District Health Board

A Report by the
Health and Disability Commissioner

(Case 19HDC00534)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided to a woman by a district health board following an emergency Caesarean section for the delivery of a baby boy at 33 weeks' gestation. The woman lost 1.8L of blood during surgery, and postoperatively she suffered significant further blood loss in ICU and required a subtotal abdominal hysterectomy.[1]

Findings

2. The Commissioner found that the clinical and nursing care provided was appropriate and timely, but was critical that some aspects of the system did not operate as they should. These included the ICU registrar incorrectly recording that blood products had been given to the woman prior to her arrival in the ICU, and inadequate nursing documentation in the ICU. The Commissioner was satisfied that the deficiencies identified did not have an impact on the quality or timeliness of care the woman received, but considered that they highlighted areas for improvement in the DHB's service.

Recommendations

3. The Commissioner made a number of recommendations to the DHB, including that it provide a written apology to the woman and her family; review its team culture; consider updating its ICU nursing policy; develop an ICU template to allow for handover in ICU to be documented clearly; provide updates on new processes developed since these events; and undertake a documentation audit that checks the accuracy of admission summaries and accessibility of ICU admission documentation.

Complaint and investigation

4. The Health and Disability Commissioner (HDC) received a complaint from Mrs B about the services provided to her daughter, Mrs A, by a district health board (DHB). The following issue was identified for investigation:

- *The appropriateness of the care provided to Mrs A by the DHB in 2018.*

5. The parties directly involved in the investigation were:

Mrs A	Consumer
Mrs B	Complainant/consumer's mother
District health board	

6. Statements were considered from the following staff:

Dr C	Obstetrician
Dr D	Anaesthetist

[1] Removal of the uterus body, not including the cervix.

RN E	Post Anaesthesia Care Unit (PACU) nurse
RN F	Intensive Care Unit (ICU) nurse
RN G	ICU nurse
Dr H	ICU consultant
Dr I	Anaesthetist

7. Dr J, a DHB reviewer, is also mentioned in the report.

8. Information from ACC was also considered.

9. Independent expert advice was obtained from a nursing advisor, RN Lynsey Sutton-Smith (Appendix A), and an intensivist advisor, Dr Tony Williams (Appendix B).

Information gathered during investigation

10. This report concerns the care provided to Mrs A (in her thirties at the time of events) by the DHB over two days in 2018.[2] In particular, the report considers whether Mrs A was monitored appropriately in the PACU and ICU following an emergency Caesarean section, and whether her complications following surgery were identified and treated in a timely manner.

Background

11. In 2017, during her first pregnancy, Mrs A experienced a placental abruption (when part of the placenta separates from the wall of the uterus) at 27+2 weeks' gestation. The baby was delivered via emergency Caesarean section but, sadly, died two weeks later. The obstetrician who looked after Mrs A during this episode of care was Dr C, an obstetric registrar at the public hospital at the time. Dr D was the anaesthetic consultant for Mrs A's Caesarean section.

12. In 2018, Mrs A became pregnant again and asked Dr C, who by that stage was a consultant obstetrician, to look after her in a private capacity. Because of her past history, Mrs A was at high risk of obstetric complications. In addition, Mrs A was diagnosed with a placenta previa (when the placenta grows over the lower part of the uterus and is located near to, or covering, the cervix), which placed Mrs A at an even greater risk of obstetric complications.

13. In light of this risk, Dr C put in place a comprehensive management plan for Mrs A's pregnancy, which included regular ultrasound scans and a preoperative anaesthetic review, and planned for an elective Caesarean section under general anaesthetic at around 34 weeks' gestation.

[2] Relevant dates are referred to as Days 1–2 to protect privacy.

14. At 30 weeks' gestation, an ultrasound and MRI scan indicated a small area of increta — when the placenta attaches itself deeply into the myometrium (middle layer) of the uterus wall — further increasing the risk of bleeding.

15. The anaesthetist who reviewed Mrs A was Dr D. He told HDC that at that time he discussed with Mrs A the risk of significant blood loss and his recommendation for general anaesthetic with either an elective or emergency presentation "due to the risk of cardiovascular instability with regional anaesthesia and significant blood loss". Mrs A agreed to Dr D's recommendation.

16. In Dr D's clinic letter, he noted that if Mrs A were to bleed acutely, "the only solution may be an emergency Caesarean hysterectomy".

Day 1

17. The day before the planned elective Caesarean section, Mrs A presented to the public hospital with bleeding.

18. Prior to Mrs A's arrival on the labour ward, staff alerted Dr C, Dr D (who was the on-call anaesthetist that day), the obstetric and paediatric teams, and the blood bank to Mrs A's presentation and pending arrival.

19. Mrs A arrived at 11am, and consent was obtained for a Caesarean section under general anaesthesia as planned. Mrs A was transferred to theatre immediately.

Emergency Caesarean section

20. The Caesarean section commenced at 12.10pm. During anaesthesia, Mrs A received four litres of fluid replacement[3] and a dose of tranexamic acid, which helps to minimise blood loss. She was not given any blood products during surgery.

21. Mrs A's estimated blood loss during surgery was 1.8L, and her haemoglobin[4] at the end of the procedure was low.[5] Cell salvage (the process of recovering blood lost during surgery and transfusing it back into the body) was set up, but not enough blood was obtained to transfuse.

22. At 12.14pm, the baby was delivered. He required resuscitation and was transferred to the Neonatal ICU (NICU). At 12.18pm, the placenta was delivered and a Bakri balloon — an intrauterine device used to reduce or control postpartum haemorrhage — was inserted.[6] Mrs A was woken from the anaesthetic and then transferred to PACU.

[3] Compound sodium lactate solution (CSL) — a fluid and electrolyte replacement.
[4] Haemoglobin is a protein found in red blood cells.
[5] Her haemoglobin was 89g/L (normal range is 115–155g/L).
[6] A Bakri balloon is an inflatable device that is inserted into the uterus with a catheter to allow drainage. The device is designed to monitor ongoing uterine bleeding.

Care provided in PACU — 1.20pm–4.50pm

23. At 1.20pm, Mrs A arrived at PACU in a stable condition.

24. Throughout the afternoon, Dr C and Dr D monitored Mrs A constantly for signs of internal bleeding. In addition, Registered Nurse (RN) E provided 1:1 nursing, with monitoring and documentation of Mrs A's heart rate and arterial blood pressure every 5 minutes, and oxygen saturation and respiratory rate every 15 minutes.

25. At approximately 1.40pm, there was a brief period of low blood pressure. In response to this, fluids were increased and a phenylephrine infusion (a medication used to increase blood pressure) was commenced at a low dose. Mrs A's haemogloblin was measured as slightly improved but still low (94g/L). At 1.50pm, Dr D requested a full blood count and coagulation profile.

26. At 2pm, there was a further short drop in blood pressure, although Mrs A's heart rate remained normal.[7] At around 2.15pm, the phenylephrine infusion was increased to a moderate dose but then gradually reduced again from 3.20pm. In addition, further fluid replacement was given. Dr D documented that, at that time, Mrs A was also experiencing a moderate amount of pain despite having been administered pain relief.

27. At 2.22pm, the full blood count was reported, and at 2.46pm the coagulation profile reported a low fibrinogen[8] and haemoglobin.[9]

28. At 3.10pm, there was another drop in blood pressure,[10] which was managed by Dr D and resolved quickly.

29. At 3.44pm, an ultrasound was carried out and discussed with Dr C. The scan showed that the uterus was intact and there was free fluid lateral to the fundus (the top part of the uterus). The view was that there was no immediate concern regarding bleeding, and the plan was for Mrs A to be transferred to the High Dependency Unit (HDU) for ongoing close monitoring, due to her history.

30. Dr D told HDC: "Due to the period of initial instability and small (though initially increasing) inotropic requirement[11] I was significantly concerned about the patient."

31. At 4.12pm, a further set of coagulation results[12] showed a small change since the previous results at 2.22pm, including a further lowering of haemoglobin[13] and fibrinogen.[14] The platelets remained within the normal therapeutic range. These results were telephoned through to Dr D, who discussed the recommended management with the haematologist at

[7] 70bpm (normal is 60–100 bpm).
[8] Fibrinogen is a coagulation factor. Mrs A's was measured as being 1.6g/L (normal is 1.7–4.3g/L).
[9] 94 g/L (normal is 115–155 g/L).
[10] To 78/38mmHg.
[11] Medications to stimulate the heart contractions.
[12] Requested by Dr D at 3.18pm.
[13] From 94g/L to 81g/L.
[14] From 1.6g/L to 1g/L.

the medical laboratory. Dr D told HDC that because Mrs A remained stable, with no evidence of ongoing bleeding, the haematologist advised that Mrs A was likely showing signs of dilutional coagulopathy,[15] for which no current treatment was advised, but if she deteriorated further she should be managed with a combination of fresh frozen plasma[16] (FFP) and cryoprecipitate.[17] Dr D recorded this on the anaesthetic record, noting that if any active bleeding occurred, treatment should aim to correct the fibrinogen.[18]

32. Because Mrs A required ongoing close monitoring, Dr C wanted her to be transferred to the HDU. However, no bed was available on the HDU, so Dr D, Dr C, and the ICU admitting team planned to transfer Mrs A to an ICU bed. At 4.35pm, Dr D telephoned Dr H, who was the on-duty ICU consultant from 5pm. Dr H confirmed that an ICU bed was available. Dr D said that this conversation was centred around Mrs A's progress in PACU, "specifically her most recent clotting status and potential for ongoing bleeding requiring close monitoring".

33. At 5.10pm, an additional comment was added to the reported coagulation results (from 4.12pm), which stated:

> "I note the acute drop in fibrinogen along with the prolonged PT and APTT.[19] D-dimers[20] (not reported) were extremely high. Please consider disseminated intravascular coagulation (DIC).[21]"

34. The DHB told HDC that this additional comment was added after the initial results had been telephoned through to Dr D at 4.10pm. There is no record of the D-dimer result or the additional comment on the formal report having been communicated to either Dr D or the ICU team.

Transfer to ICU — 4.50pm

35. Mrs A was transferred to ICU at 4.50pm.

Handover and admission documentation

36. At the time of transfer to ICU, an in-person handover at Mrs A's bedside was provided by Dr D and RN E of the PACU team, to the receiving ICU team, which included an ICU registrar and ICU nurse RN F.

37. Dr D said that his handover followed a standard format and covered all aspects of Mrs A's clinical status, and included the recent blood results.

[15] Dilution of coagulation factors, which occurs when blood is replaced with fluids that do not contain coagulation factors.
[16] Fresh frozen plasma is a blood product that contains coagulation factors.
[17] Cryoprecipitate is a blood product that contains a high concentration of fibrinogen.
[18] To at least 2.5g/L.
[19] Prothrombin time (PT) and activated partial thromboplastin time (APTT) are screening tests that help to evaluate a person's ability to form blood clots appropriately.
[20] D-dimer is a protein made when a blood clot dissolves in the body.
[21] A condition that affects the blood's ability to clot.

38. RN E, who was present to hear Dr D's handover, then provided a nursing handover to RN F. RN E said that this followed a standardised verbal and physical handover process and included details of dressings, drains, pain, IV lines, and fluid infusions. RN E stated that the fluid chart and fluid balance chart were part of this handover, and "clearly documented all fluids that [Mrs A] had been administered". At the time of handover, the view was that Mrs A was "in a very stable condition" and "appeared clinically unremarkable". The plan was for coagulation studies to be repeated at 9pm.

Error in handover information

39. The ICU admission note, recorded by the ICU registrar at 6.47pm, noted: "Clotting corrected with FFP, cryo[precipitate] and 6 units R[ed] B[lood] C[ells]", indicating his belief that blood products had been given to Mrs A. However, at that time, no blood products had been administered to Mrs A, and there is nothing in the clinical records to indicate that they had. The DHB told HDC[22] that while the ICU registrar does not recall the details of the verbal handover, he believes that during the handover he was given the impression that blood products had been administered.

40. Dr D told HDC:

> "[The handover provided to the ICU team was] formal, structured and comprehensive. I am confident there were no errors or ambiguities in the information provided, which included the anaesthetic notes in which any blood products administered would have been recorded."

41. The DHB noted that while it is unclear exactly why the error occurred, it is clear that the handover process was suboptimal, "as there was not a clear shared understanding of some aspects of the management so far and of the plan going forward". However, the DHB noted that at that time it is unlikely that the management plan would have changed, regardless of whether or not ICU staff had understood that blood products had been given at some point previously.

Ongoing management in ICU — 4.50pm to 7.35pm

42. RN F told HDC that on arrival in ICU, Mrs A was stable and appeared relaxed. In the initial ICU nursing assessment, documented at 5pm, RN F recorded that the plan was to continue to monitor Mrs A's heart rate, haemoglobin, coagulation, urine output, and drainage from the Bakri balloon overnight.

43. At 6.20pm, Dr C reviewed Mrs A and documented that she was "stable currently" and the Bakri drain contained 180ml of fluid. Dr C documented that the plan was for Dr D and the ICU registrar to decide on fluid management, and to act on the Bakri volume only if Mrs A became haemodynamically unstable (abnormal or unstable blood pressure).

[22] The DHB conducted a review of events and obtained recollections from the clinicians involved, and provided information to HDC. The ICU registrar declined to provide a statement or additional information further to what was provided to the DHB.

44. At approximately 6.30pm, Mrs A reported mild uterine cramps. RN F said that she contacted one of the midwives to ask whether this was common following Caesarean section, but the midwife was unsure. RN F then rechecked Mrs A's haemoglobin, which remained stable, and contacted the ICU registrar regarding Mrs A's uterine cramps.

45. RN F said that the ICU registrar advised that "the cramping was most likely normal as she remained hemodynamically stable, there was no output from her B[akri balloon] and that the pain relief she had received in PACU would be wearing off so she should be encouraged to use her [patient controlled analgesia]".

46. At around 7pm, RN F began her handover to the oncoming nurse for the shift, RN G. RN G said that the obstetric registrar was present during the handover, and Dr D and Dr C also arrived to review Mrs A.

47. Dr D told HDC that he believes he returned to check Mrs A at around 6.50pm. He said that although he no longer had clinical responsibility at that stage, he wanted to check on Mrs A's progress. Dr D stated that at that time he considered that Mrs A was looking more unwell than when he had last seen her at around 5.45pm, and he noted a further 180ml of blood in the Bakri drain. Dr D told HDC: "This made me concerned about further bleeding."

48. Dr D said that because the ICU registrar was present at that time, rather than discuss the situation with the ICU consultant, he decided to take bloods for a full blood count and coagulation study. Dr D took the bloods and signed the relevant form at 7.19pm.

49. At that time, Dr D also contacted the blood bank and requested two units of blood to be sent to the ICU, and charted one unit to be given immediately and the other over one hour. He also charted further pain relief and tranexamic acid. Dr D stated: "[T]he ICU Registrar was present and did not disagree with my assessment, concerns and treatment." After requesting the blood tests, Dr D contacted anaesthetist Dr I and asked him to check on the results. Dr D then left Mrs A's bedside.

50. The on-duty ICU consultant, Dr H, told HDC that Dr D recorded his prescribing on the regular ward chart, rather than the ICU observations chart. Dr H said that this was raised with Dr D at the time, and that "[a]fter a short discussion [he] established the proper process and that for a patient in ICU, the ICU team is solely responsible for any prescribing using only the ICU pathways of doing so".

51. Between 7pm and 7.30pm, Mrs A's observations were not recorded on the ICU 24-hour flow chart. The DHB said that although they were not recorded in the clinical notes because the handover was being carried out, vital signs are monitored continuously by machine.

Deterioration — 7.35pm

52. RN G said that following handover, initially Mrs A remained stable, but was requiring an increasing amount of phenylephrine to maintain an acceptable blood pressure.

53. At 7.35pm, Dr C documented that she had been contacted by one of the midwives regarding Mrs A's increase in pain. At that time, Dr C noted 300ml in the Bakri drain, and documented

in brackets: "active bleeding — slowing". Dr C noted the full blood count results, including that Mrs A's platelets and haemoglobin were low[23] and her white cell count was high, and documented that the plan was to await the coagulation results and review following their receipt. The full blood count results were also telephoned to Dr D, as the requester of the blood tests, at that time.

54. At 8pm, RN G documented that the Bakri drain contained 300ml. She said that at around that time she asked another ICU nurse to assist her, as Mrs A was due to receive the blood that had been ordered by Dr D.[24] RN G stated:

> "I was constantly mindful of watching for any change in vitals which may suggest further bleeding. At this point, while her blood pressure had decreased slightly, her heart rate, respiratory rate and level of consciousness had remained the same."

55. Also at around 8pm, Dr I arrived and asked to see the coagulation results, and was advised that these had been received but the nurse had not yet had time to action them. The coagulation report is time stamped 8.09pm. According to the DHB, the results were also telephoned through to Dr D at around the same time.

56. Dr I said that he noted that the results were very abnormal. Dr I stated:

> "My assessment was that this lady was bleeding and rapidly heading towards extremis.[25] At this stage I told the nurse who was looking after her that [Mrs A] needed to go to theatre straight away and to get prepared for that, that I was going to theatre to get staff organised and that I would be back to collect [Mrs A] very shortly."

57. Dr H was called to assess Mrs A sometime between 8.20pm and 8.30pm. Dr H said that when he arrived, a number of people were gathered around Mrs A's bedside, so he did not check the Bakri drain immediately. He said he noted that there was a total recorded blood loss of 350ml for the previous hour. Mrs A's heart rate was above 100bpm, and her blood pressure had dropped slightly but was still stable.

58. Dr C also arrived at around the same time and identified that the Bakri drain had drained a further 900ml since 8pm. Dr C said that on arrival on the ICU it was clear that Mrs A was bleeding heavily, having lost one litre of blood over the past hour. Dr C stated that Mrs A was at significant risk, and it was decided to return her to theatre immediately for a postpartum hysterectomy (removal of the uterus).

59. Mrs A was administered further blood products between 8.30–9pm.[26] At 9pm, Mrs A's vital signs were noted to have deteriorated, and more blood had drained into the Bakri drain.

[23] Her haemoglobin was 75g/L.
[24] The first unit was administered at 7.55pm.
[25] At the point of death.
[26] These blood products (fresh frozen plasma and cryoprecipitate) were issued by the blood bank at 8.17pm.

Communication between consultant and ICU nurse

60. Dr H recalled that at that time Dr C questioned why nobody had informed her that 900ml in the Bakri drain was unaccounted for and that there was a total of 1200ml in the drain.

61. Dr H said that there was then a subsequent discussion between RN G and himself regarding the amount of blood in the drain, which became heated, and then escalated. Dr H stated: "This was, due to the rising anxiety that we might have a major problem on our hands, said in a tone and volume that definitely could have been perceived as 'unprofessional'."

62. The DHB said that Dr H recognised at the time that this was not good practice, and apologised to RN G and had a long conversation with her as soon as the acute crisis was over, which they both felt addressed the matter adequately.

Return to theatre

63. Mrs A was transferred to theatre, and a subtotal abdominal hysterectomy was commenced at 9.35pm. During the procedure a significant clot in the uterus was noted, as well as active bleeding vaginally when the Bakri balloon was released. Estimated blood loss was 2900ml (in addition to 1450ml in the Bakri balloon and 1800ml at Caesarean section).

Ongoing care

64. Following surgery, Mrs A was returned to the ICU. Mrs A remained stable, and the following day was transferred to the ward.

65. A few days later, Mrs A was discharged from hospital.

Initial complaint

66. While Mrs A remained on the ward, Mrs B (Mrs A's mother) contacted the ICU to express concern about the way in which Dr H had spoken to RN G regarding the blood in the Bakri drain at the time of Mrs A's sudden deterioration.

67. Upon receipt of Mrs B's message, the Associate Charge Nurse Manager (ACNM) visited Mrs A on the ward and later spoke with Mrs B by telephone. The ACNM said that an in-depth discussion took place with Mrs B about the events in the ICU and her concerns about the obstetric care and plan. The ACNM subsequently contacted Dr C to explain the situation, but did not re-contact Mrs B following this, as it was the ACNM's understanding that Dr C wanted to take the lead in addressing Mrs B's concerns.

68. The DHB told HDC that often the ICU ACNM will informally follow up long-term or complex patients who have been transferred to ward-level care to "ensure that patients and their families have an opportunity to ask any outstanding questions regarding their ICU care or issues that they would like to highlight". The DHB stated:

> "Learning from patient follow-up can help raise awareness of patients' and families' perceptions and what is important to them to improve the experience of future patients in ICU."

Incident review

69. Mrs B subsequently submitted a formal complaint to the DHB. In response to this, the DHB undertook an incident review. The review identified the following:

- The initial clinical assessment was that the abnormal coagulation results were caused by the large volume of fluids administered during the operation, as there was no indication of ongoing bleeding at that time.
- While earlier correction of coagulation may have reduced the risk of subsequent bleeding, this has to be weighed against the risks associated with transfusion of donated blood products. At the time, the obstetric and anaesthetic teams considered the latter risks to outweigh the former.
- The Bakri drain was last checked 20–30 minutes prior to bleeding being discovered. It was noted that the bed space was very busy and the drain was not always visible. However, heart rate and blood pressure were monitored continuously in the ICU.
- It was noted that the nursing handover from PACU happened independently of the medical handover. The registrar appears to have been under the impression that the abnormal coagulation had been corrected. It was noted that this failure of communication is "clearly unacceptable", but that this was unlikely to have changed the management at that time.
- The location of Mrs A's bed allowed more privacy, but it was harder to keep an eye on what was happening and for nurses to ask for help.
- Unprofessional communication occurred between staff. It was noted that it is important that this is recognised, reflected upon, and learned from, and that relationships within the team are preserved. It was noted that this can have an impact on family.

70. The review concluded:

> "Poor communication appears to have been the root of many of the challenges faced both clinically and interpersonally. There were failures of optimal communications as to the delegation of clinical oversight of [Mrs A's] care upon arrival from PACU, whether or not she had received blood products to support her coagulation in PACU, the desired goals of therapy, triggers for escalation of concerns, and communication of telephoned results to the ICU team. In addition, shortcomings have been identified in staff–staff and staff–family interpersonal communications. Some of the attempts to amend for those problems identified near the time of incidence may additionally have inadvertently compounded the offence."

71. The review team made the following recommendations:

- Education to increase knowledge and confidence dealing with obstetric patients.
- Multidisciplinary debrief for learning and feedback.
- Handover processes to be reviewed as part of a planned move to a new ICU space. Recommendation that all ICU patients have a formal "pit stop" handover. In addition, it

recommended a specific obstetric handover record that would include guidance on specific obstetric areas.

- Encourage a culture where staff are encouraged to ask for help, and staffing resources to allow this.
- The importance of documentation should by emphasised. It is noted that the new ICU environment will be more conducive to allowing close monitoring whilst also allowing privacy and space for visitors.
- Communication — staff should be aware of communication between staff and with patients and families. The open, reflective culture in ICU should continue to be encouraged with both formal and informal feedback.
- Routine follow-up of patients transferred to the ward and consideration of an ICU outreach service.
- Laboratory results should be phoned to a named individual and documented.
- Provide an apology to Mr and Mrs A.

Further comments

72. As part of the response to HDC, the DHB provided the following statement:

> "This case has served to strengthen awareness of [post partum haemorrhage (PPH)] management at [the DHB]. Although PPH is a well-recognised complication, management has improved and we are aware of the need to continue with teaching sessions to ensure all who are likely to come into contact with these women either in Delivery Suite, Theatre, Recovery Room or in ICU are fully aware of the need for correct observation, clear communication and prompt responses, especially where more than one team is involved. We regularly reinforce these issues at our teaching sessions and case discussions. In particular we emphasise the importance of ensuring that only one team should be 'In Charge' when multiple teams are involved, to avoid confusion over lab reports and care plans."

Comment from Mrs B

73. Mrs B told HDC that she is concerned that staff failed to monitor Mrs A adequately while she was on the ICU, and that this resulted in delays in managing the bleeding. Mrs B believes that had action been taken earlier, a hysterectomy may have been avoided. Mrs B told HDC:

> "While in ICU I believe that staff failed to monitor [Mrs A's] worsening situation considering her already noted high risk and failed to notate clinical observations correctly, particularly with blood loss. I believe had the Registrar for Obs and Gynae not decided to call back the specialist, then the ICU team would not have bothered to swing into action until things became critical and the timing of events may perhaps have resulted in a loss of life for [Mrs A]."

ACC

74. A treatment injury claim was made to ACC in relation to whether there was a failure to treat the coagulopathy, which resulted in a hysterectomy.

75. ACC declined the claim on the basis that treatment would not have prevented the requirement for a hysterectomy.

DHB policy/guidelines

76. The Post-partum Haemorrhage policy defines "PPH" as "blood loss greater than 500 ml and continuing" in the first 24 hours postpartum. Blood loss of greater than 2000ml requires the Massive Obstetric Bleed Protocol to be implemented, necessitating urgent blood collection and red cell transfusion.

77. The Post Anaesthetic Care Unit (PACU) Handover guideline sets out the handover process for PACU nurses. This includes a verbal handover that covers medications, IV infusions and drains, and any postoperative instructions, as well as a physical handover that covers all infusions and drains.

78. The ICU Nursing Standards require vital signs and fluid input/output to be monitored every hour.

Responses to provisional opinion

Mrs B

79. Mrs B was provided with a copy of the "Information gathered" section of the provisional opinion, and advised that she had no further information to add. She said that while the family does "accept the hysterectomy having to happen" in the event, she reiterated her view that "had the clotting products been administered and other subsequent failings now clear, then [Mrs A] may not have been taken to this life threatening situation".

DHB

80. The DHB accepted the findings and recommendations of the provisional opinion.

Opinion: District health board — adverse comment

Introduction

81. The DHB was responsible for ensuring that Mrs A was provided with services that complied with the Code of Health and Disability Services Consumers' Rights (the Code), and to have adequate systems to ensure that care delivered to Mrs A was safe, appropriate, and timely. Overall, guided by expert advice, I have some criticisms about the care provided to Mrs A, which I consider arose from systemic issues at the DHB. I discuss these in more detail below.

82. To assist my assessment of the care provided to Mrs A, I considered expert advice from an intensivist, Dr Tony Williams, and a registered nurse, RN Lynsey Sutton-Smith.

Initial postoperative monitoring and management

83. Postoperatively, initially Mrs A was managed on the PACU, where she received close monitoring by the nursing, anaesthetic, and obstetric teams. During that time, Mrs A remained stable. Although there were periods of instability, these were monitored closely and managed by Dr D and Dr C. At 3.44pm, an ultrasound scan showed that the uterus was intact and there was free fluid in the uterus. At 4.12pm, coagulation results were telephoned through to Dr D. It was noted that while these showed a small change since the previous results, following discussion with the haematologist, this was considered to be due to dilutional coagulopathy, and no active treatment was advised.

84. At 5.10pm, a subsequent note was added to the formal laboratory report, which stated that the D-dimer was high and that consideration of disseminated intravascular coagulation was recommended. However, there is no evidence that this was communicated to Dr D, or to any of the obstetric or ICU teams, at the time.

85. Dr Williams noted that while there were initial periods of instability, there was no evidence of significant ongoing bleeding, and generally Mrs A remained stable while on the PACU. Dr Williams noted that the coagulation results at that time were not completely normal, but advised that "this would not be uncommon in a setting of stabilisation following significant intraoperative blood loss". Further, Dr Williams advised that the coagulation results at that time "would not have been an indication for further administration of factors in the absence of ongoing bleeding regardless of whether or not previous transfusion of factors had been required".

86. RN Sutton-Smith also considered that the care during this time was reasonable, and that observations by the PACU nurse were documented thoroughly and diligently.

87. I accept this advice and am satisfied that based on the clinical information available at the time, the clinical management in PACU was appropriate.

88. It is concerning that the additional note regarding the D-dimer result does not appear to have been communicated to the medical teams at that time. I note the DHB's advice that had this information been available, it may have resulted in a plan to repeat the coagulation tests earlier than 9pm, as was planned initially. However, I am also reassured that staff remained attentive to the risk of bleeding and, as noted by Dr Williams, in any event the tests were repeated just after 7pm and appropriate actions taken.

89. I note that since this incident the DHB has written to the medical laboratory requesting that clinically relevant comments are telephoned through to the requesting doctor.

Management in ICU

Handover and admission documentation

90. Handover is a verbal process and, as such, was not documented. However, according to staff accounts, handover between the PACU and ICU medical and nursing staff covered all key areas, and although the nursing and medical handovers were separate, staff were present for both.

91. RN Sutton-Smith advised that based on accounts from staff that all key clinical information was handed over and understood by the receiving team:

> "I am satisfied that a clear handover process was followed, and all aspects of communication related to [Mrs A's] risk of bleeding and current clinical state was done thoroughly and diligently."

92. RN Sutton-Smith noted that the nursing admission summary was documented within 10 minutes of Mrs A's arrival in the ICU, and that a nursing plan for haemodynamic parameters, blood test results, and urine and drain outputs was completed. While certain information, such as the blood tests and escalation plan, were not included in the admission summary, RN Sutton-Smith noted that they had been documented clearly in the anaesthetic/PACU record, which was handed over to the ICU team.

93. I accept RN Sutton-Smith's advice. However, while Mrs A's risk of bleeding appears to have been communicated clearly and understood by the receiving ICU team, there was an error in the ICU admission documentation, in which the ICU registrar incorrectly documented that clotting had been corrected with blood products prior to ICU admission.

94. As noted by Dr Williams, the fact that such key information was recorded incorrectly indicates a failure at some point in the handover process. However, despite this error, both RN Sutton-Smith and Dr Williams consider that the error did not affect the care provided to Mrs A. In particular, Dr Williams noted that Dr D and Dr C had the complete information and their own clinical impression. Dr Williams stated: "The handover communication did not lead to clinical problems in this case." RN Sutton-Smith also advised: "I am satisfied the risk of bleeding was understood and received by the members of the ICU team."

95. I accept this advice and am reassured that the error did not affect the care provided to Mrs A. However, it remains a concern that this breakdown in communication occurred at the time of handover. I note that the DHB has acknowledged and responded to this issue with the introduction of a more formalised multidisciplinary handover process for all ICU patients. I consider that this will help to ensure that all relevant information is communicated clearly and is accessible to all staff. I also consider that RN Sutton-Smith's recommendation of a template to record the handover would be appropriate.

Monitoring

96. Following transfer to the ICU, Mrs A initially remained stable and continued to be monitored closely.

97. With the exception of a brief period around 7pm, Mrs A's observations were recorded on the 24-hour flow chart. The DHB said that although the observations were not documented during that time, they were still being monitored continuously. RN Sutton-Smith advised that this is not uncommon during clinical handovers, but would be considered a minor departure from accepted practice.

98. I accept RN Sutton-Smith's advice. I also note that the DHB has acknowledged this lapse in documentation and has undertaken to ensure that staff are aware of their documentation

requirements, and has increased its nursing resource to ensure that staff have access to support when needed.

99. At 6.20pm, Dr C reviewed Mrs A and noted 180ml in the Bakri drain and that Mrs A remained haemodynamically stable. At 6.30pm, Mrs A began to experience uterine cramps but remained stable. At around 6.50pm, Dr D returned to review Mrs A and noted that she was looking more unwell than when he had last seen her. While the Bakri drain still contained only 180ml and the plan was to repeat coagulation studies at 9pm, at 7.19pm Dr D requested repeat blood tests and coagulation studies because he was concerned about further bleeding. At that time Dr D also requested blood products to be sent to the ICU. While I note that because Dr D made the request for blood tests, the results were telephoned to Dr D rather than the ICU consultant, as is the normal process on ICU, as noted below, the results were also sent through to the ICU.

100. Administration of blood products[27] commenced at 7.55pm. At 8pm, RN G recorded 300ml in the Bakri drain, and Mrs A's observations remained stable. At around that time (8pm), Dr I arrived and reviewed the coagulation study results (reported at 8.09pm). Dr I immediately noted a significant deterioration in the results, which he considered indicated bleeding.

101. Dr H was then called to review Mrs A and, at the time of his arrival, sometime between 8.20pm and 8.30pm, a further 900ml was noted in the Bakri drain. Following review by Dr C, it was decided to return Mrs A to theatre.

102. Dr Williams advised that monitoring and management of Mrs A for post-partum haemorrhage was in accordance with acceptable practice. Dr Williams stated:

> "The timely ordering of the coagulation tests by [Dr D] and his alert monitoring of the situation was a key part of the safe management of [Mrs A's] postpartum haemorrhage."

103. Dr Williams noted that Mrs A did not meet the criteria for post-partum haemorrhage until around 8.30pm, "by which time transfusion was underway and transfer to the operating theatre for definitive management was imminent". Dr Williams advised:

> "The time interval between the coagulation results being reported by the laboratory at [8.09pm] and the issuing of [further][28] blood products from blood bank at [8.17pm] is remarkably short and is a credit to the [public hospital] system."

104. RN Sutton-Smith also considered that the monitoring during that time was appropriate, noting in particular that although the Bakri drain was obscured and not always visible, it was checked regularly and in accordance with the ICU monitoring requirements.[29]

105. RN Sutton-Smith noted that the drain had been checked at around 8pm, and "[i]t is extremely unfortunate that the blood loss occurred so rapidly". RN Sutton-Smith considered

[27] Namely, red blood cells.
[28] Namely, fresh frozen plasma and cryoprecipitate.
[29] The DHB's ICU Nursing Standards.

that once the deterioration was noted, "all care and treatment was escalated quickly and appropriately".

106. Although some issues arose because of the multiple staff and teams involved in Mrs A's care, which I discuss further below, guided by expert advice, as set out above, I am satisfied that Mrs A was monitored appropriately while on the ICU. When the unexpected bleed occurred, staff responded quickly and managed the situation appropriately. As noted by Dr Williams:

> "One of the main benefits of admitting patients to high care areas for post operative care is the high nurse to patient ratio that these areas provide. This enables vigilant monitoring and proactive management of problems such as postoperative pain and bleeding."

107. Both experts commented on Mrs B's concern that the ICU team failed to recognise the deteriorating situation and that the situation was not under control. Dr Williams advised: "It is unusual for rapid bleeding to suddenly begin after a long period of stability, and it [is] understandable that there may be some surprise at the sudden bleed."

108. RN Sutton-Smith noted that the environment around Mrs A's bedspace was very busy, with multiple staff working hard to monitor and manage Mrs A. RN Sutton-Smith stated:

> "It is challenging when patients rapidly deteriorate and when multiple competing priorities ensue. Clearly the priority of care was to stabilise [Mrs A] and address the bleeding that happened very rapidly. I believe from the responses provided, there was clear and appropriate prioritisation of work to manage a deteriorating patient."

109. As discussed above, I am reassured that the clinical care was appropriate and timely. However, clearly this was a stressful situation for all involved, and must have been distressing for the family to witness.

110. The DHB has acknowledged that there were issues relating to the communication between team members, which undoubtedly would have contributed to the family's distress and concerns. The DHB advised that it has taken steps to improve team communication and relieve some of the pressures on staff, to help with such situations, which I consider appropriate.

Communication with family and complaint management

111. Mrs B initially raised concerns about the care provided in ICU while Mrs A was still on the ward. The ACNM contacted Mrs B and discussed her concerns, but there appears to have been a breakdown in communication between Dr C and the ICU team regarding who should contact Mrs B and how her concerns should be managed. As noted by Dr Williams:

> "The ICU team realised that [Mrs B] had some concerns about [Mrs A's] care while she was in ICU and made contact, however this loop was not closed and she was left with the impression, despite her later meeting with [Dr C], that things were not done in a timely manner."

112. I note the DHB's response explaining the ACNM's decision to try to address Mrs B's concerns immediately. It is unfortunate that this approach was not better coordinated with Dr C.

113. I consider that the DHB's response to Mrs B's subsequent formal complaint was appropriate and timely. However, I note Mrs B's concern that the DHB has yet to provide a written apology to Mrs A as recommended in the event review report. I recommend that this be completed.

Conclusions

114. Overall, guided by expert advice, I am satisfied that the clinical and nursing care provided to Mrs A was appropriate and timely. In particular, based on the clinical information available at that time, I consider that Mrs A was monitored carefully. When she deteriorated suddenly, staff responded appropriately and in a timely manner.

115. However, aspects of the system did not operate as they should. In particular, I have concerns about the following:

- The additional D-dimer result and recommendation by the haematologist were not communicated adequately to the clinical teams caring for Mrs A at the time.
- The ICU registrar incorrectly recorded that blood products had been given prior to Mrs A's arrival in the ICU.
- Blood tests requested by Dr D while on the ICU were not ordered as per normal ICU processes, and, as a result, were communicated to him verbally, rather than to relevant ICU staff.
- Aspects of the nursing documentation on ICU were inadequate.

116. While I am satisfied that these failings did not have an impact on the quality or timeliness of the care Mrs A received, they have highlighted areas for improvement, which the DHB has acknowledged and taken steps to address, as set out below.

117. I acknowledge the family's belief that there were systemic concerns, and that had clotting products been administered earlier Mrs A may not have been in a life-threatening situation. I reassure Mr and Mrs A, and Mrs B that their concerns have been explored thoroughly in the course of this investigation, and that steps have been taken, and will be taken, to improve aspects of clinical management for the future care of women in Mrs A's situation.

Changes made by the district health board

118. The DHB acknowledged that there have been a number of learning points in response to this complaint, and it has undertaken the following changes:

- The introduction of a new model of care in the ICU, increased nursing resource, and co-location of the ICU and HDU on one floor, which provides a better working environment.
- Education: It provides regular simulation teachings, in which multidisciplinary handovers are discussed. The DHB is providing regular teaching for ICU resident medical officers and nurses, including simulation sessions and teaching on the management of Bakri balloon drains. In addition, this case will be presented at the ICU and anaesthetic education sessions focusing on coagulopathy.
- Standardisation of the admission handover processes for all ICU patients, with the aim of a single multidisciplinary "pit stop" handover for all ICU.
- A review of the daily medical assessment and planning sheet to make it a more multidisciplinary document with clear plans in one location. The DHB also advised that ICU has made a capital request for a clinical information system "which will allow a clear multidisciplinary daily goals plan", to help mitigate any communication issues.
- A review of the nursing resource to align with the Critical Care Medicine standards. The DHB advised that it is making good progress with nursing recruitment.
- It ensures that staffing levels and culture in the ICU allow staff to feel able to ask for help whenever necessary.
- The introduction of a rapid response team involving experienced nurse clinical coordinators to help with patient follow-up.
- Communication with the medical laboratory regarding this incident, and a recommendation that clinically relevant results are telephoned to the named clinician.
- A review of the Massive Obstetric Bleed protocol.

Recommendations

119. I recommend that the DHB:

a) Provide a written apology to Mrs A and her family. The apology should be provided to HDC, for forwarding to Mrs A, within three weeks of the date of this report.

b) Review its team culture — in particular, survey whether nursing staff feel adequately resourced and supported to provide safe and timely nursing care. The outcome of the review should be reported to HDC within three months of the date of this report.

c) Consider updating its ICU nursing policy to clarify the frequency of checks for drains and when this should be escalated. In addition, the DHB should include the requirement that

any drain or monitor should be clearly visible at all times. These actions should be completed and reported on to HDC within three months of the date of this report.

d) Consider developing a template to allow handover in ICU to be documented clearly, and report to HDC on the outcome of this within four months of the date of this report.

e) Provide an update on the introduction/development of a clinical information system, within four months of the date of this report.

f) Provide an update/review of the new ICU "pit stop" handover process, within five months of the date of this report.

g) Undertake a documentation audit, within five months of the date of this report, that includes:

— the accuracy of admission summaries; and

— the clarity and ease of accessibility of ICU admission documentation and daily management plans.

Follow-up actions

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

Appendix A: Independent clinical advice to Commissioner

The following expert advice was obtained from ICU nursing advisor Mrs Lynsey Sutton-Smith:

"**Independent Advice on HDC Case No C19HDC00534**

I, **Lynsey Sutton-Smith** (MNclin, RNdip) have been asked to provide an opinion to the Commissioner on case number **19HDC00534**.

I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

I am a Clinical Nurse Specialist working within an urban tertiary level Intensive Care Unit (ICU). I qualified in the UK in 1996 and have worked in the ICU at my current DHB for 15 years. I am a senior expert RN with extensive experience in ICU nursing, achieving Masters in Nursing (honours) in 2012. I am also a part time teaching fellow for the Post Graduate Masters in Nursing programme at Victoria University of Wellington. I have published several papers in the medical & nursing literature around clinical practice quality improvement projects and have a clinical interest in quality of care, audit and research in the Intensive Care Unit.

Background to the complaint:

[Mrs A] was 33 weeks pregnant when she presented with bleeding to [the DHB] on [Day 1]. [Mrs A] had a Caesarean section (C-Section) performed that day and a Bakri balloon was inserted following the procedure. She was closely monitored in the Post Anaesthesia Care Unit (PACU), but coagulation results suggested Disseminated Intravascular Coagulation (DIC) and she was transferred to the Intensive Care Unit (ICU).

While in ICU, it was incorrectly documented that [Mrs A's] clotting had been corrected with the administration of blood products. [Mrs A] remained stable and was noted to have 300mL of blood in the Bakri balloon at 8pm. At approximately 8:20pm, [Mrs A] experienced intractable pain, increased heart rate, decreased blood pressure and her Bakri balloon was noted to have filled to 1200mL. This increased to 1450mL by 9pm. At 9:30pm [Mrs A] underwent a subtotal abdominal hysterectomy. She was found to have a significant clot in her uterus and active vaginal bleeding when the Bakri balloon was released. She lost 2900mL of blood, in addition to the 1500mL in the Bakri balloon and 1500mL from her C-section.

[Mrs A's] mother, [Mrs B], raises concerns that ICU staff failed to monitor her daughter's worsening condition and holds particular concerns about the management of coagulopathy in ICU. She also raises concerns about incorrect clinical documentation, the time taken by ICU staff to address [Mrs A's] critical situation and the communication and manner of ICU staff.

Expert advice requested

Please review the enclosed documentation and advise whether you consider the care provided to [Mrs A] by [the DHB] was reasonable in the circumstances, and why.

In particular, please comment on:

1. The adequacy of the handover from PACU to ICU, including the communication and documentation about [Mrs A's] condition.
2. The adequacy of nursing observations of [Mrs A] during her admission to ICU.
3. The adequacy of nursing documentation in ICU.
4. Whether appropriate consideration was given to [Mrs A's] risk of bleeding and the adequacy of subsequent monitoring of the Bakri balloon.
5. Any other matters in this case that you consider amount to a departure from accepted standards.

THE REVIEW:

Each of the points/questions raised have been provided in points 1–4 of this report. In preparing for this report several documents were reviewed including:

- [Dr J's] [DHB specialist intensivist and anaesthetist] report and summary.
- All clinical paperwork, notes and observations from the post-operative period in PACU (post anaesthesia Care Unit or 'recovery') including the PACU observation record. All nursing, anaesthesia and Obstetric written documentation in the clinical progress notes.
- The nursing admission summary and medical admission summary.
- The ICU 24-hour flow chart.
- Clinical progress notes from both the operative period, post-operative period and the ICU.

Terminology used:

The drain, including drain monitoring or drain output relates to the Bakri balloon specifically in this case and the level of blood within it (output). The recommendations that relate to 'drain monitoring' or 'drain output' relate to all patient drains that may belong to a patient in the ICU.

24-hour flow chart is the ICU chart of all observations and vital signs, fluid balance, prescriptions of fluid or blood given, invasive lines, daily care plan and drug infusion prescriptions.

'Haemodynamic' refers to the patient's cardiovascular status as measured by heart rate monitoring, Blood pressure, and urine output.

RESPONSE TO THE QUESTIONS RAISED FROM THIS COMPLAINT

1) Adequacy of handover from PACU to ICU; including communication and documentation about [Mrs A's] condition.

Summary of the ICU journey from [Dr J], The Intensive Care Unit/Critical Care Unit Initial Nursing Assessment, the medical admission summary and ICU chart have been reviewed.

Handover

It is challenging to provide comment on the adequacy of handover from PACU to ICU because this is a verbal process, not usually evidenced by documentation. Because this process relies on good verbal skills and communication and often involves multiple teams, it is important that adequate time and due diligence is given to this process. Transfer of information from speciality to speciality and department to department is particularly fraught with issues, handover of important information may be missed in a busy or chaotic period, especially if the patient is unstable, or the handover is brief, or fragmented. In [Dr J's] summary I note the nursing handover from PACU to ICU is separate to the medical handover. This may have led to fragmented communication and information that one team may be party to but not another. It may also lead to different levels of clinical risk conveyed and key information missed. Both the medical and nursing handover from PACU to ICU is briefly described by [Dr J]. From the information provided, it is not known how explicitly [Mrs A's] risk of bleeding was conveyed during the handover process. However, [Dr J] mentions this risk *was* conveyed to the ICU RMO, albeit with some incorrect information around the correction of blood results with blood products. [Dr J] states the nursing handover simply described the patient as stable. The fact that there were separate medical and nursing handovers during the admission process may have led to a misunderstanding of [Mrs A's] risk for deterioration for the nursing team. It may also have led to the incorrect handover of those blood results having been corrected (which they hadn't). It is also unknown from the information provided how the details of [Mrs A's] operative course was communicated from PACU to ICU. I would expect that information be provided around blood loss, the two episodes where [Mrs A's] blood pressure had dropped, fluid balance (the poor urine output despite 6 Litres of fluid) and the results of any blood tests, medications given or pain levels as a standard of care. I could not find any documentation related to the handover, the details of what was communicated, who was involved in the handover, how the handover was performed and who was leading this process. I note, the bottom of the vital signs/observation PACU document form however, is signed by the PACU nurse and the 'ward' nurse. Despite this entry being signed by both parties, it is still difficult to ascertain what exactly was handed over from PACU to the ICU nurse. I recommend this process be reviewed by both areas and efforts made to improve the flow of key information. The handover process as it stands from the documentation and the fact that key information was either miscommunicated or not given at all from PACU to the ICU suggests a moderate to severe departure from current acceptable practice. This is the responsibility of all the teams involved in the care of that patient. Specifically the anaesthetic and PACU nursing team on that shift to hand over key information.

2. Documentation in PACU related to [Mrs A's] condition

In reviewing the written clinical progress notes during the period in PACU I note no written entries by the PACU nursing staff. In clinical practice this is often the case, as recording of observations and vital signs is documented on the anaesthetic record in the recovery section by the PACU nursing staff. The observations are documented on the PACU record thoroughly every 10 mins from 1320 to 1345, then 15 mins from 1345 to 1615. In reviewing all the documentation from the perioperative and post-operative period I note several entries by the Obstetrician and the anaesthetist. There are two entries in the notes by the Obstetrician, one at 1420 following a review of the patient after a period of hypotension in PACU and then again at 1600 — 50 mins prior to transfer to the ICU. These entries do allude to some concern over [Mrs A's] clinical progress in the PACU period. I also see a handwritten entry by the anaesthetist in the additional notes as part of the anaesthetic record. They do provide a little more clarity as to the clinical picture and the operative course in PACU. The anaesthetist documents that pain was a continued problem despite multiple analgesics and the INR, APPT and Fibrinogen results (no time of when bloods taken or when the results were received). It is very difficult to decipher the rest of this sentence due to some illegibility but alludes to a plan to transfuse products if bleeding. Based on this there is acknowledgment of [Mrs A's] risk of bleeding (even if not explicit or overt) by the anaesthetist.

There is however, no documentation on the PACU anaesthetic record of the time any blood tests were sent, the results obtained, or indication of blood loss anywhere on the chart. I see a section allowing comments at the bottom of the form, and this could have been used to document these aspects. I recommend this document be re-evaluated and perhaps a section at the bottom of the anaesthetic PACU/recovery record to include comments on clinical issues during the operative course, the time blood tests were sent, results and any other pertinent clinical information (maybe a template to highlight key information). This document should be used as part of the handover process and given to the receiving ICU nurse once handover is complete to solidify the verbal handover. As this lack of documentation may have compounded the issues with poor communication of coagulation results and poor handover I suggest this be a moderate departure from the acceptable standard practice. This is the responsibility of both the anaesthetic team, & the PACU nursing team.

Putting all this information together, there is some written documentation during this period from the obstetrician and anaesthetist that alludes to the clinical course and what is summarised does provide enough information as to the clinically fragile state of (potential bleeding) for [Mrs A]. The verbal handover is still the key to ensuring this is communicated to the receiving area, nursing and medical staff. I believe this process should be improved.

Nursing admission summary

The nursing admission summary is reviewed to provide further information of how the ICU nursing staff understood [Mrs A's] risk of bleeding and condition. [Mrs A] was admitted from PACU to the ICU at 1650 on [Day 1]. A medical admission note was written

at 1847. In the period of the first 6 hours a nursing admission summary is completed as part of the ICU policy. I note the nursing admission summary was completed at 1700 hours, within 10 minutes of admission. There is evidence of a plan to *'monitor BP, Hb (haemoglobin levels), Coags (Coagulation results), HR (heart rate), UO (Urine output), Bakri ON (overnight)*' and this does lead one to believe that the ICU nurses were aware of [Mrs A's] risk of bleeding. However, the general quality of the information on it requires attention. For example, there is no mention of fluid balance, fluid received in OT or PACU, the amount of blood loss in OT or PACU, or the current drainage level at that time. There is no mention of any blood results or when samples may have been sent to the laboratory or a plan to do so. Whilst there is a plan, it is not greatly specific; there is no mention of how often these aspects should be monitored and how deterioration would be escalated and to whom. I recommend this document be evaluated by the ICU, as I wonder how useful the document is in the care of (any) patient. This is a minor point only and a minor departure from acceptable practice of documentation. This is ICU nursing responsibility. A well written nursing and medical plan could easily be completed on the 24-hour flow chart and would ensure nursing and medical teams understand the care that is required and is easily accessible, in one place for both teams. This should include the frequency of drain checks, the plan for next blood tests, and what to do in the event of an increase in drain output or change in haemodynamic (blood pressure and heart rate) status. A thorough shift record written retrospectively would fulfil the requirements for legal documentation in the evaluation of care.

Medical admission summary

The medical admission summary is also reviewed. This is an important document because this summary is used by both Doctors, Nurses, Allied health and other primary teams to understand the patient's history, history of presenting condition, past medical and surgical history as well as the current clinical condition, the operative and post-operative course and the plan of care. Firstly, I note a discrepancy in this admission note stating the clotting was corrected with FFP (Fresh frozen Plasma), Cryo (Cryoprecipitate) and 6 units of RBC's (Red Blood Cells) whilst in PACU. If the handover and documentation from PACU had been more thorough, and accessible (to all teams) this error could have likely been avoided. There is a section titled **Pertinent results** (Hb, PT, APPT, fibrinogen, Thrombin time, INR) on the medical admission summary, however, neither the time the bloods were sent, what time the results were obtained and what treatment (if any) was recorded in this section. This entry may have misled the rest of the nursing, medical and primary team into believing treatment was given and any coagulation dysfunction corrected. I see that [Dr J] also recognises this error in her summary statement. I recommend that the ICU team reviews how this summary is written and find a way of mitigating the risk of missing key clinical information and errors in future. This is a moderate departure from acceptable standard of practice. This is the responsibility of the medical team in the ICU.

The standard of care:

An optimum clinical handover from the transferring unit to the receiving unit begins with an outline of the patient's presentation and history, the surgery completed, complications, treatment & management plan. Using a process driven, structured

handover that includes blood results and associated treatments, haemodynamic and respiratory status, neurological status post recovery, complications, medications given, pain, blood loss, accurate fluid balance, blood products administered, and any other significant findings and family details are also incorporated. The plan from the surgical team is also of great importance, especially if clinical deterioration is expected. During handover there should be a formal process whereby one person leads the handover, everyone listens, and a systematic method is utilised. This ensures nothing is missed and everyone understands the patient's plan of care and what to do if the patient deteriorates. All this information should be correctly and thoroughly summarised on the medical admission summary and nursing admission summary and the 24-hour flow chart. If handover is thorough, the related documentation is likely to be more accurate.

Recommendations:

1. Adopt a structured handover process for all patients admitted to the ICU. This should be led by one person only and follow a systematic method of addressing all the above clinical elements. This handover should be completed as soon as the patient is stabilised in the ICU and should include the primary team or anaesthetist, ICU Doctor, ICU nurse, ACNM or charge person. However, the key to this process is that it is led by one senior person and be detailed and thorough. A template or laminated 'algorithm' may be beneficial in reminding the handover 'giver' what is to be covered.
2. The nursing admission summary document needs updating or reviewing for its usefulness. In the section around fluids & electrolytes, there should be a drain and output box. Education and guidance around the correct way to complete a nursing summary should be given to all staff who complete these documents. A plan of care should be explicit and tailored to the individual patient with specific aims for monitoring and timeline for blood tests and investigations. A templated example of a 'perfect' nursing assessment could be used for teaching purposes.
3. The medical admission summary could be better utilised and pertinent results accurately recorded for time of bloods taken and the results obtained.

2) Comment on the nursing observations during the ICU stay

The 24-hour flow chart and nursing summary is reviewed from 1700 [Day 1] to [Day 2] at 8 am. The patient has a set of vital signs documented on admission and thereafter every hour. However, a set of observations is not documented at 1900 hours. This often happens in clinical practice at handover times and this is a minor departure from practice in any case. This is the responsibility of the ICU nursing team taking care of the patient. I note [Dr J] states the patient was continuously monitored during the ICU stay even though this was a missed set of documented vital signs (more than acceptable practice). I assume this to be because of nursing shift change, and handover. I note from [Dr J's] summary that nursing shift change and handover was chaotic and busy with attending obstetric team and day anaesthetist arriving during this time. Again, a busy patient and multiple interruptions to the handover may lead to fragmented communication and missed details (as was noted with the missed vital signs documentation). This I make a minor point only and this is only a minor departure from acceptable practice. This is the

responsibility of the ICU nurse on that shift however the handover process should be led from the senior ICU nursing team, charge nurses/ACNMs to ensure adequate cover whilst handing over the patient. I recommend nursing handover process be reviewed. The clinicians still need to be by the bedside, delivering care, and discussing plans, however perhaps a proportion of the nursing handover needs to be delivered away from the bedside, in peace, so that things are not missed. I recommend this process be supported by the nurse in charge who could source a 'float' or suitable free person to be the nurse at the bedside delivering care whilst handover is given.

3) Adequate consideration as to the risk of bleeding and subsequent monitoring of the BAKRI balloon.

Monitoring of the drain output:

The standard of care would be for 30 min observation of the drain output for 2 hours immediately post operatively, then hourly thereafter. The drain level was documented at 1600 (I assume this to be 1700 check), and then no drain output documented till 2000 (this is not acceptable practice). Whilst I acknowledge, documentation may be a lower priority with a complex patient, and without knowing for certain how often the nurses *were* checking the drain levels, I can only assume this to be a deficiency in monitoring of the patient. I believe the nursing observations were completed timely and diligently as evidenced by the 24-hour flow chart, however the drain output monitoring was not. If this was a true deficiency of monitoring, this is an unacceptable moderate to severe departure from acceptable practice and this needs to be addressed with unit wide education on a local policy. If this was purely a lack of time to document (but the drain was checked — mild to moderate departure from practice). This is the responsibility of the ICU nurse taking care of the patient on that shift to ensure monitoring is done effectively. However, it is difficult to know if this was monitoring deficiency or documentation deficiency. Either way, this also falls to the responsibility of the senior nursing team to ensure nursing staff are properly supported at the bedside with the resources they need to ensure care, monitoring and documentation are done in a timely manner. I recommend the senior nursing management team to evaluate how the nurses are supported with deteriorating patients and look to ensure adequate staffing or ACNM oversight to help complete all documentation and care. I also see that the 24-hour ICU flow chart does not support the documentation of drain output any more often than hourly (design of the chart). The chart may need to be adapted to allow nursing staff to recognise more frequent observations of drains and bleeding are needed and to do so. I recommend also a drain monitoring policy be developed/reviewed that outlines how often (all) drains should be checked and an escalation pathway as part of this. If there is no such policy or any guidance on monitoring critically ill patients in general I would suggest this to be a moderate to severe departure from acceptable standard of care. Policy review is the responsibility of the senior nursing team or whoever is responsible for reviewing policies.

In ascertaining if there was adequate consideration given to bleeding based on the documentation, I have reviewed the ICU 24-hour flow chart, the clinical progress notes and nursing assessment form as follows:

- There are no clinical progress notes by the nursing staff for [Mrs A's] admission at 1650 to 1930 when the day nursing shift ends so this could not be reviewed.
- The nursing assessment summary states '*Bakri balloon insitu, [Dr C] to come and review tomorrow*' however this appears to be the only mention of a general plan around drain output monitoring.
- The plan at the end of this document does not specify how often the *'Bp, HR, Coags, Hr, UO and Bakri drain ON'* should be monitored.
- There is however an entry on the bottom right of the ICU flow chart, that estimated blood loss in OT is documented, as well as the fluid replacement given and the level of drain output that was in PACU. It is not known who documented this. The nurses had clearly understood that this was important information (because they had written it down). This implies that the nursing staff did consider bleeding to be a risk for [Mrs A].
- The medical admission summary clearly states; *'plan to repeat clotting at 2100 hours, and observe for further bleeding and Obstetric review if any concerns ongoing haemorrhage — blood from Bakri balloon.'*

In summary, I believe that adequate consideration of [Mrs A's] bleeding risk was evident, especially in the documentation from the medical staff. The consideration among the nursing staff is less overt, because the nursing documentation around the plan of care is not explicit. However, in future I recommend the following:

Recommendations:

1. Review local policy (or create if there is not one) on the frequency of drain observations and documentation and clearly outline the escalation process for increased output/noted bleeding.
2. All staff should be educated on the policy.
3. The 24-hour flow chart needs accommodating to enable more frequent drain observations.
4. Review the ICU nursing assessment form to reflect a more specific plan of care including nursing observations.

4) Nursing documentation in ICU

Much of the documentation has already been covered in points one to three, however, I make mention specifically here of the general lack of nursing progress notes from the day shift from ICU admission to the 1930 end of shift. This I do find to be a moderate to severe departure from acceptable practice. The responsibility falls with the individual nurse taking care of the patient on that shift. All nurses are required to complete a 'shift progress report'. I am unsure why this was not completed. The night nurse does complete the shift progress note and this is done within acceptable standard practice. I recommend that all nursing staff are educated on the importance of documenting a shift evaluation/progress notes for each patient.

Final Summary and comments

I believe on evaluating all the documents and evidence, that the care given to [Mrs A] overall was reasonable. There are several reviews by the obstetrician and anaesthetist prior to ICU admission and this summarises the issues reasonably well. The observations of [Mrs A] by PACU nurses is done diligently. However, I recommend how they review the way the (nurses and anaesthetic teams) document the results of blood tests, the times they are taken and what treatment was given to correct any coagulopathy (or not). This could involve a review of current documentation or PACU chart.

I also recommend the handover process from PACU to the ICU be reviewed. Each patient that is admitted to the ICU should have a thorough, systematic, templated handover that includes the whole team of ICU doctors involved in the care of the patient, ICU bedside nurse, ICU ACNM and the anaesthetic/PACU/other medical staff transferring the patient from anywhere in the hospital. This should be led by one person that was involved in the care of that patient prior to arriving and whilst all other staff members are listening.

I believe the Care and monitoring of [Mrs A] in the ICU up to her emergency hysterectomy was adequate in most aspects, however, the documentation of her drain output was not completed consistently. I recommend this be reviewed, either by the refinement of an existing policy on drain output monitoring in the ICU with advice sought from obstetric teams around the BAKRI balloon particularly. I also recommend a more specific nursing and medical plan be documented around how often (all) drains should be checked, and an escalation plan if the drain output exceeds a specific level. This could include a review of either the medical plan on the 24-hour flow chart, nursing timeline plan that is also on the flow chart and/or the nursing admission summary (plan). With all that said I acknowledge the drain was checked at 2000 and did not appear to have an increased blood output until it was checked again at 2020 — when the obstetric team had arrived and noted it to be so. This would appear to be as a result of good timing of review and rapid management by the obstetric team.

Yours Sincerely

Lynsey Sutton-Smith (MNclin, RNdip)"

Further advice

"**RESPONSE TO HDC NO C19HDC00534**

I, Lynsey Sutton-Smith (MNclin, RNdip) have been asked to provide a review of the initial complaint regarding case number **19HDC00534.**

I have re-familiarised myself with the documentation and the relevant expert reviews including my own initial recommendations. The issues raised from my initial review are summarised under the 'summary of initial review'. A brief response and corrective answer is highlighted in blue in italics under each point. A much more in-depth review of [the DHB's] response and corrective actions taken in each of the initial review points is

also provided. An overall conclusion of the case re-review is provided at the end of this document. I do not provide assessment of aspects of the case that are outside of my scope of practice or that were not part of my initial review questions.

SUMMARY OF INITIAL REVIEW

1. Adequacy of handover from PACU to ICU; including communication and documentation about [Mrs A's] condition.

- Nursing handover from PACU to ICU is separate to the medical handover. Information conveyed may be fragmented, aspects lost.
- It is unknown from the information provided how the details of [Mrs A's] operative course was communicated from PACU to ICU as there was no documentation related to this aside from a signature from both the ICU receiving nurse, and PACU RN handing over. *This has since been clarified from the PACU and receiving ICU RN in their written statements.*

2. Documentation in PACU related to [Mrs A's] condition

- No written entries by the PACU nursing staff.
- The observations are documented in PACU thoroughly and diligently as evidenced by the documentation.
- Several written entries by the Obstetrician and the anaesthetist. These entries do allude to concern over [Mrs A's] clinical progress in the PACU period and there are some written blood test results.
- Limited to no documentation on the PACU anaesthetic record of the time any blood tests were sent, the results obtained, or indication of blood loss on the record. *[Dr D] conveys an additional notes page was completed which would have conveyed the above information. The notes have been checked and this is confirmed.*

3. Nursing admission summary

- [Mrs A] was admitted from PACU to the ICU at 1650 on [Day 1]. A medical admission note was written at 1847.
- In the period of the first 6 hours a nursing admission summary is completed as part of the ICU policy. I note the nursing admission summary was completed at 1700 hours, within 10 minutes of admission and a nursing plan to haemodynamic parameters, blood test results, urine and drain outputs was completed.
- But there is no mention of fluid balance, fluid received in OT or PACU, the amount of blood loss in OT or PACU, or the current drainage level at that time, blood tests results or escalation plan. *The response acknowledges, this could have been completed more thoroughly and [the DHB] has a plan in place to address documentation around plans of care with a clinical information system request.*

4. Medical admission summary

- A discrepancy in this admission note stating the clotting was corrected with FFP (Fresh frozen Plasma), Cryo (Cryoprecipitate) and 6 units of RBCs (Red Blood Cells) whilst in PACU.
- There is a section titled **Pertinent results** (Hb, PT, APPT, fibrinogen, Thrombin time, INR) on the medical admission summary, however, neither the time the bloods were sent, what time the results were obtained and what treatment (if any) was recorded in this section. *Teaching with all new rotation registrars around documentation (including admission summaries) and handover is now completed, and this is outlined in the RMO orientation guide.*

5. Nursing observations during the ICU stay

- There was diligent hourly documentation of vital signs every hour except for a missing set of observations at 1900 pm (assumed to be because of nursing shift change and handover).
- This handover period was documented as chaotic and busy with attending obstetric team and day anaesthetist arriving during this time. *There is work ongoing around recruitment of nurses that will help support the unit in times when RNs with busy patients require more help and support.*

6. Adequate consideration as to the risk of bleeding and subsequent monitoring of the BAKRI balloon (Monitoring of the drain output).

- The drain level was documented at 1600 (I assume this to be 1700 check), **and** then no drain output documented till 2000. *This has since been clarified in [the DHB's] response, that observations of the drain did take place and a table is provided in the patient record? (however I cannot see this in the notes provided to me) but I am satisfied based on all accounts that drain observation did occur timely and regularly.*
- Consideration of risk of bleeding is evidenced in the medical and nursing notes (*and also clarified from the verbal handovers in the clinician statements*).
- Limited documentation plan on the nursing assessment summary does not specify how often the 'Bp, HR, Coags, Hr, UO and Bakri drain ON' should be monitored.

7. Nursing documentation in ICU

Lack of nursing progress notes from the day shift from ICU admission to the 1930 end of shift unacceptable.

KEY RECOMMENDATIONS FROM INITIAL REVIEW

1. Adopt a structured handover process for all patients admitted to the ICU. This should be led by one person only and follow a systematic method of addressing all the above clinical elements. This handover should be completed as soon as the patient is stabilised in the ICU and should include the primary team or anaesthetist, ICU Doctor, ICU nurse, ACNM or charge person. However, the key to this process is that it is led by

one senior person and be detailed and thorough. A template or laminated 'algorithm' may be beneficial in reminding the handover 'giver' what is to be covered.

2. I recommend the PACU document be re-evaluated and perhaps a section at the bottom of the anaesthetic PACU/recovery record to include comments on clinical issues during the operative course, the time blood tests were sent, results and any other pertinent clinical information.
3. The nursing admission summary document needs updating or reviewing for its usefulness. In the section around fluids & electrolytes, there should be a drain and output box. Education and guidance around the correct way to complete a nursing summary should be given to all staff who complete these documents. A plan of care should be explicit and tailored to the individual patient with specific aims for monitoring and timeline for blood tests and investigations. A templated example of a 'perfect' nursing assessment could be used for teaching purposes.
4. The medical admission summary could be better utilised and pertinent results accurately recorded for time of bloods taken and the results obtained.
5. A proportion of the nursing handover needs to be delivered away from the bedside, in peace, so that things are not missed. I recommend this process be supported by the nurse in charge who could source a 'float' or suitable free person to be the nurse at the bedside delivering care whilst handover is given.
6. Review local policy (or create if there is not one) on the frequency of drain observations and documentation and clearly outline the escalation process for increased output/noted bleeding. All staff should be educated on the policy.
    a. The 24-hour flow chart needs accommodating to enable more frequent drain observations.
    b. Review the ICU nursing assessment form to reflect a more specific plan of care including nursing observations.
7. All nursing staff are educated on the importance of documenting a shift evaluation/ progress notes for each patient.

REVIEW OF CORRECTIVE ACTIONS AND RESPONSE FROM DHB (IN RELATION TO POINTS 1–7)

1. Handover from PACU to ICU

[RN E] (PACU RN) clearly articulates the content of her verbal handover which is thorough and diligent. The policy that underpins handover process from PACU to receiving area is clear and thorough also. [RN E] can recount despite there being a separate handover between Medical and Nursing staff in ICU from PACU, she heard the medical handover (as well as the Nurse receiving [Mrs A] in the ICU) and this was also thorough and included all the aspects highlighted as necessary in the initial review.

Standardising admission handover processes for all ICU patients is still a work in progress as part of the new model of care as reported by [the DHB]. The aim is for all ICU patients

to have a multidisciplinary 'pit-stop' handover involving the anaesthetist, surgeon, theatre nurses, and ICU doctors and nurses. I note from the Debrief session, as evidenced by [a] document that the process for developing a standardised handover is in progress:

- one verbal handover with everyone present and listening
- written key points, agreed by all
- plan including tests
- who to call
- opportunity for questions
- Action: ICU team to liaise with obstetric team to produce ICU obstetric handover document. Timescale reported to be Feb 2020. Has this now been finalised?

I also note [Dr D's] response indicating that due diligence was paid to the handover with all aspects of [Mrs A's] status, bleeding, blood results, clinical status, and clinical journey and that this was thorough and systematically articulated and understood by the receiving team.

I also note that [RN G] who was the night nurse taking care of [Mrs A], was clearly aware that the risk of bleeding was high. This had been handed over by the day RN ([RN F]).

I am satisfied that a clear handover process was followed, and all aspects of communication related to [Mrs A's] risk of bleeding and current clinical status was done thoroughly and diligently. I am encouraged by the work that is going on to firm up a unit pit stop led handover process. Please continue to develop this work perhaps, with a template for the process (if one has not already been developed).

2. PACU documentation on the PACU anaesthetic record

I am satisfied with [Dr D's] documentation on the additional notes as part of the anaesthetic record included information related to [Mrs A] shows the blood loss, blood test results, haemodynamic response, and urine output. I believe this clearly shows that bleeding was front and centre in the priority of care and management. [Dr D] also communicates this document would have been shown to the ICU team at the point of handover.

In relation to concerns regarding inadequate documentation of times when blood samples were sent or results reviewed, might have been due to the unavailability of the electronic patient record at the initial review. This record reliably documents the time a blood sample has been acknowledged and processed by the laboratory (articulated by Dr H). I would not have been able to access this, so I appreciate the additional information provided and clarity that correct information around blood testing and timing was available for those accessing the electronic health records.

3. & 4. Nursing Admission Summary and medical admission summary

In the initial review assessment, it was alluded to there was no mention of fluid balance, fluid received in OT or PACU, the amount of blood loss in OT or PACU, or the current drainage level at that time, blood tests results or escalation plan. I had suggested that the nursing admission summary form could be better used to document these aspects. However, on review of all the evidence by the team members involved, clearly this had been documented in the anaesthetic/PACU record and handed over by several people from PACU to ICU and then again from nursing shift from day to night. I am satisfied the risk of bleeding was understood and received by the members of the ICU team.

In terms of documentation review for documenting plans of care (both medical and nursing) I am satisfied that work is ongoing in this area; The ICU staff have made a capital request for a clinical information system which will allow a clear multidisciplinary daily goals plan to mitigate these communication issues and are still awaiting confirmation of this funding for the 2020/21 financial year. Until then, the daily medical assessment and planning sheet is being reviewed to make this more multidisciplinary with clear plans in one place. Please ensure the nursing admission summary sheet includes fluid balance, drain monitoring (if not already).

Teaching on new rotation registrars' documentation (including admission summaries) and handover are discussed in the RMO orientation guide and will also undoubtedly contribute to improving the quality of handover and care overall.

I want to commend the unit on the work in this area.

5. Nursing Handover from shift to shift

For this I have reviewed [the ACNM's] response who outlines that 'bedspace was very busy and noisy, multiple medical staff from various specialties, the [RN F] & [RN G], and [the ACNM] was there for short periods to assist handover and ensure it was not interrupted'. [The ACNM] clearly acknowledges that multiple personnel at the bedside, multiple competing priorities, jobs and tasks meant the bedside appeared chaotic and frantic. In [the ACNM's] words 'the physical space around [Mrs A's] bedspace was restricted by the number of active staff, patients and family in adjacent bed spaces'. It is my view that this environment and what was happening within it, was incredibly distracting, and there was a very real potential for this working environment to be unsafe.

It is challenging when patients rapidly deteriorate and when multiple competing priorities ensue. Clearly the priority of care was to stabilise [Mrs A] and address the bleeding that happened very rapidly. I believe from the responses provided, there was clear and appropriate prioritisation of work to manage a deteriorating patient, and this may appear frantic and chaotic, but it is a team of clinicians working their hardest to save a patient's life. It is encouraging nursing recruitment is being addressed related to this case because of concerns around staffing and support for nursing caring for busy, deteriorating patients (as seen in the debrief minutes). I see the response from [the CEO] also articulates that 'A review of the nursing resource has been completed to align with

College for Intensive Critical Care Medicine (CICCM) standards and has been budgeted for since the 2019/20 financial year. The ICU is making good progress with nursing recruitment (42 FTE in 2015 to 104 FTE) and critical care 4 level training (18 participants on the 2020 course graduating in November 2020), with a plan to be fully recruited by the end of 2020'. Please continue to recruit the nurses you require to continue to provide the quality care you need to deliver to critically ill patients. In current times, I appreciate this is extremely challenging with the recruitment and retention issues for nursing staff in New Zealand.

6. Frequency of drain observations; policy

As outlined in [the DHB's] response from [the CEO] advised that *all drain outputs are regularly checked by the ICU nursing team and the output is documented on the ICU observation chart. Normally on an hourly basis. Should there be any indication of unduly high output the nurses check every 20 minutes or even shorter intervals. Due to the limited space on the chart only the hourly total is written down. Medical staff and senior nursing staff are informed about high drain outputs.* In this specific case there was due diligence paid to drain assessments from the responses provided caring for [Mrs A]. I note the nurse's ([RN G's]) statement outlines she had checked the drain shortly before (2000pm), as the policy of drain checks in the unit supports. It is extremely unfortunate that that blood loss occurred so rapidly. I see that all care and treatment was escalated quickly and appropriately.

On a side note, I read that family members may have blocked the direct visualisation of the drain ([Dr H] ICU Doctor). Please add to your nursing safety checks or policy that any drain should be placed in an unobstructed view so that it can be easily visualised outside of drain check times. I cannot see where the frequency of drain observations any more frequent than one hour is documented in the nursing care policy (my apologies if I have missed something). Please ensure you clarify on the appropriate policy or document, that drain outputs should be checked at minimum hourly for (decide an appropriate time frame) and escalate this period if there is suspicion of bleeding. Again, if this is already done and I have not seen it in the right document consider this recommendation actioned.

7. Nursing Progress report (shift summary)

I note that this has also been acknowledged by the team with no handwritten notes in the progress notes for this admission and nursing documentation could have had more detail. I also acknowledge that formal progress shift report on day of admission is not completed but a nursing admission form is. Please continue to ensure the nursing assessment document is reviewed regularly and compliance with what is documented by the nursing staff is checked for completeness and thoroughness (perhaps as a point prevalence audit?).

Summary and conclusion

The personal statements from the clinicians and nursing staff related to this case have provided a great deal of context which is not always gleaned from documentation alone.

Overall, I can see from the clinician and nursing statements, the impact that this case has had on the individuals involved and on evolving unit practice. I have no additional recommendations around the documentation or care by the PACU team. In the ICU I can see a tremendous amount of work has gone into improving communication, handover, and documentation of plans of care and this is encouraging. On the nursing staff statements, I sense some distress at the case overall and I acknowledge this must have been an exceedingly difficult and upsetting event. I hope the staff are supported by [the DHB] to seek support from Employment Assistance Programme (EAP) if they have ongoing support needs.

I can see at the time of her deterioration, [Mrs A] was managed rapidly by a dedicated team who under the circumstances did all they could to care for this critically unwell woman. I can see the nursing team worked hard to monitor and care for [Mrs A] in ICU. Having reviewed all the evidence (unit policy to escalate drain monitoring, personal statements from the nursing staff) it is clear there were multiple competing priorities — the need to manage pain, to check blood products in a very fraught time during patient deterioration. [RN G] clearly articulates that 'she was constantly mindful of watching for any change in vitals which may suggest further bleeding' and there were multiple clinicians around, diligently managing [Mrs A]. I cannot say there was a shortfall in her monitoring in the ICU by nursing staff or medical staff, but it is unfortunate that she bled so rapidly and the eventuate hysterectomy that was needed to control haemorrhage. My deepest condolences go to the patient and their whānau.

The following aspects are simple recommendations and reminders to continue to carry out the work you are doing (because it's not clear if these have been actioned or not — apologies if I have missed pertinent documents).

1. Continue your work around the pitstop handover and if not already, a templated process should be developed to support this (I believe this is in progress).
2. Add to your nursing safety checks/policy that any drain should always be placed in an unobstructed view at the bedside for direct visualisation. This is a must.
3. Please clarify on the appropriate policy or document (ICU standards) to support your practice of checking the drain more frequently than hourly observation when bleeding risk is high or suspected (maybe the nursing admission summary sheet).

Yours sincerely

Lynsey Sutton-Smith (MNclin, RNdip)"

Appendix B: Independent clinical advice to Commissioner

The following expert advice was obtained from ICU specialist Dr Anthony Williams:

"20 May 2020

In response to your request for a further opinion on the care provided by [the DHB] to [Mrs A] on [Day 1], I have expanded my report.

Your ref: C19HDC00534

My name is Anthony Brendan Williams. I am an Intensive Care Specialist and have been employed for 22 years in that role at Counties Manukau Health.

I have the following qualifications: BMedSc, MBChB, FANZCA, CICM.

I have been asked to provide an opinion on the care provided by [the DHB] to [Mrs A] on [Day 1].

I have read the document published on the HDC website titled Guidelines for Independent Advisors.

I have read the documents provided:

- Letter of complaint dated 19 March 2019.
- Attached documents to letter of complaint, including letter of complaint to [the DHB], dated 14 January 2019; report from [the DHB] dated 11 March 2019; and comments to report from complainant, dated 19 March 2019.
- Report provided by [the DHB] to complainant, dated 26 March 2019.
- [The DHB's] response to complaint dated 28 May 2019.
- Clinical records from [the DHB] covering the period of [Day 1].
- [The DHB's] Massive Obstetric Bleed Protocol.

I am not an expert in obstetric practice and will not offer comment on the use of the Bakri balloon, the ultrasound performed in recovery or the increasing abdominal pain in the postoperative period. The included documentation did not include any dictated operation notes.

A brief summary of the events:

[Mrs A] presented with known placenta previa and antepartum bleeding requiring delivery by Caesarean section on [Day 1]. She was treated with tranexamic acid (to minimise blood loss) and there was no need for transfusion intraoperatively. As a further aid to haemostasis a Bakri balloon was inflated in the uterine cavity at the end of the operation. She arrived in the recovery room at 13:20 and phenylephrine (a vasoconstrictor) was commenced for some episodes of low blood pressure. [Mrs A] had abdominal pain which began in recovery and worsened over her stay in recovery and became severe in the ICU. While she was in recovery and after she was transferred to the

ICU [Mrs A] was reassessed multiple times by [Dr C] the obstetrician and [Dr D] the anaesthetist.

[Mrs A] was transferred to the ICU at 16:50 for ongoing monitoring because of the risk of further bleeding. The ICU plan was to repeat the coagulation test which had been performed postoperatively at 21:00 and to monitor for signs of ongoing bleeding and call for obstetric review if this was detected.

In the ICU her observations were stable until about 20:30, the blood tests (blood gas, full blood count (FBC) and coagulation profile) were performed early at 19:13. The FBC results showed a decrease in haemoglobin concentration and platelet count which led to red cell transfusion just before 20:00, a further dose of tranexamic acid was prescribed by [Dr D] around this time. The coagulation results became available at 20:09, these results showed a significant worsening of all coagulation parameters and were consistent with ongoing bleeding, the results rapidly came to the attention of the team and appropriate coagulation factors were being issued within 10–15 minutes.

[Mrs A] developed tachycardia and low blood pressure (as evidenced by an increasing phenylephrine infusion rate) during this period of time between 19:00 and 20:00. Around 20:30 there was noted to be a large amount of blood in the drain of the Bakri balloon. She was reviewed again in the ICU by [Dr C] and transfusion of blood and coagulation factors was begun. She was transferred to the operating theatre and around 21:35 a subtotal hysterectomy was performed. In the operating room control of the uterine bleeding was achieved, both the hemodynamic parameters and the coagulation measurements improved.

[Mrs A] returned to the ICU intubated post hysterectomy and the rest of her ICU stay was uneventful.

Comments on specific questions:

1. The adequacy of monitoring of [Mrs A's] coagulation parameters.

[Mrs A] was generally stable in the postoperative period, in response to some episodes of low blood pressure there was a low dose vasoconstrictor infusion instituted. The cause of the hypotension was not fully explained, but it was not felt there was ongoing significant bleeding. There was no diagnosis of ongoing bleeding during the three hours in recovery or in the first two hours in the ICU. Under these circumstances planning to repeat the coagulation tests is appropriate, the timing of repeated tests is related to the clinical situation. In general if there is no bleeding it is unusual for the coagulation tests to worsen. In the event the tests were performed just after 19:00 and appropriate actions were promptly taken once the results were available.

I believe the monitoring of the coagulation parameters was in accordance with standard practice.

2. The timeliness and appropriateness of [Mrs A's] management in ICU particularly following receipt of her coagulation results.

Patients who are transferred to the ICU because of post partum haemorrhage are observed to enable rapid return to the operating theatre if significant bleeding occurs. Emergency hysterectomy is often required in life threatening obstetric haemorrhage. In the ICU the pulse and blood pressure as well as the volume of blood in the drain of the Bakri balloon were monitored. It appears that the phenylephrine infusion rate was increased between 19:00 and 20:00, I interpret this as indicating that the blood pressure was falling over this period, the pulse rate increased over the same time period. This was at the same time as the full blood count results were available to the team and transfusion of red blood cells was begun. [Mrs A] was reviewed by the obstetrician at 19:35 after the FBC results were reported and a further review was planned. The volume of blood in the Bakri drain was 300 mL at 20:00.

The time interval between the coagulation results being reported by the laboratory at 20:09 and the issuing of blood products from blood bank at 20:17 is remarkably short and is a credit to [the DHB's] system. I believe the monitoring and management of [Mrs A's] post-partum haemorrhage was within accepted practice.

The adequacy of handover process from PACU to ICU, including communication and clinical documentation regarding [Mrs A's] condition.

It appears that the responsibility for [Mrs A's] care was shared between the obstetric team, the ICU team and the anaesthetist. This sharing of care resulted in some results being phoned to the anaesthetist rather than to the ICU staff. The final result was good care but this sharing of decision making meant there was not a definitive handover in care from one team to another.

I believe the handover process failed to communicate the details of the intraoperative blood product administration accurately to the ICU team. There was no clear handover of the treating team's plan for retesting coagulation. Best practice is to have a formal handover of medical and nursing care at the time the patient arrives in ICU. [Mrs A] spent three and a half hours in PACU and her post-operative care until that time had been managed by the obstetric and anaesthesia teams. I am not sure at what point it was decided to transfer her to ICU and whether there were any phone or face to face handovers to the specialist or the registrar in the ICU.

It appears that the handover to the ICU team resulted in some loss of information. If important information is required to be handed over it should be written in the notes and verbally handed over.

The matter of whether this amounts to a deviation from standard practice is complex. In that the ICU team appears to have formed an incorrect view of what happened with regard to blood transfusion in the operating room the handover process was deficient. The team who managed [Mrs A] in the operating room continued to be closely involved in her management in the ICU. They had complete information about previous

transfusion and their own clinical impression about the risk of rebleeding. The handover communication did not lead to clinical problems in this case. It is not possible to say from reviewing the notes where the communication in handover was deficient.

3. The adequacy of clinical documentation during [Mrs A's] admission to ICU.

Apart from the electronic medical admission at 18:47 and the ICU chart there are no nursing notes or other notes from the ICU medical and nursing team. There are notes from the obstetrician at 18:20 and 19:35 which document that the obstetric team was aware of the situation, at that time pain rather than bleeding seemed to be the main concern. The admission contains an incorrect documentation that there had been blood and coagulation factors transfused around the time of delivery.

The coagulation profile at 15:18 showed mild derangement of coagulation parameters and would not have been an indication for further administration of factors in the absence of ongoing bleeding regardless of whether or not previous transfusion of factors had been required. It was the clinical impression of the team from 13:00 until around 19:30 that there was no ongoing bleeding. The first abnormality which was noted, apart from the pain, was a fall in haemoglobin and platelets which resulted in transfusion of red cells at the same time as [Mrs A] began to show signs of hemodynamic instability around or after 20:00.

The clinical notes as a whole accurately record [Mrs A's] situation and the plan.

Was there appropriate and adequate adherence to [the DHB's] Massive Obstetric Bleed Protocol.

The protocol defines post-partum bleeding as greater than 500 mL blood loss with ongoing bleeding. [Mrs A] met this criterion around 20:30, by which time transfusion was underway and transfer to the operating theatre for definitive management was imminent. Her earlier coagulation test from the recovery room had shown an APTT which was greater than 1.5 times normal, however in the absence of ongoing bleeding I believe that monitoring and repeat testing would be standard practice.

4. The adequacy of the remedial measures outlined in [the DHB's] response to the complaint.

The problems in [Mrs A's] care seem to be more in the area of communications than in the actual practice. It appears from reading the complaint that [Mrs B] was left with the impression that the situation in the ICU was not under control and that there was a degree of serendipity to the rapid response to her daughter's deterioration. These events seem to have been in relation to the reactions of members of the team caring for [Mrs A] to the sudden large volume of blood which appeared in the drain of the Bakri balloon. It is unusual for rapid bleeding to suddenly begin after a long period of stability, and it understandable that there may be some surprise at the sudden bleed. It is difficult to comment from such a remote time and without speaking to those who were involved on the best way to improve team communication and provide calm and clear communication with the family during a rapidly changing situation such as this was.

Other matters:

[Mrs A] was cared for by the obstetrician and anaesthetist who worked together often. They had both met [Mrs A] before the day of the delivery. They were integral in forming the plan and remained closely involved in her care after the delivery. I am not sure if this is normal practice in [the public hospital] but it appears that [Dr D], the anaesthetist, was the person receiving phone calls from the laboratory about results, rather than the ICU team who would normally have taken over responsibility for monitoring [Mrs A]. I wonder whether this reflected that the anaesthesia/obstetric team remained as the primary decision makers and had information about the falling haemoglobin and worsening coagulation before the ICU team was necessarily aware of these results. This may have been one of the factors which gave the impression that the ICU team appeared to be on the back foot in comparison to other members of the team who were understandably better informed.

The ICU team realised that [Mrs B] had some concerns about [Mrs A's] care while she was in ICU and made contact, however this loop was not closed and she was left with the impression despite her later meeting with [Dr C] that things were not done in a timely manner. The ICU team may wish to review their handling of follow up communication with patients and their families when there have been issues or complaints regarding care provided.

Yours sincerely

Tony Williams"

Further advice

"In response to your request for a further opinion after the response by [the DHB] to [Mrs A] on [Day 1].

Your ref: C19HDC00534

With regard to the specific questions I was asked to comment on in my initial report having read the review profile having read the response provided by [the DHB] and the included statements provided by various members of the team caring for [Mrs A] I will again run through those questions with an update.

1. The adequacy of monitoring of [Mrs A's] coagulation parameters.

The overall monitoring of [Mrs A's] coagulation was satisfactory. The timely ordering of the coagulation tests by [Dr D] and his alert monitoring of the situation was a key part of the safe management of [Mrs A's] postpartum haemorrhage. His ongoing involvement in [Mrs A's] care was one of the factors which meant that by 20:30 h when there was a rapid increase in drain loss from the Bakri balloon occurred and there were marked signs of cardiovascular instability, blood product transfusion had already commenced, the obstetric team were at the bedside and [Mrs A] was able to be transferred to the operating room in a controlled manner.

2. The timeliness and appropriateness of [Mrs A's] management in ICU particularly following receipt of her coagulation results.

The coagulations results (19:19h) which were telephoned to [Dr D] were acted on immediately. The earlier results (15:18h) were not completely normal with mild prolongation of the APTT and a moderate decrease in fibrinogen; this would not be uncommon in the setting of stabilisation following significant intraoperative blood loss, and I do not believe they would normally lead to further transfusion in the absence of ongoing revealed bleeding, nor would these results normally trigger urgent retesting.

3. The adequacy of handover process from PACU to ICU, including communication and clinical documentation regarding [Mrs A's] condition.

It seems that the intensive care team had the wrong impression there was significant blood product transfusion during the caesarean section however this error did not materially affect [Mrs A's] care.

4. The adequacy of clinical documentation during [Mrs A's] admission to ICU.

I have no particular further comment to make about this.

5. Was there appropriate and adequate adherence to [the DHB's] Massive Obstetric Bleed Protocol?

I have no particular further comment to make about this.

6. The adequacy of the remedial measures outlined in [the DHB's] response to the complaint.

One of the main benefits of admitting patients to high care areas for post-operative care is the high nurse to patient ratio that these areas provide. This enables vigilant monitoring and proactive management of problems such as postoperative pain and bleeding. I note [the DHB] is working to improve both the education and the staffing in the ICU and this is the correct way improve the care of future patients."