HEALTH & DISABILITY COMMISSIONER
TE TOIHAU HAUORA, HAUĀTANGA

Delayed recognition of acute cardiac event in emergency department

Executive summary

1. In 2022, this Office received a referral from the Nationwide Health & Disability Advocacy Service regarding concerns raised by Ms A about the care provided to her late partner, Ms B, at a public hospital (Health New Zealand | Te Whatu Ora Hauora a Toi Bay of Plenty (Health NZ)). Ms B tragically died from a heart attack a day after presenting to the hospital's emergency department (ED), and I convey my sympathies to her family for their loss.

2. Ms A's primary concern was that clinicians misdiagnosed Ms B as having a mental health condition and, as a result, failed to provide the appropriate treatment that Ms A believes may have saved her life. Ms A was also concerned that Ms B was not given sufficient insulin and was denied fluid and pain relief while in the ED and that clinicians did not give nursing staff any plan of care.

3. I find Health NZ in breach of Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code) for failing to provide services to Ms B with reasonable care and skill in relation to the delayed recognition that Ms B was experiencing an acute cardiac event.

4. I also make adverse comments about Health NZ in relation to the lack of clinical notes, the lack of a management plan, and poor communication not only between clinicians but also with Ms A and Ms B.

5. I also make other comments about the confusion in relation to Ms B being 'medically cleared' and the administration of insulin and fluids.

Information gathered

Background

6. Ms B had an extensive medical history of type 1 diabetes, peripheral neuropathy,[1] psoriatic arthritis,[2] and daily chronic pain. Ms A said that Ms B was on a significant amount of medication, most of which was pain relief,[3] but she managed well. At the time of these events, Ms B had recently stopped taking methotrexate, Plaquenil, and venlafaxine,[4] and

[1] A condition that involves damage to one or more nerves around the body.
[2] An inflammatory arthritis/spondyloarthritis that causes joint pain, stiffness, and swelling.
[3] Ms B's regular medications included prednisone (a steroid medication), omeprazole (to reduce the amount of acid produced by the stomach), oxycodone (an opioid pain medication), and gabapentin (an anticonvulsant medication used to treat a number of conditions such as nerve pain and epilepsy).
[4] Methotrexate is a chemotherapy agent and immunosuppressant drug used to treat severe autoimmune conditions (such as rheumatoid arthritis, psoriasis, and Crohn's disease) and certain types of cancer. Plaquenil is a medication used to treat rheumatoid arthritis, lupus, and malaria. Venlafaxine is an antidepressant used to treat major depressive disorder, generalised anxiety, panic disorder, and social anxiety. Ms A told HDC that Ms B had been prescribed venlafaxine by her rheumatologist to treat her pain. There is evidence that venlafaxine is effective in the treatment of neuropathic pain, although its use in treating pain is off label in New Zealand.

earlier in the year had stopped taking her fentanyl[5] patch. Ms B also took cannabis to treat her pain.

Hospital ED

7. On Wednesday, Ms A called an ambulance to take Ms B to hospital. Ms B had chest pain, had been vomiting, and had urinary incontinence. The electrocardiogram (ECG) completed by ambulance officers was described by Hato Hone St John as indicating a normal heart rhythm.[6]

8. Ms B arrived at the hospital ED at 1.33pm. Her initial physical observations were all normal and remained largely normal each time the observations were repeated,[7] aside from one instance of a slow heart rate (46 beats per minute) and two episodes of elevated blood pressure (136/89 at 4.18pm and 145/90 at 8.50pm). At triage, Ms B was noted to have worsening general body pain and convulsions and had 'odd behaviour'. In response to the provisional opinion, Ms A said that Ms B had described worsening chest pain, not general pain. It appeared to Ms A that Ms B presented as someone in 'very obvious cardiac distress'. The clinical notes also record that Ms B said she felt like she was 'coming off meds'.

9. Ms A said Ms B was in a lot of pain in the hospital and asked medical staff for pain relief multiple times. Ms A had Ms B's daily medications (including her regular pain relief medication) in her pocket but was told by a nurse that Ms B was not allowed to take anything because they were still completing tests to determine what was wrong.

Initial ED doctor review

10. Ms B was seen by Dr D.[8] Dr D noted that Ms B was very distressed and thrashing on the hospital bed. Dr D's overall impression was that Ms B was agitated because of an unknown cause, possibly from medication withdrawal or a medication side effect. Dr D's orders included an ECG and blood and urine tests.[9] Dr D also prescribed lorazepam[10] to treat Ms B's distress. She told HDC she did not prescribe pain relief because Ms B appeared more agitated than in pain, and Dr D was worried that Ms B's presentation was caused by medication and she did not want to make it worse.

11. Blood and urine tests were completed by approximately 4pm. The tests were mostly normal with some variations.[11] Her glucose was high, at 16.2mmol/L, and clinical records state that Dr D prescribed Ms B a fast-acting insulin (NovoRapid) to address this at approximately

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[5] A synthetic opioid drug used as pain relief and as an anaesthetic.

[6] However, HDC's clinical advisor and emergency medicine specialist, Dr Stuart Barrington-Onslow, considers that the Hato Hone St John ECG was not normal. He described it as suboptimal but showing signs suggestive of a cardiac event.

[7] At 1.46pm, 3.13pm, 4.18pm, 8.50pm, and 10.05pm.

[8] Dr D is a paediatrician who covers the ED during the ED Registered Medical Officer teaching hours on Wednesdays. It is not clear exactly when Dr D reviewed Ms B because her clinical notes were written retrospectively at 3pm.

[9] Dr D also referred Ms B to the chronic pain and adult rheumatology services and requested notes from two other hospitals because Ms B had moved to her current city four months earlier.

[10] A benzodiazepine medication used to treat anxiety disorders, insomnia, severe agitation, and other conditions.

[11] Kidney function was slightly low, the full blood count showed slightly raised neutrophils but a normal white cell count, and liver function tests showed a raised GGT and slightly low globulin levels.

2.55pm, but this does not appear to have been administered by hospital staff.[12] The blood gas analysis was also normal, which meant that Ms B did not have diabetic ketoacidosis (a serious and potentially life-threatening condition that can affect people with diabetes).

First ECG performed

12. The findings of the ECG ordered by Dr D, completed at approximately 3pm,[13] are not in Ms B's clinical notes. Registered nurse (RN) C recalled having difficulty taking the ECG because of Ms B's distress and agitation. RN C said he printed three ECGs,[14] which Dr D sighted. Health NZ told HDC that Ms B's identification details were not entered into the bedside monitor and, because the initial ECG was not labelled, it was appropriately destroyed.

13. Dr D finished her shift at around 5pm and discussed Ms B's presentation with emergency medicine specialist Dr E[15] as part of handover. Dr E told HDC that Dr D reported to him that the first ECG was normal with no ST elevation.[16] In response to the provisional opinion, Dr D stated that she cannot recall whether she personally reviewed the ECG. However, if she had interpreted the ECG as showing an acute cardiac event, her usual practice would have been to request a troponin test (which indicates damage to the heart muscle) and discuss with a senior medical officer.

14. Dr E decided to review Ms B in person as he was concerned that hers was a dangerous toxicological presentation (specifically, a possible venlafaxine overdose or medication withdrawal). However, Ms A recalled that, when Dr D spoke to her along with Dr E at the end of her shift, Dr D told her that the medications Ms B had come off had nothing to do with her presenting condition. Dr E found Ms B's demeanour bizarre, noting that she had poor concentration and was argumentative and combative. Dr E's impression was that Ms B was possibly experiencing an acute mental health crisis[17] and asked for Dr D to arrange for a mental health review. Dr D wrote in the clinical notes that Ms B had been 'medically cleared' and had been referred to the crisis team; however, subsequent ED nursing notes noted that Ms B was not medically cleared.

Crisis team review

15. At approximately 7pm, Ms B was seen by the crisis team (initially by two other RNs, later by psychiatric registrar Dr F and a consultant psychiatrist). Ms A said that Ms B was in too much pain to talk a lot to the crisis team. The assessing team concluded that there was no clear impression of a mental health problem but, because of the ongoing medical issues, they recommended further medical review. Dr F's clinical notes record that Ms B was not eating

[12] According to the clinical notes, Ms B self-administered her own insulin also at approximately 2.55pm while waiting to receive NovoRapid (although Ms A said Ms B was told she could not administer her insulin until after tests were carried out). The clinical notes record that Ms B was given NovoRapid again at 8.50pm.

[13] Ms A does not recall an ECG being performed at 3pm but instead believes it happened shortly after Ms B was admitted to the ED at 1.33pm.

[14] In response to the provisional opinion, RN C explained that none of the ECGs were completely free of movement artefact, so he printed three that cumulatively showed each individual lead without significant artefact. He also advised that, at handover, he requested the evening staff re-attempt a clear ECG.

[15] Health NZ told HDC that on the day of Ms B's presentation Dr E was the sole senior clinician managing several critically unwell patients for much of the shift, and that this was not normal practice.

[16] ST elevation is a finding on an ECG that can indicate a heart attack.

[17] Dr E considered Ms B's demeanour and history strongly appeared to be in keeping with agitated mania.

and drinking (Ms A noted that Ms B had not been offered any water or any food while in the ED), and there was some evidence of dehydration. Dr F discussed Ms B's presentation with the medical team registrar Dr G, and Ms B was accepted for medical review. The crisis team also offered assessment by the psychiatric liaison team if needed, once Ms B was medically stable.

Second and third ECGs

16. Dr E said that the psychiatry service asked him about Ms B's ECG. Dr E had not sighted the original ECG and could not locate it,[18] so he ordered another ECG. This ECG, completed at 8.46pm, was abnormal. The ECG was repeated at 9.34pm and was again abnormal.[19] Dr E sought the opinion of an emergency medicine colleague, who also viewed the ECG, and they agreed that the changes visible on the ECG could not be attributed to Ms B's medications. Dr E said that the ECG changes were discussed with the psychiatrist and later Dr G. Dr E was then called away to perform several critical procedures on other patients.

Ms B and Ms A leave the ED

17. It is unclear what was communicated to Ms B and Ms A about the ECG results or intended next steps. There is no reference in the clinical notes to the 8.46pm and 9.34pm ECGs. Ms A recalled being told by a nurse that the doctor who reviewed the ECG changed his mind and no longer saw anything of concern and that Ms B might not be seen by a doctor again until the morning. She said she was horrified because Ms B had not had anything to eat or drink all day and was getting weaker. They were feeling frustrated, upset, and as though they had been ignored all day.

18. An RN stated that she told Dr G about Ms A's concerns. The medical registrar was reviewing Ms B's clinical notes prior to potential medical admission but was called away to a stroke emergency. Feeling as though they had not been listened to, Ms B decided to self-discharge. She left the hospital at 12.10am on Thursday with Ms A.

19. Ms A wrote on the self-discharge form that Ms B signed:

> 'I am going home because I am not receiving any treatment here. The nurses are helpful and doing their best but I have given up waiting to be seen by a doctor. I have not eaten or had anything to drink all day. I am type 1 diabetic and complex health needs and it seems I am too complex to be treated at [this] Hospital.'

20. At around 1am on Thursday, Dr E began to hand over to the ED night registrar, and he then learned that Ms B had left.

21. At some point, a troponin test was ordered. Dr E told HDC that Dr G arranged for the troponin test after Dr G became aware of the abnormal ECG. There is no record in the clinical notes of who ordered the test or when. The result was reported at 2.45am on Thursday as 63ng/L (normal is <20ng/L). A raised troponin level indicates damage to the heart.

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[18] He told HDC that there were two ECGs next to Ms B's notes slot that were unnamed and it was unclear whether they belonged to her.

[19] The ECGs persistently demonstrated isolated ST elevation in V4 and Q waves anteriorly, which suggests a heart attack has occurred or is occurring.

22. Dr G attempted to call Ms B, but the call was not answered.

Subsequent events

23. At home, Ms B remained distressed and became very short of breath. Ms A rang an ambulance again, and the ambulance transported Ms B to hospital. After being assessed, Ms B was transported by ambulance to a larger nearby hospital for surgery. Ms B went into cardiac arrest shortly after arriving at that hospital. Resuscitation was attempted but the decision was made to cease resuscitation and, she passed away at 9.07am on Thursday. The cause of her death was determined to be a heart attack.

Further information

24. Ms A told HDC: 'I brought [Ms B] to [the] Hospital believing she was in good hands. It failed in its duty of care and I have nightmares about how she suffered.'

25. Several nursing staff who provided statements to HDC's investigation commented on the 'lack of communication between doctor and nurse, nurse and patient, doctor and patient' and that the management plan for Ms B was at times unclear. Similarly, the clinical notes show that, at 8.50pm, nursing staff were 'awaiting plan from [Dr E]' and at 10.05pm were 'unsure of plan'. One of the RNs also stated that, at approximately 10pm, she asked one of the ED doctors about whether a troponin test was required and recalled being told that the ECG was not a concern. The RN also asked about giving Ms B intravenous fluids, but this was denied while they were awaiting medical review.

Adverse event investigation

26. Health NZ completed an adverse event investigation (AEI) 10 months after Ms B's death. It made the following key findings:

- There was a failure to run multiple diagnoses or consider differential diagnoses for Ms B's presentation.
- While there was an atypical presentation for a cardiac event on admission, troponin was not included in the initial blood work.
- Guidelines in place for ST-elevation myocardial infarction (STEMI) and non-STEMI pathways were not actioned, including that the ECG completed at 3pm was completed and not labelled and therefore discarded; the ECGs completed at 8.46pm and 9.34pm had no doctor's signature or interpretation of ECG documented, despite appearing abnormal; and there was a long delay between discarding the original 3pm ECG and completing the next ECG at 8.46pm.
- The meaning of 'medical clearance' was misinterpreted.
- There was poor communication between staff and Ms B and a lack of management plan.
- The ED was understaffed at the time of Ms B's presentation, and handover was taking place at the time of her admission.

Independent clinical advice

27. Independent clinical advice was received from an emergency medicine specialist, Dr Stuart Barrington-Onslow (see **Appendix A**). Dr Barrington-Onslow considered that there had been

multiple severe departures from accepted practice with respect to the care Ms B received at the public hospital. Dr Barrington-Onslow's advice is discussed further below. Health NZ submitted that, although these factors do not diminish its obligations under the Code, they form part of the environment in which clinicians were required to assess patients.

Decision

Health NZ: breach

28. At the outset, I extend my sincere condolences to Ms A and Ms B's family. Ms B and Ms A had planned a life together, and Ms B's death has been devastating for Ms A and others who loved Ms B.

29. I have several concerns about the care Ms B received in the hospital ED based on the expert advice I have received. I consider that these amount to a failure to provide services with reasonable care and skill. Although there were individual failings by several clinicians involved in Ms B's care, in my view Health NZ is ultimately responsible. Accordingly, I find Health NZ in breach of Right 4(1) of the Code. I outline my reasoning in further detail below.

<u>Delayed recognition of acute cardiac event</u>

30. In my opinion, the most significant failing in this case was the delayed recognition that Ms B was experiencing a significant and life-threatening cardiac event. I consider that multiple issues contributed to this failure. First, there was no record in the clinical notes of the initial ECG at 3pm. I acknowledge the explanation put forward by Health NZ – that this ECG was not labelled, possibly because of the difficulties with completing the ECG due to Ms B's distress and agitation, and therefore it was discarded; however, as Dr Barrington-Onslow comments, whoever discarded the ECG should have requested another ECG for Ms B, as this was an essential requirement for her presentation.

31. It is now impossible to know whether the 3pm ECG showed any abnormalities and, if it did, whether this would have prompted clinicians to investigate further and possibly treat Ms B's cardiac event earlier. In making this comment, I acknowledge Dr E's recollection that Dr D reported the 3pm ECG to him as normal. I am concerned that it was not until nearly six hours later that the need for another ECG was recognised.

32. Second, troponin was not requested with the initial blood work, as noted by Health NZ's AEI. Dr Barrington-Onslow explained that cardiac biomarkers (blood tests that look for specific substances, including troponin, that are released into the bloodstream when the heart is damaged or stressed) are an important factor when determining whether a person is having a heart attack. Given that an ECG was performed at 3pm, clearly consideration was being given to cardiac function, and in my view a troponin test should have also been considered at that point.

33. Finally, the ECGs repeated at 8.46pm and then again at 9.34pm showed an acute myocardial infarction (heart attack) according to Dr Barrington-Onslow. This is a medical emergency. Dr Barrington-Onslow noted that cardiac biomarkers should have been requested at this point. Health NZ agreed, noting that the usual practice following the ECGs taken at 8.46pm and 9.34pm would have been to request a troponin test and activate the STEMI pathway. Health NZ acknowledged that there was a delayed recognition of the cardiac event that Ms B was experiencing.

34. I note that Dr E discussed the ECG results with an emergency medicine colleague and the results were also shared with the crisis and medical teams. However, it is unclear why urgent and immediate action was not taken to confirm the diagnosis and provide appropriate treatment.

35. Dr Barrington-Onslow considered that the failure to take an adequate ECG initially and the non-recognition of the acute cardiac event amount to a severe departure from accepted practice. I accept this advice. Although I understand that there were challenges with obtaining an initial ECG at 3pm, I consider that the delay of nearly six hours between the first ECG and obtaining an accurate (and accurately labelled) second ECG at 8.46pm was a serious failing in Ms B's care. Moreover, I am concerned that it appears that multiple clinicians failed to recognise the acute cardiac arrest – not only Dr E, but also his colleagues with whom he discussed the ECG result. The result should have prompted immediate action. Dr G did order a troponin result at some point, but it is unclear why this was not ordered sooner (and I note that an RN did query whether troponin was needed at approximately 10pm). It is not my role to determine whether the outcome could have been different had different decisions been made, but the inescapable conclusion is that the delayed recognition of the acute cardiac event following the ECG at 8.46pm was a missed opportunity for Ms B to receive timely and appropriate treatment.

Pain relief

36. Ms A was concerned that Ms B was not given any pain relief despite asking multiple times. Dr Barrington-Onslow's view was that pain relief appeared to have been neglected. He commented: 'Ms B was already taking opiates and as such would need to maintain adequate analgesia otherwise she would [withdraw]. … someone who is on long-term opiates should be treated with adequate analgesia when they complain of pain, being aware that their requirements may well be higher than expected.'

37. Dr Barrington-Onslow considers that the failure to adequately treat Ms B's pain was a severe departure from accepted practice. I acknowledge that Ms B's presentation was challenging and unusual and that Dr D considered that Ms B was more agitated than in pain (and accordingly prescribed lorazepam). However, there are multiple references to Ms B experiencing pain in the clinical notes but apparently no consideration given to pain relief and no pain relief was in fact given. Ms A said they asked for pain relief multiple times, although these requests are not documented. I am critical that no pain relief was provided to Ms B when she needed it, and especially when her regular medications (about which the ED clinicians were aware) included strong opiate pain relief.

Summary

38. As outlined above, I believe there were multiple failings in the care that Health NZ clinicians provided to Ms B. The most concerning issue is the delayed recognition that Ms B was experiencing an acute cardiac event. I acknowledge that the ED was, at the time, under significant pressure, which impacted generally on clinicians' ability to assess, investigate, monitor, and treat patients in a timely manner. I also acknowledge that Ms B's presentation may have been unusual and challenging, and I am not critical that other causes, including mental health, were being considered. However, I do not consider that this context materially mitigates Health NZ's responsibility to provide Code-compliant care or demonstrates that the care provided was reasonable in the context of these resource

constraints. Ultimately, I consider that the issues outlined above represent a failure to provide services with reasonable care and skill and, accordingly, I find Health NZ in breach of Right 4(1) of the Code.

Health NZ: Documentation – adverse comment

39. The clinical notes in this case are fairly minimal, which has made it at times difficult to ascertain when exactly certain events occurred and who was involved. I am particularly concerned that there was no record in the clinical notes of the ECGs being performed or the interpretation of the results. I accept that the ED was under pressure at the time of events, but, in my view, this does not excuse there being no written record of an important diagnostic investigation, and I am critical of this aspect of Ms B's care.

Health NZ: Lack of plan and communication – adverse comment

40. Ms A felt that there was no clear plan for Ms B. She also felt as though they were not being listened to, and this is partly why they decided to leave the ED and return home. The clinical notes at times show that nursing staff were unsure of the plan, and – in statements to HDC – nursing staff commented about the lack of clarity regarding a management plan for Ms B and poor communication between clinicians and with Ms A and Ms B. The AEI also acknowledges these issues.

41. Dr Barrington-Onslow commented that clear communication and planning can be difficult in an overcrowded and understaffed ED. I accept this, although, as discussed above, once there was clear evidence that Ms B was experiencing a heart attack (in other words, at the time of the ECG at 8.46pm), clear communication with Ms B and Ms A, and a plan for urgent action, was critically important. I note with concern that these shortcomings likely contributed to Ms B and Ms A's decision to leave the ED.

Health NZ: Medical clearance for crisis review – other comment

42. The clinical notes record in several places that Ms B had been 'medically cleared'. Health NZ's AEI highlighted that this phrase was misinterpreted and that Ms B had been medically cleared for crisis team assessment but not for discharge. It is unclear to me the extent to which the confusion about what was meant by 'medically cleared' might have impacted on the care that Ms B received. In any event, I note that Dr Barrington-Onslow's view was that Ms B should not have been cleared medically for psychiatric review, and instead she should have been adequately sedated to properly assess her. I agree, noting (as discussed above) that an adequate ECG and appropriate blood tests had not been completed at that point. To be clear, I am not critical of the team for the consideration of a mental health condition in itself; however, Ms B was observably still unstable, insufficient tests were done to rule out medical conditions that were more likely given her complex history and presentation, and it remains very unclear on what basis a mental health issue was being considered at that point. As such, it was inappropriate to request that assessment at that time.

Health NZ: Administration of insulin and fluids – other comment

43. Ms A was also concerned that Ms B was not given insulin or fluids while in the ED.

44. The clinical notes show that Ms B was prescribed NovoRapid by Dr D at approximately 2.55pm; however, Ms B self-administered her own insulin at around the same time while

the NovoRapid was being prepared by staff. Ms B was given insulin again at 8.50pm. Dr Barrington-Onslow considered that the administration of insulin was appropriate and that blood tests showed Ms B did not have diabetic ketoacidosis. I accept this advice and accordingly am not critical of the administration of insulin.

45. As for fluids, I note that Dr F noted that there was some evidence of dehydration and that Ms B was not eating or drinking. Dr Barrington-Onslow did not consider that intravenous fluids were required in this case. I accept this and am not critical of this issue but note that, when Dr F noted potential dehydration, ideally more thought should have been given to ensuring Ms B was taking on fluids to address this.

Changes made

46. Health NZ told HDC that, since these events, the following changes have been made:

- Three new clinical nursing coaches who are on-floor support for new and existing staff have been appointed.
- A flow coordinator who supports the six-hour ED target, reviews patients waiting for medical review or follow-up, and expedites care, referral, or transfer has been appointed.
- A review has been undertaken, and improvements made, to the variance response management (VRM) process. VRM is used to assess capacity status to ensure staff are receiving the support needed at times of high acuity and volume.
- A new ECG process has been adopted:
    - Staff must input patient data before storing and printing ECGs from patient monitors.
    - ECGs must be sighted by a senior medical staff member and signed.
    - ECG findings must be written in the clinical notes.
    - All ECGs are automatically uploaded to an electronic patient monitoring portal.
- Training has been provided to ED staff on atypical presentations for women in Ms B's age group for cardiac concerns; and training has been provided to all staff on the new ECG process.
- Peer support workers have been introduced in the ED to provide support and engagement for patients presenting in times of vulnerability and stress.

47. Health NZ also told HDC that the following four ED risks have been escalated to regional and national leadership (and it continues to report patient safety concerns):

- significant patient safety and staff health and safety risks (no specific details provided by Health NZ);
- shortage of staff in the hospital ED;
- the hospital ED being too small for the number of presentations;
- lack of patient privacy and dignity in the ED.

48. Health NZ is also working on projects to fast track medical (cardiac) patients into the Assessment and Planning Unit for management plans, implement an intra-professional approach to patient care, in particular, between mental health and emergency medicine, and piloting an initiative to provide greater whānau support for patients in the hospital ED.

49. In response to the provisional opinion, Health NZ outlined the following further initiatives it is progressing to strengthen clinical assessment, documentation, workforce capacity, and ED infrastructure:

- Artificial intelligence scribe technology has been introduced in the ED to support clinical documentation.
- Health NZ is implementing Centric in EDs within the next six months. This introduces electronic notes and observations in the ED and will provide opportunities to build in mandatory assessment fields and prompts.
- A business case has been developed seeking additional ED medical staff across both senior and junior medical workforce groups.
- It has committed funding to a long-term redevelopment programme that includes construction of a new acute services block incorporating an ED with about three times the current capacity. Interim funding has also been approved to expand the size of the current ED in the shorter term.
- This case will be used as a learning opportunity within the ED.

Recommendations and follow-up actions

50. I acknowledge the changes already made by Health NZ following these events. In addition, I recommend that Health NZ:

- provide separate written apologies to Ms A and to Ms B's family for the failings outlined in this report, providing them to HDC for forwarding within three weeks of the date of this report;
- update HDC on the progress of work described in paragraph 49, including an assessment of the effectiveness of these changes and details of any further improvements identified, within three months of the date of this report;
- provide HDC with evidence of the effectiveness of the new ECG process, including whether abnormal results are recognised and escalated within an appropriate timeframe and following the appropriate pathway, reporting to HDC within six months, including any corrective actions to address any issues that may have been identified;
- present this investigation as an anonymised case study for clinical staff in the ED on the role of withdrawal and toxicity in diagnostic error; and
- provide HDC with a report on the current staffing mix and levels over the past year in the hospital ED, including a summary of VRM and recruitment.

51. A referral to the Director of Proceedings was considered because of the number of severe departures of care identified. However, I have given regard to Health New Zealand | Te Whatu Ora Hauora a Toi Bay of Plenty taking accountability for these failings and engaging with HDC throughout this investigation as well as the substantive improvements made since the time of these events in not progressing a referral.

52. A copy of this report with details identifying the parties removed, except Health New Zealand | Te Whatu Ora Hauora a Toi Bay of Plenty and my independent advisor, and placed on the HDC website, www.hdc.org.nz, for educational purposes.

Dr Vanessa Caldwell
Deputy Health and Disability Commissioner

Appendix A: Independent clinical advice to the Commissioner

The following independent advice was obtained from the emergency medicine specialist Dr Stuart Barrington-Onslow.

Independent clinical advice to Health and Disability Commissioner

Complaint:	**Ms B / Health NZ Hauora a Toi Bay of Plenty**
Our ref:	**22HDC02596**
Independent advisor:	**Dr Stuart Barrington-Onslow**

I have been asked to provide clinical advice to HDC on case number 22HDC02596. 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:	M.B.; B.S. FACEM Fully trained Emergency Medicine Specialist and working as such for the past twenty years.
Documents provided by HDC:	1. Letter of complaint …. 2. Health NZ's response …. 3. Health NZ's response …. 4. Clinical records from Health NZ covering the period [Wednesday and Thursday]. 5. Relevant sections of Health NZ's adverse event review summary. 6. Clinical records from St John covering [Wednesday].
Referral instructions from HDC:	1. Whether the assessment of Ms B by the ED was adequate/appropriate? Please include comment on the attribution of the symptoms to a psychological issue and absence of myocardial infarction as a differential diagnosis. 2. Whether the investigations undertaken by the ED were adequate/appropriate? Please consider the blood test and ECGs undertaken by the ED and any other investigations that may have been warranted. 3. Whether the management of ECG testing and actioning results by the ED was adequate/appropriate? Please comment on the delay between the first (3pm) and second ECG (8.46pm), and the delay in medical assessment of Ms B following the abnormal ECG result at 8.46pm.

	4. Whether the treatment provided by the ED was adequate/appropriate? Please comment on the administration of insulin, fluids and pain relief, noting the complaint and clinical records contain differing accounts about the administration of insulin. 5. Any other matters that you consider warrant comment or amount to a departure from accepted standards.

Factual summary of clinical care provided complaint:

Brief summary of clinical events:	Ms B, at the time of presentation to hospital on [Wednesday], was 47 years of age. She unfortunately died the following day, and a complaint has been made by her partner, Ms A, with permission from the family of Ms B. The basis of the complaint is documented below. • Clinician mis-diagnosed Ms B's condition and as a result, failed to provide correct treatment, which may have saved her life. Ms A was told that Ms B's bloods and E.C.G had been given the all clear and that there was no cause for concern. Later that day, another ECG was designated "quite peculiar". However, the doctor later changed his opinion to say that he was no longer concerned with the ECG and that Ms B could be safely discharged. • Clinician delayed potentially life-saving treatment, having falsely deduced that her condition was related to mental health, rather than any physical condition. • Staff failed to administer (or allowed drugs to be administered by her partner) insulin, which Ms B was dependant on as a type1 diabetic, despite tests showing Ms B was in a hyperglycaemic condition and her need for insulin being communicated to them on multiple occasions. Complications of diabetic ketoacidosis (DKA) include heart attack due to the build-up of ketones in the body. Moreover, DKA can also affect the brain, resulting in patient confusion and irritability, which supported the hospital's erroneous diagnosis of a "psychotic" episode. • Staff failed to provide fluids to Ms B, who had become dehydrated through multiple episodes of vomiting at home and in the ambulance prior to admission. • Clinician failed to provide or allow pain relief to Ms B, who endured more than 12 hours of agonising chest pain before the severity of her condition was recognised. • Clinician failed to provide the nursing team with any plan of care for Ms B during her initial protracted admission.

SEQUENCE OF EVENTS

I would like to note that Ms B has a complex medical and medication history [and] had recently moved with her partner [to this city]. It appears, from the notes I have read, that she had not registered with a general practitioner. Therefore, she would not have access to ongoing medications as the longest a prescription can last before needing to be repeated is three months.

Initial Concerns

[Wednesday], Ms A went to work as usual and received a phone call at approximately 11.30am from Ms B asking her to return home as she was not feeling very well. When Ms A found her partner, she was in marked distress with vomiting and clutching her chest complaining of pain. Ms A appropriately called the St John ambulance service.

Ambulance Assessment and Transport

The ambulance arrived promptly and made a good assessment of the situation as well as starting treatment with medication to ease Ms B's vomiting. It unfortunately did nothing for her symptoms, also they gave inhaled methoxyflurane as an analgesic agent, which again had little beneficial effect. The paramedics documented that Ms B [said] I've been unwell for three days with generalised body spasms, crampy chest pain amongst other symptoms. The vital signs taken were appropriate apart from a slightly raised blood pressure and a random blood glucose of 16.8mmol/l; she was a known diabetic on insulin. They also commented that Ms B had stopped several of her medications in the [previous] two weeks.

I have no concerns regarding the assessment and treatment by the St John team, who have done a fine job in a difficult situation.

Hospital – Triage

The arrival time at the hospital is stamped 13:33 hours, and the initial triage made her a category two; to be seen within 10 minutes. They documented that Ms B had been suffering with agitation and emotional, I assume lability, for a week and now had body spasms and generalised pain. Vital signs were normal.

In my opinion, the triage process was of a high standard.

	Hospital – Medical Review Ms B was seen by a medical officer in the emergency department. The notes were written in retrospect, and the timing of the notes was 3pm. The assessment was reasonable, and I note that chest pain was also documented on this note. The conclusion was in my opinion appropriate, but I would expect more input from the duty emergency department specialist. It is common knowledge that emergency departments throughout New Zealand are under a huge amount of stress due to chronic non-maintenance of staffing and equipment levels for several years, but despite this I would expect more input from the ED specialist. My specific issues are: 1. Although the medical officer was in my opinion correct in suggesting that part of Ms B's presentation was due to drug withdrawal, it appears the duty specialist did not adequately consider this. It had been documented that Ms B had recently discontinued several medications; I would expect an ED physician to be aware of the issues with respect to venlafaxine and gabapentin. The former agent needs to be carefully reduced as sudden discontinuation will lead to nausea, dizziness, agitation, confusion and restlessness. Withdrawal from gabapentin can cause similar issues, but [this] is much less common than those from venlafaxine. 2. An ECG in this type of presentation is essential, with the nursing staff making valiant attempts to obtain a decent record. Unfortunately, it appears from the notes that said ECG was unlabelled with a name and so removed from Ms B's medical chart. In such a situation, I would expect the person or persons who removed the ECG to request another from this patient as it is an essential requirement for such a presentation. Unfortunately, this was not done, and the first ECG I have access to is one taken at 20:46 hours and this, in my opinion shows an acute myocardial infarction (heart attack). I will explain the findings on the ECG for those who are not familiar with this test. *For the diagnosis of acute ST-elevation myocardial infarction (STEMI), you take into consideration the clinical presentation (which was blurred due to the effect of venlafaxine withdrawal), typical ECG changes, that are present on this tracing and elevated cardiac*

	biomarkers, ie, blood tests, that were not requested. ECG changes in STEMI are, for women, ST elevation of 1.5mm or more in leads V2 and V3 or 1mm in the other contiguous leads. Ms B's ECG showed 1mm of ST elevation in lead I and aVL, suggesting a high lateral infarction. These two leads are contiguous. Also, there is marked ST elevation in V2, V4–V6, suggesting an infarction of the anterior and lateral cardiac walls. 3. The blood tests taken during her presentation were essentially normal. She did have an elevated blood glucose, and this was appropriately treated in the department. Her blood gas analysis was also normal, and so she did not have DKA; [it] appears this was not made clear to the patient and her partner. As I have stated above, cardiac biomarkers were not requested when they should have been. 4. I suggest she was not medically cleared, and it was in my opinion an error to involve the psychiatric team. Nevertheless, I was impressed by the assessment and care provided to Ms B by that service. Indeed, the mental health team requested a review by the general medical team as they were concerned about an organic cause for her behaviour rather than a psychiatric one. There was discussion in the root cause analysis with respect to the medical clearance, and this is something the ED needs to clarify. 5. There appeared to be some confusion within the ED with respect to the self-discharge of Ms B, and one of the main issues was the perceived lack of communication and a plan going forward. I acknowledge that this is difficult in an overcrowded and understaffed department And I would encourage the [hospital] ED to consider this in case it is a generalised rather than single issue. ***Self-Discharge and Return to ED*** At 10 past midnight on [Thursday], Ms B and her partner decided to leave the hospital as it appears they were frustrated by the lack of a medical plan. It appears that the general medical team were going through the medical record before seeing the patient. From what they saw, a cardiac biomarker was requested, and they tried to contact Ms B to ask her to return to the hospital. Later that morning, Ms B deteriorated with increasing breathlessness and chest pain. An ambulance was called, diagnosed an acute STEMI, commenced treatment and transported her to [the hospital] ED, arriving at 03:08hrs. Ms B was critically unwell with her heart attack and heart failure. She was treated with appropriate therapies but showed no clinical improvement, so was referred to [a larger nearby]

	hospital for consideration of coronary angiography and further treatment. She arrived [there] but had a cardiac arrest from which she was unable to be resuscitated, and died.

Question 1: Whether the assessment of Ms B by the ED was adequate/appropriate? Please include comment on the attribution of the symptoms to a psychological issue and absence of myocardial infarction as a differential diagnosis.	
List any sources of information reviewed other than the documents provided by HDC	
Advisor's opinion	Please be aware that my only information I have regarding this matter is from notes that are never a completely accurate record of events, especially with the ongoing degradation of medical services by successive governments. My review of the documents after my first and subsequent reads leads me to the opinion that Ms B was suffering with venlafaxine withdrawal and an acute cardiac issue. The former explains the "behavioural" component of her illness, with the latter explaining the chest pain.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Severe No adequate ECG, and the non-recognition of an acute cardiac event when one was obtained at 20:46 hrs on [Wednesday].

How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	I have shown the aforementioned ECG, with no history except chest pain, and non-identified to specialist ED colleagues and RMOs in my department, and all put forward the correct diagnosis.
Please outline any factors that may limit your assessment of the events.	Above
Recommendations for improvement that may help to prevent a similar occurrence in future.	Was fatigue a factor? If so, need to urgently review the roster and staffing of senior doctors. If not, the department should consider ECG education for medical and nursing staff.

Question 2: Whether the investigations undertaken by the ED were adequate/appropriate? Please consider the blood test and ECGs undertaken by the ED, and any other investigations that may have been warranted.	
List any sources of information reviewed other than the documents provided by HDC	
Advisor's opinion:	As stated, the ECG should've been available much earlier in the assessment with staff encouraged to write a brief note on this investigation. I would suggest that if the ECG was taken earlier, then this would've led to appropriate cardiac biomarkers being requested. I acknowledge that the St John team had taken an ECG on [Wednesday]; however, I felt this was unreadable due to excessive baseline wander.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	Anyone who presents to an emergency department with a potential toxicological problem should have an urgent ECG to exclude cardiac toxicity. Also, anyone complaining of chest pain should also have the same test as well as cardiac biomarkers.

Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	This again in my opinion was a severe departure from standard of care as I explained above.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	
Please outline any factors that may limit your assessment of the events.	Above
Recommendations for improvement that may help to prevent a similar occurrence in future.	Departmental toxicology review at regular intervals coinciding with Junior doctor run changes.

Question 3: Whether the management of ECG testing and actioning results by the ED was adequate/appropriate? Please comment on the delay between the first (3pm) and second ECG (8.46pm), and the delay in medical assessment of Ms B following the abnormal ECG result at 8.46pm.	
List any sources of information reviewed other than the documents provided by HDC	
Advisor's opinion:	I received no ECG from 3pm, as it appears they were removed due to non-labelling of patient details. The delay in medical assessment following the ECG at 20:46 hours appears to be due to non-recognition of the acute cardiac event.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	I have said in my commentary that an ECG is essential in such presentations. And I would expect an emergency [physician] to recognise the abnormalities.

Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Severe. An ECG should've been made available and formally reviewed by a clinician within a reasonable timeframe of such a patient arriving in the ED. For example, 10 minutes.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	
Please outline any factors that may limit your assessment of the events.	I did not see the ECG taken at 3pm, but also there was no comment on it in the notes.
Recommendations for improvement that may help to prevent a similar occurrence in future.	Review the policy of taking and assessing ECGs in appropriate patient cohorts. An electronic record of ECGs would be most beneficial but unfortunately comes at a cost during a period when the government is trying to cut medical expenditure.

Question 4: Whether the treatment provided by the ED was adequate/appropriate? Please comment on the administration of insulin, fluids and pain relief, noting the complaint and clinical records contain differing accounts about the administration of insulin.	
List any sources of information reviewed other than the documents provided by HDC	
Advisor's opinion	The administration of insulin was appropriate, the client did not have DKA. Intravenous fluids, in my opinion, were not needed in this case. With respect to analgesia, this appeared to be neglected in this case. Ms B was already taking opiates and as such would need to maintain adequate analgesia otherwise she would withdrawal.

What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	The standard of care for someone in pain is to treat pain in a timely manner.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Severe Opiates are not recommended for chronic non-cancerous pain as they have too many side effects. However, someone who is on long-term opiates should be treated with adequate analgesia when they complain of pain, being aware that their requirements may well be higher than expected. The use of lorazepam was clinically indicated, but suggest the dosing was minimalistic.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	
Please outline any factors that may limit your assessment of the events.	Not knowing the prior medical issues with this client.
Recommendations for improvement that may help to prevent a similar occurrence in future.	A more senior presence in the department during shifts, so that the onus is not directed towards an overworked clinician.

Question 5: Any other matters that you consider warrant comment or amount to a departure from accepted standards.	
List any sources of information reviewed other than the documents provided by HDC	
Advisor's opinion	I wish to express my condolences to Ms A as well as the family of Ms B.

What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	
Please outline any factors that may limit your assessment of the events.	
Recommendations for improvement that may help to prevent a similar occurrence in future.	

By signing this report, I agree to HDC correcting any formatting, spelling, or grammar issues on the proviso that the substance of the report and any quoted material remains unchanged.
Signature: 
Name: Dr Stuart Barrington-Onslow
Date of Advice: 2022

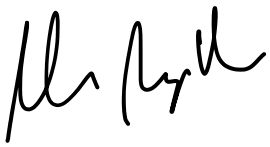
The following further advice was obtained from Dr Barrington-Onslow:

Response to My HDC Report on Ms B 22HDC02596

I see that most of my points are agreed with.

1. I have mentioned the delay in obtaining the ECG (see below).
2. An ECG is a time-sensitive and essential part of a toxicology assessment.
3. In my opinion, Ms B should have been adequately sedated to assess her medically as she was not cleared medically for a psychiatric review.
4. I completely accept the inadequacy of the staffing levels and that is why significant fault lies with the Ministry of Health and various Health Ministers. In an environment that is majorly under resourced and is put under extra stress due to another service that is decaying because of the same reasons, ie, primary care. Clinicians cannot be expected to provide high-quality care with the current lack of support for services.
5. The ambulance ECG is not normal in my opinion. It is sup-optimal, I presume because of Ms B's agitation, but it does show ST elevation in the inferior leads, II, III and aVF and T-wave inversion in aVL, suggestive of a cardiac event.

Yours faithfully,



Dr Stuart Barrington-Onslow