Opinion 23HDC00147
22 July 2025

HEALTH & DISABILITY COMMISSIONER
TE TOIHAU HAUORA, HAUĀTANGA

Care provided by Health New Zealand | Te Whatu Ora Te Toka Tumai Auckland

Complaint

1. On 23 March 2023, a complaint was received from Ms A via the Nationwide Health and Disability Advocacy Service on behalf of her brother, Mr B. Mr B was admitted to Auckland City Hospital (Health New Zealand | Te Whatu Ora (Health NZ) Te Toka Tumai Auckland) following a motor vehicle accident on day1 month1 2022. During the admission, during a chest drain insertion, Mr B sustained a spinal cord injury, which resulted in paraplegia.

Scope of investigation

2. The following issues were investigated:

- Whether Health New Zealand | Te Whatu Ora Te Toka Tumai Auckland provided Mr B with an expected standard of care whilst planning a chest drain insertion on day4 month1 and undertaking a chest drain insertion on day5 month1 2022.
- Whether Dr C provided Mr B with an expected standard of care whilst undertaking a chest drain insertion on day5 month1 2022.

Background

3. On day1 month1 2022, Mr B sustained multiple injuries in a motor vehicle accident.

4. Mr B was taken to the Emergency Department (ED) at Auckland City Hospital, arriving at 8.29am.

5. As part of the assessment in ED, a computerised tomography (CT) scan was performed. At 10.13am, the Radiology registrar gave the senior medical officer (SMO) a verbal report that Mr B had lung contusions,[1] a traumatic abdominal wall defect[2] and herniation of the bowel[3] (for which Mr B had undergone multiple previous surgeries), swelling and bruising of the right eye, but no evidence of a cervical spine fracture.

6. Other injuries identified throughout Mr B's admission following the accident were a bilateral rib fracture with pulmonary contusion,[4] a small pneumothorax,[5] a left shoulder blade fracture

[1] Bruising of the lung caused by chest trauma.
[2] Trauma to the muscles surrounding the abdominal cavity.
[3] Protrusion of part of the intestine through the abdominal wall.
[4] Fractured ribs and bruising of the lungs.
[5] A collection of air outside the lung but within the chest cavity.

Names (except Health New Zealand | Te Whatu Ora Te Toka Tumai Auckland and the independent advisor on this case) have been removed to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's actual name. Relevant days and months are referred to as day1–day8 and month1–month4 to protect privacy. Days and months reflect the sequence of events, not consecutive calendar days.

with an acromioclavicular (AC) distraction injury,[6] a right knee ligamentous injury,[7] and a fractured tibia[8] and left talus.[9]

7. An exploratory laparotomy[10] was undertaken, followed by a sigmoid colectomy[11] and a left abdominal hernia[12] repair. Mr B was admitted to the Department of Critical Care Medicine until day2 month1, when he was transferred to the General Surgery Ward under the Trauma service.

8. Clinicians were concerned about Mr B's ongoing increased respiratory and heart rates, and Mr B underwent a CT pulmonary angiogram[13] (CTPA) on day3 month1 2022. The CTPA did not indicate pulmonary embolism but showed moderate pleural effusion[14] on the right lung and a small amount on the left lung.

Chest drain insertion

9. Mr B was reviewed by the trauma SMO on day4 month1 2022 during the morning ward round. The SMO noted that Mr B had ongoing high respiratory and heart rates and pleural effusion, for which he would require a chest drain.

10. Health NZ's Chest Drain Management policy states that, unless in an emergency, all chest drains for fluid aspiration should be guided by real-time radiology imaging. In this instance, the request for real-time radiology imaging could not be accommodated by the Interventional Radiology team, for reasons Health NZ had been unable to determine at the time of the Serious Adverse Event Review (SAER). As an alternative to real-time imaging, a chest ultrasound was scheduled to indicate where the drain should be inserted.

11. The clinical records outline that the chest ultrasound could not be tolerated by Mr B. The radiology report noted that the ultrasound did not proceed because Mr B was in pain and could not be mobilised for the scan. This procedure was rescheduled for the following day.

12. During the trauma SMO morning round the following day (day5 month1 2022) (prior to proceeding with the rescheduled ultrasound), a decision was made to insert the chest drain

[6] Separation or pulling apart of the shoulder blade and collarbone.
[7] Injury to the ligaments of the knee.
[8] Inner and larger of the two bones of the lower leg.
[9] A bone in the ankle joint that supports the weight of the body.
[10] Surgical incision of the abdomen to examine the abdominal organs for injury or disease.
[11] Excision of a portion or all of the colon affected by injury or disease.
[12] A protrusion of an organ or part through connective tissue or through a wall of the cavity in which it is normally enclosed.
[13] A procedure to visualise the pulmonary arteries and veins.
[14] A build-up of fluid between the tissues that line the lungs and the chest.

at the bedside using the Seldinger technique.[15] Health NZ's SAER described this as the preferred method for Mr B as it would cause less pain and was less invasive.

13. The SAER outlined that a trauma registrar (under the supervision of two trauma fellows[16]) made two attempts at inserting a chest drain using the Seldinger technique. The SAER noted that the guidewire and chest tubes did not pass smoothly on these first attempts. The SAER also notes that no nurse was present during the insertions, despite Health NZ's Chest Drain Management policy stating that 'an experienced nurse should ideally be present for assistance and be responsible for monitoring the patient for pain, distress, and clinical deterioration'. Mr B remained in the same position throughout the attempts to aspirate fluid. After the trauma registrar's two failed attempts, the two trauma fellows took over.

14. On insertion of the needle by the second trauma fellow, dark/old-looking blood was aspirated. Once in place and during suturing of the drain to the chest wall, Mr B became very sweaty. The emergency bell was activated, and a nurse attended and noted that Mr B was hypertensive[17] and tachycardic.[18] The chest drain collection bottle had filled with blood and was clamped by the second trauma fellow to prevent further blood loss.

Resuscitation

15. As Mr B's condition deteriorated, a code red (a medical emergency) was called. The code red response was described in the SAER as chaotic, noisy, and without a clear code leader or any detailed communication or indication of the volume of blood that Mr B had lost.

16. The on-call Trauma SMO upgraded the code red to code blue (meaning that the patient was in cardiac or respiratory arrest). By this point, Mr B had lost approximately four litres of blood and had lost cardiac output. Mr B was given at least five minutes of cardiopulmonary resuscitation (CPR) prior to being taken into theatre for an emergency laparotomy.

17. During resuscitation efforts, Mr B's aorta was clamped for approximately five to seven minutes, and with continued transfusion he regained a cardiac output. During the surgery, the drain was seen to traverse the abdominal wall and pass into the right lobe of the liver.

18. An abdominal CT scan confirmed that the drain had traversed through the liver and entered the middle hepatic vein, and the tip was in the inferior vena cava.[19]

[15] A method used in various medical procedures to obtain safe access to blood vessels and other hollow organs. A hollow needle is inserted into a body cavity, a round-tipped guidewire is then inserted through the needle, the needle is withdrawn leaving the guidewire in place, and then a catheter is advanced over the guidewire into the cavity.
[16] Qualified doctors undertaking specialty training in trauma.
[17] High blood pressure.
[18] Faster than normal heart rate.
[19] The largest vein in the body.

19. Sadly, as a result of hypovolemic shock[20] and cardiac arrest, Mr B developed ischaemic bowel and spinal cord injury, which resulted in paraplegia from the level of the T9 vertebrae, and suspected mild hypoxic brain injury.

Information gathered

Response to complaint

20. In a letter to this Office, Health NZ advised that, in late month2 2022, staff met with Mr B and Ms A to discuss the SAER that was undertaken as a result of this incident. At the meeting, Health NZ acknowledged the distress and impact of this devastating and tragic incident and encouraged Mr B's family to submit a complaint to HDC for an independent review.

Serious Adverse Event Review

21. Health NZ provided HDC with a copy of the SAER undertaken in response to this incident, through which Health NZ determined the following three key issues surrounding the management of Mr B and the insertion of a chest drain for pleural effusion:

1. The chest drain was inserted incorrectly, which resulted in a hepatic vein injury and massive bleeding.
2. There were evident issues relating to the resuscitation, including that the procedure room was cluttered, and there was a lack of code leader to determine when a code red and subsequent code blue was required. In addition, the communication among the staff present was poor, and the equipment required for a code red and/or code blue was not readily available as it should have been.
3. No written informed consent was documented for the chest drain insertion.

Independent advice

22. Independent advice was obtained from trauma surgeon Dr Grant Christey (Appendix A), who reported the following departures in relation to Health NZ's standard of care:

- Undertaking the procedure in an unsafe environment — moderate departure.
- Not using ultrasound to guide the placement in real time, and the failure to identify why this was unavailable at the time of these events — moderate departure.
- Not having the most senior clinician undertake the procedure — moderate departure.
- Resuscitation efforts were hindered by environment, inadequate leadership, lack of nursing staff who could quickly locate necessary equipment, and poor communication — severe departure.

[20] Shock caused by insufficient blood volume or fluid in the body.

- Health NZ Chest Drain Management policy lacking essential detail regarding medical indications for drainage, choice of drain, insertion techniques and use of imaging, risks, and identification of complications — moderate departure.

23. Dr Christey also reported the following departures in relation to the individual providers:

- Dr C (surgeon — trauma fellow at the time of the incident) — moderate departure as ultimately, he was responsible as the senior clinician.
- Dr D (ED physician — trauma fellow at the time of the incident) — moderate departure for not speaking up to prevent error.
- Dr E (surgical registrar) — moderate departure for not speaking up when he thought the procedure was unsafe. However, this is mitigated as he did hand care over to the more senior clinician when he felt out of his depth.

Responses to provisional opinion

24. Ms A, who made the complaint on behalf of Mr B and his family, was given an opportunity to comment on the 'information gathered' section of the provisional decision. No comments were provided to HDC.

25. Dr C confirmed that he accepted the provisional findings and apologised for the difficulties caused by his actions.

26. Health NZ provided submissions disputing Dr Christey's expert advice and some parts of the provisional findings. Health NZ's key submission was that the first two attempts at the chest drain being unsuccessful does not indicate that the drain was being incorrectly positioned, as it is not unusual for more than one attempt to be needed. It also considered that the drain being ultimately found to have pierced the liver did not indicate that the doctors involved were aware that the trajectory or placement was incorrect. Health NZ submitted that Dr D and Dr E could not have been expected to speak up about an error they did not know about at the time.

27. Dr E provided a response to the provisional opinion. He confirmed that he did not think the procedure generally was unsafe, and that he handed over the procedure to his senior doctors when he was no longer comfortable to proceed. He said that from that point it was impossible for him to assess if the trajectory of the drain was accurate.

Decision: Health NZ — breach

28. I commend Health NZ on the thorough approach undertaken once the incident occurred, including openly disclosing and discussing the incident with Mr B and his family, extending an appropriate apology, undertaking an SAER, and recommending that Mr B and his family make a complaint to this Office for an independent review.

29. Nevertheless, a serious incident resulted in Mr B sustaining a life-altering injury. Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code) outlines that Health NZ had an organisational responsibility to provide services to Mr B with reasonable care and skill.

30. On review of the aforementioned information, including the SAER report and the independent advice provided by Dr Christey, I consider that Health NZ failed to provide services to Mr B with reasonable care and skill and breached Right 4(1) of the Code.

Decision: Dr C (surgeon/ trauma fellow) – Breach

31. Dr C was the senior clinician and made the decision to undertake the procedure on the ward without real-time radiology. Dr C also asked surgical registrar Dr E to undertake the first attempt at the chest drain insertion. Dr Christey stated that, as the senior clinician, Dr C was ultimately responsible for ensuring that the procedure was safe and effective. It is expected that an experienced surgeon would be alert to the risks of incorrect placement of a drain and would facilitate this invasive procedure in a safe manner. I accept Dr Christey's advice that the decisions made by Dr C were a moderate departure from the accepted standard of care.

32. Given that Dr C was ultimately responsible for the chest drain insertion procedure and there was an obvious failure to provide services with reasonable care and skill, I consider that Dr C breached Right 4(1) of the Code.

Decision: Dr D (ED physician/trauma fellow) — educational comment

33. Dr D was the second trauma fellow observing the chest drain insertion. Dr Christey advised that Dr D would be expected to have adequate skills in drain placement and therefore would be expected not to allow placement of a drain in a position or trajectory that would puncture the liver. Despite the actions of the more senior clinician, he would be expected to speak up and prevent the error.

34. Health NZ submitted that the doctors were not initially aware that the trajectory or placement was incorrect and therefore Dr D could not have been expected to speak up to prevent the error. Whilst I accept this submission, I consider that given the difficulties encountered with two failed attempts to insert the chest drain, this presented an opportunity for Dr D to query whether the placement was proceeding correctly.

Decision: Dr E (surgical registrar) – other comment

35. I appreciate that Dr E appropriately requested that a more senior clinician take over the chest drain insertion procedure when he felt out of his depth. Dr E confirmed that he did not consider the procedure generally was unsafe, and that from the point that he stepped back he was unable to assess if the trajectory of the drain was accurate. I accept that Dr E's actions in the circumstances were appropriate.

Changes made since events

36. As noted above, Health NZ's SAER identified areas for improvement. The SAER made the following recommendations:

a) Commission a working group to develop a model of care for the provision of pleural services across Te Toka Tumai. This should have senior leadership team oversight and must include a system to ensure that clinicians have the correct training, skills, and credentials to insert chest drains, with clear triggers for escalation to request real-time radiology chest drain insertion.

b) In situations that require ward-based procedures, staff must discuss the plan with the wider multidisciplinary team (MDT) and ensure that a nurse is present where policies, guidelines, or procedures state that this is essential.

c) Provide all ward staff with education about management of codes in a ward situation, with medical and nursing input.

d) Ensure that procedure rooms across the organisation are maintained as a clinical environment that enables care provision to patients. Ensure that clinicians undertake the informed consent process to expected standards and that the consent process is documented clearly in the clinical record.

37. Dr C confirmed that he made an immediate change to his practice following the result of this case. He no longer attempts or allows chest drain insertion without real-time ultrasound guidance for drains placed using the Seldinger technique. Dr C is no longer working in New Zealand.

38. Dr E completed a Training in Professional Skills course run by the Australasian College of Surgeons and has provided HDC with his reflection on this incident.

Recommendations

38. I further recommend that Health NZ:

a) As per Dr Christey's advice, update the Chest Drain Policy to encompass environmental safety, training and education requirements, technical guidelines, and oversight of relationships and provide HDC with a copy of the updated version within six months of the date of this report.

b) Provide an update on all the recommendations included in the SAER, within three months of the date of this report.

c) Undertake an audit of 30 patients who have undergone a chest drain insertion within the last year to ensure that the informed consent form was completed adequately as per the SAER findings and provide a report of the outcome within six months of the date of this report.

39. I recommend that Dr C:

a) Use this report as a basis for a written case study for Health NZ focusing particularly on the breach of the Code identified, including details of the actions/decisions taken, the results of these actions/decisions, and the appropriate course that should have been taken to arrive at a more desirable outcome. Evidence confirming the content of the presentation is to be provided to HDC within six months of the date of the final report.

b) Provide an appropriate written apology for Mr B, including decisions made, with a personal reflection and details of changes made to his practice as a result of this incident. The apology should be provided to HDC for sending to Mr B within three weeks of this report being finalised.

Follow-up action

40. A copy of the final report with details identifying the parties removed, except Health NZ Te Toka Tumai Auckland and the independent advisor on this case, will be placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

41. Further to the completion of the investigation, Dr C raised a question regarding the expert advice. Additional information was sought as a result, and the decision remains unchanged.

Dr Vanessa Caldwell

Deputy Health and Disability Commissioner

Appendix A: Independent clinical advice to Health and Disability Commissioner

'Complaint:	**Mr B/Health New Zealand | Te Whatu Ora Te Toka Tumai Auckland**
Our ref:	**23HDC00147**
Independent advisor:	**Dr Grant Christey**

I have been asked to provide clinical advice to HDC on case number **23HDC00147**. I have read and agree to follow HDC's Guidelines for Independent Advisors.

I am not aware of any personal or professional conflicts of interest with any of the parties involved in this complaint.

I am aware that my report should use simple and clear language and explain complex or technical medical terms.

Qualifications, training and experience relevant to the area of expertise involved:	MBChB FRACS FACS Trauma Surgeon since 2006
Documents provided by HDC:	1. Letter of complaint from the Advocacy Services dated day7 month3 2022 2. Clinical records from Health New Zealand | Te Whatu Ora for Mr B between day1 month1 and day6 month1 2022. 3. Health New Zealand | Te Whatu Ora's response dated day8 month4 2023, including the following four documents: • Patient Deterioration Recognition and Response — Clinical Codes • Patient Deterioration Vital Sign Monitoring in Adults Warning Score Measurement and Clinical Escalation • Chest Drain Management — Adult • Clinical Emergency Response
Referral instructions from HDC:	Health New Zealand | Te Whatu Ora 1. The decision to proceed to performing a chest drain on Mr B. 2. The decision to perform the chest drain using the Seldinger technique. 3. The appropriateness of using bedside ultrasound to identify the site for chest drain insertion.

	4. Whether the care provided by Dr C/Surgeon during the chest drain insertion met the expected standard of care? 5. Whether the care provided by Dr D/ED Physician during the chest drain insertion met the expected standard of care? 6. Whether the care provided by Dr E/Surgical Registrar during the chest drain insertion met the expected standard of care? 7. Whether the outcome for Mr B is a known risk of the chest drain insertion procedure? 8. Who would be expected to lead these kinds of procedures given the situation. 9. The appropriateness of any relevant policies (bedside ultrasound to mark sites for chest drains, chest drain insertion procedures, staff orientation on current policies etc). 10. The appropriateness of care provided when Mr B's condition deteriorated. 11. How would the care provided to Mr B be viewed by your peers? 12. Overall has there been a departure from the standard of care or accepted practice.

Factual summary of clinical care provided complaint:

Question 1: The decision to proceed to performing a chest drain on Mr B.	
List any sources of information reviewed other than the documents provided by HDC:	International and national chest injury management guidelines, DSTC, DATC, EMST/ATLS.
Advisor's opinion:	The decision to place a chest drain was reasonable. There was a barrier to access to regular specialised environments for this intervention and may have prompted the clinicians to do this in a relatively unsafe environment. There was inadequate attention paid to technical safety and performance of this procedure in a suitable and safe environment.
What was the standard of care/accepted practice at the	ADHB Chest Drain Management Policy is extensive but lacks essential detail regarding medical indications for drainage, choice of drain type, insertion techniques,

time of events? Please refer to relevant standards/material.	use of imaging, risks and identification of complications.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Despite a reasonable indication to place a drain, it would be deemed a risky procedure in an inadequate environment
Please outline any factors that may limit your assessment of the events.	Limited information of staff skill levels, and the professional communication and dynamics at the time of the incident
Recommendations for improvement that may help to prevent a similar occurrence in future.	Updated Chest Drain Policy encompassing environmental safety, training and education requirements, technical guidelines and oversight relationships
Question 2: The decision to perform the chest drain using the Seldinger technique.	
List any sources of information reviewed other than the documents provided by HDC:	Standard languages of trauma care: DSTC, EMST, DATC.
Advisor's opinion:	Seldinger technique is safe and effective when performed by experienced operators in the right environment. In this case the space and staffing were suboptimal for both the procedure and the complication.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	Chest Drain Policy

Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Risky with limited options to mitigate severe complications. Choices were likely influenced by limitation of access to a safer environment; however, a safety-first approach was not taken.
Recommendations for improvement that may help to prevent a similar occurrence in future.	As above
Question 3: The appropriateness of using bedside ultrasound to identify the site for chest drain insertion.	
Advisor's opinion:	Ultrasound is accurate and effective when performed by a skilled operator. Of note, it was not used while the drain was being placed, therefore the extra safety of real-time imaging was not available. The operators followed a mark placed by ultrasound. Real-time, dynamic ultrasound during drain placement would have prevented hepatic injury.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Risky and chaotic

Please outline any factors that may limit your assessment of the events.	Limitations in information regarding decision-making and interactions at the time of the procedure
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update (as above)
Question 4: Whether the care provided by Dr C/Surgeon during the chest drain insertion met the expected standard of care?	
Advisor's opinion:	As the senior clinician, Dr C was ultimately responsible to ensure that a safe and effective procedure was done. It would be expected that an experienced surgeon would not allow placement of a drain in a position or trajectory where it would puncture the liver.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Inadequate
Please outline any factors that may limit your assessment of the events.	Limited information on operator and supervisor skill levels, or their communication and professional interactions at the time of the procedure
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update (as above)

Question 5: Whether the care provided by Dr D/ED Physician during the chest drain insertion met the expected standard of care?	
Advisor's opinion:	As a surgical fellow, Dr D would be expected to have adequate skills in drain placement and therefore would be expected to not allow placement of a drain in a position or trajectory where it would puncture the liver. Despite the actions of the more senior clinician, he would be expected to speak up and prevent the error.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Inadequate
Please outline any factors that may limit your assessment of the events.	Limited information on skill levels, or the communication and professional interactions at the time of the procedure
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy (see above)
Question 6: Whether the care provided by Dr E/Surgical Registrar during the chest drain insertion met the expected standard of care?	
Advisor's opinion:	Dr E was a junior surgical registrar therefore would be expected to understand basic anatomy of the chest

	wall. As the operator, he would be expected to understand the procedure he was performing, and he would be required to speak up if he thought the procedure was unsafe. It is presumed he handed over voluntarily once he was out of his depth. It is acknowledged that offering alternatives [would] have been difficult when under the oversight of two more senior clinicians
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Inadequate
Please outline any factors that may limit your assessment of the events.	Limited information on experience levels or the potentially challenging communication and professional interactions at the time of the procedure
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy (as above)
Question 7: Whether the outcome for Mr B is a known risk of the chest drain insertion procedure?	
Advisor's opinion:	Yes. Hepatic injury is a rare but well-known complication of chest drain placement, with known causative factors and technical requirements. The subsequent systemic and spinal hypoxic insults are

	common outcomes from severe, prolonged hypotensive shock and/or aortic clamping, respectively.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
Please outline any factors that may limit your assessment of the events.	Limited information on the relative impacts of systemic hypotensive shock and aortic cross-clamping on his eventual outcome
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy (see above)
Question 8: Who would be expected to lead these kinds of procedures given the situation?	
Advisor's opinion:	A skilled, senior clinician with specific training and experience in various techniques of chest drain placement would be expected to lead procedures. In this case, the most experienced member should have led.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure

How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Inadequate and unsafe
Please outline any factors that may limit your assessment of the events.	Limited information on experience and training of the team leader in chest drain placement and the ability to communicate and direct other clinicians at the time of the procedure
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update
Question 9: The appropriateness of any relevant policies (bedside ultrasound to mark sites for chest drains, chest drain insertion procedures, staff orientation on current policies etc etc).	
Advisor's opinion:	Local policies regarding technical aspects of chest drain placement were not available for this review. In general, they should ensure safe and effective chest drain placement in a range of environments and with a range of techniques. The requirement for real-time, ultrasound guidance of chest drains should be considered and potentially included in the protocols. In this case, ultrasound was used to mark the skin but not to determine trajectory of the drain. If this had been done, injury would have been avoided. A similar approach is used in many anaesthetic techniques where accurate placement of lines and drains is routinely do[n]e with ultrasound guidance. The levels of experience and skill of the operators is not known; however, all of the clinicians should have been able to perform a safe and effective procedure, and had the clinical responsibility to readily to defer the procedure if it was deemed to be unsafe. The argument that it was done routinely on the ward suggests that the lack of a practical strategy for avoidance and management of rare but severe complications had become acceptable. I[f] this is not explicit in existing guidelines it should now be made the standard of care.

What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	Chest drain placement may already be covered in hospital guidelines and protocols not available to me. There are a number of other standards related to trauma care such as DSTC, EMST/ATLS and DATC
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Risky and not in line with best practice
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update, training and education. Improved access to acute imaging and IR services for drain placement
Question 10: The appropriateness of care provided when Mr B's condition deteriorated.	
Advisor's opinion:	Staff appeared to respond quickly; however, it appears that resuscitation leadership was inadequate and the environment was cramped and cluttered, making resuscitative efforts chaotic. There was apparently no nurse present who would likely have a detailed knowledge of where to obtain ward-based equipment in an emergency. The choice to do this procedure on the ward had the added risk of not being close to a clinical environment where immediate haemostasis and physiologic restoration could be achieved. There are concerns regarding the choice of aortic clamping in the setting of severe hepatic bleeding: hepatic isolation with inflow control can significantly reduce arterial and venous inflow and bleeding. Aortic clamping may reduce arterial flow but carries a known risk of gut and spinal ischaemia with paraplegia. In this

	case, cross-clamping time was at least 10 minutes, arguably making this a likely scenario.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Severe departure.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Unfavourable. There was a rapid early response with resuscitative efforts hindered by the procedural environment and inadequate staff and communication. The choice to cross-clamp the aorta should be reviewed.
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update. Decision to cross-clamp needs exploration. Review of immediate response protocols for ward-based emergencies. Improvement of access to IR and real-time imaging.
Question 11: How would the care provided to Mr B be viewed by your peers?	
Advisor's opinion:	With concern. The choice of procedure was reasonable; the timing, location environment and technical decision-making were inadequate given the known, rare and potentially devastating complications of hepatic perforation
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above

Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Risky and chaotic. Lack of training and/or dysfunctional communication may have prevented conversations focussed on ensuring patient safety.
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Protocol, training and education. Improved access to acute imaging and IR services for drain placement. Review of aortic cross-clamping algorithms.
Question 12: Overall has there been a departure from the standard of care or accepted practice.	
Advisor's opinion:	Yes. There was a coalescence of infrastructure limitations, decision-making and communication failures that depleted the safety margins for interventions and diminished the ability of treating teams to deliver safe and effective care. This increased the risk of problems and hindered the immediate response to time-critical bleeding
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Moderate departure resulting in rare but severe consequences

How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	Some would not perform these procedures on a ward because of the possibility of a low-frequency, severe consequence complication. If necessary in a resource-limited environment, a safe approach is paramount
Recommendations for improvement that may help to prevent a similar occurrence in future.	Chest Drain Policy update, training and education. Improved ward facilities if this practice is ongoing. Improved access to acute imaging and IR services for drain placement. Note: It is important for the hospital to acknowledge that Mr B believes his life has been ruined as a result of avoidable failures in decision-making and through no fault of his own.'