020, Response from [RM E] 26 May 2020. [Mrs A's] clinical notes from Hawkes Bay DHB.
2. **Background:** [Mrs A], [in her thirties], was in her first ongoing pregnancy. Obstetric history included a salpingectomy for an ectopic pregnancy. Medical history included grommets. BMI was raised at 38. [Mrs A] had been well during her pregnancy. Appropriate midwifery referral was made for discordant fetal growth which resolved during the pregnancy. Latent labour commenced on 2 [Month2]. Progress during the labour was slow and culminated in an emergency caesarean for fetal distress. Problems occurred with maternal ventilation during the anaesthetic and [Baby A] required resuscitation and transfer to [DHB2].
3. **Advice Request:** I provided midwifery advice 23 June 2020. I have been asked to provide further advice regarding the antenatal care provided by [RM G] and [RM E]. In particular: Whether the antenatal care provided by LMCs [RM E] and [RM G] to [Mrs A] was appropriate. Whether the management of [Mrs A's] raised BMI was appropriate and whether she should have been referred to a specialist.

[Mrs A] booked with [RM G] at 8 weeks and 4 days gestation. [Mrs A] was seen 15 times in the antenatal period by either [RM G] or [RM E], her last clinic visit was at 39 weeks and 4 days gestation. During the course of the antenatal care provided by [RM G] and [RM E] all routine midwifery care, referrals, tests and discussions are documented including planned pregnancy vaccinations, pregnancy supplements, birth plan with, in my opinion, no departure from accepted Midwifery care.

BMI and referral.

- Booking midwifery visit at 8 weeks and 4 days records [Mrs A's] BMI at 38.
- At 24 weeks and 6 days gestation, antenatal documentation records a discussion regarding referral based on [Mrs A's] BMI. At this time a diabetes screen is ordered (Polycose) by [RM G].
- At 27 weeks and 4 days gestation, serial growth scanning commenced due to raised BMI. A discussion regarding the potential need for referral based on BMI is documented [date].
- At 29 weeks and 4 days gestation ([date]), a referral is made to the obstetricians based on asymmetric fetal growth, detected at previous scan.
- At 31 weeks and 6 days gestation ([date]), an obstetric clinic visit in the preceding week is documented and a further scan is scheduled for [date].
- At 33 weeks and 6 days gestation, a follow up email to the clinic is sent as no correspondence has been received by [RM E] regarding previous obstetric clinic appointment.

- At 35 weeks and 6 days normalised fetal growth based on subsequent scan is documented.
- At 36 weeks and 4 days pre-eclampsia bloods are arranged due to a rise in [Mrs A's] blood pressure. Results are normal.
- At 37 weeks and 4 days a phone discussion between [RM E] and the Obstetric Registrar is documented. This discussion is based on [Mrs A's] elevated routine blood pressure. The discussion culminated in an obstetric assessment (same day) in the birth suite.

In forming an opinion I have considered the following:

- [Mrs A's] booking BMI was raised at 38.
- The *Guidelines for Consultation with Obstetric and Related Medical Services (referral guidelines)* suggest consultation if the BMI is >35 (page 25, 4017). There is no specification as to when this should occur.
- [RM G] and [RM E] have documented discussion with [Mrs A] about the potential need for consultation based on BMI at 24, 27 and 29 weeks.
- Serial growth scans are ordered from 28 weeks
- Diabetes screen is ordered at 24 weeks.

In my opinion these actions are in keeping with accepted midwifery practice with no departures. My opinion is formed for the following reasons. Serial scanning is appropriate from 28 weeks gestation as fundal height measurement alone (which commences at 24–28 weeks) is unreliable in the context of a raised BMI, this is due to the additional maternal adipose tissue; serial scans have been appropriately initiated.

The additional scan information regarding fetal growth is useful to the obstetricians on referral. In addition to the commencement of the growth scans, the diabetes screen is useful in identifying whether the raised BMI is associated with pre existing or developing maternal diabetes.

Whilst it is accepted that diabetes screening should not be based on risk factors alone the *Screening, Diagnosis and Management of Gestational Diabetes in New Zealand, A Clinical practice guideline 2014* (page 5) identifies a BMI ≥ 30 as a risk factor for gestational diabetes.

In summary, in my opinion the care provided by [RM G] and [RM E] regarding [Mrs A's] raised BMI is in keeping with accepted midwifery practice. The documented discussions, commencement of serial growth scans, subsequent referral regarding discordant fetal growth along with accompanying diabetes screening is in keeping with *The Guidelines for Consultation with Obstetric and Related Medical Services (referral guidelines)* suggesting consultation if the BMI is >35 (page 25, 4017). Additionally, Intrauterine growth restriction (page 25, 4011) discordancy of abdominal circumference (AC) with other growth parameters requires referral. This referral has occurred.

In addition a further referral was made on 11 [Month1] (37weeks and 4 days) following a phone discussion with the on call obstetric registrar. [Mrs A] was obstetrically assessed that day following a maternal rise in blood pressure at her routine midwifery clinic appointment. It is worthy of note that a pre pregnancy BMI ≥ 35 is a risk factor for raised blood pressure (Hypertension) and pre-eclampsia.

Diagnosis and Treatment of Hypertension and Pre-eclampsia in Pregnancy in New Zealand, A Clinical practice guideline (2018, page 35).

In my opinion the care provided by [RM E] and [RM G] is cognisant at all times of the risk posed by [Mrs A's] raised BMI and the timely appropriate assessment, consultation and referral is in keeping with accepted midwifery practice with no departures.

I hope this has answered any remaining questions regarding [Mrs A's] antenatal care and obstetric referral.

Nicky Emerson — BHSc — Midwifery”

The following further advice was received from RM Emerson:

“Thank you for the request that I provide further clinical advice in relation to the complaint from [Mrs A] about the antenatal care provided by LMC Midwives [RM G] and [RM E]. The additional advice requested relates to the care provided by the staff midwives at Hawkes Bay DHB. In preparing the advice on this case, to the best of my knowledge I have no personal or professional conflict of interest. I agree to follow the Commissioner’s Guidelines for Independent Advisors.

1. I have reviewed the additional documentation provided by the HDC: Response from Hawkes Bay District Health Board including responses from staff midwives [RM H] and [RM F], statements from [Dr I], [Dr C], [Dr D], Dr [...], [Dr J], Dr [...], Appendix A, B, C and D.
2. **Background:** [Mrs A], [in her thirties], was in her first ongoing pregnancy. Obstetric history included a salpingectomy for an ectopic pregnancy. Medical history included grommets. BMI was raised at 38. [Mrs A] had been well during her pregnancy. Appropriate midwifery referral was made for discordant fetal growth which resolved during the pregnancy. Latent labour commenced on 2 [Month2]. Progress during the labour was slow and culminated in an emergency caesarean for fetal distress. Problems occurred with maternal ventilation during the anaesthetic and [Baby A] required resuscitation and transfer to [DHB2].

Advice Request: I previously provided midwifery advice 23 June 2020 and 1 December 2020. I have been asked to provide further advice regarding the midwifery care provided by the hospital midwives based on the additional documentation provided. In addition, I have been asked to comment on any system issues identified. The advice provided below is an addendum to my previous advice.

On 3 [Month2] [Mrs A] was transferred from [the birthing unit] to [the specialist maternity facility] by her LMC [RM E]. On review of the intermittent care provided by the staff midwives at [the birthing unit] there appears to be no departures from accepted midwifery care.

At 8.00pm care was handed from [RM E] to the Secondary Obstetric care team at [the specialist maternity facility]. Due to the acuity in the labour and birthing suite there was no midwife available for [RM E] to hand over to until 10.40pm. This is acknowledged in the Hawkes Bay DHB report 4 February 2021. Midwifery care was handed from [RM E] to [RM H] at 10.40pm.

[RM F] commenced care for [Mrs A] from 3 [Month2] 11pm until 7.30am 4 [Month2]. During this time, [RM F] requested review or discussed care with [Dr C] at 12.10am, 12.55am, 1.20am, 1.54 am, 3.00am, 5.37am.

[RM F] notes that an 'open dialogue' was maintained with [Dr C] throughout the night. Hawkes Bay DHB and their practitioner reports acknowledge the high acuity in the unit overnight. There were delays due to [another woman presenting acutely]. It is reported that this woman's surgery was complex and was delayed due to sourcing specific cross matched blood. This situation presented acutely so could not have been planned for in advance.

Hawkes Bay DHB review (4 February 2020) notes that [Dr C] was aware that [Mrs A's] labour was not progressing at 3am but did not have the physical resources to perform a CS at the time and further acknowledges that the situation could have been escalated to the SMO who may have made the decision to open a second theatre (page 4).

Following my careful review of the additional documentation, given the continued dialogue with [Dr C], consideration of unit acuity and finite practitioner resource available I do not consider that [RM H] or [RM F] have departed from accepted Midwifery care. I note that there was no Midwifery leader on the unit at that time and this has subsequently been changed. In addition, DHB changes listed below in my opinion reduce the likelihood of [Mrs A's] situation reoccurring.

DHB Changes

- I note that HBDHB midwives and medical staff are now mandated to complete annual RANZCOG online fetal surveillance CTG training (FSEP) annually.
- A formalised 'fresh eye' (every two hours) role of viewing CTGs is now required from either the Clinical Charge Midwife or Shift Co-ordinator.
- The CTG sticker has now been updated to align with FSEP terminology.
- A Shift leader is now available overnight and, in the weekends.

Summary

Whilst my previous advice raised concerns regarding the possibility that [RM F] could have escalated care I am now satisfied that the resources and acuity at the time limited her ability to do so. I hope this report has addressed the questions raised and would be happy to discuss further if required.”

Appendix B: Independent clinical advice to Commissioner

The following expert advice was obtained from obstetrician Professor Peter Stone:

“The complainant was patient [Mrs A] (DOB [...]), aged [in her thirties] at the time of the events associated with this complaint.

From [Mrs A’s] detailed comments there are issues relating to:

Delays in communication with the clinical staff

Delays in sending forms to ACC

Disadvantage suffered due to the delays

(These issues are justified and the DHB has acknowledged that. In 2019–2020 it is not acceptable and would be below acceptable care standards.)

There does not seem to be specific comments about the issues of the care provided and the outcome for [Baby A] from [Mrs A], though in part due to the fact that the Health Board identified a SAC 2 event, both the Board and now HDC are investigating.

For reasons which are unclear (and should be specified), [the] Acting Chief Operating Officer has redacted some parts of the letter to HDC.

A summary of the clinical details and a time line in labour follow:

(Comments are in italics and the fetal heart rate monitoring will be commented upon separately.)

Pregnancy:

[Mrs A], [in her thirties], was in her second pregnancy, the first being an ectopic pregnancy for which she had a salpingectomy in 2017. (There would be anaesthetic notes somewhere about that surgery.) The index pregnancy occurred spontaneously.

It appears that menstrual data and ultrasound scans confirmed the gestation with an estimated date of delivery being ... She booked early with a self employed midwife (LMC) at 8 weeks gestation. There was no other past medical history though her BMI was 38.9 (obese — <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight/healthy-weight-gain-during-pregnancy>).

The booking HBA1c was 32mmol/L (which is in a non-diabetic range). She had a clear birth plan which included aiming for gas for analgesia and physiological third stage.

At around 29 weeks gestation, the LMC sought an assessment at the hospital clinic as there had been some possible asymmetry in fetal growth. (Whilst the LMC notes are not included in the bundle, it would be surmised that the LMC had been having fetal growth checks by ultrasound *(given the patient’s weight this is not unreasonable*

because using a tape measure for fundal height assessment is not accurate with high BMI and a maternal weight >100kg — there are Ministry of Health guidelines for use of the tape measure).

At that assessment it was noted that the midwife had also arranged a polycose screen which showed a result of 7.7mmol/L which is the top of the range for not proceeding to do an oral glucose tolerance test. Also as a result of that clinic assessment and after further scanning it was decided that the baby's growth was following an expected trajectory and was not asymmetric and the patient was returned to the LMC to continue care. It was noted that at the clinic, the pregnancy weight gain had been 8kg already and that the BMI would now have been 41.9 — which is at a level that according to the Maternity Referral guidelines warrants transfer of care to secondary care (although the guidelines are interpreted as being a booking BMI). Despite possibly having excluded gestational diabetes, this is now a high acuity situation due to predictable problems with fetal growth, possible development later of gestational diabetes should the high weight continue and also predictable problems in labour (Chu et al, 2007, Fyfe EM et al, 2011, [New Zealand data], Carlhall et al 2013). There was no comment about these issues from the clinic assessment.

A further hospital clinic assessment was requested by the LMC (or a different LMC as the referral was from [RM G] not the original booking midwife, [RM E]) [at 37 weeks gestation]. The reasons given for the referral were possible breech presentation and raised blood pressure. No weight or BMI seems to be available from that clinic assessment. A cephalic presentation was confirmed and hypertension or preeclampsia were excluded. The patient was returned to LMC care. *(As seems to be usual nowadays, there does not seem to have been any comment about future planning especially around further glucose monitoring and plans for labour and delivery.)*

Labour:

2 [Month2] time uncertain:

The patient attended the hospital on 2 [Month2] at 40 weeks gestation with an untimed assessment and a signature possibly from a midwife. It is surmised from the entry that the visit was later in the day because the patient stated that she had been contracting 'niggling' since 6.00am. A vaginal examination was done which showed the cervix to be fully effaced and 2–3 cms dilated with the fetal presenting part (head) at station -2. Membranes were said to be 'felt'. The patient was sent home to 'call LMC when contractions becoming intense, regular and unable to cope, otherwise review at 9 am tomorrow'. The fetal welfare assessment was said to be satisfactory with a reactive cardiotocograph (CTG).

(This assessment suggests that the woman was having sufficient contractions and/or discomfort to warrant coming into hospital. The findings on examination could be consistent with the start of active labour given that the cervix was fully effaced and 3cms, but it is possible that in a woman labouring for the first time that there may be

some hours before active labour would be established. — Labour onset is diagnosed retrospectively, but it is accepted that the definition of labour is [painful] regular uterine activity leading to cervical dilatation and ultimately birth of the baby. Once a diagnosis of labour is made, labour must therefore be progressive because the whole biological purpose of labour is to produce the birth of the baby. At this assessment, should there be no immediately abnormal findings, it is acceptable to wait but there must be a plan, because uterine activity is a stressor for mother and baby and at some point after this assessment it would be expected that active progressive labour would ensue. The plan to wait until 9am would be considered by many clinicians to be acceptable, but given the known associations between dysfunctional labour and obesity, caution needs to be exercised. (Also there are data that show that a prolonged latent phase of labour is associated with adverse outcomes for mother and baby Chelmow et al 1993 — over 10,000 cases reviewed; Maghoma J et al 2002.)

3 [Month2] 11.00am:

The patient was reassessed with a history that there did not seem to be an increase in the contractions overnight. Whilst there had been no per vaginal (pv) loss, the patient mentioned now that yesterday there had been a ‘little bit green’ pv discharge (*this should raise concern as this could be meconium if the fetal membranes had ruptured*). A further vaginal assessment was done which now showed the cervix to be fully effaced and 4 cms dilated, fetal head felt. It is also stated that no membranes were felt and that after the vaginal assessment there was ‘bloodstained? liquor following ?SROM ...’ At some point a vaginal swab was taken because in the laboratory results available there is high vaginal swab from 3 [Month2] which grew Group B streptococcus.

Also it is written ‘CTG commenced: Given ice cold water to drink’ (*whilst this action has been discredited [Bradford BF 2019, {NZ data}], it was thought that giving ice cold water to mother would ‘wake up’ the fetus in an attempt to see if the CTG became reactive — it implies that the CTG was not reactive otherwise there would have been no reason to give the water. It is not recorded if there were or were not concerns about the baby’s welfare at this time*).

11:45am

Further to the above, it was written ‘PS with regards to the VE, Stretch + sweep done, no membranes felt ...’. It was further stated that the CTG was reactive. (*This is now a serious situation with possible ruptured membranes for an unknown period, with possible green-meconium and now with active sweeping of the membranes — a definite plan to get labour established needed to be made. It was suggested that in an entry at 12.00pm — see below — that ‘if not laboring could go home’*).

12.00pm

A plan as discussed with the registrar on call was to give Pethidine, rest-sleep for 4–6 hours with then if in labour to continue with normal labour cares and if not to go home with augmentation tomorrow. (*To consider the plan as written would not only go*

contrary to the patient's original intention to avoid that type of analgesia, but also, if there had been ruptured membranes with or without meconium and after a stretch and sweep, to consider sending the woman home is surprising to say the least and does not take into account the fact that there is a problem with the establishment of labour). (Whilst some midwives may follow this type of care, the majority of specialists — and the patient was now apparently under secondary care — would have augmented the labour at this point.

1.00pm and 2.00pm

At 1.00pm the patient was resting and was undisturbed, that is no recordings were done.

At 2.00pm 'LMC [RM E] visiting to see [Mrs A], now on call for [Mrs A]. (This again illustrates a common problem in NZ maternity care at present — which is who is actually looking after and determining the care plan for the patient. She had been transferred to the hospital team and they had done the VEs and the registrar had prescribed Pethidine and agreed with the hospital midwife about the plan. It needs to be clear exactly who is taking responsibility for the care and hence the outcome for the woman and importantly her baby).

5.05pm

[Another DHB midwife] assumed care for the patient at this time. She documented a small amount of pink liquor on the pad. Contractions were noted.

6.40pm

[The DHB midwife] consulted with [another DHB midwife] regarding the CTG. It was then decided to call the LMC, [RM E] for primary assessment and the patient was made aware of this. (Yet again, there is lack of clarity of care and who is responsible. The DHB midwife took responsibility for the fetal welfare, that is assessing the CTG, but called the LMC for a 'primary assessment'. This is not a satisfactory situation in what is clearly now not a normal labour — there is developing prolonged rupture of membranes, and the midwives have also clearly felt that they would not be sending the patient home as had been mentioned previously, thus implying that more surveillance was needed.)

7.00pm

LMC midwife [RM E] documented a vaginal assessment with the cervix being fully effaced, 4 cm dilated, station -2, no membranes felt and some caput (oedema of fetal scalp). (Therefore there had been no objective change.) The LMC said the patient and her husband agreed to 'secondary input'. The registrar was contacted and the patient was moved to [the specialist maternity facility] — the delivery unit. At 7.30pm it is written that 'DHB aware of request to handover as secondary'.

8.00pm

Now in the delivery unit, registrar [Dr I] reviewed the situation and at 9.40pm discussed with the specialist on call [Dr D].

9.40pm

Here in the notes it states 'D/W [Dr D] given abn CTG and no progress — augment'. *(It is unclear why there was no comment about why the CTG was deemed abnormal and what actions would be taken to confirm fetal welfare. It seems surprising that at this early stage in what was shaping up to be a complex situation that the fetal welfare issue was not addressed further. Whilst HDC has named [Dr C] and seeks answers, there are also questions to be asked of all clinicians at this point.)*

[Dr I] performed a further vaginal assessment and wrote 'ARM w fundal pressure — clear liquor; that is artificial rupture of membranes (with pressure to hold the fetal presenting part in the pelvis and the fluid seen was clear). *Thus at least at this point the forewaters had been intact till now and when ruptured the fluid was clear, hence not meconium stained.* Now there was a commitment to augment labour and deliver because there had been a definitive rupture of the membranes *(the rationale though to write 'given abn CTG ... augment' does not necessary follow logically, if the CTG is abnormal there needs to be a clear definition of what abnormal means and why it would be reasonable to stimulate more contractions with the potential to add stress to the baby).*

10.00pm

At this time an epidural was in situ. At this time there is a comment that care had not been handed over due to staffing and acuity on the unit. Also at this time there was a changeover of registrars and the oncoming doctor was briefed. The plan was to continue Syntocinon and reassess vaginally after 4 hours which would now be at 02.00am on 4 [Month2].

10.40pm

DHB midwife [RM H] now assumes midwifery care.

10.50pm

Midwife reviews the CTG and scores as normal, one previous prolonged deceleration noted by the registrar seemed not to have recurred.

11.30pm

DHB midwifery staff changed to [RM F]. The oxytocin was not increased so was running at 2mU/min *(which is a very low dose in this situation).*

4 [Month2]

12:10am CTG deceleration noted and registrar [Dr C] called. A vaginal assessment was performed and a fetal scalp electrode was placed to provide a better recording of the fetal heart rate. There had been no change in cervical dilatation with this remaining at 4 cms. It was decided to increase the syntocinon.

12:55

[Dr C] was called to review the fetal heart record, it being described as 'widely variable FH — Difficult to ascertain baseline'. The fetal scalp electrode had become detached and at 1.20am was reapplied and it was stated 'all well again'.

2:25am

There were difficulties with administering an epidural top up (needed as with increasing Syntocinon, more analgesia was required) and the anaesthetist was called and re positioned the epidural catheter.

3:00am

It is noted that [Dr C] reviewed the patient (*but it does not appear that there was a vaginal assessment as previously planned*). It was stated that [Dr C] would review at 5.00am but at 3.15 am it is written that [Dr C] said to turn the Syntocinon off.

A critical point is that it is apparent that the partogram had been started at 8.00pm on 3 [Month2] at 4 cms — but she was 4 cms at 11.40am. Thus at the time the partogram was started she had been at 4 cms for over 10 hours with no progress. Once she came in the DHB team care and the DHB delivery unit, the clinicians started the partogram and even if that start time is accepted (which this reviewer has grave doubts about) the alert and action lines should have been drawn on at that time, that is 8.00pm. However, at 3.00am on 4 [Month2], thus retrospectively, someone revised that definition of when labour started and placed the lines from 3.00am. In my view this is a critically deceptive and potentially dangerous thing to do, because it now appears as though the labour progressed well when in fact for many hours — at least 4 hours — there had been no progress. I would submit that there had been no progress for many hours before that and given the events of 2 [Month2] and earlier on 3 [Month2] and including knowledge of how obesity may affect the efficiency of the first stage of labour, it could be anticipated that the labour progress was likely to be poor. Even if this submission is not accepted, had the lines been drawn at 8.00pm, then at 3.00am, progress would have fallen outside the expected and accepted norms and would have been at the action line which in this case, given the augmentation already, would have indicated need for caesarean section then. It would seem that that is what the anaesthetist expected given the note written.

(It is also noted that on the Pregnancy and Delivery Record it states that the first stage of labour was 48:28 — thus the midwife filling this out considered that that was the case — this duration is clearly outside the range of normality.)

3.30am

A retrospective note from the anaesthetist described the repositioning to the epidural but ends ‘... advised by obstetric team — for C/S for FTP (failure to progress)+foetal distress ... LMC checking block height’ (*but the caesarean section did not proceed then, no reasons are given*).

4.00am

A retrospective note from [Dr C]:

‘ATSP CTG +iv at 0130 ... reviewed again at 0300 BL (means baseline fetal heart rate) 140 with prolonged variable decels with normal variability

Syntocinon stopped + repositioned

CTG improved with this + no further decels+ n variability’.

‘Plan 1 review again at 0530+ if still 4cm — for LSCS

2 contact if any concerns about CTG’

(Thus the patient was 4cms at 11:40 am on 3 [Month2] and was augmented — albeit with small and somewhat intermittent dosages of Syntocinon from 10:00pm and yet over 7 hours after this, it was decided that if she was still 4cms that this would be the decision point to diagnosis ‘failure to progress’ and deliver by caesarean section. It is not known what the seniority or experience of the registrar was and/or whether the specialist was involved during the night in the decision making processes). (It would also appear that [Dr C] changed her mind about the caesarean at 3.30am because the plan became ‘review again at 0530’. There is no record of the specialist being consulted.)

4.20am

The notes record the ‘patient sleeping intermittently and that contractions continue 4–5 in 10 (no oxytocin)’. *(It is unusual especially in a nulliparous labour which required augmentation to be able to cease augmentation and for the labour to continue, but it does occur. To be sure that this is the case, careful vaginal assessment is required. The next assessment was at 5.45am and this was done because of fetal heart rate concerns rather than assessment of labour progress. It would have been necessary or at least prudent to have been doing a further vaginal assessment for progress at this time anyway.)*

5.15am

The midwife noted a rising baseline fetal heart rate and at 5.30 am it appears as though the pain relief was not satisfactory so Entonox was being used in addition to the epidural. The registrar was in the operating theatre, but asked that a vaginal assessment be done.

5.45am

The vaginal assessment showed that the cervix was now 7–8cms dilated, there was fetal scalp oedema-caput and this was below the maternal pelvic ischial spines and it was difficult for the midwife to determine the position of the fetal head. The comment was that the fetal heart rate and variability had improved following the vaginal assessment.

6.30am

A retrospective note from the registrar [Dr C] shows that the CTG had a baseline of 160–165 beats per minute with ‘complicated variables not recovering to baseline.’ A further vaginal assessment showed the cervix to be 8 cms dilated with a deflexed occipito posterior position of the fetal head. Apparently a fetal scalp blood sample must have been taken because the fetal scalp lactate result was 11mmol/L which shows fetal acidaemia and requires urgent delivery. An urgent caesarean section was called at 6.25 am. *(This was the only appropriate action available at this stage as the baby was not deliverable vaginally due to cervical dilatation. The time from decision to perform caesarean section until knife to skin and then delivery was acceptable.)*

Delivery:

There appears to have been anaesthetic problems at the caesarean section.

Given it took just over 30 minutes from decision to deliver to knife to skin, it is not clear why this delivery was not performed using the epidural. The anaesthetic notes seem to be confined to a small handwritten comment on the bottom of the anaesthetic record. *(There may be more notes somewhere else but these are not apparent. There is no clear reason to perform a general anaesthetic unless the epidural was not working. There would have been time to do a delivery top up. This is safer than a general anaesthetic and especially in an obese patient.)* The epidural was removed at the end of the operation so it can only be deduced that this was not functional.

In addition it is noted in small print that immediately on intubation there was ‘rapid desaturation’ and the baby was delivered ‘whilst maternal sats in 80s’.

There was an operation note (after which [Dr C] does not appear to have made any further entries in the notes. *(Given the outcome of the baby, and the labour, it would have been good practice for [Dr C] to have communicated with the patient and documented her conversation in the medical record.)*

The operation note explains that the patient was delivered ‘Under maternal hypoxia with saturations of 57–80% for 5 minutes after RSI (which is rapid sequence induction. Baby delivered with significant caput and moulding and handed over to Paediatricians requiring CPR ...’

It was further recorded that under procedure ‘Under GA supine position ...’

(It has been clearly and very well documented that the supine position is associated with aortocaval compression and reduced blood supply to the uterus and this is a suboptimal position for a pregnant woman and especially in the situation of acute fetal compromise – Humphries et al 2018 [New Zealand data]. It could be a reason for the patient’s desaturation as there may have been reduced venous return to the heart and reduced cardiac output. Such a situation can only further compromise an already complex situation.)

Review of the Cardiotocographs:

11 [Month1] 1310 hrs

A 15–16 minute record is available which shows a normal baseline heart rate with normal variability, accelerations, fetal movement and no decelerations with uterine activity. This would be considered a reactive CTG not requiring any action.

2 [Month2] 2050hrs

A record of 33 minutes which would be summarized as reactive with accelerations and no adverse response to uterine activity. This CTG would be considered by clinicians as reactive, satisfactory and would not require any action.

3 [Month2]

A number of records are provided from this date and unfortunately some are enlarged and some are reduced in size.

- i) Starting 11:15 until around 11:58am. This record has a normal baseline rate with normal baseline (long term) variability. There is a break at 11:37 but overall there are no decelerations that can be verified apart from possibly at the very end of the record before the machine was taken off. This CTG would have been reported as normal and reactive and in the absence of continuing the tracing further comment at this time is not possible.
- ii) Starting at 17:03 (and now on a different machine which alters the way the recording is printed out) the immediate obvious impression is that the CTG pattern has changed and now there are decelerations clearly shown at 17:08 and 17:14 which are associated with uterine contractions. Compared with the record earlier in the day, the variability (LTV) is reduced but does meet the criterion of being 5 beats per minute (bpm). There are no decelerations by accepted criteria. At around 17:59 the CTG is stopped. It was at 1840 in the notes that the midwife did notice the decelerations and discussed this with [another midwife] who advised to call the LMC. And at 1900 a note was made to call for secondary input given that the patient was 4 cms dilated. The reason for the call for secondary input was not documented but the DHB registrar planned to move the patient to the [specialist maternity facility] delivery unit. It was at this point that the plan as discussed with the specialist was to rupture the membranes, and commence Syntocinon

augmentation. It was clearly noted that the CTG was abnormal and all would agree with this, this reviewer included.

- iii) Probably around 19:40 — the reproduction is poor and the timing hard to read but around this time the CTG has recommenced and continues very much as before, though there is a period around 19:45–19:50 where the variability seemed to increase to a normal pattern for a short period. Just after 20:50 the fetal heart trace abruptly changed from a baseline of 135 bpm to 85–90 bpm. There is a serious problem here because there is nothing in the clinical notes from 19:40 to 22:00 so it is not possible to know what the clinicians thought about the abrupt change in the fetal heart tracing. It could have been considered maternal, but (despite poor quality reproduction — and it may be worth looking at the original) it would seem that the succeeding tracing may have shown an increasing fetal heart rate which could be interpreted as a recovery from a fetal bradycardia. What is clear is that at trace number 08282 an epidural is noted as being inserted and the fetal heart rate is showing variable decelerations and after a period of instability in the fetal heart rate baseline, there is a recovery to a baseline of 155bpm with reduced variability by about 21:53. It was recognized that the CTG was abnormal because the syntocinon was recorded as being stopped and the patient moved onto her side. It was recorded that at 22:30 the Syntocinon was restarted. Thereafter, the CTG could not really be considered as normal.

From 21:50 to 22:38 there is reduced variability with decelerations (although subtle or ‘undramatic’ nevertheless the fetal heart rate drops >15bpm for >15seconds with contractions). There was a registrar review at 22:40 with the comment about one prolonged deceleration but it is unclear when this was. *(It is reasonable to suggest that during all the above the CTG would be consistent with the baby being hypoxic. It is noted that a healthy fetus has reserves and may recover from an hypoxic period, but this has to be taken into the overall clinical context).* At 22:50 [RM E] took over and wrote that the CTG was normal.

At midnight on 3 [Month2] there was one large variable deceleration and although there was good fetal heart rate tracing, the registrar took the opportunity to reassess labour progress and apply a fetal scalp electrode. There had been little progress (noting the very low dosage of Syntocinon being given), and it was decided to increase the dose.

- iv) At 00:40 there is a period of markedly increased fetal heart rate variability and this was recorded in the clinical notes. This was from 00:40 to about 00:53. This pattern is considered consistent with hypoxic variability as it is seen when the fetus is hypoxic or recovering from a period of hypoxia. It was decided to reduce the Syntocinon infusion rate. There was a further period of increased variability at 01:00 to about 01:03 after which until 01:46, the fetal heart rate has reduced variability with a baseline between 155 and 160 bpm and variable decelerations. These are clear changes but may not have been appreciated as attempts were

- made to increase the Syntocinon and from at least 02:06 to 02:29 it was considered that the CTG was normal and taken in isolation, during that period it would score as 'normal'.
- v) At around 02:25 there were problems with the epidural and also the CTG showed a prolonged deceleration from 02:30 to 02:33. The registrar reviewed the situation at 03:00 and it was decided to continue care as planned with a reassessment at 05:00. At 03:15 the Syntocinon was turned off on the registrar's instructions. It is assumed this was because at 03:13 there was a fall in the baseline fetal heart rate and a period of 5 minutes before the rate increased again to around 150 bpm. Following this there was a period of what was taken to be 'normal' variability but at 03:53 to 03:56 there is a period of increased abnormal variability. (*Again it is reasonable to suggest that the CTG is indicating that the baby is reacting to an hypoxic stress*). All through the tracing from at least 02:20 there are ≥ 5 contractions in 10 minutes. The tocograph cannot indicate the strength of the contractions, but this frequency of contractions is more than the usual 3–4 in 10 minutes and may well stress a fetus. It is noted that the Syntocinon infusion was stopped at 03:15, so uterine activity after that was spontaneous and thus progress would be expected unless that labour was dysfunctional possibly due to obstruction from a malposition such as an occipito posterior position of the fetal head — not uncommon in nulliparous women. The CTG continued for some time with abnormal features from time to time and periods interpreted as normal variability.
- vi) At 05:30 the midwife noted a rising fetal heart rate baseline and reduced variability. Also at this time a maternal temperature was recorded at 37.6 which may indicate infection or dehydration and is higher than expected due to the epidural per se. The registrar was unavailable, but a vaginal assessment showed that the cervix was now 7–8 cms dilated, thus there had been progress but the fetal position was undetermined. At some point and for some reason now, the registrar attended. At 06:00 there were variable decelerations, an unstable baseline and at 06:10 a complicated baseline tachycardia. The registrar performed a fetal scalp blood sample which showed a lactate level of 11mmol/L which was very high and necessitated urgent delivery. As the patient was not fully dilated and the fetal head was still too high in the pelvis, the delivery had to be by caesarean section.

Answers to specific questions:

[Dr C]:

1. As indicated above, the registrar has not documented the reasoning behind some of the actions taken. As discussed in detail above, it is apparent that all clinicians in the unit considered parts (at least) of the CTG abnormal. This reviewer did not see any suggestion that the staff considered that they were having difficulty interpreting the CTG and therefore asking the specialist to review it, either by faxing it through to him or asking him to come in to review the situation. This reviewer was unaware of the 2200hr hand over procedures at Hawkes Bay DHB, but in centres such as Auckland

(National Women's and Middlemore) the specialists attend the handovers in person and this provides an opportunity to review all patients in the unit. This is a system and 'culture' issue.

Having said the above, and not knowing the experience of [Dr C], it is apparent that the abnormal CTG was considered but not in terms of overall context. These are difficult situations and clinicians hope that the labour will progress well and the baby will be born expeditiously and hence tolerate the labour. The fact is that this does not always occur and there are very few signs that can predict an outcome until the labour unfolds. Had [Dr C] had concerns but was unwillingly to take the major step of calling a 'halt' to the labour, she could have had a discussion with the specialist on call. Similarly, had the midwives been concerned, they could have placed more pressure on the registrar to act or seek help. Thus it is concluded that the CTG interpretation was not adequate. Given that registrar trainees in the RANZCOG training scheme are required to complete the RANZCOG FSEP early on and in New Zealand there is a midwife trainer and many midwives have also done the course now, it would be fair to conclude that the interpretation of the CTG, but more importantly the labour care that followed fell below what would be good practice nowadays.

2. The issue of labour augmentation is difficult because the woman began in the midwifery unit where augmentation is not generally done. There is some relatively low grade evidence that early augmentation in the latent phase or early in labour once the cervix is effaced will shorten the duration of labour. Whether this is associated with better obstetric outcomes has been open to considerable debate. The patient had a BMI>40 (which is the NZ maternity referral guidelines at the end of pregnancy and only 5 kg could be attributed to fetus, placenta and amniotic fluid) and would not have been suitable for booking for delivery in the midwifery unit. It is known that there is a relationship between gestational weight gain obesity and adverse pregnancy outcomes including from New Zealand data (Chung JGY et al 2013). *It is noted that in the DHB guideline for 'Risk Factors for consideration when discussing place of birth BMI is not an 'absolute'. This is an omission which needs to be corrected.*

Having said that, the transfer did occur at an early stage in the labour, but nevertheless having a clear written policy that the LMC remains 'responsible for the midwifery care of a woman having an induction' leads to lack of clarity as to who is ultimately responsible for detecting problems which may arise and then taking appropriate action. In the culture prevalent in New Zealand, the oversight is based on midwifery and particularly in Hawkes Bay, so it is a team effort and [Dr C] cannot take individual sole responsibility for the management of the labour, even if it was felt that she should.

Whether this is therefore an appropriate standard of care or an optimal way of providing care is to some extent beside the point because the way the care was arranged is now standard practice in New Zealand. This also answers some of the questions posed to the District Health Board. Current practice of maternity care in New Zealand is not seamless and collaborative, but episodic with boundaries between carers

and differing employment relationships of the clinicians. Individuals are required to work within these systems. This is clearly shown in this case where the LMC midwives wrote at 11:45 on 3 [Month2] that there was a prolonged latent phase and to discuss with registrar but care was not transferred till 1930hrs that day. *(There has been considerable discussion and controversy about the latent phase but whether it ends at 4 or 6 cms cervical dilatation is irrelevant in this case because the whole clinical situation has to be taken into account and the staff all seemed to concede that [Mrs A] had a prolonged latent phase. [Angeby K et al 2018, Tilden EL et al 2018; with Rosenbloom et al 2019 showing that slow progress from 4 to 6 cms is associated with adverse outcomes.]*

3. Lactate testing. Ideally with some degree of hindsight, of course, if the determination of the fetal acid base status or lactate had been made earlier delivery would have been expedited earlier. However as commented, it is very difficult to perform fetal blood sampling at ≤ 4 cms cervical dilatation so it is likely that in reality only an assessment between 3.15am and 5–6.00am would have provided an opportunity to make such a test. Therefore, as also stated earlier in the report, a review of the whole case and a decision as to whether it was reasonable to continue with the labour was really the issue. What is agreed by most clinicians, is that if it is thought there is a reason to do a fetal blood sample and then this becomes not possible, delivery has to be expedited on the basis that it is considered possible that the baby is truly acidaemic. The CTG was already abnormal in the latent phase or early active phase of labour, such that it is likely that the baby will not tolerate continuing the labour unless the delivery is likely to be very soon.

4. The timing of the caesarean section is really based on the clinical assessment as well as the lactate. As per the answer to question 3 above, it follows that the nature of the CTG abnormalities was such that a definitive decision involving the specialist needed to be made earlier than 6.00am as to whether it was reasonable to continue the labour. As stated earlier in this report, it is considered likely that the specialist would have delivered earlier — but it is acknowledged that this is speculation. The continuance of the labour in the face of a consistently abnormal CTG (because the patterns were unchanged for some considerable periods as described above) without clear reasons being written in the notes would fall below a good standard of care.

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1. The DHB correspondence has suggested that the staffing levels were adequate. However in the notes at 2200 hrs on 3 [Month2] it states 'still unable to handover care to DHB due to staffing and acuity'. At 2240 care was handed over to a team midwife and at 2330 there was another team midwife assigned to the patient. The provided rosters do not explain what a care associate or a casual care associate is nor does the list of abbreviations explain N ca. There is a letter from [the] Chief Operating Officer dated 9 July 2020 which discusses the staffing. Some of the names in this list who are said to have looked after [Mrs A] seem to be different from those in the clinical notes.

What is not apparent from the letter is whether on the night in question there were sufficient staff noting that there seemed to be a total of 5 midwives on the floor and the letter states that midwife [RM F] was facilitated in providing 1:1 care to [Mrs A]. From the clinical notes it does appear as though [RM F] was providing 1:1 care which is to be applauded. It would be necessary to know exactly how many women were in labour and what the acuity was before it is possible to comment on adequacy of staffing. It was noted that at some stage in the early hours of the morning the registrar was performing a caesarean section but it does not seem as though it was felt necessary to call in the specialist on call.

2. It does not appear as though [RM F] was particularly concerned about the labour and CTGs, in that, concerns, if these were present, were not elevated to the midwife in charge. Given the model of care with primarily the 1:1 midwifery taking the minute by minute responsibility for the labour, it would have been ideal if there had been another opinion more than once about the course of the labour and the fetal welfare. This would be true of all labours that were not progressing normally. As many midwives now have undertaken the RANZCOG Fetal Surveillance Education Programme, it is suggested that many midwives would consider the CTG abnormal and requiring definitive action. The concept of a second pair of eyes is now well established and it may have been beneficial and led to a different outcome in this case.

3. The anaesthetic difficulties require detailed comment from an experienced obstetric anaesthetist. The anaesthetic notes that have been made available in the bundle are too scant to make detailed comment. Most anaesthetists do examine the neck at least prior to general anaesthesia. This was a very difficult and potentially dangerous anaesthetic with obstetric urgency, possibly a poorly functional epidural, an obese patient at night (or early morning) and the levels of experience of the staff unknown. Further assessment of the anaesthetic should come from an anaesthetist.

4. The escalation of care guideline or Support Flow is only as good as its implementation. It is unclear if it is mandatory. Also it does not seem that all caesarean sections need to be notified to the specialist on call by the registrar. In a unit with only one registrar on call and the specialist at home, it would seem wise to have the specialist notified not the least because a midwife may have an emergency whilst the registrar is unavailable in theatre, for example. This could also include an addition to the bubble, where the midwife could call the specialist directly, perhaps at the agreement of the registrar when the staff know that the registrar is in theatre and therefore unavailable.

5. The other issue is that of obesity. It is noted that in the 2015 Hawke's Bay Maternity report (reference given) that obesity with a BMI>35 is identified as a risk and is being used as a clinical indicator. It would be appropriate if the DHB had specific policies around the care in pregnancy and labour related to this group of women. At present in the Support Flow chart a BMI>40 is a 'phone consultation' and 'consultant consideration of consultant attendance'. This is rather ill defined given that according to the report this group of women have a 33.8% caesarean rate and the complexities are well known.

At National Women's in Auckland, registrars must notify the specialist for all caesarean sections:

(https://nationalwomenshealth.adhb.govt.nz/healthprofessionals/referrals-and-information/maternity/Registrars-Guidelines-for-Support-in-Obstetric-and-Gynaecology_2018-07-13.docx accessed 19 August 2020).

It is suggested that given the acuity noted in the 2015 Hawke's Bay Annual Report (<http://hawkesbay.health.nz/assets/Maternity/HAWKES-BAY-MATERNITY-SERVICES-ANNUAL-CLINICAL-REPORT-2015.pdf>) and the needs to triage and elevate care when the unit is busy that modifications be made to the Support Flow Chart.

Summary:

This patient illustrates the problems of a dysfunctional or obstructed and hence prolonged labour in a nulliparous woman, who after a long period of slow progress does eventually get into labour. This is not uncommon in nulliparous women especially if there is an occipito posterior fetal position but will be more likely in obese patients who labour less efficiently. So, in these circumstances by the time labour progresses, not infrequently the baby is compromised and requires urgent delivery.

Especially in the obese woman, this then becomes an extremely complicated and risky procedure with junior staff, in an after hours situation with difficult anaesthesia and difficult surgery.

These circumstances are or should be well recognised by obstetricians and midwives alike and should be anticipated and then planned for. Accurate and 'proactive' planning and discussion with the woman (and family) can lead to the development of a labour plan which seeks the alerts to when progress is not as expected and actions can be taken before 'it is too late'.

What might be acceptable practice for a healthy multiparous woman is very different from the situation faced here. In the former situation, a period of assessment without intervention is appropriate and indeed augmentation of multiparous woman must be done with great caution so as to avoid uterine rupture. In the nulliparous situation which is the subject of this complaint, the failure to recognize all the factors which impact on the labour and delivery will likely result in the outcome that occurred or even should the baby be well, in a complex birth and difficult recovery for the woman.

In this case, the initial plan to deliver in the midwifery led unit may be seriously questioned given the risk factor of obesity and known associations with complex labour. However, after attempting to deal with the prolonged start to labour, the midwives involved did seek secondary advice and transfer was arranged to the delivery unit. That was a prudent decision and it was recognized by all that the patient was not labouring in a normal or expected way.

It was also recognized that there were abnormalities on the fetal heart rate tracing and as such there was the difficulty of getting sufficient adequate uterine contractions to progress labour whilst not compromising fetal welfare. This is not an infrequent situation, but it requires the clinicians to step back — undertake a reassessment of the whole situation and seek as much objective evidence about fetal welfare as possible. Sometimes it has to be recognised that this is difficult or not possible and the delivery plan needs to be revised. Generally, (though not always) it is very difficult to obtain a fetal scalp blood sample at ≤ 4 cms cervical dilatation and thus it is difficult to determine whether the fetal heart rate patterns are indicative of fetal acidaemia (increased lactate or low pH and abnormal base excess). Whilst it is accepted that the relationship between fetal heart rate patterns and fetal acidaemia are not absolute, there are indications on the CTGs available that the fetus was at least stressed and hypoxic and given the early stage of labour, a decision has to be made as to whether it is prudent to continue with labour. One of the issues in this case is that there is no written discussion about what the thought processes of the clinicians were, so it has been difficult to determine what their views were on the overall clinical situation.

(It is pure supposition, but had the specialist seen the CTGs and reviewed the progress, there might have been a different outcome. It is also assumed that all the staff involved had undertaken the RANZCOG Fetal surveillance programme teaching course and were up to date with this.)

Abnormal fetal heart rate patterns are often the catalyst for urgent delivery or more objectively a fetal blood sample as done here, but the healthy term fetus has considerable reserves and only uses these up when there is an abnormal situation such as poor progress. Long labour is associated with infection, fetal hypoxia and if prolonged, fetal acidaemia.

Thus, it is the opinion of this reviewer that there were abnormalities on the intrapartum CTG that presented a missed opportunity to step back and reassess. Having said that, these are difficult clinical situations and a team effort can assist in clinical decision making. This questions the chain of responsibility and questions at what point registrar trainees or individual midwives should be deemed responsible for managing complex cases. (The DHB correspondence suggests that these were all senior midwives.) Thus there are system issues as well. Most peers would agree that the CTG was abnormal and required clearer decision making. There will be lesser consensus about who should be taking responsibility.

In units such as Hawke's Bay with a strong focus on midwifery led care, it would not be unusual for the registrar to place reliance on midwifery advice and should a midwife not speak out, then the registrar is likely to take this as at least passive acceptance of the management. The days of specialist oversight of all labours seems to be over. It is when there are outcomes such as that which has happened to [Mrs A], that it becomes apparent that there can be lack of clarity about responsibilities. On the contrary, if this is not the situation in this case, that is, if all clinicians felt that the CTG and care were

satisfactory, then that is in a way a more serious matter and one of education about the risks presented by the patient and the response to the labour progress and fetal heart patterns.

Clinicians should not suggest to parents that a claim to ACC at this stage is necessarily helpful nor likely to be successful. In the absence of the paediatric notes, it is not possible to conclude what the baby's outcome is likely to be. In this case it is likely that due to the acidaemia, evidenced by the lactate values, the condition at birth was due to intrapartum factors, but a full investigation of the baby is needed before conclusions can be made. In individual cases it is not always clear why a baby may 'exhaust' his or her reserves at a particular time and as information about the baby becomes available a clearer picture develops. Other causes which can be relevant include metabolic disease, infection, drug exposure, nervous system malformation and neonatal stroke (Edwards and Nelson 1998). It is also unclear how the baby will progress in childhood, as remarkably, many babies born with low pH or suffering neonatal encephalopathy progress well. However, some do not which is why paediatric followup and developmental assessment is critical.

Unknowns:

There are some unknowns in this case and it would be helpful for the HDC to ascertain answers as this will provide a clearer picture about the level of care and experience being brought to this case.

- Experience of registrar

- Experience of LMC midwives

- Experience of hospital midwives

- Attendance at RANZCOG FSEP courses

There needs to be a neonatal review specifically to determine immediate assessment at birth, neonatal gases, not just relying on cord gases, the period of stabilization prior to transfer.

Assessment of likely acidaemia and or birth asphyxia and consideration of neonatal cooling — what documentation is there about this?

Can Hawkes Bay initiate cooling and if not given the geographical location, should the Unit be able to start cooling?

There needs to be an anaesthetic review also — are there more records, could the induction of the anaesthetic have been performed differently, what steps were taken to improve maternal oxygenation?

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The following further advice was received from Professor Stone:

“In reply to the request I need to clarify the position that as an expert advisor I need to take.

The original complaint related to delays in the District Health Board staff communicating with the complainant.

These delays have been acknowledged and I would consider that in 2020 such delays are not acceptable as these add to the complainant’s distress. It has long been acknowledged that timely open disclosure is the principle by which adverse outcomes should be dealt with. As such, I do consider this to be a serious issue, not the least because not only is it below an acceptable standard of care but it only exacerbates potential harm to the complainant as that person (and family) are having to come to terms with what happened. It would or should be an expectation that all DHBs in New Zealand have good systems in place and people take responsibility for ensuring that timely follow-up is achieved.

Following the complaint to HDC, the HDC instigated an investigation of the care of the complainant during the event which had led to the original notification. As has already been stated, the HDC is to be applauded for doing this. However, it does need to be noted that the questions that the HDC has developed are to some extent arbitrary and may not be able to be answered simply.

There were two groups of staff involved in the care during labour. The first was the self-employed midwives (LMCs) who have an access agreement (it is presumed) to [the birthing unit] at the Hawke's Bay DHB. These midwives are required to work within the Ministry of Health and New Zealand College of Midwives guidelines. The second group are the DHB employees, both junior and senior doctors and the midwives.

The questions then are, to whom are these people responsible? LMCs are personally responsible for the care they provide. DHB employees have a line management system. Trainees would not generally be expected to be taking individual personal responsibility for systems that they work in but cannot influence. It would only be if a trainee deviated from clear instructions or policies that they would then be taking personal responsibility for their actions.

Thus, the original report given, stated as clearly as was deemed fair to [Dr C], what was considered an opinion about her care. Potential deficiencies in knowledge of fetal heart rate surveillance from her, the preceding registrar and the midwives were highlighted and it was suggested that if there was a gap in knowledge then this needed to be rectified. It was also suggested that most units now accept the concept of a second pair of eyes to review case management and it is not clear if this did occur, but both midwives and doctors were looking at the fetal heart rate tracings, suggesting either a lack of knowledge or an unwillingness to accept that there was an abnormality — thus hoping 'that it would go away', (some of the patterns seen in this case are shown in the Ugwumadu A 2013 reference). It has already been stated that this is viewed as a system failure and given that in the view of the advisor, not only was the trace clearly abnormal but that the staff also had raised concerns, this is a departure from accepted practice and that this departure is of at least moderate severity. This is because of system and clinical cultural issues.

The issues of anaesthesia are concerning but this advisor has suggested that the HDC seek expert anaesthetic advice. There is nowhere on the booking sheet that there is a mention of questioning the complainant about the actual surgery for the ectopic pregnancy which could have been helpful but further comment should come from anaesthesia.

Similarly, at the end of this advisor's main report, a list of unknowns was given and it would be the answers to those unknowns which could provide further information on which to judge the adequacy or otherwise of the care given.

A final summary of the overall impression of the care given was provided. It is the view of this advisor, (who has had considerable experience in labour management — Stone PR — and fetal monitoring — Lear et al 2018) that the care was poor and was below an acceptable standard, being a moderate departure from acceptable. It was also noted however, that this could be a minority view as current training does not have a large emphasis on labour cares and in the current New Zealand 'climate' this could be a minority view.

Professor Peter Stone

24 August 2020

Lear CA, Westgate JA, Ugwumadu A, Nijhuis JG, Stone PR, Georgieva A, Ikeda T, Wassink G, Bennet L, Gunn AJ. Understanding Fetal Heart Rate Patterns That May Predict Antenatal and Intrapartum Neural Injury. *Semin Pediatr Neurol*. 2018 Dec;28:3–16. doi: 10.1016/j.spen.2018.05.002. Epub 2018 Jun 20

Ugwumadu A. Understanding cardiotocographic patterns associated with intrapartum fetal hypoxia and neurologic injury. *Best Practice & Research Clinical Obstetrics and Gynaecology* 27 (2013) 509–536. 1998

Stone, P.R. Labour In Studd, J. *The Yearbook of the Royal College of Obstetricians & Gynaecologists* London RCOG Press pp85–92 1996

Stone, P.R. & Murray, H.G. Fetal Surveillance during Labour. In: Bonnar J. (ed) *Recent Advances in Obstetrics and Gynaecology*; 19 Edinburgh Churchill Livingstone:pp45–62.”

The following further advice was received from Professor Stone:

“I have been asked to comment further on the provided notes from the Hawkes Bay District Health Board, individual comments and those of the Clinical Director and senior anaesthetist.

This case was sadly tragic and reflects the problems of prolonged labour in an obese nulliparous woman. There is no reason to suspect that the fetus-baby was compromised prior to the labour.

As I wrote at length in my original report, this woman met all the criteria to be managed by the secondary service. I do note that the booking BMI was 38.1 which was a warning and the BMI was 40 at the time of the birth.

In the event, LMC care continued, but I have taken an extract from the Hawkes Bay Primary Secondary interface document which the HDC appended and I have marked in red and underlined relevant points related to this case.

I believe that the points marked did not occur as intended and noting that the use of the partogram is required, it seems unexplained and extremely disappointing that an intrapartum partogram was not used to highlight the failure of labour to progress in this case and therefore lead to action.

From Hawkes Bay Policy

Transfer of Clinical Responsibility (Midwifery):

The decision regarding ongoing midwifery care is a discussion held between LMC and DHB midwife and the woman with clear documentation of the decision of who is responsible for providing midwifery care documented in the woman's clinical record. This can be revisited at any time along the care continuum. The most important principle is that the right care is received at the right time by the right person in the right place ensuring the safety of the woman/mother and baby at all times.

(from page 2 Hawkes Bay Maternity Primary/Secondary Interface)

LMC Midwife:

- Notify Labour and Birthing suite/[birthing unit] staff of expected admission
- Attend within a reasonable time period (usually within 20–30 minutes) of woman arriving in hospital (negotiable if out rurally at the time of admission)
- Inform CMC/Senior midwife of working capacity to support timely handover if required
- LMC midwifery assessment: as per definition at the beginning of the document
- Ensure DHB Midwifery and Obstetric staff are aware of history, risk factors, progress and any concerns during labour/birth/postpartum period
- Provide **minimum 60 minute lead in** of plan to transfer midwifery responsibility to DHB midwives to ensure safety of the woman and safe staffing ratio is maintained. For all primary women it is a requirement that LMC midwifery responsibility is continued for 2 hours following birth of placenta (4th stage), if the LMC is requiring handover it is expected that the LMC will call the back-up primary care LMC to continue midwifery care
- For all secondary women where the LMC is providing midwifery care, indication of handover will adhere to a 60 minute lead in time including comprehensive handover of care to DHB midwife provided
- Complete all DHB documentation including partogram (for Secondary Care woman), Labour and Birthing Summary, Drug charts, birth notes, birthweight centile and Newborn record in a contemporaneous manner and prior to leaving

Transfer of medical clinical responsibility from Primary to Secondary Care on admission (Midwifery responsibility to be decided as part of 4 way conversation)

- Suspected or confirmed Preterm Labour less than 37 weeks
- Diagnosed Pre-eclampsia
- BMI>40 in labour
- Any other medical concerns or conditions discussed and referred by LMC.

I do acknowledge the letter from Dr [...] and also that of the senior anaesthetist. The letter from the anaesthetist has clarified a number of points and it would be on these that I can make some additional comment and modification to my original report. It would appear quite unequivocally that there was no problem with intubation and that the desaturation that occurred has been considered due to atelectasis. Also, of importance, the senior anaesthetist has clarified the extent of the deoxygenation or reduction in oxygen saturation which seems to have been in the high 80% to low 90%. These levels would not trouble a healthy fetus because of what is termed the fetal oxygen margin of safety. (I do not intend to explain this, but can do so should that be considered helpful.)

The point about the oxygen is that the levels that occurred during the start of the anaesthesia — and the measures taken to effect improvement — would not have resulted in the poor condition that the baby was in. As I had explained in my initial report, the baby was acidaemic and this was due to the prolonged labour and not an acute event on the operating table. (It might be fair to state that given the baby's poor condition, the short period of maternal hypoxia would not have helped but would not have been the primary event which led to the outcome.)

As I wrote in my original report, sadly, this case and the outcome was due to what seems to have been either a hands off approach or failure to accept that the course of the labour was abnormal and actions needed to be taken. For example at 9.40 pm it is acknowledged by staff that the CTG was abnormal, but the explanations given in the midwifery letters and the medical notes do not state why it was thought to be abnormal and what action should be taken. The CTG was continued and watched.

[Dr C] made a note in her letter of reply to the Commissioner that when she came on duty the unit did not seem busy but became so at around 1.00am. The midwifery staff seem to be suggesting that the unit was busy or at least had some high acuity activity going on. Either way, at handover, there does not seem to have been a holistic view of how [Mrs A's] labour was progressing.

It is clear that all staff concerned in the Unit have reviewed the case. It seems though that the issue was that for perhaps unknown reasons no one acted early enough to reduce the chance that the baby would suffer the outcome that has occurred. As I mentioned in my initial report, system issues, a culture of non intervention, an expectation that the labour was going to be normal may all have contributed to the late actions in this case.

As far as I can determine, [Mrs A] had enough issues to be booked for the secondary service and would then have been admitted directly to that Unit. Once in that unit, a careful analysis of the prolonged latent phase, the issues of known poor uterine contractility in obese women and then the poor progress, let alone the abnormal CTGs would all add up to a high risk labour needing very close surveillance and a proactive approach, rather than waiting until the labour had to be ended as an emergency.

Knowing when to act (and when time can be allowed) is part of the skill of obstetric management. I fully acknowledge that such cases are difficult but they do require a very 'hands on' approach.

Given the increasing acuity being seen in New Zealand in general and in Hawkes Bay as a regional hospital in particular, there does need to be consideration about staffing levels, but more importantly an acceptance that there will be an increasing number of women who bring acuity to their pregnancies and everyone needs to accept that this needs to be managed and cannot be considered 'normal'. (It is not part of this report to expand on this, but in the New Zealand SCOPE study of supposedly healthy nulligravida only 65% had no complications during the index pregnancy and in the old reports from Cornwall-National Women's in 1949–51, the normal birth rate was <80%, in days when interventions were considered a major high risk event. So even in a population with no obesity and other co morbidities it cannot be expected that normal outcomes without intervention will occur all the time and as such women with acuity, such as in this case, need active management and a low risk approach is inappropriate).

I believe that the Hawkes Bay Maternity Service has spent a great deal of time reviewing this case and I sincerely hope that the reflection will lead to an acceptance that a more active approach in such cases is required.

I thank the Commissioner for the opportunity to comment further. I have found that the anaesthetic records have now been appropriately corrected and this provides confirmation that the outcome was not primarily due to an event at the induction of the anaesthetic for caesarean section.

It is also pleasing to see that the medical staff has reviewed this case at length. [Dr C's] comments about readiness to consult are good, but any junior doctor has to realise that it is how they 'put the case' to the specialist on call that can determine the outcome. It is important as I noted that at every medical review of a case, the doctor thinks about what is occurring and puts these thoughts together as a situation plan before calling the specialist. The specialist needs to know what the doctor on the 'shop floor' thinks and then the specialist can either agree or provide an alternative plan. It is the explanation for why the doctor and team (extra eyes) did not act that remains unclear and I suspect will never be known.

Professor Peter Stone
Professor Maternal Fetal Medicine
The University of Auckland

31 March 2021"

Appendix C: Independent clinical advice to Commissioner

The following expert advice was obtained from anaesthetist Dr David Jones:

“Thank you for your letter 2 March 2021 inviting independent expert advice on this case as above.

I have read and agree to follow the Health and Disability Commissioner’s guidelines for independent advisers dated March 2019. I do not know or have any conflicts of interest in respect of the case or the parties.

My qualifications and relevant experience are at the end of this report (Appendix 1). I have been provided with and reviewed:

1. Letter of complaint dated 13 March 2020
2. Hawke’s Bay District Health Board’s response dated 6 May 2020 and its adverse event review report
3. Clinical records from Hawke’s Bay District Health Board covering the period 3–4 [Month2]
4. Further response from Hawke’s Bay District Health Board dated 9 July 2020
5. Letter from HBDHB dated 16 September 2020 and attachments
6. Further information from [RM G] and [RM E]
7. Response from HBDHB dated 4 February 2021 and attachments including statements from relevant staff members and anaesthetic notes.

Background

[Mrs A] was in latent labour for approximately 48 hours. On 2 [Month2] her care was escalated to secondary care at HBDHB. In the early morning of 4 [Month2] there was a decision to perform a caesarean section urgently under general anaesthetic.

In the immediate theatre pre-operative area, the mother advised the medical staff that she had historical issues with anaesthesia. It was not known before this point, but a decision was made to proceed with the C-section. Almost immediately after intubation the C-section incision was made, then issues with ventilation began, and the mother’s oxygen saturation levels dropped briefly. [Baby A], was born in a poor condition. He was ‘floppy’, pale and had no respiratory effort.

Expert advice requested: Limited to anaesthetic care.

1. Whether you consider the anaesthetic care provided to [Mrs A] for her C-section surgery on 4 [Month2] was reasonable in the circumstances, and why?

Answer: YES

Once anaesthetic team were freed from the preceding C-section, the Obstetric Registrar informed them of another Cat 1 emergency C-section to follow for fetal distress. They

understood the severity of fetal condition with Lactate of 11 in context of abnormal CTG. [Dr B] divided the 3 anaesthetic team members between tasks: she to carry out preoperative assessment, [Dr J] and anaesthetic technician to check equipment and prepare drugs. That was the most expedient way to go about it.

From the anaesthetic record, and each party's account of their actions, they positioned this patient (with a challenging BMI 43) in left tilt & head up, pre-oxygenated, induced intravenous anaesthesia by rapid sequence method then secured airway by easy intubation. All these were in a standard manner without hitches. Surgery commenced almost immediately after assent from [Dr B], with patient already prepped and draped in advance. The ventilation problem arose just as surgery commenced. Baby was delivered in 2 minutes from incision, so one could not fault that overall performance and its timing.

A question was raised by others whether GA was an appropriate choice (vs Regional anaesthesia). But under the same circumstances, namely a poorly functioning epidural and urgency, General Anaesthetic would I believe be the choice of most anaesthetists.

The ventilation problem commencing at incision did challenge them further. Poor gas exchange was indicated by the 'up sloping' CO₂ trace, with high airway pressures causing pressure alarm to sound. The record shows SpO₂ 97% just pre-incision, then 86% at time of delivery; however they observed, as stated in their reports, that between those recordings by the machine (usually 2.5 or 5 min intervals) a trough SpO₂ value very briefly of 'low 70s'. In the context of already known poor fetal condition at decision time this would not have been the cause of poor fetal outcome. Significant desaturations while inducing high BMI cases, whether obstetric or otherwise, are common, were anticipated by this team, and were well mitigated by their actions¹ prior to incision.

The difficult ventilation event would have added to the usual high workload demands in such a case. Troubleshooting as described in [Dr B's] statement followed a standard method, working systematically back from the patient (breath sounds heard both sides, no wheeze, endotracheal tube patency checked) then on to checking all the breathing equipment system. This clearly was performed swiftly, because the maternal ventilation and oxygenation was already resolving after a few manual 'recruitment breaths' by [Dr B] when baby was delivered (ie within 2 min). It is unlikely they could have performed all the troubleshooting actions in a lesser time.

Taking all the above into account, I concluded the anaesthesia teamwork and care was of an excellent standard.

¹ See 2. b. ix for [Dr B's] hand ventilation action while awaiting full paralysis

2. The appropriateness of the care provided by

a. [Dr J], anaesthetic registrar?

Answer: Satisfactory care

- i) [Dr J] was 7 months into her basic anaesthesia training at the time of this case. The hospital's anaesthetic department required 1:1 consultant supervision for any C-section within first year.
- ii) This is consistent with, but at a higher standard than could be interpreted from ANZCA trainee supervision requirements, which [Dr J] quoted in her report. She was appropriately 1:1 supervised by consultant presence for this and the prior C-section.
- iii) [Dr J's] first knowledge of [Mrs A] was via the handover report from the previous registrar who had inserted the epidural at 21:30hrs.
- iv) The epidural was apparently satisfactory until 02:25 when midwife could no longer inject a top-up and sought [Dr J's] assistance.
- v) She applied the logical adjustment on discovery of a catheter migration and kink, and proceeded with a further top-up, which was judged by the midwife 15 min later to have improved patient comfort, even though apparently a unilateral block.
- vi) [Dr J] reports being informed by midwife around 30 min after that top-up that [Mrs A] would be for a C-section, although it did not proceed immediately. She and [Dr B] became involved in an alternative C-section instead. There would have been no role for [Dr J] in deciding which had the greater priority, as that was an obstetric team role.
- vii) [Dr J's] report states that neither she nor [Dr B] became aware of the poorly functioning epidural (from the attending midwife(s)) while they were engaged with the alternative C-section.
- viii) Even had she become aware of it, with the detail recorded (right groin pain, on the side for which the epidural was not working) I doubt she would have made an adequate rescue of it for the ultimately declared C-section.
- ix) Insertion of a new epidural was a possibility if there was going to be enough time before the C-section on [Mrs A], but only if its inadequacy had been communicated to them while in theatre.
- x) [Dr J] reports: 'While awaiting [Mrs A's] arrival to theatre, I began completing an anaesthetic pre-assessment form based on the information I had learned from my interaction with [Mrs A] earlier in the morning'.

- xi) The detail she included was a good start for the situation, recording either what she was told or had read in the record (exact source(s) not clear). Although she noted the named previous operation [Mrs A] had undergone, there was at this time no indication of a problem during it. That was only forthcoming immediately before C-section when [Dr B] questioned [Mrs A] further.
- xii) In theory an earlier search for the past paper file could have been initiated by a number of persons prior to decision for C-section, [Dr J] amongst them. A routine process to access same when someone enters the labour environment would have been helpful. Others referred to these as missed opportunities. It remains true for the majority of NZ hospitals an electronic copy of anaesthetic record is not accessible online.
- xiii) **IF** there had been **BOTH** warning of an imminent C-section **AND** any mention of a prior anaesthesia problem (eg via admission questions), **THEN** [Dr J] would have had a chance to enquire further. Those conditions did not coincide at a time that would have made it possible, earlier than [Dr B's] later assessment.
- xiv) Teamwork between [Dr J], the anaesthetic technician and [Dr B] is described above, and appears to have worked well.
- xv) Globally I consider the anaesthesia care contributed by [Dr J] was of a satisfactory standard.

b. [Dr B], anaesthetic consultant

Answer: a thoughtful high standard of care, including subsequent review actions

- i. [Dr B] gave 1:1 supervision to registrar [Dr J] as required by their anaesthesia department.
- ii. This commenced for a C-section immediately prior to the one under consideration here.
- iii. Until the Cat 1 C-section for [Mrs A] was declared, there was no necessity for [Dr B] to be directly involved in the epidural adjustment and top-ups for [Mrs A] unless requested by the registrar.
- iv. They were alerted by phone around 06:30 of the need for Cat 1 C-section for [Mrs A] on returning to theatre after previous C-section.
- v. [Dr B] directed an appropriate division of tasks, already referred to above. She carried out a more detailed preoperative assessment, where she learned of the prior anaesthetic problem, and ascertained it was not a drug type problem (eg anaphylaxis). That would have cast a high suspicion on airway difficulty.

- vi. [Dr B] had undertaken Thoracic Anaesthesia and Difficult Airway Management [training overseas] in recent past, and was difficult airway lead at the institution.
- vii. She was therefore well equipped for preoperative airway assessment of [Mrs A], amongst other decisions. She described 'a reassuring airway examination from an anatomical perspective'. She discussed that with [Mrs A], who acceded to the recommendation that it was suitable for GA.
- viii. [Dr B] indicated she briefed the other two members of the anaesthetic team. She chose to manage the airway herself. Both parties indicated it was managed during induction and intubation without problem.
- ix. [Dr B] then describes: 'hand ventilated the patient' immediately following, confirmed CO₂ return. This was further proof that ETT was correctly sited.
- x. If certain possible problems had developed during the induction of anaesthesia (eg bronchospasm, insufficient paralysis) then I expect she would have noticed them then before incision, and recorded/reported same. She/they did not report any problem at that time point however.
- xi. Immediately following induction, and before giving the go-ahead for incision, [Dr B] noted SaO₂ (97%), a sign of satisfactory maternal oxygenation. That was reassuring, because high BMI parturients at GA induction often desaturate more rapidly than their normal BMI counterparts.
- xii. In addition, the anaesthetic record does not indicate much BP drop with induction, another common problem in this situation. If profound, a severe drop in BP can compromise placental blood flow. That did not happen here.
- xiii. Up to that point all the indications are of a well conducted induction, airway management and prevention of hypotension. They were aware in the background of a prior undefined anaesthetic problem [NB: when **not pregnant** then].
- xiv. On account of that knowledge of a previous problem, they were most likely better prepared for it when it did occur. However the statements are silent on whether/what specific briefing might have occurred around that subject.
- xv. From [Dr B's] statement [Page 6:10, para 2 et seq.] the ventilation problems are reported to have commenced **after** she indicated the surgeon could start.
- xvi. The rapid troubleshoot described above was standard practice. I concluded that it was [Dr B's] experience that led to her delivering the few recruitment breaths when they found no other specific remediable cause.
- xvii. Once the ventilation problem resolved, other actions which can be discerned from the record were: they considered possible awareness so delivered more propofol

plus Midazolam for amnesia, recognised the short acting muscle relaxant Suxamethonium would wear off quickly so they replaced it with Rocuronium, and acted to reduce postoperative pain by topping up the epidural in case it could still contribute (no jeopardy if it did not), along with additional morphine.

- xviii. All of those actions indicate a thoughtful high standard of care, either directly by [Dr B] or registrar under her supervision/guidance and anaesthetic technician.
- xix. The ‘aftercare’, namely retrospective review of the previous anaesthetic record for any similarity with the current event, departmental peer case review session plus writing a proactive letter in case of future anaesthesia, add to the conclusion of [Dr B’s] professionalism in handling this case.

3. Any other matters in this case that you consider warrant comment?

a. Appropriateness of decision to use GA rather than attempt to re-establish epidural

- i. Indications of likely failure of epidural to work as an anaesthetic for C-section were already present when it had failed to deliver durable labour analgesia. There was unilateral analgesia even after repair attempt by [Dr J]. It is unlikely further manipulation would have improved it.
- ii. In the face of ‘urgency’ that Cat 1 implies, further attempts to repair the epidural would likely have been a big time-waster. Similar could be said about removing it and attempting a new one, or inserting a spinal anaesthetic.
- iii. ‘Urgency’ is relative in the real world² — a goal of 30 min from decision to delivery time is commonly used. Most of us find that hard to achieve when the operating theatre is not immediately adjacent to labour suite, and without 24/7 full staffing on site.
- iv. There were other delay steps in this case/situation — eg transfer from one site to the operating suite. On this occasion it was fortunate the anaesthesia team were already on site from previous case, instead of having to be called in. There was less delay in proceeding with anaesthesia than could have been.
- v. Usually Cat 1 C-sections have an atmosphere of ‘pressure’ to get baby out fast, which impacts processes like adequate explanations for consent, sharing realistic appraisal of how long it would take for each of GA or Spinal/epidural etc.

² RANZCOG does not recommend a specific time for the various categories of caesarean section, but advocates that each case should be managed according to clinical evidence of urgency, with every single case considered on its merits. Source: The Royal Australian & New Zealand College of Obstetricians & Gynaecologists (RANZCOG) College Statement: Decision to delivery interval for Caesarean Section, Statement No. C-Obs 14, 2015.

- vi. I concluded [Dr B] did a thorough airway and other risk appraisal, communicated it to the patient and made a good decision to go straight to a GA.
- vii. In addition, I could see no evidence to support a view that if GA was avoided, the baby outcome would have been any better.

b. The ventilation/desaturation problem encountered:

[The analysis below is most suited to anaesthetists, optional for the H&DC enquiry]

- i. [Dr B] reported that while waiting for the muscle relaxant to work: ‘I was able to confirm ET_{CO}₂ by gently bag-mask ventilating the patient using a one-handed C-E mask grip and using low ventilation pressures to mitigate against the rapid desaturation commonly seen by (sic) an obese parturient under General Anaesthesia’. This was clearly successful because she noted the favourable saturation before incision.
- ii. The ventilation problem only commenced at or immediately after incision in the current case.
- iii. Its resolution also coincided with baby delivery. This would have relieved some of the several adverse pressure influences under the diaphragm interfering with ventilation (ie uterine pressure, surgical abdominal-uterine manipulation) causing impaired lower lung gas exchange.
- iv. However, the previous operation’s ventilation problem occurred without pregnant uterus. Therefore those influences were not equivalent to causes of ventilation difficulty in the previous operation. Another explanation is needed.
- v. Obesity was probably comparable in each operation.
- vi. The earlier operation ventilation problem appears to have occurred before incision (ie 2 handed BMV, ETT tube removed then re-inserted suggest before operation started).
- vii. Propofol wears off very rapidly, and could have done so before enough inhalational anaesthetic agent uptake — known as the transition ‘gap’³. In high BMI cases this can take longer than in normal BMI cases.⁴
- viii. [Dr B’s] own conclusion was that the ventilation improvement resulted from the recruitment breaths she gave to overcome lower lung atelectasis. But that

³ Chaggar RS, Campbell JP. The future of general anaesthesia in obstetrics. *BJA Education*, 17 (3): 79–83 (2017). In particular see Fig 1, page 80, and mind the gap.

⁴ Zand F, Hadavi SMR, Chohedri A, Sabetian P. Survey on the adequacy of depth of anaesthesia with bispectral index and isolated forearm technique in elective Caesarean section under general anaesthesia with sevoflurane. *Br J Anaesth* 2014; 112: 871–8. Comment: problems in elective cases will be exacerbated in emergency cases.

improvement also coincided (at 2+ min) with increasing inhalational agent uptake via the lungs to replace the waning propofol effect.

- ix. While teaching recognises possible awareness during this ‘gap’ where anaesthesia is still very light, it is also possible for very strong stimuli like an endotracheal tube in trachea, or surgical incision, to trigger reflex reactions which manifest as poor lung-chest wall compliance and ventilation difficulty, despite expected muscle paralysis with Suxamethonium doses less than 1.5mg/kg. Bronchospasm may not be present, even though high inflation pressure is required.
- x. Although [Dr B] reported what detail she could find about the prior anaesthetic, finer detail of drug doses and their timing was missing. As the rest of her reporting shows attention to detail, it is possible that it was missing. It is highly likely the prior anaesthetic also involved rapid sequence induction (RSI), because that is a very common choice for GA in high BMI patients; the same type of ‘gap’ would have occurred then also. [This is a working assumption, unless proved otherwise.]
- xi. Common, well learned ‘standard’ behaviours for Cat 1 C-sections are to get the baby out as swiftly as possible, without allowing much time for drugs to cross the placenta to baby on the way. Not a lot of attention is paid to other possible consequences of the ‘gap’, apart from concern to prevent awareness.
- xii. In high BMI cases this is especially so with reduced inhalational anaesthetic agent uptake. For such cases it could be worth considering ‘more haste, less speed’,⁵ to allow a few more minutes to pass to allow sufficient inhalation agent to reach the brain for good suppression of responses to noxious inputs.
- xiii. None of this is a criticism of the current team, because they used what is common practice. It is an alternative proposal for the ventilation difficulties at each operation.

Signed

David Jones FANZCA FFPMANZCA 28 April 2021”

⁵ See footnote 2 above: The Royal Australian & New Zealand College of Obstetricians & Gynaecologists (RANZCOG). College Statement: decision to delivery interval for Caesarean Section, Statement No. C-Obs 14, 2015.

Appendix D: Independent clinical advice to Commissioner

The following expert advice was obtained from specialist neonatal paediatrician Dr Simon Rowley:

“My full name is Robert Simon Hearn Rowley. I am a Registered Medical Practitioner and Specialist Neonatal Paediatrician. My qualifications are MB ChB. FRACP. I am a Neonatal Paediatrician working at Children’s Health, Auckland City Hospital which includes clinical management of level 3 and level 2 infants in NICU. I have also practised as a General Paediatrician in private practice here in Auckland for over 30 years. I am also the Chair of the Northern Region Paediatric Vocational Training Committee.

I have had access to the following documents:

1. Letter of complaint dated 13 March 2020
2. Hawke’s Bay DHB’s response dated 7 May 2020
3. Clinical records from Hawke’s Bay DHB covering the period 3 to 4 [Month2]; and
4. Clinical records from Capital & Coast DHB covering the period 4 [Month2] to 24 [Month2]

[Baby A’s] mother is aged [in her thirties], G2p0 (previous ectopic pregnancy with R fallopian tube removed). She has a high BMI (38 at booking), but had normal polycoese, and the pregnancy progressed well. Gestation 40+4 weeks at delivery on 4th [Month2].

She is also known to be GBS positive (it is not known if antibiotics were commenced in labour, but the baby received antibiotics soon after admission to Hawke’s Bay Hospital SCBU).

Labour spontaneous with a prolonged labour and after 11 hours in the labour ward at Hawke’s Bay Hospital. There was fetal distress with elevated scalp lactate of 11, and thick meconium necessitating emergency Category 1 LSCS. There were problems with maternal intubation for GA with maternal hypoxia — desaturations into 70s for some minutes prior to birth. This would have had the potential to carry over to the fetus.

[Baby A’s] birth weight was 3610G indicating a well grown baby.

He was noted to be floppy and pale and covered with meconium. Apgar scores (a score designed to assess the need for resuscitation where 9–10 is the least severe and 0 the most severe with no signs of life) were 1, 3, and 8. Baby was given resuscitation with oxygen, chest compressions and attempted unsuccessful intubation but given assisted ventilation via face mask and oro-pharyngeal airway and responded quickly within a few minutes. The cord gases showed a pH 7.29 BE -5 and lactate 7 which did not suggest severe or prolonged asphyxia prior to delivery. He was transferred to Hawke’s Bay Hospital SCBU and placed on CPAP with 30% oxygen breathing spontaneously otherwise. Initial blood gas showed a pH 7.11, BE -14 and lactate 12.2 reflecting likely recovering circulation following a difficult postnatal resuscitation.

At this point a decision was made not to actively cool based upon examination findings of normal tone and movements. Passive cooling was carried out with temperatures of around 35 degrees C.

Umbilical lines were inserted, chest radiographs were taken and antibiotics started.

However at six hours of age the baby had a focal left arm tonic clonic seizure accompanied by a drop in oxygen saturation and heart rate and for which he was treated with anticonvulsants — intravenous midazolam followed by a phenobarbitone loading dose. The seizure stopped. Seizures automatically mean the presence of a moderate encephalopathy and a decision was then made to actively cool in consultation with the [DHB2] retrieval team and plans were made for transfer to the [DHB2] NICU. As the blood pressure was low they also recommended inotropes to improve this.

The temperature was 34.7 degrees C by nine hours of age. The baby was transferred shortly after this to [DHB2] with a temperature of 33.4 degrees C — in the target range. It is noted that the cooling of the baby was well after the currently recommended commencement of therapeutic hypothermia within the first six hours of life.

In [DHB2] cooling was carried out as per guidelines for 72 hours before rewarming. Further seizures were recorded both clinically and on BRAINZ monitoring requiring repeat doses of phenobarbitone with good effect. MRI scan done at 15 days of age reported global hypoxic injury in addition to left sided middle cerebral artery infarction the latter of which was unexpected perhaps suggesting two separate pathologies. Anticonvulsants were discontinued before transfer back to Hawke's Bay DHB on 25 [Month2] aged three weeks. At this point baby was breast feeding fully with normal examination including neurological, although specific neurodevelopmental therapist assessment on arrival in Hawke's Bay detected some subtle asymmetries. Long term prognosis is therefore guarded but optimistic.

Comment

1. The decision not to commence active cooling following [Baby A's] birth

'Therapeutic Hypothermia is a standard of care for infants 36 weeks gestational age with moderate to severe hypoxic ischaemic encephalopathy' (Position Statement. Canadian Paediatric Society. *Ped Child Health* 2018.23.(4):285–291).

Making a decision to commence active hypothermia is therefore dependent upon there being a moderate or severe encephalopathy at any time in the first six to twelve hours after birth. Encephalopathy is usually described as mild, moderate, or severe, and there are various scoring charts that help the clinician in deciding this e.g. Sarnat scoring charts currently in use in some New Zealand units. [Baby A] was initially described as having a mild encephalopathy only.

The other factors that assist in deciding upon which babies to monitor for signs of encephalopathy include the Apgar scores (less than 7 at 10 minutes) cord blood gas or

venous/capillary blood gas less than an hour of age) — pH less than 7.1, the base excess (less than -12, and the blood lactate more than 6mmol/L. At birth these parameters were not met although they were by the time of the first blood gas).

A history of fetal distress such as fetal heart abnormalities, an obstetric mishap or sentinel event, and the presence of thick meconium prior to delivery is also supportive evidence for hypoxic ischaemic encephalopathy.

In this case, in view of the history, the Apgar scores and the cord blood gases the baby was admitted to SCBU and monitored appropriately.

There was no indication in the first six hours that there was more than a mild encephalopathy until the time of the seizure and therefore most paediatricians would have elected to continue to monitor but not to cool. Seizures automatically place the degree of encephalopathy as moderate or severe and therefore an indication to cool. Once they occurred they were treated and the baby was cooled therapeutically.

Therefore in my opinion the decision not to cool the baby immediately but to monitor was the correct one. It is important that the Hawke's Bay team thought about and made an active decision regarding cooling.

Following the early trials of therapeutic hypothermia recommendations were to commence cooling within six hours of life. More recently people have realized from animal research that there could be benefit in cooling as late as 12 hours after delivery and the initiation of cooling later than six hours is more often considered, as happened in this case.

Some experts regard passive cooling as being of dubious value because of both the lack of evidence and the inability to maintain an even temperature without fluctuations. It is very important not to overheat the baby however as that is likely to increase neurological injury. The Canadian Paediatric Society position statement again recommends passive cooling in consultation with a tertiary neonatologist and this was done here.

2. Was the intervention after birth timely and appropriate?

The Hawke's Bay Hospital paediatric team were appropriately in attendance at a high risk emergency caesarian delivery. They instituted resuscitation immediately. Although unsuccessful with intubation they managed the airway non-invasively with successful ventilation and satisfactory recovery. They correctly admitted the baby to SCBU for monitoring and importantly thought about and made a decision regarding cooling. They elected to passively cool so that once the infant had a seizure and changed to a status of moderate encephalopathy cooling was underway and they called for the [DHB2] team in a timely manner.

3. The reasonableness of care provided to [Baby A] by the Hawke's Bay DHB.

I find no fault in the management of [Baby A] by the Hawke's Bay DHB. They managed the resuscitation well, thought about and made an active decision not to cool. They realized that this decision might change and elected to passively cool in the interim. Once seizures changed the encephalopathy status of the infant from mild to moderate they initiated passive cooling and arranged a referral. The documentation was detailed and complete. They kept the parents informed.

4. Other Matters.

It is possible that this infant had more than one intracranial pathology. The MRI findings were of hypoxic ischaemic injury in addition to a stroke. A left MCA infarction (stroke) classically follows an instrumental or caesarian delivery, and presents with a focal seizure in the first 48 hours of life — with normal neurology in between times. The imaging shows ischemic changes in a vascular distribution usually unilateral and in an area covered by one of the major cerebral arteries. The origin of this is uncertain but thrombotic tendencies are often looked for after the event and a thrombophilia screen is planned for three to six months. MCA stroke can less commonly present as a hypoxic ischaemic encephalopathy as well, but radiologically is a separate entity from hypoxic ischaemic brain injury involving grey and white matter and often scattered in many regions of the cortex and basal ganglia. In [Baby A's] case this was more marked on the side of the stroke raising the possibility that the stroke may have been the main event. The management of a neonatal stroke does not include therapeutic hypothermia. One has no way of knowing this has occurred before an MRI done after 10 days of life unless an early MRI is done. (MRI is of less value if done before seven to ten days unless done in the first 48 hours as there is a time window between 48 hours and seven to ten days when the imaging signs are not distinct and MRI done whilst cooling is usually counterproductive). Another imaging modality the cerebral ultrasound scan was done early on and is helpful in ruling out intra cranial haemorrhages but is not very sensitive in picking up strokes. However there are now suggestions that management of perinatal strokes might include therapeutic hypothermia in order to lessen seizures (Harbert et al J Child Neurol. 2011 June 23) but these have yet to be tested. What this means in relation to [Baby A] is that therapeutic hypothermia was highly likely to have been beneficial, whatever the intracranial lesions.

Regardless of whether this was an MCA infarction, or a hypoxic ischaemic insult it was perfectly reasonable to institute therapeutic hypothermia at the time it was started.

Short Summary

[Baby A] was born by emergency caesarian delivery after a spontaneous labour with fetal distress confirmed with scalp lactate. There was also meconium passage. At induction of anaesthesia for the delivery mother unfortunately had several minutes of hypoxia further compromising the fetus. [Baby A] had low Apgar scores indicating some degree of asphyxia, was successfully resuscitated and observed appropriately for any development of moderate or severe encephalopathy. When he developed seizures at

six hours of age indicating worsening encephalopathy a decision was made for therapeutic hypothermia in conjunction with the nearest NICU team. He was passively cooled and transferred to the [DHB2] NICU for completion of cooling. He seems to have done well and the prognosis is guarded but hopeful. At all points in his management I believe he had an appropriate standard of care.

Yours sincerely

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