Midwife, RM C

A Report by the

Health and Disability Commissioner

(Case 16HDC00455)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. In 2015, Ms A, aged 20 years at the time, was pregnant with her first baby. At five weeks' gestation, Ms A booked a self-employed registered midwife (RM), RM C, as her lead maternity carer.

2. At 39 weeks' gestation, Ms A underwent an ultrasound scan. The scan report stated, "Liquor oligohydramnios (one single pool of 1.3cm)", and noted that there was no history suggesting spontaneous rupture of membranes to account for the reduction in liquor.

3. Following Ms A's scan, RM C assessed Ms A at Hospital 1. Ms A was then reviewed by an obstetric registrar, Dr D. RM C was also present at the consultation with Dr D. A plan was made for induction of labour the following day.

4. At approximately 6pm on 3 Month9,[1] Ms A had a gush of fluid with a pink show. At 7.30pm RM C met Ms A at Hospital 1. On examination, Ms A was 8–9cm dilated and the cervix was fully effaced. At 7.40pm RM C commenced cardiotocograph (CTG) monitoring, and recorded that the results were "reassuring".

5. At 7.40pm, RM C recorded that Ms A was "wishing to use the pool", and that the pool was filling. RM C asked a hospital midwife, RM E, for her opinion on Ms A using the birthing pool for labour. RM E advised against allowing Ms A to labour in the pool.

6. Ms A got into the birthing pool at approximately 8.10pm, and the CTG was discontinued.

7. RM C recorded on the "Labour and Delivery Record" that the second stage of labour commenced at 9pm. At this time, Ms A was fully dilated, and began pushing. Between 9pm and 9.50pm, the fetal heart rate (FHR) was monitored every 20 minutes, with the highest documented rate being 140bpm and the lowest documented rate 120bpm. At 9.55pm the FHR was documented as 100bpm.

8. At 10pm RM C recorded that peeks of the vertex (head) were visible on pushing. At 10.15pm the FHR was documented again for the first time since 9.55pm, and remained at 100bpm.

9. Ms A proceeded to deliver Baby A underwater at 10.18pm. RM C recorded that as the baby was emerging, she unwrapped the cord, which was around Baby A's neck. RM C pressed the midwifery assist call bell. RM E responded and pressed the emergency bell within seconds of walking into the room. RM E pulled the delivery instruments over to RM C, which she recorded were not in arm's reach or open, and plugged in the oxygen and tested it. RM E recorded that within 30 seconds of arriving, Baby A was transferred to the resuscitation table.

[1] Relevant months are referred to as Months 1-9.

10. Following resuscitation by RM C, RM E, and the paediatric team, Baby A was transferred to the Neonatal Intensive Care Unit at another hospital (Hospital 2). Sadly, Baby A died.

Findings

11. RM C failed to provide services to Ms A with reasonable care and skill in breach of Right 4(1) of the Code[2] in the following ways:

a) Prior to labour, RM C did not attempt to access the scan report from the radiology service to clarify her understanding of the results, and, as a result, failed to recognise that Ms A's labour would be high risk, requiring continuous CTG monitoring.

b) RM C incorrectly interpreted the CTG report at 7.40–8.10pm as being "reassuring".

c) RM C did not communicate effectively with RM E about RM E's concern with Ms A using the birthing pool during labour.

d) At 9.55pm, when the FHR was 100bpm, RM C did not undertake closer monitoring of the FHR. RM C also did not document the FHR between 9.55pm and 10.15pm.

e) When the FHR was detected at 100bpm on several occasions between 9.55pm and 10.15pm, RM C did not check the maternal pulse to ensure that she was hearing the FHR.

f) RM C did not prepare the birthing or resuscitation equipment adequately, and failed to recognise that Baby A's condition was severely compromised at birth, and immediately press the emergency bell.

12. Adverse comment is made about RM C's postnatal documentation.

Recommendations

13. It is recommended that RM C undertake further training on documentation and fetal monitoring, and apologise in writing to Ms A.

14. RM C has been referred to the Director of Proceedings for the purpose of deciding whether any proceedings should be taken.

Complaint and investigation

15. The Commissioner received a complaint from Ms B about the services provided to her daughter, Ms A, by RM C. The following issues were identified for investigation:

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

- *Whether RM C provided an appropriate standard of care to Ms A in 2015 and 2016.*
- *Whether RM C provided an appropriate standard of care to Baby A on 3 Month9.*

16. The parties directly involved in the investigation were:

Ms A	Consumer
Ms B	Complainant/consumer's mother
RM C	Self-employed midwife/lead maternity carer

17. Information was reviewed from:

Dr D	Registrar
RM E	Hospital midwife (DHB1)
Ms F	Trainee sonographer (radiology service)
District Health Board 1 (DHB1)	
District Health Board 2 (DHB2)	
Radiology service	
The Coroner	

Also mentioned in this report:

Dr G	Obstetrician

18. Independent expert advice was obtained from a registered midwife, Ms Michelle Bailey (**Appendix A**), and an obstetrician and gynaecology specialist, Dr Ian Page (**Appendix B)**.

Information gathered during investigation

Background

19. Ms A, aged 20 years at the time, was pregnant with her first baby. On 15 Month1, at five weeks' gestation, Ms A booked a self-employed registered midwife (RM), RM C,[3] as her lead maternity carer.

Anatomy scan

20. Initially Ms A's pregnancy progressed as expected, and she had regular appointments with RM C. At 20 weeks' gestation a routine ultrasound scan (USS) was performed. The scan showed normal development apart from an umbilical abnormality. This was documented as likely to be a small exomphalos[4] or an umbilical hernia.[5] RM C

[3] RM C has been registered since 2011. RM C works out of a practice with two other midwives.

[4] A weakness of the baby's abdominal wall where the umbilical cord joins it. The weakness allows the abdominal contents, mainly the bowel and the liver, to protrude outside the abdominal cavity, where they are contained in a loose sac that surrounds the umbilical cord.

[5] When part of the intestine protrudes through the umbilical opening in the abdominal muscles.

referred Ms A to the obstetric antenatal clinic at Hospital 1, and also to the Maternal Fetal Medicine (MFM) service at a hospital in a main centre.

Further antenatal care

21. Ms A was seen in MFM at 22+1 weeks' gestation.[6] A USS confirmed that the fetal measurements were appropriate for gestation, and also confirmed the abdominal wall abnormality. MFM offered amniocentesis[7] at this time, and it was declined by Ms A. The recorded plan for birth was to keep the umbilical cord long when it was cut, to avoid any abdominal injury to the baby.

22. At 23+2 weeks' gestation Ms A was seen in the antenatal clinic by an obstetrician, who noted the MFM assessment and follow-up plan, and did not consider there to be any other risk factors.

23. Ms A continued to have regular appointments with RM C, and follow-up appointments with MFM and the antenatal clinic.

24. Ms A was reviewed in MFM at 32+1 weeks' gestation. A USS showed a slight slowing of growth, although the overall estimated fetal weight was within the normal range. The abdominal wall defect was noted as unchanged, and was thought to be more in keeping with that of an umbilical hernia. The possibility of an underlying genetic or chromosomal problem was discussed again, but again Ms A declined amniocentesis. Serial growth scans were recommended, along with birth in hospital, routine care in labour, the cord to be left long at delivery to avoid accidental injury to the bowel, and paediatric review following birth. The plan was for a follow-up USS in two weeks' time, and review in the antenatal clinic.

25. Ms A continued to have regular appointments with RM C and the antenatal clinic, and regular growth scans. No concerns were noted, the abdominal wall defect showed no significant changes, and fetal growth remained within the normal range.

Ultrasound scan, 3 Month9

26. On 3 Month9, at 39 weeks' gestation, Ms A underwent a USS at the radiology service. The scan was performed by a trainee sonographer, Ms F, and a sonographer. At the time of the scan, Ms A was experiencing some contractions.

27. The scan showed normal interval growth from the previous scan at 36 weeks' gestation, with an estimated fetal weight of 3,113g. However, the liquor was reported to be much reduced, with only one measurable pool of 1.3cm. The scan report stated, "Liquor oligohydramnios (one single pool of 1.3cm)", and noted that there was no history suggesting spontaneous rupture of membranes to account for the reduction in liquor.

[6] Ms A missed an appointment she had scheduled at 21+5 weeks' gestation.

[7] An amniotic fluid test that is used in prenatal diagnosis of chromosomal abnormalities and fetal infections, and also for sex determination. A small amount of amniotic fluid, which contains fetal tissues, is sampled from the amniotic sac surrounding a developing fetus, and the fetal DNA is examined for genetic abnormalities.

28. Oligohydramnios is a deficient volume of amniotic fluid around the baby. It is associated with maternal and fetal complications. Diagnosis is by ultrasound measurement of amniotic fluid volume. The Ministry of Health Guidelines for Consultation with Obstetric and Related Medical Services set the criteria for referral for oligohydramnios as no amniotic pool depth equal to or greater than 2cm on scan, or an amniotic fluid index < 7.[8]

29. Immediately following the scan, Ms F contacted RM C to discuss the findings. Ms F's sonographer worksheet recorded: "[Midwife] verbal report √." Regarding her telephone call with RM C, Ms F told HDC:

> "Standard practice protocol is to document verbal communication of the ultrasound findings in circumstances of such result requiring prompt attention. My recall of the phone conversation is vague however written documentation made contemporaneously confirms that a phone call was made to the Lead Maternity Carer [RM C] … The detail of the conversation would have included a brief summary of the patient's obstetric background in order to identify the patient, the indication for the scan, and the scan findings. The information provided about the possibility of being in labour by [Ms A] was considered significant in the context of the scan findings and would have therefore also been communicated."

30. RM C told HDC:

> "The sonographer called me by phone on the morning of delivery to advise there was 'low pools of liquor' and asked me if there had been a history of [spontaneous rupture of membranes]. I advised there had not. It is unusual for a sonographer to call so, as a matter of caution, I arranged to meet [Ms A] and carry out an assessment, due to a concern about low liquor. I do not recall the sonographer mentioning a diagnosis of oligohydramnios."

31. The radiology service told HDC that its computer records show that the final verified report was sent to RM C by fax and mail at 5.42pm that day. The final report was also sent to Hospital 1, the antenatal clinic, and MFM.

Review by RM C

32. Following Ms A's USS, RM C arranged to assess Ms A at Hospital 1. Ms A was monitored for around 30 minutes with the cardiotocograph (CTG)[9] monitor, and her contractions settled.

Review by obstetric registrar

33. At approximately 1.30pm that same day, Ms A was reviewed by an obstetric registrar, Dr D. RM C was also present at the consultation. Dr D recorded that Ms A appeared well on examination, and that the CTG was reassuring. Dr D noted that the USS had shown reduced liquor, and also stated that growth was reduced. Dr D discussed Ms A

[8] It is important that Lead Maternity Carers are aware of what constitutes oligohydramnios so that they can refer as necessary. In this case, no referral was necessary as the obstetric team was already involved in Ms A's care and received the USS report.
[9] A cardiotocograph records the fetal heart rate and maternal contractions.

with an obstetrician, Dr G, and a plan was made for induction of labour the following day.

34. Dr D told HDC that Ms A did not appear to be in labour during the consultation. Dr D did not document a plan should Ms A present in labour prior to induction, and told HDC: "The plan would be for her to be monitored and managed in the way any other patient with spontaneous onset of labour would be under the care of her [Lead Maternity Carer (LMC)], however with continuous CTG monitoring (due to Oligohydramnios)."

35. RM C told HDC: "There was no indication from the on call obstetrician for [Ms A] to be managed other than a well woman in the event she went into spontaneous labour prior to [induction] … so when she did present in labour I resumed normal midwifery labour cares."

Commencement of labour

36. On the evening of 3 Month9, Ms A started having contractions again, and at approximately 6pm had a gush of fluid with a pink show. At 7.30pm RM C met Ms A at Hospital 1. On examination, Ms A was 8–9cm dilated and the cervix was fully effaced.[10] At 7.40pm RM C commenced CTG monitoring, and recorded that the results were "reassuring".

Decision to enter birthing pool

37. At 7.40pm, RM C recorded that Ms A was "wishing to use the pool", and that the pool was filling. RM C asked a hospital midwife, RM E,[11] for her opinion on Ms A using the birthing pool for labour. RM C said that she recalls RM E saying:

> "If it was her she wouldn't, but that it was up to me with what I felt comfortable with as her LMC. [RM E] went on to say that she would have [Ms A] deliver out of the pool. [RM E] did not express any opinion that a choice to remain in the pool would be unwise or incorrect to me and expressed it more as an option."

38. RM E provided a statement to HDC detailing a different recollection of her conversation with RM C. RM E's statement was based on her recall of events, and also on her retrospective notes written a few hours after the delivery. RM E recorded that she told RM C that Ms A "cannot get into the pool". RM E told HDC that she had seen the scan report from earlier that day, which indicated oligohydramnios and a possible umbilical hernia or exomphalos. She said that she was concerned about the potential for fetal distress during labour.

39. RM E told HDC that she questioned RM C about the oligohydramnios as a reason for not getting in the pool, and that RM C responded: "[B]ut that was only today." RM E recorded in the clinical notes, and told HDC: "At the end of the conversation, I told [RM C] it was her decision (as she had now heard my reasoning …), but I emphasised very clearly that if [RM C] decided to let [Ms A] labour in the pool, she MUST get her out for delivery."

[10] When the cervix is fully effaced it has thinned out completely.
[11] RM E is a registered midwife, and has been practising since 2006.

40. RM C told HDC:

> "In hindsight, I regret not making sure I was clear about [RM E's] advice/concerns. I did not deliberately ignore any of her suggestions — but may not have enquired closely enough for which I apologise. I was aware of the protocol that [a] woman with oligohydramnios should be continuously monitored and had I understood this to be the case, I would have approached the management of labour and birth differently starting with a discussion with [Ms A] of the recommendation for continuous [CTG]."

Birthing pool and CTG discontinued

41. Ms A got into the birthing pool at approximately 8.10pm, and the CTG was discontinued. At 8.30pm the fetal heart rate (FHR) was heard with a Sonicaid[12] at 130bpm, and at 8.40pm it was heard at approximately 120bpm. RM C recorded that, at this time, Ms A started to feel like pushing. RM C documented that it appeared as though Ms A's membranes ruptured, as there was a small amount of pinkish fluid in the pool. RM C recorded that she asked Ms A if she would like to leave the pool, but Ms A declined. RM C told HDC that at this stage she did not have any concerns for Ms A's baby, and so did not suggest that it was best for Ms A to leave the pool.

42. RM C recorded on the "Labour and Delivery Record" that the second stage of labour commenced at 9pm. At this time, Ms A was fully dilated, and began pushing. Between 9pm and 9.50pm, the FHR was monitored by Sonicaid every 20 minutes, with the highest documented rate being 140bpm and the lowest documented rate 120bpm.[13] At 9.55pm the FHR was documented as 100bpm. RM C told HDC that the birth was imminent, and the baby's head was descending through the birth canal at this stage, and that it is not uncommon for head compression and a lower FHR to occur.

43. Although RM C documented an FHR only every 20 minutes between 9pm and 9.50pm when Ms A was in the second stage of labour, RM C stated in her report to the Coroner that she was aware and made every effort to auscultate after every contraction or at least every five minutes in the active second stage of labour. RM C said that she was not always successful in obtaining an FHR reading, owing to Ms A's position and position changes in the pool. RM C said that she also recorded the FHR at other times that were not documented, and the FHR was at least 100bpm, but that she was unable to document this as her hands were in the pool.

44. Ms B was present during the delivery, and said: "I recall [RM C] looking for [Baby A's] heartbeat on numerous occasions during the final stages on [Ms A's] right side of her abdomen and she was unable to locate it. I remember looking at her wondering if this was normal after about three tries and she did not show any concern, therefore as she was the lead health professional midwife I put it to the side and continued to support [Ms A] each time she pushed. [RM C] did not try to locate [Baby A's] heartbeat when she was actively pushing at all during the final stages."

[12] A handheld ultrasound transducer used to detect the fetal heart rate.
[13] The FHR was documented at 9pm (130bpm), 9.20pm (120–130bpm), 9.40pm (140bpm), and 9.50pm (120bpm).

45. At 10.00pm RM C recorded that peeks of the vertex (head) were visible on pushing. At 10.10pm RM C recorded that Ms A was "pushing really well vertex advancing". At 10.15pm the FHR was documented again for the first time since 9.55pm, and remained at 100bpm. There was no indication that RM C checked the maternal pulse at either time to ensure that she was hearing an FHR rather than a maternal pulse. RM C told HDC that at this stage she could see the head starting to birth, so instead of asking Ms A to leave the pool at that point, she encouraged her to birth her baby.

Delivery

46. Ms A proceeded to deliver Baby A underwater at 10.18pm. RM C recorded that as the baby was emerging, she unwrapped the cord, which was around Baby A's neck. RM C told HDC that the cord unravelled quickly as she was bringing Baby A to his mother's chest. At 10.18pm, RM C recorded that Baby A was "pale and floppy".

47. Ms B told HDC that when Baby A was born he was "purple, floppy and had the umbilical cord twice around his neck".

48. RM C pressed the midwifery assist call bell. RM E responded. RM C stated that, at this point, she was not alarmed about Baby A's condition, as it was "too soon to assess the condition". RM C told HDC: "After a minute of failure to respond to stimulation, I called the baby as 'floppy' at which point [RM E] pressed the emergency bell for further assistance."

49. In RM E's retrospective notes she recorded that when she arrived, Baby A was "blue, floppy and making no respiratory effort". In response to the provisional report, RM E told HDC that she was not called into the room until Baby A was at least two minutes old. She said that she pressed the emergency bell within seconds of walking into the room. RM E pulled the delivery instruments over to RM C, which she recorded were not in arm's reach or open, and plugged in the oxygen and tested it. RM E recorded that within 30 seconds of arriving, Baby A was transferred to the resuscitation table.

Resuscitation table set-up

50. RM C told HDC that it was her normal practice to have the resuscitation table set up with a heat lamp on, warming towels, and oxygen plugged in. However, on this day, she did not. RM C said:

> "I had started this process at [Ms A's] delivery by opening the resuscitation table and putting the heater on to warm towels. I am unsure why I did not plug in the [oxygen] as normally I would … and can only assume I was distracted by all the family members entering the room and finding chairs for them. This is also why I did not have the delivery trolley wheeled over close to the pool. Due to the many bodies in the delivery room, the trolley could have been a hazard if we had needed to get [Ms A] out of the pool quickly.

> My usual practice is delayed cord clamping[14] … I do not always have the clamps by my side … They are always in the room but not always at hand. This is where the second midwife can assist if needed.
>
> On reflection, it would have been preferable to have called [RM E] in earlier to help me with getting the delivery pack opened, with the cord clamps and scissors available and ensuring the resuscitation table was fully set up."

51. In response to the "information gathered" section of the provisional report, Ms B told HDC that she "observed everyone being respectful to the midwife's space and [does] not recall [RM C] asking anyone to move or stating this was an issue".

Resuscitation of Baby A

52. Baby A's clinical notes record that intermittent positive pressure ventilation was commenced, with some chest wall rise, and that his FHR was 120bpm. RM E further assisted with Baby A's resuscitation until the paediatric team arrived at approximately 4–5 minutes of age and took over the resuscitation. The Apgar scores[15] were 0 at 1 minute, 2 at 5 minutes, and 4 at 10 minutes. At 2am, RM C transferred RM C's care to the hospital staff and went home.

Retrieval team arrival and transfer to Hospital 2's Neonatal Intensive Care Unit

53. At 9.30am on 4 Month9, RM C recorded that she went to visit Ms A, and that she was "obstetrically well". At 10.05am, the Neonatal Retrieval Team arrived. Baby A was transferred by helicopter to Hospital 2 at 2.30pm. Baby A was diagnosed with hypoxic ischaemic encephalopathy,[16] and remained critically unwell despite supportive therapy. Sadly, Baby A died.

Postnatal care

54. RM C's first postnatal contact with Ms A was on 4 Month9 (as noted above), where she ascertained that Baby A was being transferred and cared for by the Neonatal Unit. RM C told HDC that she understood that Ms A would be cared for by Hospital 2 staff during her stay, and discussed this with Ms A. RM C told HDC that she sent a text message to Ms A asking her to get in contact when she returned home.

55. The next contact RM C had with Ms A was on 7 Month9, when a friend of Ms A called on her behalf to request medication to help stop lactation. RM C said that Ms A was unavailable to speak to her at that time. RM C told HDC that she made numerous attempts to try to speak with Ms A over the next few days, but was unsuccessful.

56. RM C told HDC that she arranged to meet Ms A on 10 Month9, but had to cancel because of a client in labour. RM C said that she tried a number of times to rearrange

[14] Leaving the cord unclamped so the baby receives some or all of the oxygenated blood from the placenta.
[15] The Apgar scale is determined by evaluating the newborn baby on five criteria on a scale from zero to two, then summing up the five values. The resulting Apgar score ranges from zero to 10, with 10 being the most reassuring.
[16] Hypoxic ischaemic encephalopathy is a brain injury caused by oxygen deprivation to the brain, also commonly known as intrapartum asphyxia.

the appointment, and eventually met with Ms A on 17 Month9 (day 14 postnatal). RM C stated that Ms A "appeared well clinically" and that routine checks showed that "all was normal". RM C said that she discussed the grieving process with Ms A, and asked her whether she wanted to engage with a counselling service, but Ms A declined. RM C stated that Ms A asked her what she could have done differently during Baby A's labour and delivery. RM C told HDC that she provided a debrief to Ms A. RM C said that her final contact with Ms A was on 25 Month9, when she sent a text message to Ms A asking about her well-being and advising that she was going on leave. RM C said she provided the contact details for one of her colleagues.

Postnatal documentation

57. RM C did not record any details of her postnatal telephone calls or visits with Ms A (except for her first visit with Ms A in hospital on 4 Month9). RM C told HDC: "The personal visit dates and phone (P) attendances are noted, but regrettably I have not completed a description of the conversations or care … While I believe this documentation is not up to my usual standard, I will use this opportunity to take further education in documentation."

Further information — RM C

58. RM C told HDC:

> "I have had many months to reflect on the care I provided for [Ms A]. I am pleased that the midwifery care I provided for [Ms A] throughout her pregnancy was considered to be of a high standard. The care I provided and my decision making from when labour commenced was based on my view that [Ms A] was a well woman … As a result of this case, I am engaging in the next available Elective Fetal Monitoring Course."

59. As a result of this case, RM C now calls a second midwife to the delivery to assist with birthing, and contacts another clinician if she faces any difficulty in auscultating the FHR.

Responses to provisional opinion

60. Ms A was provided with an opportunity to comment on the "information gathered" section of the provisional report. Her response has been incorporated into this report.

61. RM C provided a response to the provisional report. Her comments have been incorporated into this report. RM C told HDC that she is agreeable to the recommendations made in this report (see below).

62. DHB1 (including Dr D) provided a response to the sections of the provisional report that related to it. DHB1 submitted:

a) Dr D's documented plan for induction was not deficient.

b) The responsibility for the management and safe delivery of Baby A resided with RM C.

c) RM C did not inform the obstetric team that Ms A had been admitted in labour that day.

d) RM E gave sound rational advice to RM C having considered associated risk factors.

63. RM E provided a response to the sections of the provisional report that related to her, and her response has been incorporated into this report.

Relevant standards

RANZCOG Intrapartum Fetal Surveillance Clinical Guideline

64. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) *Intrapartum Fetal Surveillance Clinical Guideline — Third Edition 2014* (the *Guideline*)[17] provides: "Continuous CTG should be recommended when either risk factors for fetal compromise have been detected antenatally, are detected at the onset of labour or develop during labour." The *Guideline* lists oligohydramnios as one of the antenatal risks factors.

65. The *Guideline* provides that where continuous CTG monitoring is required, and if the CTG is considered to be normal, it may be interrupted for short periods of up to 15 minutes to allow personal care (eg, shower, toilet). However, such interruptions should be infrequent and not occur immediately after any intervention that might be expected to alter the FHR.

66. The *Guideline* states that the normal CTG is associated with a low probability of fetal compromise, and has the following features:

"• Baseline rate 110–160bpm.

a) Baseline variability of 6–25bpm.

b) Accelerations of 15bpm for 15 seconds.

c) No decelerations.

All other CTGs are by this definition abnormal and require further evaluation taking into account the full clinical picture."

67. The *Guideline* provides that, where there are no risk factors and a CTG is not required, the FHR should still be monitored by intermittent auscultation every 15 to 30 minutes in the active phase of the first stage of labour and after each contraction, or at least every five minutes in the active second stage of labour.

68. In relation to fetal and maternal heart rate monitoring, the *Guideline* provides: "Regardless of the method of intrapartum monitoring, it is essential that an accurate

[17] Endorsed by the New Zealand College of Midwives.

record of fetal wellbeing is obtained. Fetal and maternal heart rates should be differentiated whatever the mode of monitoring used."

Opinion: RM C

69. This opinion assesses the care provided to Ms A by RM C antenatally, during labour, and postnatally, as set out below.

Antenatal care — other comment

70. My expert advisor, RM Michelle Bailey, advised that RM C provided a high standard of antenatal care, including all aspects of primary maternity care, and appropriate and timely secondary and tertiary referral when problems were identified. Ms Bailey also noted that when Ms A presented in labour, RM C provided a comprehensive assessment. Overall, I accept that the antenatal care provided to Ms A met accepted standards.

Care provided during labour — breach

Failure to clarify scan findings

71. At 39 weeks' gestation, Ms A underwent a USS at the radiology service. The scan showed oligohydramnios.

72. Immediately following the scan, Trainee Sonographer Ms F contacted RM C to discuss the findings. Ms F told HDC that her conversation with RM C would have included detailing the scan findings. RM C accepts that she received a call from Ms F, but told HDC that Ms F advised that there were "low pools of liquor". RM C does not recall Ms F "mentioning a diagnosis of oligohydramnios". Due to the differing accounts, I am unable to make a finding as to whether or not Ms F informed RM C that the scan showed oligohydramnios. However, I note that RM C was sufficiently concerned about Ms A's well-being from her conversation with Ms F that she arranged to meet Ms A at Hospital 1 to carry out an assessment and arrange an obstetric review.

73. The radiology service told HDC that its computer records show that the final verified report was sent to RM C by fax and mail at 5.42pm on the day of the scan. The final report was also sent to Hospital 1, the antenatal clinic, and MFM. I am concerned that RM C did not seek to access a copy of the scan report to confirm the severity of the low liquor, despite her concern for Ms A following her telephone call with Ms F. By failing to do so, RM C did not have a complete understanding of Ms A's risk factors prior to labour.

Failure to recognise high-risk labour

74. RM C told HDC: "There was no indication from the on call obstetrician for [Ms A] to be managed other than a well woman in the event she went into spontaneous labour prior to [induction] … so when she did present in labour I resumed normal midwifery labour cares." In my view, it was RM C's responsibility as LMC to clarify with the

obstetric team if she was uncertain of the management plan if Ms A went into spontaneous labour.

75. In addition, as LMC, RM C had overall responsibility for Ms A's care. I am therefore very concerned that, despite the trainee sonographer calling RM C with the abnormal scan findings, and following the consultation with Dr D where induction was recommended as a result of those findings, RM C was the only clinician who failed to recognise that Ms A's labour would be high risk.

76. RM C told HDC that she was "aware of the protocol that [a] woman with oligohydramnios should be continuously monitored", but she did not understand that the low pools of liquor constituted oligohydramnios. I note Ms Bailey's advice that she would not make a distinction between the management of a woman in labour with low pools of liquor or a woman with oligohydramnios. Ms Bailey advised that Ms A should have been advised not to labour in the birth pool, as she had a clear indication for continuous CTG monitoring. I consider that it was RM C's responsibility to read the USS report so that she could establish the severity of the reduced liquor volume, as she was aware that a certain level would constitute oligohydramnios.

77. I am highly critical that despite being aware that Ms A had "low pools of liquor" and that the plan was for induction the following day, RM C failed to establish the severity of the reduced liquor and to recognise that Ms A's labour was high risk and would require continuous CTG monitoring.

Failure to recognise abnormal CTG

78. A CTG was commenced at 7.40pm and discontinued at 8.10pm to allow Ms A to enter the birthing pool. RM C recorded that the CTG report was "reassuring".

79. Ms Bailey reviewed the CTG from prior to entering the birthing pool, and advised that it was an abnormal CTG because there were variable decelerations present. She noted:

> "On reviewing the CTG, contractions appear to be 3 in 10, baseline rate is 120–30bpm, variability is between 5 and 15 bpm, there are accelerations present and occasional fleeting variable decelerations present. Overall by definition, according to the RANZCOG Fetal Surveillance Clinical Guideline this is an abnormal CTG and the recommendation would be to continue. In my opinion, reviewing the CTG at this stage the tracing was not indicative of fetal hypoxia but I would have expected the CTG to be continued. In view of the oligohydramnios and the non-reassuring features on the CTG it is my opinion and would be that of my peers that continuous electronic fetal monitoring during labour was indicated, and unless there was telemetry monitoring available RM C should have advised [Ms A] against labour and birth in the pool."

80. The CTG recording was therefore a further indication that Ms A's labour was high risk and required continuous CTG monitoring. I am concerned that RM C did not interpret the CTG correctly.

Communication with hospital midwife

81. At 7.40pm, RM C recorded that Ms A was "wishing to use the pool", and that the pool was filling. RM C asked RM E for her opinion on Ms A using the birthing pool for labour. RM C said that she recalls RM E saying:

> "If it was her she wouldn't, but that it was up to me with what I felt comfortable with as her LMC. [RM E] went on to say that she would have [Ms A] deliver out of the pool. [RM E] did not express any opinion that a choice to remain in the pool would be unwise or incorrect and to me expressed it more as an opinion."

82. RM E provided a statement to HDC detailing a different recollection of her conversation with RM C. RM E's statement was based on her recall of events and also on her retrospective notes written a few hours after the delivery. RM E recorded that she told RM C that Ms A "cannot get into the pool". RM E told HDC that she had seen the scan report from earlier that day, which indicated oligohydramnios and a possible umbilical hernia or exomphalos. She said that she was concerned about the potential for fetal distress during labour.

83. RM E told HDC that she questioned RM C about the oligohydramnios as a reason for not getting in the pool, and that RM C responded: "[B]ut that was only today." RM E recorded in the clinical notes, and told HDC: "At the end of the conversation, I told [RM C] it was her decision (as she had now heard my reasoning …), but I emphasised very clearly that if [RM C] decided to let [Ms A] labour in the pool, she MUST get her out for delivery."

84. RM C told HDC:

> "In hindsight, I regret not making sure I was clear about [RM E's] advice/concerns. I did not deliberately ignore any of her suggestions — but may not have enquired closely enough for which I apologise. I was aware of the protocol that [a] woman with oligohydramnios should be continuously monitored and had I understood this to be the case, I would have approached the management of labour and birth differently starting with a discussion with [Ms A] of the recommendation for continuous [CTG]."

85. In my view, by asking RM E about her opinion on whether or not Ms A should use the birthing pool, RM C had some doubt about the appropriateness of its use. I am critical that RM C did not communicate effectively with RM E. If RM C was unclear about RM E's concerns about using the birthing pool, she should have clarified what those concerns were.

Failure to monitor FHR adequately during second stage of labour

86. Ms Bailey stated: "[A]s [Ms A] was not [continuously monitored throughout her labour] I would have expected [RM C] [to] auscultate the fetal heart after each contraction or every 5 minutes in the active second stage of labour."

87. RM C said that she was aware, and made every effort to auscultate after every contraction or at least every five minutes in the active second stage of labour. RM C performed intermittent fetal heart rate monitoring with a Sonicaid device. The FHR

was documented only every 20 minutes in the second stage of labour until 9.50pm. At 9.55pm it was checked and recorded as 100bpm. It was not recorded again until 10.15pm, when it was again noted to be 100bpm.

88. RM C said that due to Ms A's position and position changes in the pool, she was not always successful in obtaining an FHR reading. RM C said that she also recorded the FHR at other times that were not documented, and the FHR was at least 100bpm, but she was unable to document this as her hands were in the pool.

89. Ms Bailey advised:

> "[A]t 21.55 [the FHR] was 100bpm, which can be normal during a contraction in the second stage of labour but could also be abnormal if listened to after a contraction. I would have expected [RM C] to advise [Ms A] to leave the pool at this time to enable closer monitoring of the fetal heart. It is my opinion that this was a moderate departure from accepted practice."

90. RM C told HDC that at 10.15pm, when the FHR was documented at less than 100bpm, the birth was imminent and the baby's head was descending through the birth canal, and that at this stage it is not uncommon for head compression and a lower FHR to occur.

91. I am critical of RM C's actions in regard to FHR monitoring. I accept Ms Bailey's advice that when RM C documented the FHR at 9.15pm as 100bpm she should have undertaken closer monitoring of the FHR. In my view, at this time RM C should have taken further action, and I am critical that she did not. In addition, I find it suboptimal that RM C did not document the FHR between 9.55pm and 10.15pm.

Failure to differentiate between maternal pulse and FHR

92. RM C recorded Ms A's pulse only on admission, despite the FHR being as low as 100bpm during labour. Ms Bailey noted that it is possible that RM C was hearing a maternal pulse. The *Guideline* provides: "Regardless of the method of intrapartum monitoring, it is essential that an accurate record of fetal wellbeing is obtained. Fetal and maternal heart rates should be differentiated whatever the mode of monitoring used."

93. I am critical that when RM C believed that she had detected the FHR at 100bpm on several occasions between 9.55pm and 10.15pm, she did not then check the maternal pulse to ensure that she was listening to the FHR.

Resuscitation preparation

94. RM C did not complete her preparation of the equipment required for birthing or resuscitation. She told HDC that it was her normal practice to have the resuscitation table set up with a heat lamp on, warming towels, and oxygen plugged in. However, on this day, she did not. RM C said:

> "I had started this process at [Ms A's] delivery by opening the resuscitation table and putting the heater on to warm towels. I am unsure why I did not plug in the [oxygen] as normally I would … and can only assume I was distracted by all the

> family members entering the room and finding chairs for them. This is also why I did not have the delivery trolley wheeled over close to the pool. Due to the many bodies in the delivery room, the trolley could have been a hazard if we had needed to get [Ms A] out of the pool quickly.
>
> …
>
> On reflection, it would have been preferable to have called [RM E] in earlier to help me with getting the delivery pack opened, with the cord clamps and scissors available and ensuring the resuscitation table was fully set up."

95. Ms Bailey advised that it would be standard practice for a midwife to have equipment for birth and resuscitation checked and prepared in case it should be needed. Ms Bailey considered that RM C's failure to do so was a mild departure from normal practice.

96. I am concerned that RM C did not fully set up the equipment required to birth Ms A's baby, or the equipment needed for resuscitation. The well-being of Ms A and her baby were paramount to RM C, and should not have been compromised by attending to the family members present instead of setting up equipment.

Actions following birth

97. Baby A was delivered underwater at 10.18pm. RM C recorded that as Baby A was emerging, she unwrapped the cord, which was around his neck. RM C told HDC that the cord unravelled quickly as she was bringing Baby A to his mother's chest.

98. At 10.18pm RM C recorded that Baby A was "pale and floppy". RM C pressed the midwifery assist call bell. RM E responded. RM C stated that at this point, she was not alarmed about Baby A's condition as it was "too soon to assess the condition". RM C told HDC: "After a minute of failure to respond to stimulation, I called the baby as 'floppy' at which point [RM E] pressed the emergency bell for further assistance."

99. In RM E's retrospective notes, she recorded that when she arrived, Baby A was "blue, floppy and making no respiratory effort". RM E pulled the delivery instruments over to RM C, which she recorded were not in arm's reach or open, and plugged in the oxygen and tested it. RM E recorded that within 30 seconds of arriving, Baby A was transferred to the resuscitation table and resuscitation attempts were started.

100. In my view, RM C did not recognise with sufficient urgency that Baby A's condition was severely compromised at birth. I am critical that she did not recognise that and immediately press the emergency bell.

Conclusion

101. RM C failed to provide services to Ms A with reasonable care and skill in the following ways:

a) Prior to labour, RM C did not attempt to access the scan report from the radiology service to clarify her understanding of the results, and, as a result, failed to

recognise that Ms A's labour would be high risk, requiring continuous CTG monitoring.

b) RM C incorrectly interpreted the CTG report at 7.40–8.10pm as being "reassuring".

c) RM C did not communicate effectively with RM E about RM E's concern with Ms A using the birthing pool during labour.

d) At 9.55pm, when the FHR was 100bpm, RM C did not undertake closer monitoring of the FHR. RM C also did not document the FHR between 9.55pm and 10.15pm.

e) When the FHR was detected at 100bpm on several occasions between 9.55pm and 10.15pm, RM C did not check the maternal pulse to ensure that she was hearing the FHR.

f) RM C did not prepare the birthing or resuscitation equipment adequately, and failed to recognise that Baby A's condition was severely compromised at birth, and immediately press the emergency bell.

102. Accordingly, I find that RM C breached Right 4(1) of the Code.

Postnatal care — other comment

103. Ms Bailey advised that RM C provided standard immediate postnatal care to Ms A. Ms Bailey birthed Ms A's placenta, repaired her tear, recorded her postnatal observations, and estimated her blood loss. Ms A and her family were taken to the Special Care Baby Unit (SCBU) to see Baby A, and Ms A's care was handed over to the postnatal ward team.

104. RM C's first postnatal contact with Ms A was on 4 Month9 (the day after the birth), where she ascertained that Baby A was being transferred and cared for by the Hospital 2 Neonatal Unit. RM C told HDC that she understood that Ms A would be cared for by Hospital 2 staff during her stay, and discussed this with Ms A. RM C said that she sent a text message to Ms A asking her to get in contact when she returned home.

105. The next contact RM C had with Ms A was on 7 Month9, when a friend of Ms A called on her behalf to request medication to help stop lactation. RM C said that Ms A was unavailable to speak to her at that time. RM C told HDC that she made numerous attempts to try to speak with Ms A over the next few days, but was unsuccessful.

106. RM C told HDC that she arranged to meet Ms A on 10 Month9, but had to cancel because a client was in labour. RM C said that she tried a number of times to rearrange the appointment, and eventually met with Ms A on 17 Month9 (day 14 postnatal). RM C stated that Ms A "appeared well clinically", and that routine checks showed that "all was normal". RM C said that she discussed the grieving process with Ms A, and asked her whether she wanted to engage with a counselling service, but Ms A declined. RM C said that Ms A asked her what she could have done differently during Baby A's labour and delivery. RM C told HDC that she provided a debrief to Ms A.

107. RM C told HDC that her final contact with Ms A was on 25 Month9, when she sent a text message to Ms A asking about her well-being and advising that she was going on leave. RM C said that she provided the contact details for one of her colleagues.

108. Ms Bailey advised that RM C made a reasonable attempt to provide postnatal care for Ms A, and I accept this.

Postnatal documentation — adverse comment

109. RM C did not record any details of her postnatal telephone calls or visits with Ms A (except for her first visit with Ms A in hospital on 4 Month9). RM C told HDC: "The personal visit dates and phone (P) attendances are noted, but regrettably I have not completed a description of the conversations or care … While I believe this documentation is not up to my usual standard I will use this opportunity to take further education in documentation." I am critical that RM C did not make any notes of her postnatal communication and visits with Ms A.

Other comment: Dr D

110. Following her USS on 3 Month9, Ms A was reviewed by an obstetric registrar, Dr D. RM C was also present at the consultation. Dr D recorded that Ms A appeared well on examination, and that the CTG was reassuring. Dr D noted that the USS had shown reduced liquor, and also stated that growth was reduced. Dr D discussed Ms A with an obstetrician, Dr G, and a plan was made for induction of labour the following day.

111. Dr D did not document a plan should Ms A present in labour prior to induction, and told HDC: "[T]he plan would be for her to be monitored and managed in the way any other patient with spontaneous onset of labour would be under the care of her LMC, however with continuous CTG monitoring (due to Oligohydramnios)."

112. RM C told HDC: "There was no indication from the on call obstetrician for [Ms A] to be managed other than a well woman in the event she went into spontaneous labour prior to [induction] … so when she did present in labour I resumed normal midwifery labour cares."

113. My expert obstetrician and gynaecology specialist, Dr Ian Page, advised me that continuous CTG monitoring was indicated given the oligohydramnios. He stated: "As oligohydramnios is a standard indication for CTG monitoring, I would expect the LMC to be aware of it and would not write it into the plan." I acknowledge Dr Page's advice.

114. I accept that it is expected that an LMC knows that oligohydramnios is a standard indication for CTG monitoring. However, it was important that not only RM C but also Ms A, were aware that Ms A's labour would be high risk, requiring close monitoring.

115. In response to the provisional report, DHB1 submitted that Dr D's documented plan for induction was not deficient and that the responsibility for the management and safe delivery of Baby A resided with RM C. I accept DHB1's comment that the

responsibility for the management of, and safe delivery of, Baby A resided with RM C (as care had not been transferred to the obstetric team). However, in my view, it would have been helpful for Dr D to have discussed the indication for close monitoring at the consultation, and then documented a plan that clearly set out that Ms A's labour was high risk and would require continuous CTG monitoring. Documented and detailed plans are extremely important for continuity of care when working in a team environment.

Other comment: RM E

116. RM E told HDC that she had seen Ms A's USS report, which indicated oligohydramnios. RM E advised RM C against allowing Ms A to labour in the birthing pool. In response to the provisional report, DHB1 submitted that RM E gave sound rational advice to RM C having considered associated risk factors. I accept that RM E provided good advice to RM C. In my view, RM E could have been more firm with RM C about RM C's decision to allow Ms A to labour in the pool. I also consider that it would have been helpful for RM E to have discussed with RM C that continuous CTG monitoring was indicated owing to the oligohydramnios.

Recommendations

117. Following notification by this Office to the Midwifery Council of New Zealand of this investigation, the Council decided to conduct a competence review of RM C's practice. This was completed on 29 and 30 May 2017. Accordingly, I do not propose to make a further recommendation to the Council regarding a competence review.

118. In response to the recommendations made in my provisional opinion, RM C provided a written apology for forwarding to Ms A.

119. I recommend that RM C undertake further training (or provide evidence of recent training) on documentation and fetal monitoring, within two months of the date of this report.

Follow-up actions

120. RM C will be referred to the Director of Proceedings in accordance with section 45(2)(f) of the Health and Disability Commissioner Act 1994, for the purpose of deciding whether any proceedings should be taken.

121. A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be sent to the Midwifery Council of New Zealand and DHB1, and they will be advised of RM C's name.

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

Addendum

123. The Director of Proceedings filed proceedings by consent against RM C in the Human Rights Review Tribunal. The Tribunal issued a declaration that RM C breached Right 4(1) of the Code by failing to provide services to Ms A with reasonable care and skill.

Appendix A: Independent midwifery advice to the Commissioner

The following expert advice was obtained from a registered midwife, Michelle Bailey:

"My name is Michelle Bailey. I have been asked to provide an opinion to you on case number C16HDC00455**.** I have read and agree to follow the Health and Disability Commissioner's Guidelines for Independent Advisors.

I qualified as a Registered General Nurse in 1989 and as a Registered Midwife in 1991 in Newcastle upon Tyne, United Kingdom. I worked as a midwife in a tertiary hospital in Newcastle upon Tyne from 1991 to 2003. During this time I worked across the scope of midwifery practice, including time spent in a midwifery led unit, working as a practice support midwife and working as part of a team managing complex maternity care. On moving to New Zealand I worked as a Clinical Charge Midwife on the Assessment Labour and Birthing Unit at Middlemore Hospital from 2005 to 2009, followed by a position as a Community Midwife in a Primary Unit. My current role is the Maternity Quality and Safety Programme Facilitator at Northland District Health Board. I held the position of Co-chair of the Northland branch of the New Zealand College of Midwives (NZCOM) from July 2012 through to July 2015. I am a current member of the National NZCOM finance committee. I have provided competency supervision on behalf of the Midwifery Council and was a member of the Maternity Quality and Safety Programme Evaluation Expert Advisory Group for the Ministry of Health.

Background as provided by investigator.

On 3 [Month9], [Ms A] was 39 weeks' gestation. She received an ultrasound which showed oligohydramnios. At the time of the scan [Ms A] was experiencing some contractions. Following her scan [RM C], her Lead Maternity Carer (LMC) was contacted and she arranged to assess [Ms A] at [Hospital 1]. [Ms A] was monitored for around 30 minutes and her contractions settled. Consultation took place and [Ms A] was reviewed by an Obstetric Registrar and was booked to be induced the following day and was discharged home.

On the evening of 3 [Month9], [Ms A] starting having contractions again and had a gush of fluid at approximately 6.00pm with a pink show. [RM C] met [Ms A] on her return to [Hospital 1] at 7.30pm. On examination [Ms A] was 8–9cm dilated and the cervix was fully effaced. At 7.40pm a CTG was reportedly reassuring. [Ms A] got into the birthing pool at approximately 8.10pm. At 8.30pm the fetal heart rate was heard with a sonicaid at 130bpm, and at 8.40pm it was heard at approximately 130/130bpm. At this time, [Ms A] started to feel like pushing. [RM C] notes that it appeared as though [Ms A's] membranes ruptured, as there was a small amount of pinkish fluid in the pool. [RM C] asked [Ms A] is she would like to leave the pool, but she declined.

At 9.00pm [Ms A] was fully dilated, and began pushing. Between 9.00pm and 9.50pm the fetal heart rate was monitored by sonicaid with the highest documented as 140bpm and the lowest documented as 120bpm. At 9.55pm the

heart rate was documented as 100bpm. [RM C] notes that the birth was imminent and the baby's head was descending through the birth canal at this stage, and it is not uncommon for head compression and a lower fetal heart rate (FHR) to occur. After this FHR monitoring, [Ms A] was contracting almost constantly at a rate of 4–5 times in 10 minutes and she attempted to find the FHR, but was unsuccessful. [RM C] asked [Ms A] to move from a hands and knee position to a sitting position so she could more easily obtain the FHR. [Ms A] moved to this position, but [RM C] still found it difficult to auscultate.

At 10.00pm [RM C] noted that peeks of the vertex were visible on pushing. At 10.10pm she was noted to be pushing well with the vertex advancing. At 10.15pm the fetal heart rate was documented as 100bpm. [RM C] notes that at this stage, she could see the head starting to birth so instead of asking [Ms A] to leave the pool at that point, she encouraged her to birth her baby.

[Ms A] proceeded to deliver [Baby A] underwater at 10.18pm. [RM C] notes that as the baby was emerging she had both hands in the pool to unwrap the nuchal cord which was tightly around [Baby A's] neck. The cord unravelled quickly as she was bringing [Baby A] to his mother's chest.

At birth [Baby A] was pale and floppy with no spontaneous breathing. [RM C] pressed the midwifery assist call bell. Core midwife responded and she pressed the emergency bell for further assistance. The cord was cut at approximately 3 minutes of age and he was taken to the resuscitaire. IPPV was commenced with some chest wall rise. His heart rate was 120bpm. The Apgar Scores were 0 at 1 minute, 2 at 5 minutes, and 4 at 10 minutes. Paediatric staff were called and arrived at approximately 4–5 minutes of age.

[Baby A] developed abnormal jerking and gasping movements. On examination, his left pupil was reactive to light, but his right pupil was non-reactive. [Baby A] had no Moro, grasp, suck or gag reflex. Blood tests showed an ongoing severe metabolic acidosis. He had symptoms of persistent pulmonary hypertension of the new-born. [Baby A] was treated with supportive therapies, anti-seizure medications, and antibiotics.

At 10.05am on 4 [Month9], the [Hospital 2] Neonatal Retrieval Team arrived and [Baby A] was transferred by helicopter to [Hospital 2] at 2.30pm. He remained critically unwell with worsening respiratory and metabolic acidosis despite supportive therapy. Given the extremely poor prognosis, active therapy was discontinued and [Baby A] [died from perinatal asphyxia].

As part of [Ms A's] complaint, she notes that [RM C] did not provide adequate postnatal care. [RM C] responded to these concerns and notes that her first postnatal contact with [Ms A] was on 4 [Month9], where she ascertained that [Baby A] was being transferred and cared for by [Hospital 2] Neonatal Unit.

The next contact she had with [Ms A] was on 7 [Month9], when a friend of [Ms A's] called her regarding some medication to help 'dry up the milk'. [RM C] notes

that she made numerous attempts to try to speak with [Ms A] over the next few days, but was unsuccessful.

[RM C] eventually met with [Ms A] on 17 [Month9]. They discussed many matters and carried out all the routine checks and noted that 'all was normal'. [RM C] discussed the grieving process and asked [Ms A] whether she wanted to engage with a counselling service, but she declined. She notes that [Ms A] appeared clinically well. No further contact was made between [RM C] and [Ms A].

Issues
I have been asked to review the documents and provide an opinion on the following issues:

1) The adequacy and appropriateness of the care provided during the antenatal period
2) The adequacy and appropriateness of the care provided during the labour period, including comment on:
    i. Whether [RM C] made appropriate enquiries following the results of the ultrasound scan on 3 [Month9].
    ii. The appropriateness of [RM C] allowing [Ms A] to birth in the pool.
    iii. The actions of [RM C] immediately after the birth of [Baby A].
3) The adequacy of the postnatal care provided to [Ms A].
4) The overall care and management of [Ms A] by [RM C].
5) Any further comment I wish to make.

For each question, I will consider as requested:

a) What is the standard of care/accepted practice?
b) If there has been a departure from the standard of care or accepted practice, how significant a departure do I consider it to be?
c) How would it be viewed by my peers?

Timeline of Events taken from Clinical Notes

[Ms A] booked with [RM C] for maternity care at 5 weeks' gestation. Her expected due date (EDD) was noted to be […] based on an early ultrasound scan (USS). She was a 20 year old Maori woman with a BMI of 27.7. She was noted to smoke 10 cigarettes per day and had a history of asthma, not taking any medication. At the 1st visit it appears a comprehensive booking assessment was undertaken and information was given to [Ms A] regarding maternity care and timing of antenatal visits, diet and exercise in pregnancy and she was offered and declined smoking cessation assistance. [Ms A] had all routine 1st AN bloods taken, which were within normal limits except that she was non-immune to Rubella.

[Ms A] was seen again at 10 weeks' gestation by [a locum LMC], where blood pressure (BP) and urinalysis were normal. Maternal Serum Screening (MSS1) was fully discussed and forms given. Further smoking cessation advice was also given

and [Ms A] was considering referral to a smoking cessation group. MSS1 was completed at 12 weeks' gestation and was found to be low risk.

At 14 weeks' gestation [Ms A] was seen again by [RM C] for a routine Antenatal visit. [Ms A] continued to smoke cigarettes and cessation was discussed. The results of the MSS1 tests were explained.

[Ms A] had a home visit at 18 weeks, all antenatal assessments were normal, smoking cessation was again discussed and a form was given to book a routine anatomy scan.

At 20 weeks a routine anatomy scan [was performed]. This scan showed normal development apart from an echogenic structure at the base of the umbilical cord. This was documented as likely to be a small omphalocele or an umbilical hernia. Fetal Medicine review was recommended. [RM C] referred [Ms A] to the hospital Obstetric Antenatal clinic at [Hospital 1] and also to the Maternal Fetal Medicine (MFM) service at [a main centre hospital].

At 21+5 weeks [Ms A] did not attend an appointment [at the] Antenatal clinic. A further appointment was sent.

[Ms A] was seen at home by [RM C] at 22 weeks who documents the findings of the anatomy scan and the referrals to the hospital antenatal clinic and to [the] MFM department for consultation. [Ms A] was noted to have an appointment [at the MFM department] the next day. Fundal height recorded as 22cms, is normotensive with urinalysis normal. [Ms A] had reduced her intake of cigarettes.

She was seen [in MFM] 22+1 weeks. Further USS confirmed fetal measurements were appropriate for gestation and confirmed the abdominal wall abnormality and also noted a dilated Cisterna Magna. They offered amniocentesis at this time and it was declined. MFM follow up was arranged for 32 weeks' gestation. Plan for birth was to keep the cord long when it was cut.

At 23+2 weeks [Ms A] was seen in the hospital antenatal clinic by [an] Obstetrician, who noted the MFM assessment and follow-up plan and did not consider there were any other risk factors. [Ms A] remained normotensive and urinalysis was negative. She was to be seen again at 34 weeks' gestation.

[Ms A] was seen at home at 29 weeks' gestation for an antenatal check up by [RM C], fundal height was measured at 27cms, she remained normotensive, urinalysis normal, fetal heart was recorded at 130 bpm and fetal movements were felt. [Ms A] reported that she was feeling well and had reduced her working hours. Eligibility for travel assistance to [MFM] was discussed and [RM C] recorded she would confirm with the District Health Board that she would be entitled to petrol vouchers. Polycose screening for gestational diabetes was documented as normal and iron stores were noted to be low. Increased intake of iron rich foods was discussed.

[Ms A] was seen at home at 31 weeks' gestation for an antenatal check up by [RM C], she remained normotensive, urinalysis was normal, fetal heart was heard and fetal movements were felt. Fundal height measured 28cms. [Ms A] reported that she was feeling well and Iron supplementation was prescribed. [Ms A] was to collect petrol vouchers from [Hospital 1] for her appointment at [the] MFM department.

[Ms A] was reviewed in [the] MFM department at 32+1 weeks' gestation. USS was performed. Slight slowing of growth was noted, with the femur length less than the 3rd percentile although the overall estimated fetal weight (EFW) of 1830g was within the normal range. The abdominal wall defect appearances were unchanged and were thought to be more in keeping with that of an umbilical hernia. The possibility of an underlying genetic or chromosomal problem was again discussed, however [Ms A] declined amniocentesis. Serial growth scans were recommended along with birth in hospital, routine care in labour, the cord to be left long at delivery to avoid accidental injury to bowel and paediatric review following birth. The plan was for follow up USS in 2 weeks in [her home town] and review in the local Obstetric Antenatal clinic.

[Ms A] was seen at home at 33 weeks' gestation for an antenatal check up by [RM C], she remained normotensive, urinalysis was normal and fetal movements were felt. Fetal heart activity was heard and regular at 140–160 bpm. The fundal height measured 29cms. She was given a form to book an USS for growth and advised to have this done within the next week. The next routine visit was planned in 2 weeks.

[Ms A] was seen in Obstetric Antenatal clinic by [an obstetrician] at 35 weeks' gestation. [Ms A] remained normotensive and urinalysis was normal. Fundal height was not recorded but the baby was thought to be an average size and fetal heart activity was heard. At this stage [Ms A] had not yet had an USS for growth.

[Ms A] was seen for an antenatal visit at 35+1 by [RM C]. She remained normotensive and urinalysis was normal and her weight was recorded as 93kg. Fundal height measured 34cms, fetal movements were noted, fetal heart was heard, presentation was noted to be cephalic.

The USS for growth was performed at 36 weeks' gestation at the radiology service. This showed normal interval growth from the previous scan at 32 weeks with an EFW of 2593g. The abdominal wall defect showed no significant changes since 20 weeks. The liquor volume was noted to be normal with the deepest pool measuring 4.1cms. A follow-up scan in 2 weeks was recommended.

[Ms A] was seen for an antenatal visit at 36+1 by [RM C]. She was described as feeling very hot and exhausted, remained normotensive and urinalysis was normal. Fundal height measured 35cms, and lots of fetal movements were noted.

[Ms A] was seen again at home at 37 weeks' gestation for an antenatal check up by [RM C]. She remained normotensive and her urinalysis was normal. The

fundal height measured 36cms, the baby was moving a lot and was head down lying to the maternal right. [Ms A] was now on maternity leave.

[Ms A] was seen in the Obstetric Antenatal clinic at 37+2 weeks' gestation by [an] Obstetric Registrar. She remained normotensive, urinalysis was not recorded, fetal movements and fetal heart were documented to be present. The USS findings from 36 weeks were noted and a further USS in 2 weeks was requested. The previous birth plan was noted. The EFW was plotted on a customised growth chart and was noted to be within the normal range.

[Ms A] was seen by [RM C] at 38 weeks' gestation for an antenatal visit. She remained normotensive and urinalysis was normal. Fetal heart was heard and presentation was noted to be cephalic with 2/5ths palpable above brim. She reported that on one day in the previous week the baby had not moved as much as usual and that the movements had changed, but the baby was moving every day. She also reported having Braxton Hicks contractions with cramps.

A follow-up USS for growth was performed on 3 [Month9] at 39 weeks' gestation at the radiology service. This showed normal interval growth from the previous scan at 36 weeks with an EFW of 3113g, however the liquor was reported to be much reduced with only one measurable pool of 1.3cms. Umbilical artery and middle cerebral artery Dopplers were performed and were normal. There was no history suggesting spontaneous rupture of membranes. [RM C] was informed of scan results by phone and she arranged to meet with [Ms A] in the Maternity unit for assessment.

At 13.20 the same day [RM C] met [Ms A] and her partner in the maternity unit as arranged. Initial observations are normal with BP116/61, pulse 91 bpm and temperature of 36.3°C. [Ms A] states she had been having mild contractions since 06.00, had been feeling fetal movements and had not been leaking any fluid. Fetal heart monitoring with Cardiotocography (CTG) was commenced and obstetric consultation was requested. [Ms A] was seen by [Dr D], Obstetric Registrar, who noted the above history and reported that [Ms A] appeared well on examination and that the CTG was reassuring. [Dr D] noted that the USS had shown reduced liquor and also stated that growth was reduced. [Dr D] discussed [Ms A] with [Dr G], Obstetrician, and a plan was made for induction of labour the following day.

On the evening of 3 [Month9] [Ms A] returned to the Maternity Unit at 19.30 reporting a gush of fluid followed by pink mucus and contractions every four minutes. She advised [RM C] she was feeling fetal movements and bowel pressure. [RM C] recorded BP 122/72, pulse 96 bpm and temperature 37°C, cephalic presentation with 2/5 of head palpable. A CTG was commenced. A vaginal examination was performed with consent and the cervix was found to be 8–9 cm dilated with the presenting part at the level of the ischial spines and bloody show present. It could not be confirmed if the membranes were ruptured. At this stage [Ms A] indicated that she wanted to use the pool. At 20.10 the CTG was discontinued and [Ms A] entered the pool. She stated that she felt like pushing at 20.30 and was asked at this stage if she wanted to leave the pool, but declined. She commenced pushing in the pool at 21.00. [RM C] performed intermittent fetal

heart rate (FHR) monitoring with a Sonicaid device. The FHR was documented as follows:

20.30 130 bpm

20.40 120 bpm

21.00 130 bpm

21.20 120–130 bpm

21.40 140 bpm

21.50 120 bpm

21.55 100 bpm

[RM C] documented that the vertex of the baby's head was visible at 22.00 and at this stage [Ms A] moved from a hands and knees to a sitting position in the pool. The FHR was documented at less than 100 bpm at 22.15. [RM C] stated in the submission that she also recorded the FHR at other times and the FHR was at least 100 bpm, but was unable to document this as her hands were in the pool. The baby's head was born at 22.17, quickly followed by the body. There was cord around the neck which [RM C] disentangled and she placed the baby skin-to-skin. She reported that the baby appeared pale and floppy, but that there was cord pulsation. She rang the call assist bell for a second midwife and rubbed the baby with a warm towel. At 1 minute post-delivery [RM C] states she advised the core midwife 'we have a floppy baby'. Core midwife [RM E] pressed the emergency call bell, handed the cord clamps to [RM C]. [RM C] then clamped and cut the cord and the baby was transferred to the resuscitaire. [RM C] then proceeded to assist [Ms A] with delivery of the placenta and membranes, achieved with maternal effort, and help her out of the pool and into the shower, then bed. She administered an injection of Syntocinon 10 units because of vaginal bleeding. At 23.00 [RM C] examined [Ms A] and found an intact vagina and perineum but some labial tears, which were sutured with her consent using local anaesthetic and dissolving sutures.

[Baby A] was initially resuscitated by core midwife [RM E], who was responding to the call assist bell, who rang the emergency bell. Other staff including the Paediatric House Officer attended quickly and the Paediatric Registrar was called and arrived at 11 minutes of age and the Paediatric Consultant attended at 21 minutes of age. The baby required artificial ventilation and intubation, cardiac compressions and adrenaline and was transferred to the Special Care Baby Unit (SCBU) at 23.00, still ventilated. Cord blood gas analysis indicated [Baby A] had a severe metabolic acidosis at birth with a cord artery pH of 6.7. His case was discussed with the Neonatal Consultant at [Hospital 2], but immediate transfer was not possible due to bed shortage, so passive cooling was commenced to reduce the risk of hypoxic brain injury and ventilation was continued until he could be transferred later in the day. Unfortunately, in spite of intensive care, [Baby A died].

Following the birth [RM C] continued to care for [Ms A], while [Baby A] was resuscitated by the hospital staff. She assisted her with passing urine, took her observations which were normal, administered oral Paracetamol and took her in a wheelchair to see her baby. At 02.00 on 4 [Month9] she handed over care to the core midwifery staff on the postnatal ward. At 09.30 on 4 [Month9] she visited [Ms A] who at that time was in the SCBU where her baby was being prepared for transfer to [Hospital 2] for intensive neonatal care.

According to [RM C's] statement, she attempted to contact [Ms A] on a number of occasions to arrange to see her for postnatal care. She was advised by the Paediatrician at [Hospital 1] on 5 [Month9] that [Baby A] had died and [Ms A] would be travelling to [a main centre] as [Baby A's] body was being transferred for post-mortem examination. [RM C] reports a text conversation with [Ms A] that day and asked [Ms A] to contact her on return [home]. [Ms A] did not contact [RM C] on her return, but [RM C] was phoned by a friend on 7 [Month9] (postnatal day 4) asking for a prescription to suppress lactation, which [RM C] provided and faxed to a pharmacy; the friend stated that [Ms A] was unable to talk to [RM C] at that time, but confirmed she had no physical concerns and would contact her when able. [RM C] reports that she phoned [Ms A] repeatedly over the next two days and left a message but was unable to speak to her. She confirmed a plan by text to meet on 10 [Month9] (day 7), but [RM C] was unable to make this meeting as she was attending another woman in labour. She tried to arrange a meeting for 12 [Month9] (day 9), but [Ms A] was not available. [RM C] contacted [Ms A] by text to arrange a meeting over the next two days but [Ms A] did not respond. [RM C] eventually managed to meet with [Ms A] at her home on 17 [Month9] (day 14). Her examination was normal. [RM C] stated that she discussed the circumstances of [Baby A's] birth with [Ms A] and offered to arrange contact with a counselling service and the Stillbirth and Neonatal Death Society (SANDS), but this was declined. [RM C] also stated she offered another postnatal visit with [Ms A] to take place a week later, but she declined. [RM C] contacted [Ms A] on 25 [Month9] (day 22) to inform her she was on leave and to give her contact details for the midwife covering her practice. [Ms A] did not contact her.

Opinion on requested issues

The adequacy and appropriateness of the care provided during the antenatal period

[RM C's] responsibilities under the Maternity service notice pursuant to section 88 of the New Zealand Public Health and Disability Act 2000 pertinent to this case are as follows:

(1) For a woman in the first trimester of pregnancy, the LMC must provide the following services as required:

  (a) informing the woman regarding—

    (i) the role of the LMC, which includes confirming that the LMC will meet the requirements in clauses DA5, DA6, DA7; and

(ii) the contact details of the LMC and back-up LMC; and

(iii) the standards of care to be expected:

(b) providing appropriate information and education about screening, and offering referral for the appropriate screening tests that the Ministry of Health may, from time to time, notify maternity providers about:

(c) pregnancy care and advice, including—

(iii) all appropriate assessment and care of a woman:

(2) For a woman in the second trimester of pregnancy, the LMC must provide all of the following services:

(a) inform the woman regarding—

(i) the availability of pregnancy and parenting education; and

(ii) the availability of paid parental leave, if applicable; and

(iii) if necessary, any of the items of information listed in clause (1)(a) above:

(b) at the start of the second trimester or at the time of registration—

(i) conduct a comprehensive pregnancy assessment of the woman including, an assessment of her general health, family and obstetric history; a physical examination; and

(ii) commence and document a care plan to be used and updated throughout all modules including post-natal that meets the guidelines agreed with the relevant professional bodies; and

(iii) arrange for the woman to hold a copy of her care plan and her clinical notes (or, if the woman prefers, to be given a copy of her clinical notes following the completion of each module):

(c) throughout the second trimester—

(i) monitor progress of pregnancy for the woman and baby, including early detection and management of any problems; and

(ii) update the care plan; and

(iii) provide appropriate information and education; and

(iv) offer referral for the appropriate screening tests that the Ministry of Health may, from time to time, notify maternity providers about:

(d) book in to an appropriate maternity facility or birthing unit (unless a homebirth is planned):

In addition to the requirements set out under the service specifications for the first and second trimester, the LMC must—

(a) organise appropriate arrangements for care during labour and birth and following birth, including, if possible, organising for the woman to meet any other practitioners who are likely to be involved in her care

In my opinion, [RM C] provided [Ms A] with antenatal care as per the above service specification requirements and as per standard practice. At the time of booking [RM C] provides a comprehensive assessment of [Ms A] and notes all is well. She discusses the recommended screening with her and provides smoking cessation advice which is declined. I note that [RM C] uses the MMPO booklet to record her care. At each antenatal visit [RM C] documents a complete antenatal assessment which included, recording of blood pressure, urinalysis, fundal height, fetal heart activity and fetal movements. All recommended screening tests, including relevant blood tests were discussed and screening was undertaken as per recommendations. Smoking cessation advice was provided at each visit also. I note that [RM C] provided care to [Ms A] in her home on a number of occasions. When an abnormality was detected on routine anatomy scan [RM C] made a timely referral both to the local hospital antenatal clinic and to [the Maternal Fetal Medicine Clinic] as per referral code 4007 in the Ministry of Health Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines). [RM C] continued to provide midwifery care alongside the care provided by the Obstetric clinic and the Maternal Fetal Medicine department. At 39 weeks' gestation [RM C] received a telephone call informing her that there was noted to be oligohydramnios on [Ms A's] ultrasound scan. She arranged to meet [Ms A] at the hospital for an assessment and obstetric review the same day in accordance with referral code 4019 of the Referral Guidelines. This was appropriate management and would be viewed as such by my peers.

The adequacy and appropriateness of the care provided during the labour period, including comment on:

1) **Whether [RM C] made appropriate enquiries following the results of the ultrasound scan on 3 [Month9].**
2) **The appropriateness of [RM C] allowing [Ms A] to birth in the pool.**
3) **The actions of [RM C] immediately after the birth of [Baby A].**

[RM C's] responsibilities under the Maternity Service Notice pursuant to section 88 of the New Zealand Public Health and Disability Act 2000 pertinent to this case are as follows:

(1) The LMC is responsible for ensuring that all of the following services are provided:

(a) all primary maternity services from the time of established labour, including initial assessment of the woman at her home or at a maternity facility and regular monitoring of the progress of the woman and baby:

(b) management of the birth:

(c) all primary maternity care until 2 hours after delivery of the placenta, including updating the care plan, attending the birth and delivery of the placenta, suturing of the perineum (if required), initial examination and

identification of the baby at birth, care of the placenta, and attending to any legislative requirements regarding birth notification by health professionals:

(d) the LMC must make every effort to attend, as necessary, during labour and to attend the birth, including making every effort to attend a woman as soon as practicable —

(i) after the woman's arrival at the maternity facility or birthing unit where she will give birth; or

It is my opinion that [RM C] met all of the above requirements whilst providing [Ms A] with labour and birth care. She attended the hospital with [Ms A] for labour assessment, provided care and ongoing monitoring during labour, managed the birth and provided care in the immediate post-natal period.

As discussed previously when [RM C] received notification of the abnormal scan findings she met [Ms A] in the hospital for assessment. [Ms A] was seen by [RM C] and a full antenatal assessment was documented. Maternal observations were recorded as normal. Abdominal palpation was noted and the baby was reported as cephalic with 2/5th head palpable. Membranes were thought to be intact with no reported spontaneous rupture of membranes. [Ms A] reported that she had been contracting since 06.00 hours and contractions were noted to be mild and lasting 30–40 seconds. No vaginal assessment was undertaken at this stage which I feel was reasonable as [Ms A] is not recorded as being distressed by the contractions and therefore was most likely in very early labour. A CTG was completed and was normal. [Ms A] was referred for consultation as per the Referral Guidelines and reviewed by the on call registrar. A plan was made for induction of labour the following day and [Ms A] was discharged home. In my opinion this management plan was appropriate however I would note there was no obstetric plan made should [Ms A] establish in labour prior to her induction.

When [Ms A] presented in labour later in the evening at 39 weeks' gestation, she was contracting three in ten minutes and reported a gush of fluid at 18.00 and a mucous discharge since. Her observations were recorded as normal, a CTG was completed and documented as reassuring. On palpation the presentation was cephalic and 2/5th palpable above the brim. A vaginal examination was performed and the cervix was noted to be 8–9cms dilated with the presenting part at the ischial spines. Membranes were thought to be intact. In my opinion [RM C] provided [Ms A] with an appropriate labour assessment. She documents the reasons for admission, the maternal observations, an abdominal palpation and a thorough vaginal assessment. A CTG was commenced at 19.39, it was not stated in the notes as to the reason for the CTG, however this would be a recommendation of the Intrapartum Fetal Surveillance Clinical Guideline (RANZCOG 2014) when oligohydramnios is identified as an antenatal risk factor. This guideline recommends continuous electronic fetal monitoring in labour when oligohydramnios is identified. [RM C] notes in her statement that she thought intermittent auscultation with a Doppler was an appropriate method of fetal heart monitoring during labour as there had been no communication to her of any risk

factors, from the specialist plans that required electronic fetal monitoring. [RM C] discontinued the CTG at 20.09 reporting this in the clinical notes as a reassuring CTG.

The Fetal Surveillance Clinical Guideline documents a normal CTG as having the following features:

- baseline rate of 110–160bpm,
- baseline variability of between 6–25bpm,
- accelerations of 15bpm for at least 15 seconds
- no decelerations.

On reviewing the CTG, contractions appear to be 3 in 10, baseline rate is 120–130bpm, variability is between 5 and 15 bpm, there are accelerations present and occasional fleeting variable decelerations present. Overall by definition, according to the RANZCOG Fetal Surveillance Clinical Guideline this is an abnormal CTG and the recommendation would be to continue. In my opinion, reviewing the CTG at this stage the tracing was not indicative of fetal hypoxia but I would have expected the CTG to be continued. In view of the oligohydramnios and the non-reassuring features on the CTG it is my opinion and would be that of my peers that continuous electronic fetal monitoring during labour was indicated, and unless there was telemetry monitoring available [RM C] should have advised [Ms A] against labour and birth in the pool. It is obvious from reading [RM C's] statement, that she believed that the plan was that should [Ms A] labour spontaneously she was for routine LMC labour care as per previous recommendations from antenatal consultations. In my opinion I believe that [RM C] provided care for [Ms A] as she would a normal woman without any risk factors in labour rather than a woman whom she had referred for consultation earlier in the day because of oligohydramnios.

In the first stage of labour [RM C] records the fetal heart rate after contraction between every 15 and 30 minutes, this would be recommended best practice for a woman in normal labour. In the active 2nd stage of labour, from 21.00 [RM C] notes in her statement that she attempted to auscultate the fetal heart with a Doppler after each contraction or at least once every five minutes but she was not always successful at hearing the heart rate and notes this as due to position of the woman in the pool. [RM C] also notes that the fetal heart rate at 21.55 was 100bpm, that birth was imminent and that [Ms A] was contracting almost constantly with contractions 4–5 in 10 minutes. Following this she tried positional changes in an attempt to locate the fetal heart and next noted the fetal heart rate of less than 100bpm at 22.15. Vertex at this time was visible and [Ms A] progressed to a Vaginal Birth in the pool.

In my opinion [Ms A] should have been advised to leave the pool at 21.55 when the fetal heart rate was noted to be 100bpm. I acknowledge that on occasions it can be difficult to locate a fetal heart just prior to birth however it is possible that [RM C] was hearing a maternal pulse, as there is no documentation of maternal pulse other than on admission when it was recorded as 92bpm.

In her clinical notes [RM C] notes that baby's head was born under water at 22.17 and body easily followed, cord was unwrapped from around the baby and that the baby was guided up to mum for skin to skin at 22.18. Baby was noted to be pale and floppy and the call bell was rung, the cord was pulsing and she encouraged the mum to talk to the baby. A warm towel was used and baby rubbed. The cord was clamped and the baby taken to the resuscitaire. In her statement [RM C] notes that [Baby A] was placed skin to skin, he was lacking in tone and did not appear to be breathing, although she could feel a pulse in the umbilical cord. She notes that she dried [Baby A] and rubbed him vigorously. As [Baby A] was still partially under warm water she continued to massage him with her hands and bringing warm water over his body. In no more than one minute [RM E] attended and at approximately one minute [RM C] advised that 'we have a floppy baby'. [RM E] immediately pressed the emergency bell and handed the cord clamps to [RM C]. The cord was clamped and [Baby A] was taken to the resuscitaire and ventilation commenced within two minutes of birth by the core midwifery staff. [RM E] notes she answered the call bell and that the LMC stated 'we got a baby'. She notes she looked at the baby which was blue, floppy and making no respiratory effort. Mum and baby were in pool. Cord clamps were handed to [RM C], she pressed the emergency bell and took the baby to the resuscitaire, which was not prepared for birth.

The baby is recorded as having an Apgar of 0 at 1 minute but was documented as having a pulsating cord at birth by [RM C], however there is no documentation of a full assessment of the baby before the paediatric team arrived at 5 minutes. I would expect to see the baby's heart rate respiratory effort and tone to be noted every 30–60 seconds during a neonatal resuscitation. In the Paediatric Consultant documentation it is noted that [a midwife] reported the Heart Rate at 120bpm shortly after birth but it had dropped to below 60bpm at approximately 5 minutes when cardiac compressions commenced by the paediatric SHO.

Following the clamping and cutting of the cord [RM C] played no part in the neonatal resuscitation but continued to provide care to [Ms A].

On review of all of the notes, it is difficult to ascertain the correct timings of events. The baby is recorded as having an Apgar score of 0 at 1 minute, however is also documented as having a heart rate which if above 100 would give an Apgar score of 2.

In my opinion, and it would be that of my peers that it is standard practice for a midwife to have all of the emergency equipment checked and ready for use whilst caring for a woman in labour. [RM E] states she needed to plug the oxygen and air into the wall supply to enable resuscitation.

When [RM C] recognised that [Baby A] was pale, floppy and was making no respiratory effort she should have pressed the emergency call bell to get immediate assistance and the cord should have been clamped and cut immediately to enable prompt neonatal resuscitation as per the Resuscitation Council Neonatal Resuscitation guidelines. A pale floppy baby making no respiratory effort is indicative of a compromised baby.

[RM C] provided standard immediate post-natal care to [Ms A]. She birthed her placenta, repaired her lacerations, recorded her post-natal observations and estimated blood loss. Analgesia was given. [Ms A] and her family were taken to SCBU to see [Baby A] and [Ms A's] care was handed over to the post-natal ward team.

The adequacy of the postnatal care provided to [Ms A].

[RM C's] responsibilities under the Maternity Service Notice pursuant to section 88 of the New Zealand Public Health and Disability Act 2000 pertinent to this case are as follows:

(1) A LMC is responsible for ensuring that all of the following services are provided for the mother:

(a) reviewing and updating the care plan and document progress, care given and outcomes, and ensuring that the maternity facility has a copy of the care plan if the woman is receiving inpatient postnatal care:

(b) postnatal visits to assess and care for the mother in a maternity facility and at home until 6 weeks after the birth, including—

(i) a daily visit while the woman is receiving inpatient postnatal care, unless otherwise agreed by the woman and the maternity facility; and

(ii) between 5 and 10 home visits by a midwife (and more if clinically needed) including 1 home visit within 24 hours of discharge from a maternity facility; and

(iii) a minimum of 7 postnatal visits as an aggregate of DA29 (1) (b) (i) and (ii):

(c) as a part of the visits in clause (b), examinations of the woman

(iv) a postnatal examination of the woman at a clinically appropriate time and before transfer to the woman's primary care provider:

(d) as a part of the visits in clause (b), the provision of care and advice to the woman, including—

(ii) assessment for risk of postnatal depression and/or family violence, with appropriate advice and referral; and

(iii) provide appropriate information and education about screening; and

(vii) advice regarding contraception.

I note in the summary of the complaint in the HDC advocacy service that [Ms A's] mother Ms B reported that the first contact with [RM C] following [Baby A's] death was on the 7th [Month9] when a request was made for a script to help suppress lactation. I also note that contact between [Ms A] and [RM C] was attempted and that an appointment made needed to be rescheduled due to [RM C] having to provide care for another woman in labour. The statement also reports

that [Ms A's] mother also believed that [RM C] had attempted contact with [Ms A] but a scheduled appointment was not made until her mother had stressed the importance of post-natal care to her.

I note in [RM C's] statement that she attempted to contact [Ms A] on a number of occasions to arrange to see her for postnatal care. Before [Baby A's] transfer to [Hospital 2] [RM C] notes that she discussed with the Midwifery Manager at the local hospital regarding her responsibilities with [Ms A] while she was out of area. The Midwifery Manager confirmed that [Ms A] would receive care from the [Hospital 2] midwifery staff until her return [home]. [RM C] advised [Ms A] she would be seen by a midwife and a social worker while she was in [Hospital 2] and was to let them know if she had any problems; [Ms A] was agreeable with this plan. [RM C] was advised by the Paediatrician at [Hospital 1] on 5 [Month9] that [Baby A] had died and [Ms A] would be travelling to [a main centre] as [Baby A's] body was being transferred for post-mortem examination. [RM C] reports a text conversation with [Ms A] that day and asked [Ms A] to contact her on return [home]. [Ms A] did not contact [RM C] on her return, but [RM C] was phoned by a friend on 7 [Month9] (postnatal day 4) asking for a prescription to suppress lactation, which [RM C] provided and faxed to a pharmacy; the friend stated that [Ms A] was unable to talk to [RM C] at that time, but confirmed she had no physical concerns and would contact her when able. [RM C] reports that she phoned [Ms A] repeatedly over the next two days and left a message but was unable to speak to her. She confirmed a plan by text to meet on 10 [Month9] (day 7), but [RM C] was unable to make this meeting as she was attending another woman in labour. She tried to arrange a meeting for 12 [Month9] (day 9), but [Ms A] was not available. [RM C] contacted [Ms A] by text to arrange a meeting over the next two days but [Ms A] did not respond. [RM C] eventually managed to meet with [Ms A] at her home on 17 [Month9] (day 14). Her examination was normal. [RM C] stated that she discussed the circumstances of [Baby A's] birth with [Ms A] and offered to arrange contact with a counselling service and the Stillbirth and Neonatal Death Society (SANDS), but this was declined. [RM C] also stated she offered another postnatal visit with [Ms A] to take place a week later, but she declined. [RM C] contacted [Ms A] on 25 [Month9] (day 22) to inform her she was on leave and to give her contact details for the midwife covering her practice. [Ms A] did not contact her.

In my opinion [RM C] made a reasonable attempt to provide post-natal care for [Ms A].

She provided 1 post-natal visit in the hospital as per the notice and one post-natal visit at home, although [RM C] made a number of attempts to contact [Ms A] to arrange visits and provide midwifery care. [Ms A] was advised to contact [RM C] on return [home] but there was no contact until day 4 when a script was required to aid lactation suppression. [RM C] was unable to speak to [Ms A] at this time but she made enquiries about her wellbeing and was reassured there were no concerns. She faxed the script immediately to a local pharmacy for [Ms A] to pick up. Unfortunately after a few attempts to arrange a home visit [RM C] needed to reschedule the arranged visit as she was providing care for a woman in labour.

This would be common practice, most LMC midwives would reschedule appointments to provide labour care for women.

[RM C] managed to meet up with [Ms A] on day 14, she offered appropriate care and advice to a woman who had suffered the loss of a baby. [Ms A] declined all referrals. There were no discussions noted about family violence screening or contraception, however given the timing of the visits and the difficulty of the situation I believe this to be reasonable to have left it for a later visit. [RM C] had some leave scheduled and she provided [Ms A] with the contact numbers for her back up midwife for further care if needed but she was not contacted.

The overall care and management of [Ms A] by [RM C]

The primary maternity notice states that 'From the time of registration of a woman, a LMC is responsible for co-ordinating for the woman all of the modules of lead maternity care in order to achieve continuity of care'.

In my opinion, [RM C] provided a high standard of antenatal care, including all aspects of primary maternity care and appropriate and timely secondary and tertiary referral when problems were identified. When [Ms A] presented in labour [RM C] provided a comprehensive assessment. Unfortunately she appeared not to appreciate that [Ms A] now had a significant risk of fetal compromise in labour for which continuous electronic fetal heart rate monitoring was recommended; instead she proceeded to monitor the fetal heart rate intermittently and to manage the rest of the labour and birth with [Ms A] in the pool. The monitoring of [Ms A's] baby in the last half hour of labour was inadequate. [RM C] did not appear to recognise that [Ms A's] baby was in poor condition at birth and had not made arrangements for immediate clamping and cutting of the cord and neonatal resuscitation if this situation arose. Following the baby's transfer to a tertiary facility and subsequent death it appears [RM C] made reasonable attempts to engage with [Ms A] and arrange post-natal care and her difficulty in the provision of post-natal care was out of her control.

Any further comment I wish to make.

[Ms A] was recognised as having a pregnancy complicated with oligohydramnios, however, when she was admitted in spontaneous labour there was no mention of consultation occurring with the obstetric team to discuss a plan for care in labour. In my opinion this would have been routine practice. [RM C] acknowledges in her reflections that she should have clarified with the Registrar at 13.30 what the plan would be should [Ms A] attend in spontaneous labour.

In her statement [RM C] noted that she asked the opinion of a midwifery colleague [RM E], advising her of the maternal history, the cervical dilatation and that the CTG was normal. [RM E] advised that if it was her she would not care [Ms A] in the pool and if she did she would ask her to leave the pool for the birth. [RM C] notes that [RM E] advised it was up to her as the LMC. [RM E] in her retrospective documentation, written 2 hours after birth, recommended that [Ms A] should not labour or birth in the birth pool due to the oligohydramnios and the query exomphalus. [RM C] asked for a second opinion in this case and chose not

to accept the advice given and there was no documentation in her notes regarding this discussion, which would be standard practice.

In summary [RM C] provided continuity of care to [Ms A], she provided a high standard of antenatal care with appropriate referrals. Some of the aspects of the care provided in labour and birth were not as per recommended practices and post-natal care was challenging due to lack of engagement.

References

Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines), Ministry of Health 2012

Maternity Service Notice Pursuant to Section 88 of the New Zealand Public Health and Disability Act 2000. Ministry of Health

The Maternity Services — DHB funded Primary Maternity Facility Tier level two service Specification. Ministry of Health

Midwives Handbook for Practice. New Zealand College of Midwives. 2005

New Zealand Resuscitation Council, 2010. Neonatal Resuscitation Guidelines.

RANZCOG, 2014. Intrapartum Fetal Surveillance Guidelines — 3rd Edition.

Please do not hesitate to contact me should you require any further information or clarification of any aspects of this report.

Yours sincerely

Michelle Bailey

25 October 2016

Point 1 — It is my opinion that discontinuing the fetal monitoring in this case was a significant departure from the expected standard as there were risk factors present that would indicate the use of continuous electronic monitoring.

Point 2 — Midwives work in partnership with women and often the woman's choice is paramount in the decision making process, however there was nothing in the documentation to suggest that [RM C] took into account the need for continuous monitoring and that she had discussed this with [Ms A]. [RM C] did not advise [Ms A] against using the pool or document any discussions regarding this topic. In my opinion this is a moderate departure from standard practice.

Point 3 — It would be standard practice for a midwife to have equipment for birth and have emergency resuscitation equipment checked and prepared should the need arise. I would have expected [RM C] to have completed the same equipment checks during her provision of labour care. I would also note that the DHB has a responsibility to provide equipment ready to use, as per the primary service specifications. I would consider this to be a mild departure from normal practice.

Point 4 — I would like to reword this statement to no documented full assessment of the baby before the paediatric team arrived at 5 minutes. The resuscitation guidelines clearly expect that heart rate, tone and respiratory effort is assessed, documented and reassessed after 30 seconds of each intervention. It is expected that the oxygen saturations are monitored as soon as is possible. It was clear from the documentation that [RM C] did not initially recognise that the baby was compromised which led to a delay in her clamping and cutting the cord to allow baby to be resuscitated, however she played no further part in the resuscitation after handing [Baby A] over to the core midwifery team. In my opinion it is a moderate departure from the expected standard as a midwife should provide a comprehensive assessment at birth and be able to recognise the difference between a well baby and a compromised baby.

Point 5 — As I have stated in my reportand also in this response it is my opinion that [Ms A] should have been continuously monitored throughout her labour, but as she was not I would have expected [RM C] to auscultate the fetal heart after each contraction or every 5 minutes in the active second stage of labour. [RM C] notes that the fetal heart rate at 21.55 was 100bpm, which can be normal during a contraction in the second stage of labour but could also be abnormal if listened to after a contraction. I would have expected [RM C] to advise [Ms A] to leave the pool at this time to enable closer monitoring of the fetal heart. It is my opinion that this was a moderate departure from accepted practice.

01/03/2017

Dear [HDC investigator],

Re — C16HDC00455

My name is Michelle Bailey. I have been asked to provide further expert advice to you on case number C16HDC00455. I have read and agree to follow the Health and Disability Commissioner's Guidelines for Independent Advisors.

I have been asked to review the documents and provide a further opinion on the following issues:

1. [RM C's] response to my initial advice.
2. If [RM C] had been advised by the sonographer that there was 'low pools of liquor' (as opposed to oligohydramnios), would your advice about [RM C's] management during labour and birth differ?
3. Any other aspect of [RM C's] care you consider warrant comment.
4. Any further comments you have about the standard of care provided by [RM E]. In particular, the advice she gave [RM C].
5. The adequacy of [DHB1's] policies.

For each question, please advise:

a. What is the standard of care/accepted practice?
b. If there has been a departure from the standard of care or accepted practice, how significant a departure do you consider this to be?

c. How would it be viewed by your peers

I can confirm I have read and reviewed the following documents when considering my advice

1. My initial expert advice report
2. [RM C's] response dated 13 December 2016.
3. [DHB1's] response dated 14th December 2016 including
   - [Dr D's] statement (undated).
   - [RM E's] statement dated 22 December 2016
4. Statements from [Ms F], Trainee Sonographer

[RM C's] response to your initial advice.
I have read [RM C's] response to my report. In her response [RM C] notes that she provided midwifery care to [Ms A] as she would do for any uncomplicated woman in labour with her 1st baby, as it was not clear to her that [Ms A] was diagnosed with oligohydramnios. [RM C] reports that she received a phone call from the Sonographer stating there were low pools of liquor and as a result of this verbal report she consulted with the Obstetric team. [RM C] also notes that she should have considered further consultation when [Ms A] was admitted to Delivery Suite in labour. [RM C] comments in her response that she discussed the midwifery plan with [RM E] and acknowledged that she was not clear about the advice or concerns [RM E] had noted. In my opinion her response does not seem to correlate with the actions taken by her following the initial report from the Sonographer. She was sufficiently concerned to consult as per the Ministry of Health Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines), and to discuss her plan of care with her core midwifery colleague when [Ms A] attended in spontaneous labour. I agree with [RM C] about the point that following the consultation with the Obstetric team a plan should have been documented regarding fetal surveillance in the event of [Ms A] labouring spontaneously. Midwifery and Obstetric colleagues expect an Obstetric plan to be detailed in this scenario.

I acknowledge that in my report I documented that [RM C] noted the baby was pale and floppy and that [RM C] notes that she was not concerned until the baby was 1 minute old, failed to respond to stimulation and remained floppy. I believe that on initial assessment [RM C] was not expecting a compromised baby and therefore acted accordingly however as I stated in my original report when it was recognised that [Baby A] was pale and making no respiratory effort she should have pressed the emergency bell to get immediate assistance. There is a discrepancy between the opinions of [RM C] and [RM E] regarding their initial assessments of the baby.

If [RM C] had been advised by the sonographer that there was 'low pools of liquor' (as opposed to oligohydramnios), would your advice about [RM C's] management during labour and birth differ?

[RM C] notes in her response letter that she had been telephoned by the Sonographer to report that there were low pools of liquor but no mention of a diagnosis of oligohydramnios.

I would have expected [RM C] to clarify with the Sonographer what she meant by low pools of liquor. The Sonographer in her statement notes she cannot recall the conversation clearly but notes in her report Oligohydramnios, with the deepest pool of liquor being 1.3cms deep. The Sonographer notes in her statement that standard practice protocol was to document verbal communication of the Ultrasound findings in circumstances when the findings need prompt attention. She also notes that the scan result was faxed both to [RM C] and the hospital. [RM C] acknowledges in her response letter that is unusual for a sonographer to call with scan results which would indicate a degree of concern on behalf of the Sonographer.

'Low pools of liquor' would not be a normal finding on an ultrasound scan so I would not change my previous advice on the management of [Ms A's] labour and birth. The scan report was available to [RM C], it had been faxed to the hospital and to [RM C], and I would have expected that she would have looked up this report following the conversation with the sonographer and discussed the management of [Ms A] with the Obstetric team. I would consider this a moderate departure from accepted practice.

Any other aspect of [RM C's] care you consider warrants comment.
During the second stage of labour I noted in my report that I would have expected [RM C] to record the fetal heart either after each contraction or every 5 minutes during the second stage of labour. [RM C] notes she recorded the fetal heart rate below 100bpm on repeated occasions but only records the maternal pulse on one occasion. The NZCOM consensus statement Assessment of Fetal Monitoring during Pregnancy states that 'if a midwife is undertaking fetal heart auscultation she should consider measurement of the maternal pulse at the same time to ensure that there is a distinction between maternal and fetal heart rates'. This is a mild departure from accepted practice.

Any further comments you have about the standard of care provided by [RM E]. In particular, the advice she gave [RM C].
According to the statement provided by [RM E], [RM C] approached her asking for advice regarding [Ms A] labouring and birthing in the pool. [RM E] noted that she had seen a scan report indicating oligohydramnios and advised [RM C] to keep [Ms A] out of the pool because of this. [RM E] notes in her statement that she was very clear regarding the reasons [Ms A] should not get into the pool, stating she said to [RM C] she cannot get into the pool and that Oligohydramnios and the umbilical hernia were not normal findings in pregnancy therefore a pool birth was contraindicated. [RM E] notes she advised [RM C] that it was her decision but advised clearly that if the LMC let her labour in the pool she should get out for delivery.

[RM C] recalls the conversation differently and does not recall [RM E] using the word Oligohydramnios in their conversation. She notes in her response that she

would have approached the labour and birth care differently had she understood that low liquor was Oligohydramnios. The advice [RM E] gave to [RM C] would be regarded as good advice by my peers. I would have expected RM young to recommend continuous electronic fetal monitoring during labour and consultation with the obstetric team. However the clinical responsibility for the care of this woman remains with [RM C].

On answering the call bell following the birth of [Baby A], [RM E's] midwifery actions were appropriate and she summoned help, however there were some issues noted when contacting the switchboard when attempting to contact the paediatric registrar and consultant.

The adequacy of [DHB1's] policies.

[DHB1] provide the following national consensus statements as the guidelines they would use

Observation of the mother and baby in the immediate postnatal period — MOH

Assessment of fetal wellbeing during pregnancy — NZCOM consensus statement

Use of water for labour and Birth — NZCOM consensus statement.

I was surprised that the Intrapartum Fetal Surveillance Clinical Guideline (RANZCOG 2014) was not included in the list provided. It's not possible to comment on the adequacy of the [DHB1's] policies as there were no local guidelines provided.

In summary I would not alter the advice I gave in my initial report regarding the management of the labour and the birth of [Baby A]. I would not have made a distinction between the management of a woman with low pools of liquor or a woman with Oligohydramnios. It is my opinion that [Ms A] should have been advised not to labour in the birth pool as she had a clear indication for continuous electronic fetal monitoring. In my opinion if [RM C] was unclear regarding any diagnosis she should have sought clarification from the Sonographer and followed up the USS report.

References

Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines), Ministry of Health 2012

RANZCOG, 2014. Intrapartum Fetal Surveillance Guidelines — 3rd Edition.

Assessment of fetal wellbeing during pregnancy. NZCOM consensus statement 2012.

Please do not hesitate to contact me should you require any further information or clarification of any aspects of this report.

Yours sincerely

Michelle Bailey

Appendix B: Independent obstetric advice to the Commissioner

The following expert advice was provided by a consultant obstetrician and gynaecologist, Dr Ian Page:

"**Investigation: [Ms A]**

Your ref: C16HDC00455

Thank you for your letter of 13 February and the enclosed documents, requesting expert advice to the Commissioner on the care provided by [Dr D] to [Ms A] on 3 [Month9] at [Hospital 1]. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

I am a practising obstetrician & gynaecologist and have been a consultant for 28 years. I obtained my MRCOG in 1985, my FRCOG in 1998 and my FRANZCOG in 2002. I have been employed for the past 16 years by Northland DHB. I have been a member of the RANZCOG Expert Witness register since 2012.

Background

On 3 [Month9] [Ms A] was at 39 weeks' gestation. She had an ultrasound scan which showed oligohydramnios. At the time of the scan [Ms A] was experiencing some contractions. Following her scan [RM C], her Lead Maternity Carer, was contacted and she arranged to assess [Ms A] at [Hospital 1]. [Ms A] was monitored for about 30 minutes and her contractions settled. [Ms A] was reviewed by Obstetric Registrar [Dr D], who noted the above history and reported that [Ms A] appeared well on examination and that the CTG was reassuring. [Dr D] noted that the scan had shown reduced liquor, and also stated that growth was reduced. [Dr D] discussed [Ms A] with [Dr G], Obstetrician, and a plan was made to [induce] labour the following day. [Ms A] went into spontaneous labour that evening.

Advice Requested

You asked me to review the documents and advise whether the care provided to [Ms A] by [Dr D] on 3 [Month9] was reasonable in the circumstances, and why. You also asked me to comment specifically on:

1. [Dr D's] management plan for [Ms A]
   Whether or not I would expect the plan to include advice should [Ms A] go into spontaneous labour.

Sources of Information

In assessing this case I have read:

- [Dr D's] (undated) statement
- [Ms A's] midwifery notes up to 3 [Month9]

- The clinical records relating to [Ms A's] pregnancy up to and including [Dr D's] notes from her consultation on 3 [Month9]

Summary of the Case

[Ms A] booked early in her first pregnancy with [RM C] as her Lead Maternity Carer. The only risk factor identified was that she smoked, and help with smoking cessation was offered.

In [Month4] she had her 'anatomy' scan which showed her fetus had either exomphalos or an umbilical hernia. She was reviewed by the [MFM team] on 8 [Month5], and the diagnosis was thought to be of an umbilical hernia.

The pregnancy proceeded normally and [Ms A] was reviewed by the MFM team on 17 [Month7]. They confirmed the diagnosis, advised that her LMC could continue with routine care and that vaginal delivery was appropriate. They recommended that the umbilical cord be left long at delivery, and that, as there was a slight slowing of fetal growth, fortnightly growth scans should be performed.

The next growth scan was on 13 [Month8], and it was normal. Her routine antenatal care was normal. The next growth scan was on 3 [Month9] which showed oligohydramnios. The rate of growth the fetal abdominal circumference had also slowed a little, moving from the 30th to the 18th centile, as had the femur length (14th to <2nd centile).

In light of the scan results [Ms A] was seen by her LMC at about 1.30pm on 3 [Month9] in the maternity unit at [Hospital 1]. The LMC recorded that her observations were normal, and that [Ms A] reported having mild contractions from 6am, occurring one in 10 minutes and lasting 30–40 seconds. She further noted that fetal movements were felt, and there was no fluid leaking. She commenced a CTG and arranged for a consultation with the obstetric team.

The notes record [Dr D] reviewing [Ms A], noting the scan findings and the plan for labour (in light of the umbilical hernia), and that the CTG was reassuring. She discussed the situation with her consultant ([Dr G]) and a plan was made for induction of labour the next day.

The next entry in the notes is at 7.30pm, recording that [Ms A] had had a gush of fluid, and a possible show. She was contracting one in every four minutes. The labour summary states that labour was thought to have established at 6pm, that [Ms A] was admitted at 7.35pm, ruptured her membranes at 8.30pm and the baby was born at 10.18pm.

My Assessment

You asked me to review the documents and advise whether the care provided to [Ms A] by [Dr D] on 3 [Month9] was reasonable in the circumstances, and why. You also asked me to comment specifically on:

1. *[Dr D's] management plan for [Ms A]*

This appears to have been completely appropriate.

[Dr D's] review of [Ms A] was adequate. It was very reasonable to plan to induce labour when there is concern over fetal growth at term. The responsibility for the decision did, of course, rest with [Dr G] who approved it.

Neither [Dr D] nor [RM C] thought [Ms A] was in labour when she attended in the afternoon. This is consistent with the advice in the Birth Plan Preferences document in the notes. I too would have sent [Ms A] home, to return when in labour or for induction the next morning. From the information in the notes I would not have felt a vaginal examination was indicated. I would not insult an LMC by documenting every aspect of care that I thought should be provided, when the hospital already has guidelines in place that covered the situation. Hence I think [Dr D's] clear and simple plan was all that was required.

2. *Whether or not I would expect the plan to include advice should [Ms A] go into spontaneous labour.*

There was already a clear statement about this from the MFM team. The only possible change would be that of continuous CTG monitoring, given the oligohydramnios. As oligohydramnios is a standard indication for CTG monitoring[1], I would expect the LMC to be aware of it and would not write it into a plan. The reference is endorsed by the New Zealand College of Midwives.

I do not have any personal or professional conflict of interest to declare with regard to this case.

If you require any further comment or clarification please let me know.

Yours sincerely,

Dr Ian Page MB BS, FRCOG, FRANZCOG
Consultant Obstetrician & Gynaecologist
Whangarei Hospital

Reference

1. Intra-Partum Fetal Surveillance 3rd Edition 2014, RANZCOG."