

Waitematā District Health Board

A Report by the Health and Disability Commissioner

(Case 18HDC01266)

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Executive summary

1. This report concerns the care provided to a man by Waitematā District Health Board (WDHB) in 2017 when the man's pleural effusion was treated with a chest drain. A number of oversights in the man's care relating to the lack of communication and handover, and subsequent lack of assessment and monitoring, resulted in his deterioration not being detected in a timely manner, which contributed to a delay in commencing resuscitation. While the outcome for the man may not have been any different, an opportunity to maximise his survival was lost.
2. This report highlights the importance of communication and handover from doctor to nurse to enable nursing staff to carry out appropriate monitoring and assessment and identify when a patient's condition deteriorates.

Findings

3. The Commissioner found WDHB in breach of Right 4(1) and Right 4(5) of the Code. The Commissioner was critical that communication and handover from doctor to nurse was lacking after the chest drain was removed; a plan for monitoring was documented but not verbally communicated to nursing staff; there was no assessment and monitoring of the man after the chest drain was removed; and WDHB's policy on observations was not followed.
4. The Commissioner was critical that two doctors did not check the man's anticoagulant status before removing his chest drain, and did not verbally communicate to nursing staff that the chest drain had been removed and that the plan included monitoring and observations.
5. The Commissioner was also critical that a nurse did not assess the man before administering IV opiates, when he had respiratory compromise and had been administered opiates for severe pain an hour earlier.

Recommendations

6. The Commissioner recommended that WDHB use an anonymised version of this report as a case study; consider updating the WDHB Bedside Handover Policy; consider including in WDHB's Adverse Event Investigation Action Plan a strategy on communication and handover; provide an update on the implementation of the draft Intrapleural Haemorrhage Guidelines Policy; consider updating the WDHB Respiratory Chest Drain Policy; require registered nurses who care for patients with chest drains to demonstrate competency in all aspects of chest drains; and provide a formal written apology to the man's family.

Complaint and investigation

7. The Health and Disability Commissioner (HDC) received a complaint from Miss B about the services provided by Waitematā District Health Board to her father, Mr A. The following issue was identified for investigation:

- *Whether Waitematā DHB provided Mr A with an appropriate standard of care in 2017.*

8. The parties directly involved in the investigation were:

Miss B	Complainant/consumer's daughter
WDHB	Provider

9. Further information was received from:

Dr C	Respiratory registrar
Dr D	Respiratory consultant
RN E	Graduate nurse
Dr F	General medicine registrar
RN G	Registered nurse
The Coroner	
Mr H	Family friend

Also mentioned in this report:

Dr I	Consultant general physician
Dr J	House officer
Dr K	Interventional radiologist
Dr L	Chief medical officer
Dr M	Relative of Mr A

10. Independent expert advice was obtained from a respiratory physician, Dr Ben Brockway (Appendix A), a nurse practitioner, Ms Stephanie Thomson (Appendix B), and a general medicine physician, Dr Richard Shepherd (Appendix C).

Information gathered during investigation

Background

11. Mr A, aged in his sixties, presented to WDHB with multilobar pneumonia¹ and a pleural effusion.² This report concerns the care provided over five days in 2017 when Mr A's pleural effusion was treated with a chest drain.

¹ A lung infection affecting multiple lobes of a lung.

² A build-up of fluid around the lungs.

Days 1–3

12. At 8.40pm on Day 1, Mr A presented to the Emergency Department (ED) via ambulance with right scapular³ pain. He had a two-week history of pain that had been treated with antibiotics by his GP and initially resolved. Mr A had a history of cardiac⁴ issues, including persistent atrial fibrillation (AF)⁵ and a cardiac pacemaker,⁶ and his regular medication included dabigatran⁷ and aspirin.
13. Mr A was assessed medically around 9pm and admitted to a General Medicine ward and given antibiotics and pain relief. A chest X-ray showed a moderate right pleural effusion and lung changes. Mr A was diagnosed with multilobar pneumonia with moderate right pleural effusion.
14. At 10am on Day 2, Mr A was seen by the consultant general physician, Dr I, and registrar Dr F, and the plan was for continued intravenous (IV)⁸ antibiotics with a switch to erythromycin,⁹ pain relief, and a bedside pleural ultrasound scan (USS) to determine whether there was sufficient fluid to require a chest drain. Dabigatran was withheld in anticipation of inserting a chest drain.
15. At 2.30pm, Mr A was afebrile but had shortness of breath and pain after moving, which was treated with morphine. Dr F assessed the pleural effusion with a bedside USS, but did not insert a chest drain at the bedside as she could not do so safely. Aspiration¹⁰ with a syringe was unsuccessful. A more detailed USS in Radiology was required. At 6.03pm, Mr A was given dabigatran as it had not been withheld in the e-prescribing system.¹¹
16. A USS was performed at 1.45pm on Day 3, and the report at 2.14pm described “a moderate volume of complex fluid with internal septations,¹² with underlying consolidated lung”. The findings state: “[A]n x mark¹³ is unable to be safely applied.” The report concludes: “If aspiration is still required, an ultrasound guided procedure can be considered in the radiology department.”
17. At 3.50pm, the house officer, Dr J, and registrar Dr F noted: “[D]iscussed USS [with] radiology — small → moderate effusion — if to be drained, should be USS guided by IR.¹⁴” The plan was to discuss the insertion of a chest drain with interventional radiology the

³ The shoulder or shoulder blade.

⁴ Heart issues.

⁵ A heart rhythm condition.

⁶ An electronic device that is implanted in the body to monitor heart rate and rhythm. The device stimulates the heart when it does not beat normally.

⁷ Dabigatran is an anticoagulant drug that inhibits the action of thrombin (an enzyme in blood plasma that causes the clotting of blood). It is used to reduce the risk of stroke, and to treat or prevent deep vein thrombosis and pulmonary embolism.

⁸ Administered into a vein.

⁹ An antibiotic.

¹⁰ Removal of fluid.

¹¹ Electronic prescriptions.

¹² The division of a cavity.

¹³ An “X marks the spot” for a pleural tap.

¹⁴ Interventional radiology/radiologist.

next day if Mr A continued to have increased temperatures overnight. The notes state “W/H Dab”, indicating that dabigatran was to be withheld in anticipation of this intervention. Both the morning and evening doses of dabigatran were withheld.

Day 4 — chest drain inserted

18. On Day 4, Mr A had recurrent fevers, a continued rise in CRP¹⁵ (increased from 140 on Day 2 to 324 on Day 4), and ongoing pain and breathlessness. The impression was that the pleural effusion could be empyema,¹⁶ and the plan included discussion of “USS guided drainage” with interventional radiology. The morning dose of dabigatran was withheld in anticipation of inserting a chest drain.
19. Interventional radiologist Dr K completed a consent form with Mr A, which included bleeding and infection as possible complications. At 3.00pm, Dr K inserted a right-sided chest drain for the pleural effusion using the Seldinger technique¹⁷ and a size 10 French pigtail catheter.¹⁸ Cloudy haemoserous¹⁹ fluid was drained and a sample sent for testing. Dr K’s notes state: “[Patient] tolerated the procedure well with nil c/o²⁰ of pain.” Instructions on post-pleural drainage care were included in Mr A’s clinical notes, covering observations and removal of the catheter.
20. On returning to the ward, Mr A’s vital signs were completed at 4.21pm, 5.24pm, and 7.59pm, and all showed haemodynamic stability.²¹ At 4.44pm, a referral was made to the specialist respiratory service seeking further advice and input. Dabigatran was administered intentionally at 6.12pm because of concern about Mr A’s increased stroke risk from the persistent AF. At 9.38pm, the nursing notes record that the drain was “swinging but not bubbling”, and that observations were taken and pain relief provided.

Day 5 — chest drain removed

21. At 2.00am, the on-call house officer attended as the drain had stopped swinging (indicating that it was blocked), and an attempt to flush the drain was unsuccessful. As Mr A was stable with a NEWS²² score of 0, the plan was to review the drain in the morning.
22. RN E, a new graduate nurse, was Mr A’s nurse on the morning shift. At 7.45am e-vitals²³ were recorded, and at 8.05am RN E gave Mr A his medications, including analgesia²⁴ and dabigatran, which had not been withheld. RN E told HDC that Mr A was on eight-hourly e-vitals monitoring and was not due for particular monitoring or treatments that morning.

¹⁵ C-reactive protein in the blood is a marker of inflammation.

¹⁶ Pus gathered in the area between the lungs and the inner surface of the chest wall.

¹⁷ A medical procedure to insert a chest drain.

¹⁸ A small-bore chest tube.

¹⁹ Pink-coloured fluid composed of blood and serum.

²⁰ No complaint of.

²¹ Stable blood flow.

²² National Early Warning Score, which determines the degree of illness of a patient using six physiological findings and one observation.

²³ An electronic solution for collecting patient observations and assessments.

²⁴ Medication for pain relief.

23. At 10am, Dr F and Dr J assessed Mr A and noted that the drain had collected 125ml of fluid but had stopped swinging overnight. The plan was to attempt to flush the drain again, discuss the situation with the respiratory team, provide pain relief, and obtain a chest X-ray.
24. At 11.20am, the respiratory registrar, Dr C, and Dr F assessed Mr A in response to the referral made to the respiratory service the previous day. They noted that the drain was blocked and that two attempts to flush it had been unsuccessful. Dr C decided to remove the drain because it was blocked and not able to be flushed. Dr C removed the drain with assistance from Dr F, following the post-pleural drainage care instructions from Radiology. Mr A's nurse, RN E, was not present for the removal of the drain, and there is no evidence that the nursing staff were informed that the drain had been removed.
25. In response to the provisional opinion, Miss B stated that a family friend, Mr H, was with Mr A from 10.35am and recalled that Dr F arrived in the room at approximately 11am and had what he assumed were two interns with her. Dr C then arrived and removed the drain with the assistance of one of the interns and Dr F, and the other intern remained at the foot of the bed.
26. The Chest Drain Clinical Practices Manual states that the risk of bleeding will be reduced if removal of a drain occurs more than six hours since the last dose of anticoagulant, and that the anticoagulation status of the patient should be checked before removing a drain.
27. Mr A's anticoagulation status was not checked prior to removal of the chest drain. After the chest drain had been removed, Dr F identified that Mr A had been given dabigatran. Dr C recorded in the notes: "Some bleeding post-removal. Team had restarted dabigatran since this morning." Dr C believed that only the morning dose had been given, although Mr A had in fact been administered an evening dose of dabigatran as well.
28. Dr C documented a plan in the clinical record. This included a new drain to be inserted, dabigatran to be stopped, a chest X-ray to be performed, and for Mr A to be "monitor[ed] closely". Dr C understood this to include the checking of vital signs. Dr C described Mr A as stable and noted that he would discuss Mr A with the Senior Medical Officer (SMO), Dr D.
29. Dr F stated:

"[Mr A] reported experiencing pain in his abdomen when the drain was pulled. The drain site bled afterwards and it was at this time that I recalled and advised [Dr C] that [d]abigatran had been restarted that morning."
30. Dr F said that dabigatran had in fact been started the previous evening at 6.12pm, owing to Mr A's cardiovascular disease and increased risk of stroke from persistent AF.
31. In response to the provisional opinion, Miss B stated that her father complained of severe pain in his right shoulder, not in his abdomen. Mr H, who was present at the time, stated: "[Dr C] appeared to manipulate the tubing which caused [Mr A] to grimace with pain. This occurred a number of times."

32. At about 11.30am, Mr A began experiencing severe pain and was rubbing his shoulder, which was sore, and Mr H rang the call bell. RN E attended, and Mr H recalls Mr A telling her that on a scale of one to ten, his pain was a fourteen. RN E administered pain relief at 11.37am. She did not check Mr A's vital signs, and told HDC that she does not recall asking him any other questions about the pain. RN E stated: "I was not told by the medical team that the drain was removed. I do not recall at what stage I did discover that the drain was removed."
33. RN E told HDC that she did not escalate Mr A's pain to the medical staff, as he had experienced pain earlier and she was of the understanding that the analgesia had worked well after 10 to 15 minutes.
34. Between 12pm and 1pm, Dr C telephoned the respiratory consultant, Dr D, and met to discuss the ward consultations. Dr C stated that he explained that a radiology-guided chest drain had been inserted to treat a probable empyema and that the drain had become blocked and attempts to flush it had been unsuccessful, and it had been removed. The plan regarding the next steps for managing the potential empyema was discussed.
35. Dr C stated that he "mentioned [his] concerns and those of [Dr F] relating to [Mr A's] exclamation of pain and that there had been some mild bleeding and that [Mr A] had been on dabigatran but that he was clinically stable".
36. Dr D told HDC that Dr C informed him that Mr A had had a radiology-guided chest drain placed the previous day for the treatment of probable empyema, and that because the drain was blocked and not able to be flushed, Dr C had removed the drain that morning, which was appropriate. Dr D said that the plan for the next steps of managing the potential empyema was discussed.
37. Dr D stated that "no issue regarding the removal of the chest drain was raised by [Dr C] at the time". Dr C said that he mentioned that there had been some mild bleeding, and that Mr A had been on dabigatran but that he was clinically stable. Dr C does not recall Dr D's exact response, but does recall that he was not particularly concerned, which Dr C found reassuring.
38. At 12.40pm, RN E handed over to RN G and went on her break. During the handover, Mr A rang his bell. RN G attended and found Mr A sitting on the edge of the bed with 9/10 abdominal pain. RN G told HDC that she returned to the nurses' station and spoke to RN E, who explained that Mr A had experienced pain all morning, and that analgesia had been administered and the team were aware. RN G administered PRN²⁵ morphine and encouraged Mr A to ring his bell if needed. RN G told HDC that she did not take any observations at that time, as Mr A "did not display any need to do vital signs other than assess his pain score".
39. No observations were recorded on the e-vitals record between 7.43am and 1.04pm on Day 5.

²⁵ To be taken "as needed".

40. At 1pm, Dr F checked Mr A after her ward round, and recognised that he was very unwell and deteriorating quickly. Attempts were made to stabilise Mr A and reverse the anticoagulation effects of dabigatran. However, resuscitation efforts were unsuccessful, and Mr A died 2.12pm.
41. In response to the provisional opinion, Miss B stated: “[D]uring the 1 hour and 12 minutes that my father was rapidly going downhill NONE of the staff thought to contact either myself or my mother who were listed as next of kin.”
42. The post mortem report stated:

“[T]he cause of death is right haemothorax²⁶ due to complication of removal of right pleural drain inserted for acute and organising exudative right pleuritis and empyema.

...

It would appear that there was focal disruption²⁷ of the right eighth intercostal artery during the procedure, and it would also appear that the vessel was tamponaded by the drain²⁸ so that when the drain tubing was removed, there was bleeding into [the] pleural cavity resulting in acute right haemothorax.”

Additional information

Specialist respiratory care

43. WDHB told HDC that it does not have a dedicated inpatient respiratory ward or dedicated beds where patients would be under the direct care of a respiratory consultant. Where possible, patients with complex respiratory needs are cohorted on a general medical ward, allowing for development of specialist nursing, medical and allied health staff skills and knowledge, and greater oversight by the consulting specialist respiratory team, but this is not always possible owing to high occupancy. The DHB stated that it has a longer-term strategic view to develop a dedicated inpatient respiratory unit at the public hospital in the next three to five years.
44. WDHB acknowledged that earlier referral to the specialist respiratory service for expert review could have been considered for Mr A, and said that following the placement of the chest drain, Mr A should have been actively considered for transfer to the general medical ward. However, this did not occur, and does not appear to have been discussed by any of the clinical staff participating in his care. The level of expertise in nursing cares for chest drain patients may have had an impact on the outcome.

Chest drain insertion

45. WDHB told HDC that the decision to place a chest drain was “appropriate and strongly clinically indicated”. A post-insertion chest X-ray was not undertaken, but WDHB commented that this would not have shown the disruption of the intercostal artery that was tamponaded by the drain.

²⁶ When blood collects between the chest wall and the lungs.

²⁷ An artery that supplies the area between the ribs.

²⁸ Blocked by the drain, which stopped any bleeding.

46. WDHB told HDC that injury to the intercostal artery is described in published literature as “an infrequent but potentially life-threatening complication of all pleural interventions”, and discussion of the bleeding risk was part of the consent process with Mr A.

Chest drain removal

47. WDHB stated that the staff who manage patients with intercostal drains should be familiar with the relevant policies and procedures, and have the requisite knowledge and skills. WDHB acknowledged that this was not the case regarding the nursing staff for Mr A, and that insufficient monitoring and observation were undertaken, and this contributed to the delay in starting resuscitation.
48. WDHB stated that it considered the possibility that injury occurred on drain removal, but concluded that it was unlikely. Dr C was familiar with the type of drain and followed the procedure, with no unusual resistance occurring on drain removal. In response to the provisional opinion, Miss B referred to Mr H’s observations at the time that when the chest drain was removed, Mr A grimaced with pain, and that this occurred a number of times.
49. Dr C told HDC that “[r]emoval of a pleural drain that has been inserted under ultrasound guidance would generally be regarded as a minor procedure”. He commented that although most drains are Seldinger drains, he had been shown by respiratory teams how to remove pigtail drains, and “had taken several out before prior to [this]” and “followed the same unlocking approach with [Mr A’s] drain as [he] had done previously”.
50. Dr C commented that removal of the drain was “straightforward with no unusual resistance”, although “[Mr A] gave an exclamation of pain at the point of drain removal (which was unusual) and there was a trickle of blood from the entry site after removal”. Dr C stated that “the drain removal had not been as uncomplicated as is usually expected”.
51. Dr F told HDC:
- “I had removed drains from coagulated patients before [Mr A’s] case without complication. While the removal of the drain had not been as uncomplicated as is usually expected, I was not overly concerned because [Mr A] was clinically stable when I reviewed him and the ‘danger time’ associated with drain removal is usually when the drain is inserted not removed. However, with the benefit of hindsight this was not the case for him. I was also satisfied with the post-drain removal plan for care.”
52. WDHB acknowledged that Dr C and Dr F were aware that the drain removal had not been as uncomplicated as expected, and that Dr C’s plan reflected that concern. The plan included close monitoring, a chest X-ray, a repeat haemoglobin measurement, withholding of dabigatran, and Dr C contacting the respiratory consultant, Dr D, for advice.

Dabigatran

53. WDHB stated that Mr A was on long-term oral anticoagulation²⁹ with dabigatran for persistent atrial fibrillation, and noted that dabigatran was withheld appropriately on Day 2 prior to the chest drain placement on the afternoon of Day 4.
54. WDHB acknowledged that restarting the dabigatran “may not have been preferred in this case given the potential for [Mr A’s] complex infected effusion to require intra-pleural lytic therapy³⁰ during the hospital admission, or the potential for early drain removal due to occlusion”.
55. WDHB commented that the use of oral anticoagulation is not an absolute contraindication to the removal of a chest drain that has been placed without complications.
56. Dr F told HDC that at the time the drain was removed, she did not recall that Mr A had been restarted on dabigatran, and therefore did not review Mr A’s anticoagulation status beforehand. She said that had she remembered, she would have delayed the drain removal.
57. Dr F accepts that it is good medical practice always to review a patient’s anticoagulation status before the insertion or removal of anything potentially associated with bleeding. She stated that Mr A’s case has been a significant learning experience, and she now ensures that she checks a patient’s anticoagulation status.
58. Dr C noted that he was not aware of the recommencement of the dabigatran prior to the removal of the chest drain, and acknowledged that the status of Mr A’s anticoagulation medication administration was not checked when he made the decision to remove the drain.
59. Dr C stated: “Generally removing drains for patients on anticoagulation is not absolutely contra-indicated ... there is more risk of bleeding with drain insertion.” He commented that had he known that the dabigatran had been restarted, he may have delayed the removal of the drain.
60. Dr C acknowledged that good safe medical practice should always involve a review of a patient’s anticoagulation status before insertion or removal of anything potentially associated with bleeding, and has taken the learnings from this case.

Communication and handover

61. Dr C told HDC:

“I do not recall specifically speaking directly to the ward nurse about the post-drain removal plan for care.

...

²⁹ Medication that makes the blood take longer to clot.

³⁰ Medication to break down blood clots.

I had assumed that the nursing staff had the appropriate skills and experience and were aware of the protocols and policies relating to safe care post drain removal in accordance with best practice guidelines.”

62. Dr C said that he expected that nursing staff would have reviewed Mr A’s notes and seen that the drain had been removed, and the instructions for close monitoring. He also had an expectation that any verbal handover to nursing staff would be from the primary care team registrar. Dr C commented that he has reflected on Mr A’s case and now has a heightened awareness of the importance of both written and verbal handover from doctors to nursing staff.

63. Dr F cannot recall specifically speaking to nursing staff. She told HDC:

“[I]t is clear from the nursing report that the removal of the drain and post-drain removal plan for care was not verbally handed over to nursing staff, which in turn compromised the care provided to [Mr A].”

64. Dr F stated that it is her usual practice to speak directly with the ward nurses about the procedure and post-drain removal plan for care, and she regrets not doing so in this case. On reflection, she had assumed that the ward nurses were aware that the procedure was being undertaken, and therefore she did not think to speak directly to them. She recognises that this does not constitute a proper handover.

65. Dr F commented that a home-based ward system had been instituted just before Mr A’s admission, which meant that teams were based in only one ward, which helps with clinical handover from doctor to nurse and vice versa. She commented that this had only just come in the week of Mr A’s admission, so the nurses were still unknown to them. Dr F stated that she now ensures that a nurse is present for any procedure associated with bleeding, to enable direct handover.

66. WDHB acknowledged that its Bedside Handover policy does not clearly cover interdisciplinary clinical handover, and said that it would review and improve the policy and the education of clinical staff in this key area.

Nursing assessment and monitoring

67. WDHB acknowledged that observations and monitoring following chest drain removal were not conducted in line with the Chest Drain Clinical Practices Manual.

68. RN E told HDC that she did not undertake a set of vital signs at 11.30am, as she “did not recognise that the severe pain that Mr A described was an indicator of something serious”. She stated that on reflection she has learned that she “should have taken vital sign observations as part of a total assessment of his pain and called for medical assistance”.

69. RN E also stated that at that time she was not aware of the policy/procedure requirements relating to chest drain removal and the frequency of post-procedure removal observations of 15-minute observations for the first hour and then hourly for four hours.

Nursing skill level and support for new entrant to practice (NETP) nurses

70. RN E stated that at the time of events she was a new graduate nurse, having commenced the NETP programme two months previous. She told HDC that her learning programme had included patient deterioration, but at this time she had yet to review practice on pain assessment and advanced respiratory management. WDHB told HDC that RN E had just finished the supernumerary³¹ process, and had just started being more independent.
71. WDHB stated that Mr A's observations had been stable prior to the commencement of RN E's morning shift, and it was not unreasonable to have an NETP nurse on an acute general medical ward providing care to patients in a stable condition with a chest drain. Senior registered nurse support was available to assist with clinical cares and offer mentorship and coaching to RN E. The senior nurses on the ward that day were a charge nurse manager, an experienced ward shift coordinator, and an NETP clinical coach who had spent some time working with RN E during the morning.
72. WDHB described the following supports that it provides to NETP nurses:
- “• 6 weeks supernumerary with a ward preceptor³² and support from a Clinical Coach and Nurse Educator dedicated to NETP programme;
 - Intensive support as they transition from supernumerary to more independent practice. Again this is supported by the RN Coach dedicated to NETP nurses.
 - NETP know that they can call the Clinical Coach anytime and they are visited daily to check how they are managing clinical cares and progressing towards independent practice.
 - The NETP nurses have ten formal study days which cover the nursing care of all specialties. They learn procedures, pre and post care and the importance of escalation where there is deterioration. The nurses learn about pain assessment as part of vital sign assessment.

The NETP nurses have access to policies and procedures and these are reinforced in teaching sessions, case review and other reflection opportunities.”

73. WDHB told HDC that education and training on the care and management of patients with chest drains is available to registered nurses, although it is not deemed a mandatory competency. For General Medicine and Specialty Medicine inpatient wards that care for patients with chest drains, education and training includes:
- Respiratory study days — theory and practice application of caring for a patient (pre-insertion, maintenance, and post-removal cares).
 - New to acute study days — theory and practice application of caring for a patient (pre-insertion, maintenance, and post-removal cares).

³¹ Where the student undertakes supervised practice outside their employed position, or when they are not counted in the staffing roster.

³² Teacher or instructor.

- Orientation booklet — competency skills list, care of the patient with a chest drain.

Resuscitation

74. WDHB acknowledged:

“The delay in commencing resuscitation was significant and material, as the intrathoracic bleeding went unrecognised and unobserved. [Mr A] did not receive any objective monitoring of his clinical status in the at least 90 minutes immediately following the removal of the chest drain. Waitematā DHB acknowledges that this was not consistent with either safe appropriate clinical care or our own guidelines. There was a lack of communication between medical and nursing staff regarding the post-chest-drain removal plan of care. WDHB did not provide sufficient support to a new graduate nurse still in an ‘Entry to Practice Programme’ in providing care for a specialist problem — specifically chest drain cares. Earlier recognition of [Mr A’s] deteriorating clinical status may have led to more effective resuscitative efforts.”

75. WDHB concluded that the resuscitation efforts commenced too late to be effective. It added that the Cardiosurgical Service is based at another hospital, and would have involved a high-risk inter-hospital transfer.

WDHB’s Adverse Event Investigation

76. The key findings from WDHB’s adverse event review in July 2019 were as follows:

- Admission to a General Medicine ward was reasonable.
- The insertion of a chest drain was appropriate, clinically indicated, and carried out in accordance with guidelines.
- Following the placement of the drain, Mr A should have been considered for transfer to the general medical ward.
- Intrathoracic haemorrhage was highly likely exacerbated as a result of the prescribing and administering of dabigatran.
- The decision to remove the chest drain was acceptable.
- The documented post-drain removal plan was reasonable but appears not to have been communicated to ward nursing staff.
- Patient care post-drain removal was not in accordance with stated guidelines.
- The DHB did not provide sufficient support to a new graduate nurse who was still in the “Entry to Practice Programme” in placing her in a position of needing to provide care for a specialist problem — namely chest drain cares.
- Resuscitation efforts were commenced too late to be effective.
- Over-lapping chest drain policies/procedures currently exist that do not reference each other.

*Policies*Chest Drain Clinical Practices Manual October 2016

77. Section 16 of the manual covers the removal of chest drains, and states:

“Removal of an UWSD³³ is a medical responsibility assistance can be provided by another medical officer or registered nurse or other health professional.

Pigtail drains must be uncoiled prior to removal. Follow manufacturer’s instructions regarding removal of drainage device, distance from the chest to cut the catheter and release the string. Failure to uncoil a pigtail drain prior to removal can cause severe pain and internal tissue damage to the patient.

...

Check when anticoagulants were last given in all patients with anticoagulation therapy. The risk of haemorrhage will be reduced if removal of the drain occurs more than six hours since last dose of anticoagulants.”

78. Section 16.2 states: “[C]heck when anticoagulants were last given prior to drain removal in patients on anticoagulant therapy.”
79. Section 16.6 covers patient care and observations after removal of a pleural drain, and includes:

“Assess patient’s condition and document observations — respiratory rate, oxygen saturations, pulse and blood pressure every 15 minutes for the first hour then hourly for 4 hours.”

Actions taken

80. WDHB held meetings with Mr A’s family and friends on 20 March 2018 and 5 June 2018.
81. In March 2018, WDHB had another incident involving a pigtail chest drain resulting in an intrathoracic bleed following removal.³⁴ WDHB told HDC that this further prompted the DHB to undertake a review of the drains currently used by the Radiology Department. Further work is also being undertaken on educating medical staff regarding the need to follow the removal procedure with considerable care.
82. The Action Plan, from WDHB’s Adverse Event Investigation, highlighted the following actions taken since these events:
- Development and implementation of a Policy/Procedure/Protocol for management of intrapleural haemorrhage — as at June 2020 the policy was in draft.
 - Education for all staff to increase awareness of the Policies/Procedures/Protocols around the safe use of chest drains — as at June 2020, WDHB provides a chest

³³ Under water sealed drain, also known as chest drain.

³⁴ The patient made a full recovery.

catheter placement course and recurrent training for new RMOs. The revised Respiratory — Chest Drain policy includes a section on removal.

- A review of the current processes for the provision of appropriately skilled nursing care for all chest drain patients. WDHB said that the requirements for regular assessment of patients and the escalation process has been reinforced to nursing staff. Also, the NETP programme uses the scenario where the patient is identified with early warning score signs, of which pain is one of the indicators, as one of the key learning objects in the first days of the NETP programme. The importance of post-procedure monitoring has been reinforced to staff.
- A review of both the WDHB Chest Drain Clinical Practices Manual and the WDHB (Radiology) Pigtail Drain Policy to ensure that they are consistent in content and reference each other — as at June 2020 these were reviewed as part of developing the revised Respiratory — Chest Drain Policy, which includes a section on removal.
- A review of the current practice of using pigtail drains in the thoracic space, and consideration of alternative options being made available — as at June 2020 the review concluded that it is not realistic to stop using pigtail drains completely, as other types of drain that could be used are not suitable in all situations or have risks of their own.

Responses to provisional opinion

83. WDHB was given an opportunity to respond to the provisional opinion, and advised that it accepts the findings and recommendations. This included Dr C, Dr F, and RN G.
84. Miss B was given an opportunity to respond to the “information gathered” section of the provisional opinion. Where appropriate, Miss B’s comments have been incorporated into the report above.
85. Miss B stated:

“It is clear to me that a complete lack of communication between all parties involved and an inability to actually read medical notes, seem to be a common theme and ultimately it led to my father’s death.

It is not at all comforting to know that when you put your faith in medical professionals and its institutions, to help you in your time of need that it comes down to these basic things that are the difference between life and death.”

Opinion: Waitematā District Health Board — breach

Introduction

86. WDHB had a duty to provide services to Mr A with reasonable care and skill. This included responsibility for the actions of its staff on the General Medicine ward, and an organisational duty to facilitate reasonable care.

87. Mr A was admitted to WDHB with multilobar pneumonia and pleural effusion. This report concerns the care provided between Day 1 and Day 5 when Mr A's pleural effusion was treated with a chest drain. I have concerns about the care provided to Mr A relating to the adequacy of communication and handover to nursing staff, which directly contributed to inadequate post-procedure nursing assessment and monitoring.

Communication and handover

88. After the removal of Mr A's chest drain at 11.30am on Day 5, Mr A experienced pain and bled from the site. Dr C and Dr F acknowledged that the removal was not as straightforward as they would have expected. Dr C documented a plan that included close monitoring of Mr A and a chest X-ray, and Mr A's care was discussed with the respiratory SMO.
89. Mr A's nurse, RN E, was not present for the removal of the drain, and neither Dr C nor Dr F provided a verbal handover of the plan of care to her. Nursing staff advised HDC that they were unaware that the drain had been removed.
90. I note the advice of my expert general medicine physician advisor, Dr Richard Shepherd, that following removal of the chest drain, "good practice would mandate seeking out the involved nurse with direct handover of concerns and the opportunity for specific advice".
91. WDHB acknowledged that the documented post-drain removal plan appears not to have been communicated to ward nursing staff verbally. My expert respiratory physician advisor, Dr Ben Brockway, noted that "the removal of the drain was documented, but not handed over verbally in a timely manner, compromising care and leading to a period of inadequate observation".
92. Dr Shepherd advised:
- "Merely writing in the notes 'please monitor closely' and then leaving, would in my opinion, represent a poor standard of care. ... This should have been a team sport. Medical staff must support nursing staff in the ongoing care of patients where they have identified concerns."
93. My nursing expert advisor, Stephanie Thomson, concurs and stated:
- "The absence of team communication between the medical team and nursing team contributed to the delay in recognition of [Mr A's] deteriorating status. ... Unfortunately, a written note does not guarantee that the other members of the team will receive the message in a timely manner."
94. Both Dr Shepherd and Ms Thomson advised that the DHB policy on bedside handover did not clearly cover interdisciplinary clinical handover, and this was acknowledged by WDHB. In Dr Shepherd's opinion:

"[The lack of handover from doctor to nurse] potentially reflects what is unfortunately standard practice and established clinical culture in too many large hospitals — the silo effect of clinical handover. Doctor to Doctor, Nurse to Nurse etc. What is glaringly

missing is the recognition of the importance of clinical handover from Doctor to Nurse and vice versa — and a culture that reinforces that.”

95. The lack of handover to nursing staff meant that Mr A was not monitored closely after the removal of his chest drain, as stated in his plan of care. The Chest Drain Clinical Practices Manual outlines that Mr A should have been assessed and observations documented every 15 minutes for the first hour after removal of the chest drain, then hourly for four hours.
96. Unfortunately, no observations were taken between 7.43am and 1.04pm on Day 5. Ms Thomson advised that the lack of observation and monitoring after the removal of the chest drain led to a delay in recognising that Mr A was deteriorating. WDHB acknowledged that the lack of monitoring and observations undertaken contributed to the delay in starting resuscitation.
97. RN E was a new entrant to practice (NETP) nurse and her learning programme had included patient deterioration, but at the time of events she had not reviewed practice on pain assessment and advanced respiratory management. Ms Thomson advised that the NETP programme at WDHB was reasonable and included a clinical coach, and the staffing skill mix and number of staff on the ward was adequate on Day 5.
98. Ms Thomson also advised that there was a “dramatic, unpredictable change in the acuity of [Mr A] which was well beyond [RN E’s] capabilities”. Ms Thomson considers that it was a moderate departure from the accepted standard of care for a graduate nurse still in orientation, without supervision/preceptorship from a more senior nurse, to be caring for a patient of Mr A’s acuity. Compounding RN E’s lack of experience was the lack of verbal handover that Mr A’s drain had been removed. RN E therefore had no opportunity to call her clinical coach or request assistance and guidance from a more senior nurse working with her that day.
99. Dr Brockway advised:

“The level of nursing skill and experience available to [Mr A] was very poorly matched to his requirements, and both [Mr A] and the nurse were therefore poorly supported by the DHB.”
100. Dr Shepherd advised that “Mr A did not receive the level of care and monitoring he should have received”, and that “[t]he delay in commencing resuscitation was significant and likely material to Mr A’s outcome”. Similarly, Dr Brockway advised that “earlier identification of the acute injury and appropriate resuscitation may have improved the chances of survival”. Both experts considered this to be a moderate departure from the accepted standard of care. Ms Thomson also advised that “if the nursing staff had been notified in a timely manner regarding the removal of the chest drain, closer monitoring as per the current policy, may have been initiated, and therefore the patient’s deterioration may have been recognised earlier”.
101. My three expert advisors have identified the lack of verbal handover to nursing staff following the removal of the drain as a moderate to severe departure from accepted

practice. I agree with this advice. I note that interdisciplinary clinical handover was not covered clearly in the DHB's policy on handover, and I am critical that the lack of communication and handover to nursing staff adversely affected Mr A's care.

102. I am also critical that the lack of verbal communication about the drain removal left RN E, as a new graduate nurse, poorly matched to Mr A's acuity. This resulted in Mr A receiving inadequate observations and monitoring after the chest drain was removed, and there was a delay in recognising Mr A's deteriorating condition. There was evidence that Mr A was experiencing severe pain and agitation, and I am critical that this did not trigger appropriate assessment and closer observations of his condition. In this case, I consider that the fundamental error was the failure of the medical staff to communicate adequately to the nursing staff that the drain had been removed, and that there were concerns about the procedure. In my view, this would have initiated closer observation of Mr A's condition and earlier identification of his deterioration.

Conclusion

103. While acknowledging that it cannot be determined to any degree of certainty that Mr A's outcome would have been any different had there been appropriate communication, handover, and monitoring and assessment, I conclude that an opportunity to maximise Mr A's survival was lost. I am particularly concerned at the following inadequacies:
- a) Communication and handover from doctor to nurse was lacking after the chest drain was removed. A plan for monitoring was documented but not verbally communicated to nursing staff; and
 - b) There was no assessment and monitoring of Mr A after the drain was removed, and the DHB's policy on observations was not followed.
104. In my view, communication issues were a significant factor in this case, and I note Dr Shepherd's advice that "[t]he WHO has ranked improved communication during clinical handover as one of the top five actions needed to improve patient care". I agree with Dr Shepherd that "numerous small errors appear to have compounded over [Mr A's] care". While individual staff members hold some degree of responsibility for their failings, cumulatively, I consider that the deficiencies outlined above indicate a pattern of poor care.
105. As a result of the lack of communication and handover, and subsequent lack of assessment and monitoring, Mr A's deterioration was not detected in a timely manner, and this contributed to a delay in commencing resuscitation. Accordingly, in my opinion, WDHB failed to provide services to Mr A with reasonable care and skill, and, as such, breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).³⁵ I also find that WDHB failed to ensure quality and continuity of services to Mr A and breached Right 4(5) of the Code.³⁶

³⁵ Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."

³⁶ Right 4(5) states: "Every consumer has the right to co-operation among providers to ensure quality and continuity of services."

Other comments

Restarting of dabigatran after chest drain insertion

106. After Mr A's chest drain was inserted he was given the anticoagulant dabigatran at 6.12pm on Day 4 and at 8.05am on Day 5, because of his increased risk of stroke. Dr Shepherd advised:

“Decision making around anticoagulation and its with-holding is fraught with clinical uncertainty and an often complex risk to benefit analysis of how long to withhold the medication for to reduce risk of bleeding, versus when to restart to reduce the risk of new stroke.”

107. WDHB acknowledged that restarting the dabigatran “may not have been preferred in this case”, and Dr Brockway advised:

“The use of dabigatran after drain insertion does not constitute a clear departure from accepted practice — but alternative agents (such as low molecular weight heparins or unfractionated heparin) would be more appropriate.”

108. I accept that decision-making about anticoagulant use is uncertain, and that Mr A's doctors were able to provide a reasonable clinical rationale for restarting the dabigatran. However, I acknowledge Dr Brockway's and WDHB's views that an alternative anticoagulant would have been preferable for Mr A once the drain had been inserted.

Chest drain removal

109. I note the pathologist's conclusion that “the cause of death is right haemothorax due to complication of removal of right pleural drain”, and that the injury likely occurred on insertion and was tamponaded by the drain until removal. Dr Brockway raised the possibility that the arterial injury may have occurred because of a “cheesewire” effect during removal, when the patient experienced pain and bleeding.
110. Dr Brockway commented that pigtail chest drains are more often the preserve of radiologists, and that knowledge of the mechanisms and risks is poor amongst his peers. In his view, pigtail drains look little different from Seldinger drains to those who are unfamiliar with them, and it would be easy to assume that the locking threads are sutures tying in the drain. I note that Dr C and Dr F both told HDC that they had removed pigtail chest drains previously. Dr Brockway advised that there is a risk that “medical staff who have not been appropriately trained [can be] placed in a position where they may unwittingly cause significant harm”.
111. I note Dr Brockway's concern around the removal of pigtail drains by inexperienced or untrained clinicians. In his opinion, pigtail drains should be removed by interventional radiology staff familiar with their insertion, or staff who are identified and trained for pigtail drain removal. Dr Brockway advised:

“It is unlikely in my opinion that a respiratory or medical registrar rotating through a unit on attachment will have sufficient exposure to these drains to be able to safely remove them without further instruction.”

112. In response to Mr A's case, and another such incident in March 2018, WDHB's Adverse Event Investigation made a number of recommendations, which included a review of the current practice of using pigtail drains in the thoracic space, and consideration of alternative options being made available.
113. I accept Dr Brockway's advice that there can be a greater risk of iatrogenic damage on the removal of pigtail drains compared to Seldinger drains. I note that since these events WDHB has reviewed its practice of using pigtail drains in the thoracic space, and has revised its Respiratory Chest Drain Policy to include a section on removal of pigtail drains. I consider this appropriate.

Cohorting of patients

114. Mr A was admitted to, and treated on, a General Medicine ward at WDHB, and the respiratory service was engaged after the chest drain was inserted. WDHB told HDC that where possible, patients with complex respiratory needs are cohorted or grouped together, allowing for the development of specialist nursing, medical, and allied health staff skills and knowledge. WDHB does not have a dedicated respiratory ward or unit, although it has a longer term strategic view to develop one. I note a finding from WDHB's Adverse Event Investigation that Mr A should have been considered for transfer to the general medical ward (where patients with complex respiratory needs are cohorted) after the chest drain was inserted.
115. Dr Shepherd advised that in a New Zealand hospital without a specialised respiratory ward or admitting respiratory physicians, the placement and ongoing management of a chest drain would fall within the expected scope of practice of a general physician. Dr Shepherd also advised that the timing of the request for respiratory specialist advice was appropriate.
116. Dr Brockway advised that there is an inherent degree of risk in managing chest drains, especially with underwater seals, on non-specialist wards. In his view, patients with chest drains should be managed only on a unit with appropriately skilled and experienced staff.
117. Both Dr Shepherd and Dr Brockway advocate for specialist medical and nursing skills to be concentrated appropriately on a ward basis, with patients cohorted on a ward to maximise staff skills.
118. I agree that Mr A could have been considered for transfer to the general medical ward after removal of the drain. On the general medical ward, Mr A could have been cohorted with other complex respiratory patients and received specialised nursing skills and oversight by the consulting specialist respiratory team.

Chest drain insertion — no breach

119. Dr Brockway advised that insertion of a chest drain was indicated in Mr A's care. Dr Brockway commented that Mr A was treated with antibiotic therapies, but his CRP³⁷ continued to rise, and the insertion of a small pigtail chest drain under ultrasound

³⁷ C-reactive protein in the blood is a marker of inflammation.

guidance was appropriate to treat an empyema, and would also allow the use of pleural thrombolytic therapy. Dabigatran was withheld appropriately before the insertion of the drain. Dr Brockway advised:

“[O]nce the decision was made to insert a drain the process was exemplary — performed under image guidance in normal hours by an appropriately experienced clinician, with unambiguous guidance regarding further care.”

Opinion: Dr C — adverse comment

120. The decision to remove the chest drain was made by Dr C and Dr F without the knowledge that Mr A had been given doses of the anticoagulant dabigatran on the previous night and that morning. I note that Dr Shepherd advised that even after Mr A had been given two doses of dabigatran, chest drain removal was not absolutely contraindicated, and therefore did not clearly depart from an accepted standard of care. Dr Brockway advised that “delaying removal would be the favoured option”, and Dr C acknowledged that had he known that dabigatran had been restarted, he may have delayed the removal of the drain.

121. I acknowledge that the chest drain removal was not absolutely contraindicated after the two doses of dabigatran, but I am critical that Dr C did not check Mr A’s anticoagulation status before the chest drain was removed, as recommended by WDHB’s policy. Dr Shepherd advised:

“Good safe medical practice should ... always involve a review of a patient’s anticoagulation status before insertion of anything potentially associated with bleeding — or its removal ... I would be critical of both [Dr F] and [Dr C] for the lack of attention to a potentially critical detail.”

122. Dr Brockway and Dr Shepherd both commented that the event may well have been fatal even without Mr A having been administered dabigatran within three and a half hours of the chest drain removal. However, this does not excuse poor medical practice, and I am critical that Dr C did not check Mr A’s anticoagulant status before removing the chest drain. I note that Dr C acknowledges that good safe medical practice should always involve a review of a patient’s anticoagulation status before insertion or removal of anything potentially associated with bleeding, and he has taken the learnings from this case.

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123. I am also critical that Dr C did not verbally communicate to nursing staff that Mr A's drain had been removed. This would have been an opportune time to express concerns about the unusual bleeding at the site after removal of the drain, and to discuss the plan, which included monitoring Mr A. The failure in communication meant that appropriate nursing observations were not done and Mr A's deterioration was not recognised. This contributed to a delay in resuscitation efforts. I note that Dr C has reflected on Mr A's case and now has a heightened awareness of the importance of both written and verbal handover from doctors to nursing staff.
-

Opinion: Dr F — adverse comment

124. The decision to remove the chest drain was made by Dr C and Dr F without the knowledge that Mr A had been given doses of the anticoagulant dabigatran on the previous night and on that morning. I note that Dr Shepherd advised that even after Mr A had been given two doses of dabigatran, chest drain removal was not absolutely contraindicated, and therefore did not clearly depart from an accepted standard of care. Dr Brockway advised that "delaying removal would be the favoured option".
125. I acknowledge that the chest drain removal was not absolutely contraindicated after the two doses of dabigatran, but I am critical that Dr F did not check Mr A's anticoagulation status before the chest drain was removed, as recommended by WDHB's policy. Dr Shepherd advised:
- "Good safe medical practice should ... *always* involve a review of a patient's anticoagulation status *before* insertion of anything potentially associated with bleeding — or its removal ... I would be critical of both [Dr F] and [Dr C] for the lack of attention to a potentially critical detail."
126. Dr Brockway and Dr Shepherd both commented that the event may well have been fatal even without Mr A having been administered dabigatran within three and a half hours of the chest drain removal. However, this does not excuse poor medical practice, and I am critical that Dr F did not check Mr A's anticoagulant status before removal of the chest drain. I note Dr F's comment that Mr A's case has been a significant learning experience, and she now ensures that she checks a patient's anticoagulation status.
127. I am also critical that Dr F did not verbally communicate to nursing staff that Mr A's drain had been removed. This would have been an opportune time to express concerns about the unusual bleeding at the site after removal of the drain, and to discuss the plan, which included monitoring Mr A. The failure in communication meant that appropriate nursing observations were not done and Mr A's deterioration was not recognised. This contributed to a delay in resuscitation efforts. I note that Dr F has reflected on this case and now ensures that a nurse is present for the procedure to enable direct handover.
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Opinion: RN G — adverse comment

128. On Day 5, pain relief was administered at 11.37am by RN E, and about an hour later by RN G. Neither nurse took observations. Ms Thomson advised:

“I consider [RN G’s] actions of administering IV opiates to a patient stating his pain was abdominal and 9/10 after a dose of Sevredol 10mg an hour earlier, without further assessment, a severe departure from accepted practice.”

129. Ms Thomson advised that the severity of Mr A’s pain and agitation should have triggered an assessment from RN G, in particular a respiratory rate, as Mr A had known respiratory compromise and was receiving opiates. RN G told HDC that she did not take any observations as Mr A “did not display any need to do vital signs other than assess his pain score”.
130. I acknowledge Ms Thomson’s advice. I have considered RN G’s lack of assessment in the context of the systemic communication failure at WDHB. RN G’s lack of assessment is partly mitigated by the lack of communication from Dr C and Dr F, and the fact that she was not aware that the drain had been removed and that Mr A should have been on close observations. In addition, RN E had advised RN G that the registrars were aware of the issue around Mr A’s pain. I also note that RN G’s involvement was isolated to this one instance. However, I am critical that in the circumstances of Mr A’s respiratory compromise and having been administered opiates for severe pain, RN G did not assess Mr A and take his vital signs.
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Recommendations

131. I recommend that WDHB undertake the following, and report back to HDC within three months of the date of this report:
- a) Use an anonymised version of this report as a case study, to encourage reflection and discussion during education sessions:
 - i. For nurses and doctors on the importance of communication and handover in the hospital.
 - ii. For nurses on the importance of taking vital signs in the context of serious pain and morphine administration.
 - b) Consider updating the WDHB Bedside Handover Policy (dated August 2018) to include doctor-to-nurse and nurse-to-doctor communication and the inclusion of the patient’s allocated nurse on the ward round, or at procedures, to facilitate communication and handover.
 - c) Consider including in WDHB’s Adverse Event Investigation Action Plan a strategy to emphasise the importance and necessity of clear, timely communication and

handover between healthcare practitioners, particularly in the presence of a clinical situation where there is heightened concern.

- d) Provide an update to HDC on the implementation of the draft Intrapleural Haemorrhage Guidelines Policy, and ensure that the policy is referenced in the Respiratory Chest Drain Policy.
 - e) Consider updating the WDHB Respiratory Chest Drain Policy (dated November 2019):
 - i. For patients who require ongoing anticoagulation with a chest drain in situ, consider directing the use of low molecular weight heparin or unfractionated heparin infusion for the duration of intrapleural drainage, rather than dabigatran.
 - ii. Consider adding more detail concerning the potential cheesewire effect of a pigtail drain and its associated complications, including a picture of the locking mechanism to highlight the difference in removal technique between pigtail and Seldinger drains.
 - iii. For pigtail drains, consider directing removal either by interventional radiology staff familiar with their insertion, or individuals in the respiratory service who have been identified and trained for removal of pigtail drains.
 - f) Require all registered nurses who are to care for patients with chest drains to demonstrate competency in all aspects of chest drains, including anticipating complications, before being assigned to care for a patient with a chest drain.
132. I also recommend that WDHB provide a written apology to Mr A's family. The apology is to be sent to HDC within three weeks of the date of this report being issued, for forwarding to Mr A's family.

Follow-up actions

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

Appendix A: Independent advice to the Commissioner

The following expert advice was obtained from respiratory physician Dr Ben Brockway:

“Submission by Dr Ben Brockway,

Complaint: [Mr A]/Waitematā DHB

Reference: C18HDC01266

I am a vocationally registered respiratory physician and Senior Lecturer in Respiratory Medicine employed by the Southern District Health Board at Dunedin Public Hospital and the University of Otago, Dunedin School of Medicine. My qualifications are: BSc (Hons) University of London 1995; MB, BS University of London 1996; MRCP (London, 2001) and FRACP (2012). I hold Certificates of Completion of Training in General (Internal) Medicine and Respiratory Medicine from the Joint Committee on Higher Medical Training in the UK (2008). I was appointed as a Consultant in Dunedin in 2008.

I have read and agreed to follow the Commissioner’s guidelines for independent advisors, and believe I am appropriately trained and experienced to provide an expert opinion regarding the requested case review C18HDC01266.

I have been provided with the following information to base my review on:

- Letter of complaint from [Dr M], [...] DHB
- Response from [Dr L], Waitematā DHB
- Response from [a lawyer] on behalf of [Dr C]
- Photocopied medical notes regarding the deceased’s admission and the majority of relevant results.

I have also reviewed specialty society guidance on the management of pleural infection.

Background of complaint

[Mr A] died due to complications related to an intercostal drain (ICD) sited for the management of empyema. At postmortem a laceration was seen to the right 8th intercostal vessels, with a large resultant haemothorax. It is suggested that the chest drain insertion was complicated by a laceration that was tamponaded by the drain until its removal. Factors also contributing to the event may include the use of dabigatran, inadequate post procedural observations, unfamiliarity with specific medical devices, and the institutional model for management of admissions in terms of specialist medical and nursing care.

1. Please comment on the appropriateness of the chest drain.

My synthesis of the information available is that the drain was placed appropriately.

a. What is the standard of care/accepted practice?

It is widely agreed that insertion of a chest drain is indicated in empyema or complex parapneumonic effusion (CPE) for unresolved sepsis. This is supported by multiple specialty society guidelines.

The putative diagnosis of CPE or empyema is supported by a number of points:

The patient was febrile during admission — 38.2 recorded in the written notes at 2000hrs on [Day 2], by [...].

The CRP, a marker of infection or inflammation, was elevated on admission and subsequently increased (confirmed at 140, 216, 324, 318 on consecutive mornings from [Days 2-5]).

The white cell count was also significantly elevated at greater than 20 at admission. I have not seen all of the FBC results but confirm total WCC of 31.7 on [Day 5].

Imaging characteristics are consistent with pleural disease on CXR [Day 1] reported by [...].

Persistent pleuritic chest pain is also consistent with pleural irritation.

I cannot find a pleural fluid pH (this value is predictive of requirement for chest drain insertion).

The patient was treated with appropriate antibiotic therapies but the CRP continued to climb and there was clinical evidence of failure to control CPE, although the recorded temperatures do show some improvement during the admission.

[Dr M] raises the question of whether drainage was necessary. British Thoracic Society (BTS) Guidelines state 'All patients with a pleural effusion in association with sepsis or a pneumonic illness require diagnostic pleural fluid sampling'. It is important to note that there are two aspects here: diagnostic sampling of the fluid, and therapeutic drainage of the fluid. Achieving these simultaneously is reasonable provided ongoing care is adequate (which was not the case here). In this case the relatively small volume and loculated nature of the fluid is such that I view insertion of a small drain under ultrasound guidance entirely acceptable. There were no contraindications to doing so, as the team had withheld dabigatran for this reason.

In addition, placement of a drain would also allow the use of pleural thrombolytic therapy if the infection failed to respond to drainage and antibiotics alone (instillation of tenecteplase/dornase alfa).

I consider there is little difference in immediate risk from a staged procedure of ultrasound guided aspiration (to obtain diagnostic samples e.g. for pH) followed once supportive results are available by insertion of a small bore drain, compared to direct ultrasound guided drainage, provided that subsequent care of the inserted drain is satisfactory.

The size of chest drain is subject to debate — small drains are more likely to block, but are more comfortable (lower pain scores) and may be as effective. When the volume of fluid to target is low, a smaller drain is appropriate.

I therefore state the insertion of a 10Fr pigtail chest drain under ultrasound guidance is good practice. The Radiology Department appropriately declined a request for 'X marks the spot' scan, again in accordance with good practice (this is an unsafe method for thoracocentesis). I note the procedure was performed in normal hours (2pm) and clear documentation of management of the drain given.

Importantly, the drain once inserted was recorded by [Dr K] to have drained cloudy, rose coloured fluid. The BTS guidelines state 'Patients with ... turbid/cloudy pleural fluid on sampling should receive prompt pleural space chest tube drainage'. There was no recorded loss of blood into the pleural space. There was no evidence of haemothorax. I will return to this point later.

b. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, severe) do you consider this to be? Please explain.

No departure from accepted practice is identified. Indeed once the decision was made to insert a drain the process was exemplary — performed under image guidance in normal hours by an appropriately experienced clinician, with unambiguous guidance regarding further care.

c. How would it be viewed by your peers?

The management would be widely viewed as appropriate or ideal by my peers.

d. Do you have any recommendations for how this aspect of care could be improved?

N/A.

e. Any further comments

All pleural procedures involving fluid should be performed under image (ultrasound) guidance.

2. Please comment on the appropriateness of the monitoring following removal of the chest drain (noting that WDHB has acknowledged that this was inadequate)

a. What is the standard of care/accepted practice?

Local practice at my centre is BP, HR, SpO₂ & respiratory assessments and chest drain documentation should be done:

* 1/2 hourly x 4

* Q 2 hours until the following morning

* Then at least q 4 hours depending on patient condition

These are widely adopted values (confirmed by online searches).

The instructions given in the documentation from [Dr K] are appropriate standards of care, that were not met. I understand [the ward] to be a general medical ward and there is an inherent degree of risk in managing ICDs, especially with underwater seals, on nonspecialist wards. Because of the relatively low frequency to which nursing and medical staff on general medical wards are exposed to ICDs (especially in units where there is no routine cardiothoracic surgical caseload), my position is that chest drains should only be managed on a unit with staff appropriately skilled and experienced in their care. This is concordant with specialist society guidance.

Note is made of paragraphs 37, 38, and 39 of [Dr L's] response. I am unaware of any progress to moving to specialty ward care at the DHB; but would strongly advocate for specialist medical and nursing skills to be concentrated appropriately on a ward basis.

b. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, severe) do you consider this to be? Please explain.

Some observations were performed after removal of the ICD, but not to the expected standard. Earlier identification of the acute injury and appropriate resuscitation may have improved the chances of survival, although I agree with [Dr L] that the lack of onsite cardiothoracic input may have been the factor that most adversely affected survival even if the event had been identified earlier. Nonetheless I would consider this as being at least moderate departure from accepted practice. The patient should have been transferred to an area familiar with ICD care and with specialist medical oversight e.g. a specialist respiratory ward. I concur that at the time of drain placement there was no requirement for single or greater organ support that would necessitate admission to a level 2 or 3 care facility (such as HDU or ICU), and routine removal of ICDs should not require this either.

Specialist ward based care is appropriate for patients with ICDs.

c. How would it be viewed by your peers?

There would be widespread agreement for this statement amongst my peers.

d. Do you have any recommendations for how this aspect of care could be improved?

I recommend that all patients with intercostal drains should be managed on a ward experienced in their routine use, under the direct care of a respiratory physician. This is concordant with specialty society guidance. Level 2 or 3 specific care is not routinely required, and indeed routine admission of patients with ICDs to HDU beds would be inefficient in the majority of acute hospitals in major centres.

e. Any further comments

The level of nursing skill and experience available to [Mr A] was very poorly matched to his requirements, and both [Mr A] and the nurse were therefore poorly supported by the DHB [para 66 of [Dr L's] reply]. I am unable to verify efforts to correct this risk.

3. Please comment on the administration of dabigatran.

Dabigatran was given in the evening of [Day 2]; omitted on the morning and evening of [Day 3], and omitted for the morning dose on [Day 4]. The notes indicated 'dabigatran to be stopped prior to the insertion of chest drain'. This was achieved, albeit without the change being made on the electronic prescribing system. The reasons for the latter have not been identified.

The ICD was inserted at 3pm on [Day 4], with dabigatran then being administered on the evening of 22nd, and the morning of [Day 5]. The drain was removed at 1120 on [Day 5]; [Mr A] died in the afternoon of the same day.

a. What is the standard of care/accepted practice?

There is no guidance on this, but Pathak et al have published a summary of the literature regarding anticoagulants and pulmonary procedures (Eur Resp Rev 2017; 26:170020). There is a lack of data regarding dabigatran and the authors note 'clinicians are advised to err on the side of caution with regard to performing interventional pulmonary procedures [in patients on dabigatran]'. Withholding dabigatran prior to ICD insertion would be accepted practice by the majority of chest physicians. If anticoagulation was still needed, an alternative agent should be used.

Regarding dabigatran and the removal of the drain, there are even fewer data, but advice to err on the side of caution is still appropriate. I note that the BTS Guidance states that prophylactic anticoagulation should be used in patients with pleural sepsis, as there is a high risk of venous thromboembolism; 'All patients with pleural infection should receive adequate thrombosis prophylaxis with [low molecular weight] heparin unless contraindicated' with grade A level of evidence.

[Dr L] [para 47] states that the decision to restart dabigatran was a deliberate one, made on the basis of risk from atrial fibrillation. There is no documentation shown in the clinical record to confirm or refute this. The timing of recommencement of dabigatran is after the drain was inserted and before the drain blocked, so may well have been deliberate; alternatively the instruction to 'hold dabigatran until drain insertion' implied that dabigatran could be restarted after the drain was placed. The latter, in my opinion, has at least as much evidence in the notes as the former.

My personal practice is to use enoxaparin if the risk of thrombotic events outweighs the risk of bleeding, as protamine reversal can be given readily and is often effective at reversing low molecular weight heparins (British Society for Haematology Guidelines, 2012). The difficulty and expense of reversing dabigatran is noted. The specific reversal agent idarucizumab is generally only available on the specific recommendation of a haematologist, a process that may be slower than ideal.

b. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, severe) do you consider this to be? Please explain.

The recommencement of dabigatran prior to the chest drain removal does not, in my opinion, constitute a clear departure from accepted practice — but I judge that it would be a decision made only by a minority of my peers, as alternative agents (such as low molecular weight heparins or unfractionated heparin) would be more appropriate.

c. How would it be viewed by your peers?

As above, it is my opinion that the majority of my peers would opt for another anticoagulant. The dosing of dabigatran would be a relative rather than absolute contraindication to drain removal. However, there was also no clinical urgency to remove the drain. [Mr A] had pain before and after drain insertion, that could be managed with analgesia. Delaying removal would be the favoured option, if the circumstances had been known.

d. Do you have any recommendations for how this aspect of care could be improved?

There appears to be a lack of handover between general medical, nursing, and specialist respiratory teams relating to medications and decisions to remove the drain. The respiratory registrar was previously unfamiliar with the patient. If the decision to recommence dabigatran was indeed a deliberate one, it does not appear to have been passed on to the respiratory team. This situation could have been avoided by earlier involvement of the respiratory team in [Mr A's] care, prior to drain insertion. It is my opinion, given the factors favouring empyema listed above, that the patient should have been either (1) admitted to respiratory medicine if hospital practice allows, or (2) transferred to respiratory medicine care within 24 hours of the decision being made to drain the pleural space.

e. Any further comments

The use of dabigatran, in my opinion, contributed to the death of [Mr A]. However, given the mechanism of likely injury and the lack of availability of cardiothoracic intervention locally, the event may well have been fatal even without dabigatran.

[Dr M] asks if routine 'group and save' samples should be sent prior to insertion or removal of chest drains. I do not feel that this is likely to be practical or cost effective, especially in patients who may have drains in situ for some days. I have found no advice from specialty societies to support this practice.

4. Any other comments you wish to make.

As stated above, it is important to note that no blood loss was seen from the pleural space when the drain was inserted. The drain that was inserted was 10Fr, i.e. external diameter of <4mm. The drain was inserted under direct ultrasound guidance. The intercostal space in an adult male of [Mr A's] build would be at least twice the width

of the drain, and I struggle to envisage how a small drain can have had any tamponade effect on either intercostal arterial or venous injury. Large bore e.g. 40Fr or 12mm thoracoscopy ports can tamponade bleeding from the intercostal bundle, which only becomes significant when the tamponade is released, but this relies on the tube being 'pinched' between two unyielding surfaces e.g. ribs. Because the intercostal nerve travels with the vessels in the intercostal space, injury to the intercostal bundle is likely to have been exquisitely painful, and no report is made of the insertion, or post local anaesthetic period being unexpectedly painful, allowing for the pre-existing pain levels prior to insertion.

Careful note should be made of the mechanism of the Skater Safety String lock system. In effect a suture runs from the connector/hub of the drain to the tip of the drain internally, where it exits the drain and runs externally back to a side hole on the drain. Here it runs back into the drain lumen, before exiting the hub alongside the other strand. By pulling the threads, the external section shortens as the tip of the drain is pulled towards the side lumen. This creates a loop or 'pigtail' that prevents the drain readily migrating. This is hard to explain in words but there are a number of online videos that explain this well. I would also draw attention to <https://www.health.nsw.gov.au/sabs/Documents/2009-sn-019.pdf> highlighting the risk of damage from inadequate release of the locking system before removal. Removal of a catheter which had not been fully released would be likely to cause significant pain at the time and local bleeding, and potentially damage the intercostal vessels through a 'cheesewire' effect at removal. On the balance of probabilities I find that it is substantially more likely that the intercostal laceration was caused at the removal of the drain rather than at its insertion, given the lack of blood loss into the pleural space and then out via a functioning drain at insertion, the lack of pain after insertion, and the unlikely nature of a 10Fr catheter being able to tamponade bleeding vessels. In addition there is a known mechanism for injury previously highlighted, the patient is reported to have experienced pain at the time of catheter removal, bleeding was noted from the drain exit wound, and the subsequent cardiovascular collapse seen appears improbable from an injury sustained a day earlier (as there would have been clot formation and arterial spasm in affected vessels, even allowing for the effect of dabigatran, subsequently).

a. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, severe) do you consider this to be? Please explain.

I cannot determine for certain if the damage was caused on insertion or removal of the drain, though I favour the latter on the balance of probabilities for the reasons outlined. Insertion of the drain was in accordance with best practice. Removal of the drain may not have been, though the document referred to above supports the case that complications of removal arise with a frequency that demands release of safety notices at State level, as 'Limited knowledge and experience with management of pigtail drains has resulted in a number of serious complications including pneumothoraces'. See also Chest 114(4);1126–21, Oct 1998.

To an extent this risk is mitigated by the instructions provided by radiology regarding drain removal. However this information is held in the notes rather than with the patient or their drain.

b. How would it be viewed by your peers?

From personal experience, I was asked to remove a locking pigtail chest drain from a patient under similar circumstances, albeit almost two decades ago. These drains look (to those unfamiliar) to be little different from seldinger drains. It is easy to assume that the locking threads are sutures tying the drain in. A tentative pull caused pain and fortunately the procedure was abandoned immediately. It is disappointing that the same issues are potentially still occurring twenty years on; the issue is one of medical staff who have not been appropriately trained being placed in a position where they may unwittingly cause significant harm. I contacted a number of respiratory physicians and cardiothoracic surgeons about removal of pigtail drains, and none could describe the locking mechanism or how to remove a pigtail safely. I therefore state with certainty that a large number of my peers would be similarly unfamiliar with the device, and unless information was actively sought from the notes or radiology as to how to remove the drain safely, there is a risk of the same error being made.

c. Do you have any recommendations for how this aspect of care could be improved?

Intercostal drains should only be removed by individuals skilled and experienced with that particular drain type. Many medical registrars who have spent time in respiratory medicine will have familiarity with seldinger intercostal drains, but locking pigtails such as the one used here are more often the preserve of radiologists. Removal of seldinger chest drains placed for effusion is a low morbidity procedure, with relatively low risk of iatrogenic damage. Removal of locking catheters by inexperienced/untrained persons is of much greater risk.

Either:

1. Drains are removed by interventional radiology staff familiar with their insertion, or
2. Individuals are identified and trained for removal of pigtail drains (such as a specialist nurse in a respiratory unit). It is unlikely in my opinion that a respiratory or medical registrar rotating through a unit on attachment will have sufficient exposure to these drains to be able to safely remove them without further instruction.

Additionally, pigtail drains can be carefully manipulated by reintroduction of a guidewire under screening in certain circumstances, so it is possible that the drain may have been either flushed or manipulated adequately by an interventional radiologist. I therefore favour discussion with radiology regarding removal, repair or replacement of the drain to be the optimal route in this case.

d. Any further comments

The British Thoracic Society's Guidance on the Management of Pleural Infection advises: A chest physician or thoracic surgeon should be involved in the care of all patients requiring chest tube drainage for pleural infection. Paragraph [37] and [38] should be interpreted in this light. I am unable to verify any changes enacted in the model of care."

Further clinical advice

The following further advice was received from Dr Brockway:

"Thank you for asking for further feedback regarding this investigation.

I have reviewed the documentation provided:

- Waitematā DHB's response to the HDC from [Dr L],
- updated handover protocols,
- updated pigtail catheter management protocols,
- statements from [RN E], [Dr C], [Dr D], [RN G], and [Dr F]
- the 35 page Respiratory chest drain clinical practice manual

and note the extensive efforts that have been made to address the clinical issues identified.

In response to the points raised:

1) No changes to levels of departure are required.

2) [Dr C's] comments regarding the anticoagulation are noted. I agree that prior dabigatran dosing is not an absolute contraindication for drain removal. Dabigatran within 6 hours would in my view be a relative contraindication to drain removal, and I note there was no urgency to drain removal. In hindsight, removal of the drain would best have been delayed. The risk of bleeding is indeed highest with insertion rather than removal, and as a clinician regularly placing drains I would look upon the removal as very low risk by comparison. I do not think that failure to reassess anticoagulation usage prior to removal constitutes a significant departure from accepted practice.

In terms of communication regarding removal of the drain, as noted by the response of [Dr L], 'It is clear from the nursing report that there was no [verbal] communication that the chest drain had been removed by the medical team'. In my view this constitutes a moderate departure from accepted practice within the clinical team — the removal of the drain was documented, but not handed over verbally in a timely manner, compromising care and leading to a period of inadequate observation.

I can see few circumstances in which dabigatran would be the optimal choice for anticoagulation for a patient with a chest drain in situ. An option for consideration here might be a comment in the chest drain clinical practice manual that for patients who require ongoing anticoagulation with a chest drain in situ, consider the use of LMWH [low molecular weight heparin] or unfractionated heparin infusion for the

duration of intrapleural drainage. The use of prophylactic LMWH in patients with ICDs in situ remains recommended.

3) Assuming this refers to Chest Drain policy (rather than Chest Pain), this is an adequate document.

4) Again, the new policies are adequate, with the suggestion above to be considered.

5) Pigtail drains remain more complex than seldinger drains: the locking system reduces risk of drain slippage at the risk of additional risk at removal. When these drains are used for percutaneous renal drainage, it is commonly reported that the lumen of the drain becomes blocked by fibrinous, proteinaceous or crystalline material that makes safe removal difficult. These patients need to return to radiology and have guidewires introduced to the pigtail to straighten them before removal. The updated chest drain manual draws attention to this known issue with locking drains as previously discussed. A picture of the locking mechanism may be of help to highlight the difference in removal technique.

6) I have no further comments regarding the care provided.

Dr Ben Brockway”

Appendix B: Independent advice to the Commissioner

The following expert advice was obtained from nurse practitioner Ms Stephanie Thomson:

"I have been asked to provide an opinion to the Commissioner on case number C18HDC01266 which involves the care provided to [Mr A] (dec) by Waitematā DHB between [Days 1-5].

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

I am a Nurse Practitioner with a scope of practice in adult perioperative care. Currently, I work as a Nurse Practitioner/Clinical Nurse Manager at Southern Cross Hospital, Rotorua. I have been an RN and involved in perioperative and critical care in New Zealand and overseas since 1986.

I am not aware of any personal or professional conflict of interest in this case.

My instructions in reviewing this case were to comment on:

1. The appropriateness of the monitoring following the removal of the chest tube drain (noting that WDHB has acknowledged that this was inadequate).
2. The adequacy of senior nursing oversight, support and whether the nursing skill level was adequately matched to [Mr A's] requirements.
3. Any other comments I wish to make on the care provided.

For each question, I shall advise:

1. What is the standard of care/accepted practice?
2. If there has been a departure from the standard of care or accepted practice, how significant a departure do I consider this to be?
3. How would it be viewed by my peers?
4. Recommendations for improvement that may help to prevent a similar occurrence in the future.

Available Documents

I have been provided with a letter of complaint from [Dr M], a copy of the HDC website form filled out by [Miss B], a witness statement from [Mr H], a copy of Waitematā DHB's response by [Dr L] and a copy of the [Mr A's] clinical records from Waitematā DHB.

Chronological Summary

On [Day 1] [Mr A] presented to [the] ED via ambulance with severe right scapula pain, hyperventilating and febrile. He underwent examinations and was diagnosed with multilobar pneumonia with moderate pleural effusion, and was referred to the general medicine service for admission.

On [Day 2], on the ward [Mr A] received IV antibiotics, some morphine for pain, vital signs were essentially stable although still febrile at times. Nursing notes indicate he had a failed pleural tap that afternoon. A physician's note (signature illegible) stated that 'U/S — fluids (illegible) large' and referred the patient for a formal U/S assessment.

The request for U/S, +/- tap or CT (chest tube) was confirmed in the consultant review dated [Day 3] and signed by [Dr J], House Officer. [Dr J's] later note timed at 1550 documented that the patient 'if clinically improving may not need tap. If worsening/temps overnight, to D/W IR tomorrow.'

[Dr J's] note on [Day 4] at 1030 listed 'USS guided drainage — D/W IR, today/tomorrow.'

A Radiology note dated [Day 4] documented that the patient received an U/S guided chest drain. [Mr A] tolerated the procedure well and was transferred back to the ward in stable condition.

Overnight, [Mr A] was reviewed by [a] House Officer due to no swinging in the pleural drain. A flush was unsuccessful, due to the patient being stable no further action and for review in the morning for possible drain change +/- more tube flushes. She also mentioned patient may need Alteplase.

[Mr A] was reviewed by the Respiratory Registrar, [Dr C] at 1120hrs on [Day 5]. As the tube was confirmed to be blocked, the chest tube was removed. His plan stated patient would need a new tube but couldn't be done today as had received dabigatran. [Dr C] instructed for the dabigatran to be stopped, order a CXR and monitor closely. A note 'removed' on the chest drain observation chart at 1130 was initialed by [RN E], Registered Nurse (RN).

Vital signs have been documented for 0743 on [Day 5] prior to the chest tube being removed by [a nurse]. [Dr L's] report notes that Sevredol® 10 mg was given at 1137 by [RN E] and Morphine 2 mg IV given at 1239 by [RN G]. The next vital signs were documented at 1304 with a MEWS of 8 when resuscitation was initiated. Despite resuscitation, [Mr A] was declared dead at 2.12.pm.

I have been asked to comment on the questions below:

1. The appropriateness of the monitoring following the removal of the chest tube drain (noting that WDH has acknowledged that this was inadequate).

An acceptable standard of care for when a chest tube is removed is to have a chest X-ray done within a few hours after removal as well as close monitoring. The level of monitoring will vary with each organization's specific policy however at minimum I would expect continuous pulse oximetry for 1–2 hours, 10–15 mins vital signs for the first 30 mins–hour, then if stable 1–2 hourly. Observations should include chest tube site check, assessment of patient's pain and lung auscultation. [RN E], RN documented

on the Chest Drain Observation Chart that the chest tube was removed at 1130hrs. I see no documentation of vital signs or evidence of physical assessment since 0743hrs.

[Mr H's] witness statement describes [Mr A] with severe pain and agitation following the chest tube removal. He wrote a nurse was in attendance and administered oral pain medicine which correlates with [RN E's] administration of Sevredol at 1137.

Although there was a note in the clinical record from [Dr C] listing specific instructions after the removal of the chest tube including 'monitor closely', this does not guarantee that the nursing staff would know of this instruction in a timely manner. It appears there had been no verbal communication between the medical team and nursing team regarding the removal of the chest tube and the plan. Particularly, as there was bleeding noted by [Dr C], and the patient receiving an anticoagulant, I consider the lack of verbal handover between the medical team and nursing team as an oversight. It would have been prudent for the medical team to mention the concerns of the bleeding to the nursing team.

The lack of verbal handover from the surgical team to the nursing team regarding the recent removal of a chest tube and the concerns about bleeding, in my opinion is severe oversight and unacceptable.

However, the severity of pain and agitation alone should have triggered an assessment from the Registered Nurse, at the very least a full set of vital signs of BP, HR, temperature, RR, pulse oximetry and MEWS score.

That routine frequent observations were not begun nor an assessment initiated by the RN with [Mr A's] severe pain and agitation so soon after the chest tube removal, I consider this a serious departure of accepted practice and contributed to the late detection of the haemothorax.

2. The adequacy of senior nursing oversight, support, and whether the nursing skill was adequately matched to [Mr A's] requirements.

I note from [Dr L's] report that [RN E] was a newly graduated Registered Nurse, 10 weeks into her 12 month NETP programme. I would not expect a novice RN to recognise the early signs of patient deterioration, or that frequent and close monitoring is required after the removal of a chest tube. There was a discussion between her and [RN G] at approximately 12.40hrs. [RN G's] experience or seniority is not noted. However, with [RN G] attending to [Mr A] to administer IV morphine whilst covering for [RN E], my expectation is that [RN G] should have taken a set of vital signs in light of the fact that she knew he had received oral opiates earlier. Whether [RN G] was aware of the recent removal of the chest tube is not known. This is a moderate deviation from an accepted standard of practice. In particular, not taking a respiratory rate with a patient with known respiratory compromise and receiving opiates.

Health Workforce New Zealand has set out specifications for the NETP programme which stipulate 'clinical preceptor support must be available to the graduate nurse throughout the duration of the NETP programme.' With the documentation supplied

to me I cannot ascertain if [RN E] had clinical preceptor support available, however my opinion is that a novice RN would need a senior more experienced RN to guide and mentor her in the care of a patient after the removal of a chest tube. This would include reinforcing the need for frequent vital signs as well as the need for observing for complications and appropriate escalation of care if there were any signs of patient deterioration.

Conclusion:

- The lack of observation and monitoring after the removal of the chest tube led to a delay in recognizing that [Mr A] was deteriorating.
- The absence of team communication between the medical team and nursing team contributed to the delay in recognition of [Mr A's] deteriorating status.
- The nursing skill level was not adequate for [Mr A's] acuity. A novice RN does not have the skill level or experience to monitor a patient post chest tube removal without guidance from a more senior, experienced nurse. A novice RN still in orientation, without supervision/preceptorship from a more senior nurse, caring for a patient of [Mr A's] acuity is a moderate departure from accepted standard of care.

Recommendations:

- All RN's caring for patients with chest tubes should be required to demonstrate competency in all aspects of chest tubes including anticipating complications, before being assigned to care for a patient with a chest tube.
- Effective communication between medical and nursing teams should be insisted upon in order to ensure critical information is not missed or misinterpreted
- Clinical preceptorship, supervision and mentoring be readily available and accessible for NETP RN's.

Please do not hesitate to contact me to discuss this matter further if required,

Stephanie Thomson,
Nurse Practitioner,
Southern Cross Hospital, Rotorua"

Further clinical advice

"I received your request to review the Waitematā DHB's response and statements and make comment as below:

1. Whether this further information changes your previous advice or level of departure.

After carefully reviewing the documents supplied to me, overall I have not changed my position.

There was no monitoring from the nursing staff of [Mr A] following the removal of his Chest Tube (CT). I gather that this was due to the lack of verbal communication from

the medical team to the nursing staff that the CT had been removed. The lack of a verbal handover from the medical team to nursing, I consider a severe level of departure from accepted practice. Unfortunately, a written note does not guarantee that the other members of the team will receive the message in a timely manner. I note that the Waitematā DHB has a detailed Policy and Procedure related to handover, however it does not emphasize the necessary communication between interdisciplinary team members, such as Medical staff to Nursing staff.

2. Whether [RN G's] care departed from accepted standards, in particular regarding observation and monitoring after the chest drain was removed and taking vital signs when administering opiates. Please describe any level of departure as mild, moderate or severe.

I do not know the quality of the handover to [RN G] from [RN E], apart from that she was aware that [Mr A] had reported pain earlier requiring opiates. I consider [RN G's] actions of administering IV opiates to a patient stating his pain was abdominal and 9/10 after a dose of Sevredol 10mg an hour earlier, without further assessment, a severe departure from accepted practice. I accept that [RN G] may not have realised that the chest tube had been removed; however the patient's level of pain warranted further investigation and assessment. As a RN with 4 years' experience, I would have expected, at minimum, a set of vital signs and assessment of the CT site whether she knew the CT had been removed or not.

3. Whether NETP nurse [RN E's] care departed from accepted standards, in particular regarding observation and monitoring after the chest drain was removed. Please describe any level of departure as mild, moderate or severe.

Waitematā DHB has a comprehensive Policy and Procedure for care after removal of a pleural drain stating:

- Assess patient's condition, and document observations — respiratory rate, oxygen saturations, pulse and blood pressure every 15 minutes for the first hour then hourly for 4 hours.
- Advise patient to rest quietly for 1 hour or until reviewed.

Whether [RN E's] care departed from accepted standards by not following the policy of the organization depends on if she was aware that the CT had been removed. It seems from her statement that she was unaware the CT had been removed, and [Dr C's] report states 'I do not recall specifically speaking directly to the ward nurse about the post-drain removal plan for care in the medical ward' despite his concern '... the drain removal had not been as uncomplicated as is usually expected.' The lack of verbal, direct communication between the medical staff and nursing staff, particularly as there was concern that the CT removal was not straightforward, is a severe oversight that contributed to the death of this patient.

4. The adequacy of the support described by Waitematā DHB for NETP nurses, and suggest any recommendations for improvement if any.

[Dr L] explains in his report a satisfactory and reasonable NETP programme including the role of a Clinical Coach. [RN E's] assignment of [Mr A] and 3 other patients seems a realistic load for a novice RN. Unfortunately, this case demonstrates how a novice nurse with limited or non-existent experience failed to respond to a changing patient scenario. I would expect that a novice RN caring for a patient who had a pleural tube recently removed would need coaching and mentoring on the aspects of care that were required, particularly as this CT removal was not as expected. [RN E], in not being told that the CT had been removed had no opportunity to call her Clinical Coach or request assistance and guidance from a more senior nurse working with her that day.

5. The new information provided regarding the nursing skill level mix on the ward that day.

It seems that the staffing skill mix and number of staff on the ward was adequate. It was reasonable to assign [RN E] to [Mr A] and there were a number of experienced RN's working the shift with [RN E]. I agree it is acceptable to have a new RN care for a stable patient with a chest drain, what is not clear is that [RN E] had received any coaching, teaching or guidance around the 'what if's' of caring for a patient with a CT. Unfortunately, there was a dramatic, unpredictable change in the acuity of [Mr A] which was well beyond [RN E's] capabilities.

6. Any other issues regarding the care provided.

I have not identified any other issues in care apart from what I have stated above and in previous correspondence.

Please do not hesitate to contact me if I can be of further assistance,

Stephanie Thomson, Nurse Practitioner"

Further clinical advice

"Thank you for the opportunity to review the report from the DHB.

The only comment that I would like to add is although the recommendations and Action Plan are very thorough and address many key findings, I feel it does not address the issue of communication/handover between Medical staff and Nursing staff. I note that recommendation for the key findings 8 and 9 has a focus on the provision of appropriately skilled nursing staff for Chest Drain patients. My opinion is if the nursing staff had been notified in a timely manner regarding the removal of the chest drain, closer monitoring as per the current policy, may have been initiated, and therefore the patient's deterioration may have been recognized earlier.

Although the nurse caring for the patient was a NETP nurse, my understanding is that a Clinical Coach was available to support her, so even though she was not aware of the Chest drain removal policy, I would expect that when being told of a patient situation she was not comfortable or experienced with, she would have had the opportunity to seek assistance from her Clinical Coach or other senior nurses. So my point is, even if a

Registered Nurse with knowledge and experience of Chest Drain patients, not having a verbal handover from the physician that the drain had been removed, including his concerns that it was less than straightforward, also would have not had the opportunity to initiate closer observation, thereby earlier identification of deterioration.

My recommendation is that there is consideration to including in the Action Plan, a strategy to emphasize the importance and necessity of clear, timely communication and handover between healthcare providers, particularly in the presence of a clinical situation where there is heightened concern.”

Appendix C: Independent advice to the Commissioner

The following expert advice was obtained from general medicine physician Dr Richard Shepherd:

“Complaint: Waitematā District Health Board/[Mr A]

Your Ref: C18HDC1266

My name is Dr Richard Shepherd. I have been asked to provide an opinion to the Commissioner on case number C18HDC01266 regarding the care, the late [Mr A], received from Waitematā District Health Board between [Days 1-5]. I have read and agree to follow the Commissioner’s Guidelines for Independent Advisors.

I am a Consultant General Physician employed by the Waikato District Health Board. I graduated from Otago Medical School in 1997 with Bachelor of Medicine and Surgery (MBChB). I have attained fellowships with the Royal New Zealand College of Urgent Care, The Division of Rural Hospital Medicine and the Australasian College of Physicians. I have subspecialty interests in nephrology, emergency medicine and palliative care. I have completed the Auckland University Postgraduate Diploma of Community Emergency Medicine, the RACP Clinical Diploma in Palliative Medicine and the Otago University Certificate in Physician Performed Ultrasound. I have no conflicts of interest to declare in this case.

I have been requested by the Commissioner to provide expert advice on the following issues:

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

In particular, please comment on:

- 1/ Whether [Mr A] should have been moved to a more specialized ward. If so, at what point should this have taken place?*
- 2/ The adequacy of the advice sought from the consultant respiratory physician.*
- 3/ Any other comments you have on the care provided to [Mr A] between [Days 1-5].*

For each question I have been requested to advise:

- a) What is the standard of care/accepted practice?*
- b) If there has been a departure from the standard of care or accepted practice, how significant a departure it is in my view.*
- c) How would the departure be viewed by my professional peers?*
- d) Recommendations for improvement that may help to prevent a similar occurrence in the future.*

Sources of information reviewed in the preparation of this report:

- *Letter of complaint*
- *Waitematā DHB's response*
- *Clinical records from Waitematā DHB*

Background:

[Mr A] presented to the Emergency Department at the public hospital via ambulance on [Day 1]. He was experiencing severe right scapula pain, was tachypnoeic, febrile, and had reduced oxygen saturations. A recent history of chest infection two weeks prior, which had clinically resolved on oral amoxicillin antibiotics, was noted. A Chest XRay (CXR) demonstrated a moderate right pleural effusion, opacification/consolidation in the right lung, and early infective changes in the left lung. He was referred to the General Medical Service for admission. [Mr A's] past medical history was noted including coronary bypass grafting 2014, post-surgical complete heart block requiring pacemaker insertion and persisting atrial fibrillation. His regular medications included aspirin, dabigatran (an anticoagulant), metoprolol, atorvastatin and allopurinol for gout.

[Mr A] was assessed by the medical team at 0030hrs on [Day 2]. His observations were noted to be stable with a low risk pneumonia severity score. A General Medical Ward admission was arranged.

[Mr A] was reviewed on the post-acute consultant ward round at 10am on [Day 2]. A plan was made for pleural ultrasound as the first step in considering tapping the effusion. This demonstrated a *'moderate volume of complex fluid with internal septations, with underlying consolidated lung'*. A real time ultrasound guided aspiration procedure via interventional radiology was recommended due to an inability to safely mark a static aspiration point.

On [Day 4] concerns were raised the pleural effusion was an empyema (pus collection around the lung). This was due to a continued rise in the CRP (to 324 — a marker of worsening inflammation), and ongoing symptoms of pain and breathlessness. Subsequently [Mr A] underwent an ultrasound (U/S) guided chest drain insertion by an interventional radiologist. A consent form was completed specifically recording bleeding and infection as possible complications. The procedural entry noted insertion of a size 10 French (small size) pigtail catheter into the right pleural effusion using a guided wire (Seldinger) technique under direct visualization with U/S. No complications at the time of the procedure were observed. A 'pro forma' sticker in the notes outlined the immediate post procedure care and required nursing observations plus its removal procedure. On returning to the ward further vital signs were performed. These remained stable.

On [Day 5] the Registrar ward round noted the drain was not swinging (indicating it was blocked) and had drained 125mls of fluid. A further attempt to flush the drain, a repeat CXRay, and a plan to discuss with the respiratory service was made. At 1120hrs [Mr A] was assessed by the Respiratory Registrar. It was noted that the drain was blocked and had been unable to be flushed to re-open on two attempts. A decision

was made to remove the tube. *'Some bleeding post removal'* was recorded in the notes as well as the entry *'clinically stable at present'*. A CXRay was planned together with a discussion with the on call Respiratory Physician. There is no documentation in the clinical record regarding that specific discussion. Approximately 90 minutes post drain removal, [Mr A] was found to be unwell, clammy and hypotensive with a BP 80/40 (very low). A resuscitation call was put out. No vital sign observations were recorded between 0743hrs and 1304hrs that day. Subsequent vital signs at 1313hrs and 1323hrs recorded rapid cardiovascular collapse prior to cardiac arrest and subsequent unsuccessful resuscitation attempts.

[Mr A's] death was referred to the coroner with an autopsy performed. The autopsy report confirmed the presence of an *'acute right haemothorax (bleeding into the chest cavity) associated with disruption of the right intercostal artery and vein ... It would appear that there was focal disruption of the right eighth intercostal artery during the (insertion) procedure, and it would appear that the vessel was tamponade by the drain so that when the drain tubing was removed there was bleeding into the pleural cavity resulting in acute right haemothorax. In summary, based on the circumstances as reported and the findings at autopsy, it is my opinion that the cause of death is right haemothorax due to complication of removal of right pleural drain inserted for acute and organizing exudative right pleuritis and empyema.'*

Advice to the Commissioner:

1/ Whether [Mr A] should have been moved to a more specialized ward. If so, at what point should this have taken place?

In my opinion [Mr A's] care in that regard did not depart from the expected standard of care or accepted practice. I would regard my professional peers as holding similar views.

In defining that expected standard of care one would consider [Mr A's] initial admission decision and then the location of his care once a chest drain was placed.

In my opinion [Mr A's] care did not *require* the admission to a more specialized unit. From a haemodynamic and clinical care needs perspective, a High Dependency Unit or Intensive Care Unit was not clinically necessary. [Mr A] was correctly assessed as being at low risk for clinical deterioration with appropriate investigations and management able to occur in a General Medical Ward based setting. He would not have fulfilled standard admission criteria for units offering higher levels of care. In my opinion his admission to a General Medical Ward was appropriate and would have been the standard of care he would have received at any New Zealand hospital without a specialist respiratory unit.

Given the later requirement for a chest drain to be inserted with underwater seal drain, the question of whether this *required* management in a specialized ward, such as a respiratory ward, could be raised. In my opinion, the placement and ongoing management of such a device would fall within the expected scope of practice of a General Physician. That would again represent the standard of care in the majority of

New Zealand Hospitals not possessing a specialized respiratory ward or without admitting respiratory physicians. In larger hospitals with a dedicated respiratory unit it would be an expected scenario that a patient with a chest drain be managed in that unit.

From the response received from the Waitematā DHB, the established model of care for General Medicine in place [at this time], was for admission to [a general medicine ward] There was no inpatient respiratory specialist ward or dedicated beds where patients were under the direct care of a respiratory physician. The DHB's response goes on to state that there was (is) an intention to cohort patients with complex respiratory needs on the general medical ward where the principle of cohorting allows the development of specialized nursing skills. That would also potentially provide greater oversight by the consulting specialist respiratory team. They however acknowledge competing bed needs in a high occupancy environment do not always allow all appropriate patients to be cohorted on the general medical ward.

The level of knowledge and nursing expertise for caring for a chest drain could have been a potential factor in the delayed recognition of [Mr A's] deterioration — and therefore his delayed resuscitation. The *'Waitematā DHB's Chest Drain Clinical Practices Manual'* guidance for patient care and monitoring, after removal of a pleural drain does not appear to have been followed. I would regard that as a moderate to severe departure from the expected standard of care. I would not however regard adherence to that standard of care as being *required* to be linked to a specific ward location.

I would agree with the DHB's stated improvements to prevent a similar scenario around developing cohorting practices to maximize ward based staff skills. Of critical importance however would also be ensuring that staff managing chest drains have the required knowledge, skills and are familiar with the relevant policies and procedures. Specialist nursing comment could be obtained regarding that aspect and its management, but as a General Physician it would be my expectation that the supervising ward shift coordinator would ensure staff caring for such devices were safe to do so and not new or inexperienced staff.

2/ The adequacy of the advice sought from the Consultant Respiratory Physician?

In my opinion the advice sought from the respiratory service was probably adequate. I would not regard that aspect of [Mr A's] care as significantly deviating from the expected standard of care. I would regard my peers as holding similar views. [Mr A's] specific circumstances would in my opinion represent a rare scenario which would not have been anticipated.

In my view the decision making around indications for [Mr A's] chest drain insertion did meet the expected standard of care when appropriate concerns regarding a pleural based infection were considered. From the procedure record and autopsy report it is unclear the specific location his chest drain was inserted. This was inserted by an Interventional Radiologist under U/S guidance. Given the injury that occurred to the intercostal artery at the time of insertion, review of insertion technique and the degree of posterior approach away from the triangle of safety could be discussed at a

Radiology Morbidity and Mortality Meeting to confirm safe peer reviewed techniques are being utilised. Discussion and potentially audit regarding the small size of drain used, versus blockage rates, for anticipated thick viscous fluid could also be considered from a quality improvement perspective.

In a service without a dedicated respiratory ward or unit, and with only a consult respiratory service, I would struggle to be critical of the timing of the request for respiratory specialist advice. That advice appears to have initially involved the Respiratory Registrar with a probably appropriate course of action taken. A degree of clinical judgement was involved regarding repeating a CXRay, further drain manipulation, and removal of that drain versus timing of that removal. I would struggle to be critical of such judgements using the benefit of hindsight.

Following removal of the drain, further discussion between the Respiratory Registrar and the Respiratory Physician appears to have taken place. This is not documented in the clinical record due to the timing of [Mr A's] deterioration and peri-arrest period. Without the benefit of hindsight, and the knowledge of the complication of an injured intercostal artery, I would consider that sequence of events did not fall outside of the expected standard of consultation. From the response received from the DHB, and the consulting Respiratory Physician, I would struggle to be critical of the events as they unfolded.

3/ Any other comments you have on the care provided to [Mr A] between [Days 1-5]?

[Mr A] suffered a recognized, though unusual scenario, complication of chest drain insertion. His autopsy report suggests that complication occurred at the time of the drain's insertion, rather than as a result of traumatic, or incorrect drain removal procedures. Bleeding at the time of drain insertion would be the most anticipated scenario.

Numerous small errors appear to have compounded over [Mr A's] care.

His history was also made somewhat more complicated by his use of an anticoagulant and the timing of its administration (and with-holding) around the drain removal. In my opinion the removal of the drain within 6 hours of the administration of his last dose of his anticoagulant was less than ideal. With the benefit of hindsight, the recognition and documentation of that decision making process was also less than ideal and invites speculation of poor practice and attention to detail. I would not however regard that as an *absolute contraindication* to removal of the drain, if clinical circumstances dictated its more urgent removal (which would have been regarded as normally a low risk of bleeding procedure). Clinical judgement, and risk to benefit ratio considerations, would be expected to be involved. Whilst not an excuse for inattention to anticoagulation status, in my opinion, such an arterial bleed with a lacerated intercostal artery would have occurred with unlikely tamponade, regardless of the anticoagulant use status. In my view, the early use of reversal agents would not have materially altered that — though would have been of critical importance had cardiothoracic surgery actually occurred subsequently.

I would agree with the conclusions in the response provided by the DHB. The delay in commencing resuscitation was significant and likely material to [Mr A's] outcome. That delay is acknowledged as not consistent with safe appropriate care, or in keeping with the DHB's existing guidelines. I would regard that as a moderate to severe departure from the expected standard of care. Potential competing clinical demands and patient workloads are however unknown.

The DHB also acknowledges the lack of support for a new graduate nurse still in an 'Entry to Practice Program' in providing care for a specialist problem — specifically chest drains. I would also however be somewhat critical of the failure to perform or record [Mr A's] observations at the time of his drain removal by the Respiratory Registrar — particularly given the clinical notes entries of *'some bleeding post removal'* and *'please monitor closely'*. Adequate communication standards between the medical staff and attending nursing staff may also have been factors. There is no documentation regarding this with the responses from the DHB including *'neither registrar can now recall specifically speaking directly to the ward nurse about the post-drain removal plan for care'* and *'[RN E] has stated she was not told by the medical team that the drain was removed.'* Good direct communication is key. Merely writing in the notes *'please monitor closely'* and then leaving, would in my opinion, represent a poor standard of care. An expected standard in that scenario would be direct communication in a timely manner to the relevant nursing staff. If such poor communication standards were followed it would be difficult to be critical of the failure of nursing staff to follow a policy on post drain removal care.

I would further support the DHB's stated intention to review [Mr A's] care via the Adverse Events Committee. Such a review to involve an expectation of identifying ways to ensure adequately skilled staff are involved with the care of chest drains, are aware and orientated to policies in place, and that a protocol for intrapleural haemorrhage or massive transfusion protocol be developed.

Consideration could also be given to a proforma sticker entered into the notes at the time of drain insertion to include *both* insertion *and* removal guidelines with explicit nursing observation instructions.

Review at the Morbidity and Mortality Meeting for both General Medicine and Interventional Radiology would also be an expected recommendation for improvement, including peer reviewed technical aspects of safe insertion technique and choice of drains used.

Dr Richard Shepherd Date: 25/04/2019
Consultant Physician General Medicine
Waikato District Health Board
MBChB FRACP"

Further clinical advice

"I would regard the degree of departure as commensurate with the regarded severity of illness or concern.

I.e. If the registrar was severely concerned about [Mr A] I would regard not directly communicating that concern to the nurse as a severe departure. If the concern was mild then I would regard that as a mild departure etc.

I would expect the level of concern to be determined by clinical judgement and the patient's observations. It is not clear to me from the notes what exactly the degree of concern the attending Registrar held — by inference I would estimate at least moderate from the notes that were written. The degree of departure then might depend on the commissioner's preferred view of that concern."

Further clinical advice

"Complaint: Waitematā District Health Board/[Mr A]

Your Ref: C18HDC1266

I have been requested by the Commissioner to provide further expert advice on the following issues:

We have now received Waitematā DHB's response and a number of statements from staff involved. Please note we are also seeking advice from a respiratory physician and a nurse regarding those aspects of [Mr A's] care.

Please review the DHB's response, statements and comment on:

1. Whether this further information changes your previous advice or level of departure. Please give details if there is a change.
2. Whether [Dr F's] care departed from accepted standards. Please describe any level of departure as mild, moderate or severe.
3. Whether you require a statement from [Dr I], who has been identified by the DHB as the senior person responsible for the services provided.
4. The adequacy of the Bedside Handover Policy, the Handover Policy and the Pigtail Catheter Management Policy, all dated August 2018 (put in place after the event), and suggest any recommendations for improvement if any.
5. Any comments or recommendations you have regarding the use of pigtail chest drains.
6. Any other issues regarding the care provided.

Sources of information reviewed in the preparation of this report:

- *Statement of [RN E] Registered Nurse 5/10/2018*
- *Statement of [Dr C] Respiratory Registrar Waitematā District Health Board 12/08/19*
- *Statement of [RN G] 28/09/2018*
- *Statement of [Dr D] Respiratory Physician Waitematā District Health Board 26/09/18*

- *Statement of [Dr F] General Medicine Registrar Waitematā District Health Board 09/08/2019*
- *Waitematā District Health Board Bedside Handover Policy August 2018*
- *Waitematā District Health Board Pigtail Catheter Management Policy August 2018*
- *Waitematā District Health Board Bedside Respiratory: Chest Drain Policy October 2016*
- *Summary Statement [Dr L] Chief Medical Officer Waitematā District Health Board 2/09/2019*
- *Safe Handover: Safe patients. Guidance on Clinical Handover for Clinicians and Managers. 2006*
https://ama.com.au/sites/default/files/documents/Clinical_Handover_0.pdf

Background:

Initial advice was provided to the commissioner on 25/04/2019 regarding the care the late [Mr A] received from Waitematā District Health Board between [Days 1-5].

Advice to the Commissioner:

1/ Whether this further information changes your previous advice or level of departure. Please give details if there is a change.

Overall the subsequent information provided does not materially change my initial advice to the commissioner dated 25/04/2019.

Earlier recognition of [Mr A's] clinical deterioration was likely key to potentially providing successful intervention. The exact specifics of the communication between the medical and nursing staff remain unclear. What is clear is that [Mr A] did not receive the level of care and monitoring he should have received. In my view this was made all the more significant by the documented non routine circumstances of removal of his drain. Clearly the attending registrars were concerned something was amiss from the documentation entered into the notes at the time. I would have to be critical of the lack of direct communication of that concern to the nursing staff — allowing discussion of the potential level of risk of deterioration and advice around the potential mechanism. The level of that departure from the standard of care is less clear — I would regard it as mild in the event of a mild concern from the attending doctors and severe in the event of a severe concern etc. In my view the level of concern should have been at least moderate — though am mindful of the influence of retrospective bias in that opinion. Under such circumstances good practice would mandate seeking out the involved nurse with direct handover of concerns and the opportunity for specific advice. I would therefore regard that as at least a moderate departure from the standard of expected communication.

In my view significant factors were a combination of poor direct communication of the drain's removal and the inexperience of the assessing nurse at 11:30hrs when called regarding severe pain.

It was acknowledged by [RN E] 'I unfortunately did not undertake a set of vital signs at 11:30. I did not recognize that the severe pain that [Mr A] described was an indicator

of something serious. However on reflecting on this event, I have since learned that I should have taken vital sign observations as part of a total assessment of his pain and called for medical assistance.' I would have to agree. That said, direct communication of the medical staff's stated concerns in the clinical notes would, in my opinion, have prevented the above scenario. This should have been a team sport. Medical staff must support nursing staff in the ongoing care of patients where they have identified concerns.

2. Whether [Dr F's] care departed from accepted standards. Please describe any level of departure as mild, moderate or severe?

From a Global perspective I would struggle to be overly critical of [Dr F's] clinical management of [Mr A]. Overall decision making and consultation were in my opinion at the accepted standard of care. There was however a number of sub areas open to criticism and improvement — anticoagulation and communication.

Decision making around anticoagulation and its with-holding is fraught with clinical uncertainty and an often complex risk to benefit analysis of how long to withhold the medication for to reduce risk of bleeding, versus when to restart to reduce the risk of new stroke. I would not be critical of that decision making process. Good safe medical practice should however always involve a review of a patient's anticoagulation status before insertion of anything potentially associated with bleeding — or its removal. This basic tenet of safe practice does not appear to have been followed on the drain's removal. This should be a learning opportunity and source of reflection for those involved. In that respect I would be critical of both [Dr F] and [Dr C] for the lack of attention to a potentially critical detail. If such a practice was to be pervasive the potential outcomes could well be severe depending on patient specifics in the future. Such practice has the potential to result in severe outcomes and so deviations from accepted care.

As per my original advice, circumstances in this case could be debated that even with an awareness of the two given doses of anticoagulation drain removal would still have proceeded. It was not absolutely contraindicated and therefore did not clearly depart from an accepted standard of care. I would however agree with [Dr C's] statement '*... had I known that the dabigatran had been restarted I may, with the benefit of hindsight, have delayed the removal of the drain*'. Given the very unique and unfortunate circumstances of this case (arterial puncture with tamponade on insertion) the reality is however that the same event would likely have occurred regardless of anticoagulation status. I would acknowledge that is up for debate however. Poor baseline practice should not however be defended on the basis that it would have been unlikely to have made a difference anyway — this time.

Regarding communication I would also have to be critical of [Dr F's] role as the lead primary care team registrar for failure to directly communicate medical concerns and the removal of the drain to nursing staff. I would likely regard that failure of at least a moderate departure from the expected standard of communication. Such comments would also be directed to [Dr C's] involvement — potentially even more so as the

doctor actually performing the procedure and documenting his specific concerns in the medical notes.

3. *Whether you require a statement from [Dr I], who has been identified by the DHB as the senior person responsible for the services provided.*

[Dr I] was the General Medicine Physician providing senior oversight of [Mr A's] care in this case. As the root cause issues in this case do not appear to directly relate to [Dr I], or her oversight of the rest of her team, I would not regard a statement from her as likely to materially alter the advice given in this case.

4. *The adequacy of the Bedside Handover Policy, the Handover Policy and the Pigtail Catheter Management Policy, all dated August 2018 (put in place after the event), and suggest any recommendations for improvement if any.*

Communication was in my view a significant factor in this case. The WHO has ranked improved communication during clinical handover as one of the top five actions needed to improve patient care.

Bedside Handover Policy:

The Waitematā Bedside and Handover Policies document August 2018 does set out a reasonable framework and highlight recommended clinical tools to assist with a structured handover. In my view this would be regarded as very standard practice and established clinical culture in today's care environments. Such principles have been present in the literature since 2005. Orientation of staff to clinical handover tools and training in communication techniques is increasingly common practice.

In my view however the above document potentially reflects what is unfortunately standard practice and established clinical culture in too many large hospitals — the silo effect of clinical handover. Doctor to Doctor, Nurse to Nurse etc. What is glaringly missing is the recognition of the importance of clinical handover from Doctor to Nurse and vice versa — and a culture that reinforces that. All too often Nurse to Nurse handover misses vital changes to a patient's diagnosis and management plan simply because the nursing staff were not made aware and had insufficient time to read the clinical notes until the end of the shift. In my view this is a pervasive flaw in many current hospital system cultures. Patient safety handover strategy has traditionally focused more on shift change over periods and communication tools.

In my opinion and experience, having the specific nurse looking after the patient actually present on a ward round, (or any nurse present), is vanishingly rare. This simple, dramatically effective exchange of information from the nurse who knows what has been happening to the patient, to the doctor who is often involved in care decision making, is frequently no longer supported or prioritized in ward systems. As nursing care ratios have deteriorated and the move away from clinical charge nurses, to non-clinical managerial nurse shift coordinators — nurse to doctor communication in my view has deteriorated dramatically. This can be further weakened depending on Ward Based versus Team Based medical team structures and a culture which does not value the team and continues to reinforce silos. That view would be supported by a

large number of my Senior Medical Colleagues familiar with working within the ‘old days’ of a system where the patient’s nurse was *always* present at the time of the patient’s medical review. That prioritization of 5–20 minutes within a day of the patient’s journey, should in my view, be a priority given the dramatic potential benefits to improve communication and patient care. Handover policy focusing on the traditional change of shift handover period, in my view, has ignored that fundamental weakness. This is a case exposing that weakness. It is unclear to me if such issues in this case were an isolated event or the standard of usual practice at Waitematā.

In my view the created Handover Policy is a case in point and does not address the communication failures inherent in this case. Failures, which in my view are very common occurrences, reinforced by a system and culture which has divorced the care providers from the decision makers. In my opinion this is not an isolated issue and one which policies, procedures, guidelines, culture and orientation do not often adequately seek to improve.

In my view that is missing from Waitematā’s updated policy and missing from the stated points from the Chief Medical Officer under the heading ‘*Whether Waitematā DHB has considered making further changes to the service it provides following this incident and, if so what:*’

Pigtail Catheter Policy:

The Pigtail Policy document August 2018 adequately describes the peri procedural considerations around pigtail insertion and removal. There is however no specific guidance around anticoagulation and their removal, which in my opinion, should be considered as an addition. Consideration around more detail concerning the ‘cheesewire’ potential effect and its associated complications could also be considered. The section on the removal aspect could also include links to the intrapleural haemorrhage guideline/policy when available. It might also specifically state the observation records required, including a post drain removal observation chart similar to that incorporated into the Respiratory Chest Drain Policy document to facilitate an ‘all in one place’ useable document.

5. Any comments or recommendations you have regarding the use of pigtail chest drains.

Pigtail catheter insertion has generally remained the remit of the interventional radiologist with ward based insertion of chest drains generally involving the use of the equipment as described in the Respiratory Chest Drain Policy October 2016 (Rocket Large Bore, Rocket Seldinger, Arrow-Clarke Thoracentesis set). Consequently my own direct practice has a cautious respect for their use and potential complications. In this case I am not aware that the pigtail drain itself was at the root cause of the harm that occurred. I am not aware of the literature around head to head comparisons between available devices. I would therefore defer my comments to the HDC’s Respiratory Expert Advisor in that respect but support Waitematā’s stated plans to ‘review the current practice of using Pigtail drains in the Thoracic space and consideration of alternative options being made available’.

6. Any other issues regarding the care provided.

I would return to my previous comments to the Commissioner dated 24/04/2019 as point 3/ 'Any other comments you have on the care provided to [Mr A] between [Day 1 and 5]?' My original comments would not be significantly altered by the additional information supplied.

Dr Richard Shepherd Date: 02/10/2019
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