Nelson Marlborough District Health Board

A Report by the

Health and Disability Commissioner

(Case 15HDC00111)

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Executive summary

1. Mr A had a complex medical history including cardiac issues and a strong family history of myocardial infarction (heart attack).

2. In 2012, Mr A presented to the Emergency Department (ED) at a public hospital (Hospital 1) for a mental health assessment. He was discharged with a management plan in place. The following day, Mr A presented to the ED again after an incident of self harm. Mr A had a cardiac event and was diagnosed with an ST-segment elevation myocardial infarction (STEMI)[1] and he was transferred to the intensive coronary care unit (ICCU) at another public hospital (Hospital 2).

3. Further investigations were undertaken and Mr A was considered to have Takotsubo cardiomyopathy.[2] During the admission to ICCU, Mr A had routine blood tests taken, which showed a very abnormal troponin T result.[3] Cardiologist Dr E was not aware that the test had been ordered and was not informed of the result. At the time of these events at Nelson Marlborough District Health Board (NMDHB) it was necessary for patients to be declared medically fit for discharge so that they could be nursed in a mental health facility.

4. On Day 3,[4] Dr E reviewed Mr A and declared that he was medically fit for discharge, and he was transferred to the mental health facility that day. Mr A was to be observed every 10 minutes while in the mental health facility. On the morning of Day 4, Mr A was found deceased in his room. The manager of the mental health facility confirmed that the 10-minute observations had been adhered to overnight.

5. The Coroner found that the direct cause of death was cardiac arrhythmia[5] and that the antecedent cause was recent myocardial infarction. The Coroner found that Mr A died on or about Day 4.

Findings

6. Mr A's discharge from the ICCU was inappropriate in his circumstances. The severity of damage to Mr A's heart was not recognised, and troponin T levels were not used to guide his further management. Accordingly, Mr A was not provided with services with reasonable care and skill and NMDHB breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[6]

[1] A type of heart attack where an artery is completely blocked.
[2] A type of non-ischaemic cardiomyopathy (chronic disease of the heart muscle caused by coronary artery disease and myocardial infarctions) in which there is a sudden temporary weakening of the muscular portion of the heart. The weakening can be triggered by emotional stress.
[3] Troponin T is a highly specific marker for myocardial infarction or heart muscle cell death.
[4] Relevant dates are referred to as Days 1-4 to protect privacy.
[5] Irregular heartbeat.
[6] Right 4(1) of the Code states: "Every consumer has the right to have services provided with reasonable care and skill."

7. The NMDHB processes meant that the providers involved in Mr A's care did not cooperate appropriately to ensure quality and continuity of services. Accordingly, NMDHB also breached Right 4(5) of the Code.[7]

8. The documentation in this case was suboptimal. NMDHB failed to comply with legal standards, and accordingly, breached Right 4(2) of the Code.[8]

Recommendations

9. The Commissioner's recommendations to NMDHB include:

- Implement a system that requires the laboratory to alert the patient's treating clinician urgently (eg, by telephone) when troponin T results are abnormally high.
- Over the period of one month, in the mental health facility, audit the rate of cross-referencing information about overnight observations into the patient's clinical records (in cases where the patient has been subject to a formalised level of observations overnight).
- Review ED policies regarding the management of at-risk patients, to ensure that there is clarity about the status of such patients, the extent of any powers to detain, and the basis for liaison with Police, and provide evidence that staff have been trained on these matters.
- Review the terms of reference and/or guidelines related to the extended capacity of the Liaison Psychiatry Service and ensure that they address the concerns raised in this report, and provide quarterly statistics to HDC regarding the use of the service in other settings (eg, on medical wards).
- Provide a written apology to Mr A's wife for its breaches of the Code.

Complaint and investigation

10. The Commissioner received a complaint from Mr B, on behalf of Mrs A, about the care provided by Nelson Marlborough District Health Board to Mrs A's late husband, Mr A. The following issue was identified for investigation:

- *The appropriateness of the care provided to Mr A by Nelson Marlborough District Health Board in 2012.*

11. An investigation was commenced on 30 September 2015.

12. The parties directly involved in the investigation were:

[7] Right 4(5) of the Code states: "Every consumer has the right to co-operation among providers to ensure quality and continuity of services."
[8] Right 4(2) of the Code states: "Every consumer has the right to have services provided that comply with legal, professional, ethical and other relevant standards."

Mrs A	Complainant
Mr B	Complainant's representative
Nelson Marlborough District Health Board	Provider

Also mentioned in this report:

Mr C	Mr A's friend
Ms D	Crisis Worker
Dr E	Cardiologist
Dr G	Cardiologist
Dr H	Psychiatric registrar
RN I	Registered nurse

13. Information from the Coroner and ACC was also reviewed.

14. Independent expert advice was obtained from cardiologist Dr Ian Crozier (**Appendix A**) and psychiatric nurse Sally McPherson (**Appendix B**).

Information gathered during investigation

Background

15. Mr A had a complex medical history including ischaemic heart disease,[9] a non-ST-segment elevation myocardial infarction[10] in 2012 (following which a left anterior descending artery stent[11] was placed), hyperlipidaemia,[12] hypertension,[13] insulin-dependent diabetes,[14] obesity, and lumbar disc disease[15] (for which he had a lumbar spinal fusion[16] in 2011 but continued to experience decreasing function and ongoing pain). He had a strong family history of myocardial infarction[17].

16. Mr A had not had any previous contact with NMDHB Mental Health and Addiction Services (MHAS). The complainants told HDC that Mr A had experienced mental health issues related to his inability to work owing to his lumbar disc disease, and that Mr A had attended a three-week residential pain clinic about a month prior to his first presentation to Hospital 1.[18]

[9] A condition that affects the blood supply to the heart.
[10] A type of heart attack where an artery is partially, rather than completely, blocked.
[11] A small tube used to treat narrowed or weakened arteries.
[12] Raised cholesterol or triglycerides (a type of fat found in blood).
[13] High blood pressure.
[14] A metabolic disorder characterised by high blood sugar and a lack of insulin (the hormone that assists absorption of sugars from the blood to other body tissues).
[15] A condition that causes pain from damaged discs in the spine.
[16] Surgery designed to stop motion at a painful vertebral segment, to decrease pain.
[17] Heart attack.
[18] A facility that provides rehabilitation services.

First presentation to Hospital 1 Day 1

17. In the evening of Day 1, Mr A's friend, Mr C, called MHAS and spoke with Crisis Worker Ms D.[19] Ms D noted that Mr C was asking for advice as to where to get help for his friend, Mr A, after Mr A had an argument with his wife and left the family home. Mr A's wife had contacted the Police. The Police spoke with Mr A at Mr C's home and advised contacting the mental health crisis team. Ms D recorded that, according to Mr C, Mr A was not guaranteeing his safety and would not talk on the telephone. Ms D recorded "Nil known history of mental health problems or involvement with mental health services."

18. Ms D arranged a crisis assessment for Mr A at the Emergency Department (ED) at Hospital 1 that evening, with herself and a Crisis Worker/Duly Authorised Officer (DAO). At the assessment, Mr A reported a long history of relationship problems, and numerous physical health problems.

19. Ms D completed the Adult Mental Health Assessment form. Under the heading of Mental State Examination, she recorded that Mr A voiced suicidal ideation. She noted that after questioning, there appeared to be no evidence of intent to suicide. Ms D recorded diagnoses of a possible personality disorder and possible narcissistic personality traits, and assessed Mr A's risk to self as low. Under the heading "Past Mental Health History", Ms D recorded that Mr A "Denied any previous mental health problems, any past treatments, or involvement with mental health services".

20. The DAO completed the Suicide and Self Harm Risk Assessment form. She assessed Mr A as having a moderate risk of suicide/self-harm, documenting: "On assessment admitted ongoing thoughts of overdosing but with no clear intent in the presence of protective factors."

21. The management plan, as documented in the Adult Mental Health Assessment form, was for Mr C to remove Mr A's direct access to some of his medication, and for Mr A to attend an appointment with a psychiatrist the following day. After consultation with an ED doctor, Mr A was also prescribed two 7.5mg tablets of zopiclone[20] to aid with sleep. He and Mr C were given contact details for the Crisis Team and encouraged to make contact if required.

Second presentation to Hospital 1 Day 2

22. Mr A self-harmed in the morning of Day 2. Mr A called an ambulance and was taken to the ED at Hospital 1. An electrocardiogram (ECG) was performed, which showed a right bundle branch block,[21] with no changes from Mr A's previous ECGs. Blood tests were undertaken, his blood sugar levels were monitored, and a psychiatric assessment was arranged.

[19] A registered social worker.
[20] A medication used for the treatment of insomnia.
[21] A defect in the heart's electrical conduction system where the right ventricle is not directly activated by impulses travelling through the right bundle branch.

23. Mrs A presented to MHAS in a distressed state. She advised staff that Mr A was sending her text messages stating that he intended to kill himself once he left Hospital 1. Mrs A also notified the Police, who called the ED and requested that Mr A's cell phone be taken off him. Mr A became distressed and agitated when asked for his cell phone by ED staff, and refused to hand it over. About an hour after his arrival, Mr A left the ED. The medical record states that Mr A "escaped from dept … despite being on watch". However, there are no other references in the records to a formal arrangement regarding Mr A being required to remain in the ED. An orderly left the hospital to track Mr A. An ED nurse recorded: "Police informed and going to find [patient]." Mr A was returned to the ED by the Police shortly afterward. Another ED nurse recorded: "Apparently [Mr A] was running away from Police and was tackled to stop running." It is documented that the Police officers would "stay with pt till assessed" by MHAS.

24. However, following his return to Hospital 1, Mr A became nauseated, diaphoretic[22] and tachycardic.[23] Another ECG was undertaken, which showed ST-segment[24] elevation in anterolateral leads,[25] and Mr A complained of chest pain. An ST-segment elevation myocardial infarction (STEMI)[26] was diagnosed and Mr A was transferred to the High Dependency Unit (HDU). The planned mental health assessment was not undertaken, owing to Mr A's cardiac event.

25. Thrombolysis[27] was carried out in the HDU, followed by blood tests. Mr A's ST-segment elevation did not improve after 45 minutes, despite the thrombolysis. His case was discussed with cardiologist Dr E[28] at Hospital 2, and it was decided to transfer him there.

26. An MHAS staff member called the HDU. A registered Nurse (RN) documented: "[Mr A's family] at risk from verbal/mental abuse — consider [MHAS] review/involvement in [the town]."

Transfer to Hospital 2 Day 2

27. Mr A was flown by helicopter to Hospital 2. His transport documentation noted that his troponin T[29] level from a blood test taken earlier that day was normal at 8 ng/L (the normal level being less than 14 ng/L).

28. Coronary angiography,[30] left heart catheterisation,[31] left ventriculography[32] and coronary intravascular ultrasound (IVUS)[33] were carried out at Hospital 2 by

[22] Sweating heavily.
[23] Having a rapid heart rate.
[24] The ST segment is the flat, isoelectric section of the ECG between the end of the S wave (the J point) and the beginning of the T wave. It represents the interval between ventricular depolarisation and repolarisation.
[25] A finding on ECG where the ST-segment is abnormally high, indicating myocardial infarction.
[26] A type of heart attack where an artery is completely blocked.
[27] The pharmacological breakdown of blood clots.
[28] Dr E is vocationally registered in internal medicine.
[29] Troponin T is a highly specific marker for myocardial infarction or heart muscle cell death.
[30] A type of X-ray that uses a special dye and camera to take pictures of the blood flow in an artery.
[31] The passage of a catheter (thin flexible tube) into the left side of the heart.

cardiologist Dr G,[34] who reported: "All arteries patent[35] but [left ventricle] consistent with [significant anterior myocardial infarction] or Takotsubo.[36] IVUS [left anterior descending artery] showed no evidence of thrombus[37] making latter more likely." He recommended treating Mr A as having an acute coronary syndrome[38] and undertaking a repeat echocardiogram[39] in three months' time.

29. Mr A was admitted to the intensive coronary care unit (ICCU) and was reviewed by a house surgeon who noted that his angiography showed patent arteries but his left ventricle was consistent with significant Takotsubo cardiomyopathy. The plan was overnight observation and for Mr A to be discharged the next day, with a review and echocardiogram in three weeks' time.

30. Progress notes indicate that Police called the ICCU that night and advised that Mr A was calling and sending text messages to his family, stating that he was going to kill himself. The next morning, the Police called again. An RN documented: "Police phoned [regarding] continued texts received … [patient] states he wants to end his life. Police concerned [patient] will be [discharged] without any mental health consult." Mr A continued to express suicidal ideation throughout the morning.

31. Cardiologist Dr E reviewed Mr A that morning and noted that his chest pain was better, he had minor symptoms, sinus tachycardia,[40] and he had been stable medically overnight. Dr E recorded that Mr A was medically "fit for discharge". The plan was for mental health review and then a cardiac outpatient follow-up appointment and an echocardiogram in six weeks' time.

32. That morning psychiatric registrar Dr H carried out a psychiatric assessment of Mr A in the ICCU. Mr A reported longstanding relationship issues and expressed regret that his suicide attempt had not succeeded. Dr H concluded that Mr A had a possible narcissistic personality structure, multiple medical comorbidities, acute onset of suicidal ideation, and possible underlying depressive disorder. He assessed Mr A's risk of violence to others as moderate, and his risk to self as serious. Dr H's management plan included admitting Mr A voluntarily to the mental health facility

[32] A procedure where a catheter is advanced into the left ventricle of the heart to allow visualisation.
[33] A catheter-based system that allows physicians to acquire images of diseased vessels from inside the artery.
[34] Dr G is vocationally registered in internal medicine.
[35] Open.
[36] A type of non-ischaemic cardiomyopathy (chronic disease of the heart muscle caused by coronary artery disease and myocardial infarctions) in which there is a sudden temporary weakening of the muscular portion of the heart. The weakening can be triggered by emotional stress.
[37] A blood clot.
[38] A group of conditions due to decreased blood flow in the coronary arteries.
[39] A test that creates ultrasound images of the heart.
[40] Fast heartbeat caused by a heart rhythm in which the rate of impulses arising from the sinoatrial node is elevated.

with level B10 observations,[41] and a "low threshold for assessing under the [Mental Health Act]". He also prescribed zopiclone and lorazepam.[42]

33. Mr A's troponin T level from routine blood tests that had been undertaken by nursing staff earlier that day was available on the electronic system. The result was 8314 ng/L (very abnormal; normal level is less than 14 ng/L). Dr E was not aware of this result, and Mr A was discharged from the ICCU after the result became available. The blood test results were not included with the ICCU discharge summary, and it is not clear whether any staff were aware of the result at the time of discharge. The only instructions in the discharge summary regarding Mr A's cardiac care related to the planned follow-up appointment in six weeks' time.

Transfer to the mental health facility Day 3

34. Mr A was transferred from the ICCU to the mental health facility on Day 3. His recovery plan noted his chronic back pain and cardiac problems, and stated that the interventions for these were to monitor them and administer his prescribed medication.

35. That afternoon, a consultant psychiatrist [43] reviewed Mr A. The consultant noted that Mr A was tearful, had low energy, had a downcast mood and expressed suicidal ideation. The consultant diagnosed a severe major depressive disorder and recommended that Mr A remain in hospital, with a low threshold for use of the Mental Health (Compulsory Assessment and Treatment) Act 1992 (MHA).[44]

36. Later that day, a RN recorded that Mr A was depressed, weepy and suicidal with a plan, and that he would not give a clear answer when asked if he still had suicidal thoughts. The RN noted that Mr A remained a clear suicide and absconding risk, and that Mr A continued to state that he wanted to go home.

37. That night, another RN documented that Mr A had maintained a low profile during the afternoon and early evening, spending time lying on his bed, and that he had had a period of weeping during one-on-one time, where he stated that he wanted to be at home. Mr A requested pain relief during the evening and Dr H prescribed Maxolon[45] and paracetamol.[46] Mr A was also given zopiclone and lorazepam.

38. Sometime in the early morning of Day 4, RN I documented "slept" in the clinical records.

39. On the morning of Day 4, another RN entered Mr A's room and discovered that he was lifeless and non-responsive. He had no pulse and was not breathing. Dr H examined Mr A around 20 minutes later and declared him deceased. The RN

[41] Level B10 observations require the patient to be observed within 10 minutes.
[42] A benzodiazepine drug that is often used to treat agitation and anxiety.
[43] The consultant is vocationally registered in psychiatry.
[44] In certain circumstances the MHA can be used to compel patients to accept treatment for their mental disorder.
[45] An anti-nausea medication.
[46] A painkiller for the relief of mild to moderate pain.

subsequently documented that Mr A had been nursed on level B10 observations overnight.

40. NMDHB told HDC that following Mr A's death, the mental health facility Manager was called to attend and did so promptly. He confirmed with staff the levels of observation maintained overnight, and checked the sheet that records when observations are taken and by whom. However, the observation sheet was later destroyed, as the NMDHB procedure at the time was to destroy observation sheets routinely every month.

41. The Coroner found that the direct cause of death was cardiac arrhythmia[47] and that the antecedent cause was recent myocardial infarction. The Coroner found that Mr A died on or about Day 4.

Family concerns (via representative Mr B)

42. The family advocate, Mr B, told HDC that Mr A had mental health issues that had been escalating in the weeks leading up to his presentation to Hospital 1 on Day 1. Concerns were raised that, within 12 hours of being assessed by MHAS, Mr A self-harmed. It was also pointed out that Mr A absconded from the ED on Day 2, while supposedly under watch, and that the Police were called to bring him back, at which time he suffered a cardiac event.

43. Concerns were raised about Mr A's transfer from the ICCU to the mental health facility , but stated that the complaint centred on the level of care provided in the mental health facility. The complainants are concerned that Mr A was left without close observation or medical monitoring in the facility despite his numerous comorbidities including cardiac and self-harm issues.

NMDHB's internal investigation reports

44. NMDHB's initial internal investigation, completed in 2013, found that Mr A died of complications of a large myocardial infarction that had not been diagnosed definitively. The report recorded: "An abnormal lab result (extremely elevated troponin-T), which would have changed diagnosis and management, was not viewed prior to [Mr A's] discharge from [the ICCU]." It concluded that the troponin-T result was available electronically after Mr A had been reviewed by Dr E, but prior to his discharge from the ICCU to the mental health facility. The conclusion reached was that "[t]he patient may have survived if he had remained in [I]CCU".

45. NMDHB's initial internal investigation identified the key issues in this case as the availability of laboratory results in a timely manner, and the routine checking of all laboratory results prior to discharge. Recommendations were made for telephone notification by the laboratory of abnormal results of patients in the ICCU, and for the laboratory result field to be "required" on discharge documentation, so it cannot be left blank.

[47] Irregular heartbeat.

46. NMDHB undertook a further internal investigation in 2015. The report explained that level B10 observations are intended to note the presence of the patient, and to monitor for any mental health disturbance or agitation, in a way that is unobtrusive and promotes sleep. Observations are recorded on the mental health facility observation recording sheet, which is a record of all clients on observation in the mental health facility at any one time. At the time of these events, the sheets were the only record of observations conducted, and were destroyed routinely on a monthly basis.

47. The 2015 report stated that level B10 observations were maintained and recorded on mental health facility's observation recording sheet for Mr A, and that this was verified by the mental health facility Manager at the time. It stated that medical monitoring or treatment was not ordered or required, and staff had no concerns about Mr A's physical or mental well-being. The report noted that, when clients are transferred from the ICCU:

> "It is a requirement that they are medically cleared. [Mental health facility] staff do not have the expertise or resources to provide medical care … [Mr A] was thoroughly assessed and given a high level of mental health care and support from the MHS crisis team and inpatient services involved."

48. The 2015 report stated that, since this event, the role of Psychiatric Liaison Nurse has been established to assist communication and to provide more care options for medically unwell clients who have a mental illness. Changes have also been made to documentation requirements, including cross-referencing in clients' files that levels of observation have been maintained over a period of time, and retaining observation sheets for 10 years.

Further information — NMDHB

49. Dr G, on behalf of NMDHB, offered the following apology to Mr A's family:

> "I would like to convey my apology to [Mr A's] family that the blood result showing an elevated troponin level did not come to the treating team's attention so that it could be taken into account when planning the care provided to [Mr A]."

50. Dr G told HDC that, when diagnosing Mr A with Takotsubo cardiomyopathy, he took into account the following: the angiography showing patent arteries, the ventriculography showing new wall motion defects,[48] the IVUS showing fully patent stents and no sign of thrombus, the initial troponin T level of 8 ng/L,[49] Mr A's chest pain, the new ECG changes, and the context of an acutely stressful event. Dr G decided that, on balance, Mr A was likely suffering from Takotsubo cardiomyopathy, but should be treated as having an acute coronary syndrome in the first instance, given his background of ischaemic heart disease and the new wall motion defects.

51. Dr E told HDC that, following review of Mr A on Day 3, Dr E accepted the diagnosis of Takotsubo cardiomyopathy. Dr E noted that the angiography report indicated that

[48] Changes to the motion of a region of the heart muscle.
[49] Dr G's response states "18" ng/L but the results state "8" ng/L.

the diagnosis of Takotsubo cardiomyopathy was most likely, Mr A had only mild heart dysfunction with an estimated ejection fraction of 50%,[50] and Mr A had been stable medically overnight, with no further issues in regard to his cardiac condition, and no evidence of any unstable heart rhythms. Dr E was unaware that a troponin T test had been ordered, as, at the time of these events, troponin T test results were used for the initial diagnosis of acute coronary syndromes, not for the ongoing monitoring of a patient post-angiography. Dr G told HDC that there was no early warning system in place with the laboratories at the time to inform on-call doctors of such high troponin T results.

52. Dr E told HDC:

> "This case has caused me to reflect on my approach and to recognise that there are situations where a diagnosis should be questioned. With [Mr A] this might have led me to ask myself whether any other tests were required to help confirm the diagnosis, such as a Troponin T level, though these can be elevated to a modest degree in Takotsubo cardiomyopathy. I was unaware that the nursing team had arranged a Troponin T, and therefore did not chase up this result prior to his discharge … Had I known the level was so high, this would have meant it could not have been Takotsubo cardiomyopathy, and the management would have been altered accordingly."

53. Regarding the process at the time of these events, Dr G stated:

> "In [NMDHB] the mental health team will not become involved in a patient's care whilst they are receiving medical treatment and therefore it is necessary that patients have to be declared fit for discharge so that the patient can be nursed [in] the [mental health facility]."

54. Dr E explained that, as well as Mr A's physical condition, the decision to declare him medically fit for discharge was based on his immediate mental health requirements, as, at the time, MHAS would not become involved with patients receiving medical treatment. Dr E told HDC:

> "In view of the psychiatric history and the concerns expressed by the staff, I considered that the psychiatric issues were the most likely risk to his health in the short term. He had already attempted suicide in the previous 24 hours and continued to present suicidal ideation. There was both a flight risk and a potential health and safety issue to the staff given the lack of resources available to deal with the psychiatric aspects of his illness. I was aware of the need to declare him medically fit for discharge in order that he could be evaluated by the on call mental health team on the ICCU, and then receive the appropriate psychiatric care."

55. Dr E accepted that, had the circumstances been different and had Mr A not been acutely mentally unwell, he would have been discharged from the ICCU later. Dr E's

[50] The percentage of blood leaving the heart each time it contracts. A normal measurement is 60%.

concerns extended not only to the safety and well-being of Mr A, but also "the nurses and patients in cardiology given the lack of resources available to deal with the consequences of [Mr A's] psychiatric illness". Dr E stated:

> "I would like to conclude that I am deeply sorry for the outcome of this case. My actions to discharge the patient from medical care reflected my immediate concerns for his mental health and I considered this to be in his best interests at the time."

56. NMDHB said that Mr A's observations overnight on Day 3 were of a standard appropriate to manage suicidality or absconding, not the management of severe heart disease. NMDHB told HDC:

> "[Mr A] was not seen to be acutely suicidal or showing any mental health risks that would be of concern [in the mental health facility]. … He was in an area where monitoring of any AWOL risk and suicidality could be monitored. This was also balanced against his need for rest and that he was medically cleared as well. He was checked, but in a way that supported his mental health needs. On discovery … he was lying in bed as though sleeping in a restful pose with no disturbance of bedding or posture that would have alerted staff to an acute episode (physically or emotionally) or traumatic death. He would have appeared to be sleeping as most people would have, who had experienced the social and emotional stressors of previous days."

57. NMDHB explained that observation sheets are a convenient way for nursing staff to record the observations of all clients under observation at any one time, with any concerns documented in the client's clinical records. At the time of these events, it was standard practice to destroy observation sheets after approximately one month, as they lost clinical relevance and did not provide any ongoing clinical history for review.

Changes made

58. NMDHB has made a number of changes since this incident. A policy has been put in place to ensure that patients admitted with an acute coronary syndrome are not discharged until a rise and satisfactory fall of troponin T levels has been identified. A policy on electronic sign-off of all available blood results has been endorsed by the clinical governance team (but is not yet in place). This policy requires inpatient results to be reviewed at least twice daily. The Liaison Psychiatry Service's capacity has been increased, with a dedicated consultant and psychiatric nurse, to support care in the most appropriate medical or mental health location. Further, NMDHB has strengthened its observation protocols in the mental health facility, with a clinical decision made about the precise level of observation required for each individual patient, based on assessment needs. NMDHB told HDC that to improve accountability, observation sheets are now scanned and stored electronically for an indefinite period of time, and that it is in the process of transitioning to electronic sign-off of laboratory results with "tight business rules", which should make it harder to miss similar results.

Responses to the provisional opinion

59. Responses to the provisional opinion were received from Mrs A (via representative Mr B) and NMDHB. NMDHB had no further comment. Comments from the complainants have been incorporated into the report above where appropriate.

Opinion: Nelson Marlborough District Health Board

Hospital 1 care: Adverse comment

60. Mr A underwent a mental health assessment in the ED at Hospital 1. He voiced suicidal ideation and his risk to self was assessed by Ms D as low and by the DAO as moderate. The management plan was for Mr A to attend an appointment with a psychiatrist the next day. He was prescribed zopiclone to aid his sleep, and was given contact details for the crisis team. The next morning, Mr A self- harmed.

61. My expert advisor, psychiatric nurse Sally McPherson, advised me that the crisis assessment undertaken on Day 1 was satisfactory, with appropriate risk assessment and risk management. I accept this advice.

62. Mr A was taken to the ED at Hospital 1 on Day 2, after he self-harmed. He became agitated when ED staff asked him to hand over his cell phone and left the ED. It is recorded in the clinical records that this was despite him "being on watch". He was returned to the ED by the Police, who were to stay with him until he was assessed. An ED nurse noted that Mr A ran away from Police and was tackled to stop him running.

63. Ms McPherson advised me that an ED is not a locked unit, and Mr A had agreed to be assessed there. Ms McPherson noted that references to Mr A "escap[ing] from the department" inferred that he was not free to do so; however, there was no mention in the clinical records of concern for his capacity or consideration of using the compulsory treatment provisions of the MHA at that time. She noted that the level of watch is not documented, and it is not clear what constitutes "being on watch", leading to a question as to whether this practice was driven by ED culture or a formal protocol applied as individuals needed. I share Ms McPherson's concerns.

64. Ms McPherson also noted that it is not clear whether the Police were called when Mr A absconded because of concern for his welfare or for Mrs A's welfare. Ms McPherson advised that, when Mr A was returned forcibly by the Police, a decision should have been made about his consent, capacity, and the use of compulsory treatment. She further questioned who asked the Police to return Mr A, and under what legal justification.

65. Mr A was in the ED voluntarily, meaning he could leave of his own accord if he wanted to. Consequently, I am concerned about the emotive language used by staff in the documentation, in particular the comment that Mr A had "escaped" the ED. I also consider that the basis on which Mr A was to remain in the ED, was to be brought

back to the ED by Police, and would have the Police stay with him until he was assessed, should have been clearly and thoroughly documented.

66. I note that shortly after his return to the ED, Mr A became unwell and was diagnosed with a STEMI and transferred to the HDU then Hospital 2 for treatment. My expert advisor, cardiologist Dr Ian Crozier, advised me that "the myocardial infarction was promptly diagnosed and [Mr A] received the key time critical therapy directed towards reperfusion which minimises cardiac damage (thrombolytic treatment, transfer to [Hospital 2] and angiography)". I accept Dr Crozier's advice, and I have no concerns about this aspect of Mr A's care.

Hospital 2 ICCU care: Breach

67. Mr A was diagnosed with Takotsubo cardiomyopathy following angiography, ventriculography and IVUS at Hospital 2 on Day 2. Dr E accepted this diagnosis the following morning and declared Mr A medically fit for discharge to the mental health facility. Dr E's decision was based on Dr G's angiography report indicating that the diagnosis of Takotsubo cardiomyopathy was most likely, a belief that Mr A had only mild heart dysfunction with an estimated ejection fraction of 50%, and Mr A having been stable medically overnight.

68. Dr E was unaware that a troponin T test had been ordered on the morning of Day 3, and was not made aware when the troponin T was subsequently reported as abnormal because, at the time, there was no early warning system in place to alert on-call doctors to high troponin T results. Troponin T levels were also not used by NMDHB at that time for ongoing monitoring in the ICCU.

69. Dr E told HDC that the decision to discharge Mr A from the ICCU was also based on his immediate psychiatric requirements as, at the time of these events, the mental health team would not become involved in a patient's care whilst they were receiving medical treatment, and therefore it was necessary for patients to be declared fit for discharge so that the patient could be nursed in the mental health facility.

70. Dr Crozier advised me that Mr A's angiography appearances are consistent with Takotsubo cardiomyopathy or STEMI, but the latter was more likely as Takotsubo cardiomyopathy is a rare condition, usually seen in women and without marked troponin T elevation, Mr A had known coronary disease, and he was at risk of a major coronary occlusion[51] and acute myocardial infarction. Dr Crozier explained that the absence of a major coronary occlusion on the angiography is consistent with a thrombosis that has been lysed[52] by thrombolysis. He advised me that the diagnosis of myocardial infarction requires a typical rise and gradual fall of troponin, and that guidelines for the management of STEMI, current at the time of these events, recommend that troponin T levels be measured twice in the first 24 hours and at 24–36 hours, for both diagnostic reasons and as a guide to infarction size.

[51] The partial or complete obstruction of blood flow in a coronary artery, which can cause a heart attack.
[52] Lysis is the breaking down of the membrane of a cell.

71. Dr Crozier also advised me that the monitoring and management of Takotsubo cardiomyopathy and STEMI are similar, as both conditions are associated with the risk of subsequent complications, related to the degree of damage. He advised that Mr A had suffered a major myocardial infarction, as evidenced by the marked ECG changes, the ventricular arrhythmias on presentation, the impairment of the left ventricular function (which he considered was significant, with an estimated left ventricular ejection fraction of 30%) and the elevation of troponin T levels. Dr Crozier stated:

> "This put [Mr A] at high risk of subsequent complications including heart failure, shock, mechanical complications such as cardiac rupture, cardiac arrhythmias and death. Furthermore the sinus tachycardia noted on the ward round in ICCU was a warning sign of possible impending heart failure."

72. Dr Crozier considered that Mr A was not medically fit for discharge on Day 3, should not have been discharged from the ICCU, and should have remained under medical care with close observation, including continued heart rhythm monitoring. Dr Crozier advised that usual practice for a major STEMI is to monitor heart rhythm for a minimum of 48 hours (longer if the myocardial infarction is large or arrhythmias have occurred) and for the patient to be admitted for a duration of three to six days. In regard to the management of Takotsubo cardiomyopathy, Dr Crozier advised:

> "Some patients with minor damage from Takotsubo cardiomyopathy were discharged within 24 hours during the Christchurch earthquakes, but apart from these extreme situations a patient would normally be monitored for a minimum of 48 hours, with a hospital stay comparable to patients with myocardial infarction."

73. Dr Crozier acknowledged that Mr A also required psychiatric care, but advised me that it would have been better if Mr A had remained in the ICCU, with input from MHAS. I agree. Further, Dr Crozier advised that the handover was inadequate, as the mental health facility was not informed of the seriousness of Mr A's cardiac condition or the risk of complications, when he was transferred there. Overall, Dr Crozier considered the care provided to be a major departure from the standard of care for major STEMI.

74. I accept Dr Crozier's advice. While Takotsubo cardiomyopathy was a differential diagnosis, STEMI should not have been discounted and repeat troponin T levels should have been used for diagnostic reasons and to guide management. It is concerning that Dr E did not recognise the severity of the damage to Mr A's heart, and therefore his high risk of subsequent complications, or recognise that his sinus tachycardia was an early warning sign of possible heart failure.

75. It is unacceptable that Mr A was discharged from the ICCU 24 hours after his cardiac event. I am critical that the decision to discharge Mr A was clearly influenced by a system where medical clearance was required in order for a patient to receive psychiatric care, despite the fact that a large number of patients suffer from both medical and mental illnesses. This process meant that staff were not able to coordinate to provide the most appropriate care for Mr A.

76. I am also concerned that Dr E was not made aware that a repeat troponin T level had been ordered, and neither Dr E nor any other clinician were made aware of Mr A's abnormal troponin T test result and, accordingly, that it was not taken into account in planning his care. At the time of these events, NMDHB had no early warning system in place with the laboratories to inform clinical staff of such high troponin T results. This is suboptimal.

Conclusion

77. In my view, Mr A's discharge from the ICCU was inappropriate given his clinical circumstances. The severity of damage to Mr A's heart was not recognised, and troponin T levels were not used to guide his further management. Accordingly, I find that Mr A was not provided with services with reasonable care and skill and that NMDHB breached Right 4(1) of the Code.

78. I am critical that the NMDHB process meant that Mr A needed to be declared fit for discharge from the ICCU before he could receive appropriate mental health care, and that NMDHB systems failed to alert Mr A's treating clinicians to his repeat troponin T test, which had an abnormally high result. Finally, I am critical that the mental health facility staff were not made aware of the seriousness of Mr A's cardiac condition or risk of complications. I consider that the NMDHB processes meant that the providers involved in Mr A's care did not cooperate appropriately to ensure quality and continuity of services. Accordingly, I find that NMDHB also breached Right 4(5) of the Code.

79. I acknowledge that NMDHB has implemented some appropriate changes following these events, in particular having psychiatric liaison staff available to assist in the management of patients with both a medical and mental illness, developing a policy prohibiting patients with acute coronary syndrome from being discharged until a rise and fall of troponin T levels is seen, and developing a policy on electronic sign-off of all available results prior to discharge.

Mental health facility care: Breach

80. Mrs A raised concern that Mr A should have received closer observation and medical monitoring in the mental health facility, given his comorbidities and cardiac issues. In my view, this should have occurred, but in the ICCU. As set out above, I do not consider Mr A should have been discharged from ICCU and transferred to the mental health facility on Day 3, as that facility was not resourced appropriately for cardiac monitoring.

81. Mr A was placed on level B10 observations when he was transferred to the mental health facility to manage his suicidality and absconding risk, not to monitor his physical condition. He had been deemed medically fit for discharge from the ICCU, and the mental health facility staff were not informed of a risk of subsequent complications. Further, during his time in the mental health facility, Mr A did not exhibit any signs of physical distress. In these circumstances, I do not consider that it was unreasonable for staff to monitor Mr A on level B10 observations, rather than undertake closer observation and medical monitoring.

82. In the clinical records for the early morning of Day 4, there is one entry by RN I that says "Slept". Apart from that, there is no reference in Mr A's clinical records, until after his death, of level B10 observations being maintained. However, I have been informed that following Mr A's death, the mental health facility manager verified with staff that this had occurred and checked the observation sheets, which have since been destroyed. I consider it is more likely than not that level B10 observations were carried out, but I am concerned at the lack of documentation in the clinical records and the standard of the observations recorded there.

83. My expert advisor, Ms McPherson, noted that the mental health facility standard observation sheets document the presence of patients, but not their clinical well-being. She considered that observations recorded should reflect the reason for the patient receiving that level of monitoring and be used to inform care. Ms McPherson advised me that the least that would be expected is a note in the clinical records that the observation level was adhered to. She stated that common practice is to summarise the observations in the clinical records at the end of a shift, especially if it is known that the observations sheets are not kept, to convey that an assessment of the observations has been made and to facilitate the next decision around risk assessment and monitoring. Ms McPherson considered it a serious omission that information from observations was not recorded in Mr A's clinical records.

84. Ms McPherson also advised me that, while staff would not want to disturb Mr A's sleep, she would expect some note of his sleep pattern following medication for anxiety and sleep and, if he slept all night, note of his relaxation/agitation by comment on his sleeping position, toileting, response to room entrance and sleep noise/breathing/snoring.

85. I accept Ms McPherson's advice. Although NMDHB has implemented appropriate changes (providing for a more thorough assessment of the observation levels required, documenting in clinical records that levels of observation have been maintained, and electronically storing observation sheets), I am critical that these processes were not in place at the time, and that more detail or a summary of staff observations of Mr A was not documented in the clinical records. This Office has continually stressed the importance of clear and accurate documentation. As set out in the Health and Disability Services (Core) Standards,[53] consumer information must be accurately recorded, current, and accessible when required. In my view, the documentation in this case was suboptimal. I find that NMDHB failed to comply with legal standards, and accordingly, breached Right 4(2) of the Code.

Recommendations

86. I recommend that NMDHB:

[53] NZS 8134.1.2:2008, Standard 2.9.

a) Provide a written apology to Mrs A for its breaches of the Code. This apology should be sent to HDC for forwarding to Mrs A within three weeks of the date of this report.

87. I recommend that, within three months of the date of this report, NMDHB:

b) Provide HDC with a copy of the policy regarding the requirement of rise and satisfactory fall of troponin T levels prior to discharge from ICCU.

c) Finalise the policy requiring electronic sign-off of blood results.

d) Implement a system that requires the laboratory to alert the patient's treating clinician urgently (eg, by telephone) when troponin T results are abnormally high, and provide evidence to HDC that this has been implemented.

e) Over the period of one month, in the mental health facility, audit the rate of cross-referencing information about overnight observations into the patient's clinical records (in cases where the patient has been subject to a formalised level of observations overnight).

f) Review ED policies regarding the management of at-risk patients, to ensure that there is clarity about the status of such patients, the extent of any powers to detain, and the basis for liaison with Police, and provide evidence that staff have been trained on these matters.

g) Review the terms of reference and/or guidelines related to the extended capacity of the Liaison Psychiatry Service and ensure that they address the concerns raised in this report, and provide quarterly statistics to HDC regarding the use of the service in other settings (eg, on medical wards).

Follow-up actions

88. A copy of this report will be sent to the Coroner.

89. A copy of this report, with details identifying the parties removed, except the experts who advised on this case and NMDHB, will be sent to the Health Quality and Safety Commission, and DHB Shared Services, 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 cardiologist Dr Ian Crozier:

"My name is Ian George Crozier;
I am a registered medical practitioner and cardiologist.

I have been requested to provide an opinion regarding [Mr A] and the circumstances leading up to his death on [Day 4].

I have had medical interactions with [Dr E] and [Dr G], regarding mutual patients.

Material provided:

- Health and Disability commissioner's summary of case and request for advice.
- Post mortem report.
- Coroner's report.
- Letters from [Mr B] on behalf of [Mr A's] family 23/11/2014, 26, 27/01/2015.
- Copies of clinical notes: Nelson Marlborough District Health Board Notes [Days 2-4].
- Correspondence from Nelson Marlborough District Health Board in response to complaint March–July 2015.
- Reportable Event Brief from Nelson Marlborough District Health Board in response to [Mr A's] death.

Case summary:

Background: [Mr A] had significant medical problems including obesity, insulin dependent diabetes mellitus with poor control, and ischaemic heart disease with previous coronary stenting in 2012. There was a strong family history of premature coronary disease and premature cardiac death […].

[Previous admission]
Admitted to [Hospital 1] with chest pain. Transferred the following day to [Hospital 2].
Final diagnosis non ST elevation myocardial infarction.
Date of discharge not in documents provided or requested.
Coronary angiogram, mid left anterior descending stenosis treated with drug eluting stent.
Echocardiogram akinetic anterior wall left ventricle. Left ventricular ejection fraction 50%. Left ventricular hypertrophy.
Recommended to take Clopidogrel for 12 months to reduce the risk of stent thrombosis in a separate letter from the discharge summary. Patient was reported to be on this medication at the time of admission [in 2011].

[Day 1]
[Mr A…]… presented to the emergency department [Hospital 1] voicing suicidal ideation.

[Day 2]
[Mr A] [self-harmed] then called the ambulance.

[Day 2]
Patient assessed by ambulance staff and was transferred to [Hospital 1].
Electrocardiogram (ECG), sinus rhythm, right bundle branch block, q waves V1–5 consistent with prior anterior myocardial infarction. No acute changes.

[Day 2]
Triaged in the emergency department [Hospital 1]. […] Mental health team notified.

[Day 2]
Patient self-discharged, police notified.

[Day 2]
Taken back to [Hospital 1] by the police. He complained of shortness of breath and nausea. Observed to be diaphoretic, pulse 110–114 bpm. Glucose stable at 15.3.

[Day 2].
The ECG was abnormal and showed new and marked changes; sinus rhythm 102 beats a minute. Right bundle branch block. Q waves V1–4, Widespread ST elevation, V2–5, I aVL, consistent with a large acute antero-lateral ST elevation myocardial infarction, and previous anterior wall infarction.

[Day 2]
Treated with thrombolysis with Tenectaplase 50mg for ST elevation myocardial infarction.

[Day 2]
ECG unchanged.

[Day 2]
ECG, ST elevation more marked V2–5, and now present in leads II, III and aVF.

[Day 2]
Medical evacuation helicopter called for transfer to [Hospital 2].

[Day 2]
Medical evacuation helicopter leaves [Hospital 1] with [Mr A].
Amiodarone 300mg over 1 hour given for ventricular arrhythmias, Trigeminy and non-sustained ventricular tachycardia noted in transfer documentation.

[Day 2]
Medical evacuation helicopter arrives at [Hospital 2].

[Day 2]
[Hospital 2].
Urgent coronary angiogram reported as showing patent coronary arteries with no evidence of thrombus in the left anterior descending artery. Left ventricular angiogram consistent with significant anterior myocardial infarction or Takosubo (sic; Takotsubo) cardiomyopathy. (Cine images not provided).
Conclusion Takotsubo cardiomyopathy more likely than myocardial infarction. Treat as ACS (acute coronary syndrome (myocardial infarction)).

[Day 2]
Admitted ICCU ward [Hospital 2].
Patient comfortable.
Observed.

[Day 3].
ECG, sinus rhythm 89 bpm.
Right bundle branch block.
Poor R wave voltages.
Q waves V1–5.
Persisting ST elevation, though less marked, V2–6.

[Day 3]
Troponin T 8314 (normal <140 ng/L).
Blood drawn at this time, but result not available till later.

[Day 3]. ?? Time
Consultant ward round.
Noted that chest pain better. Minor symptoms. Sinus tachycardia. No arrhythmias.
Diagnosis: Likely Takotsubo cardiomyopathy.
Beta blocker dosage increased to Metoprolol 47.5mg bd.
Deemed medically fit for discharge with plans for outpatient follow-up.
Note: No further investigation such as an echocardiogram to assess cardiac function, though this was to be organised as an outpatient.

[Day 3]
Phone call from ICCU nurse to psychiatric team indicating he was still suicidal and medically cleared.

[Day 3]
Assessed by psychiatric registrar and nurse.
For B10 observation (observed within 10 minutes).
For transfer to [mental health facility].
No recommendation or report of cardiac physical sign monitoring in the documentation provided.

[Day 3]
Discharge time noted on medical record, no troponin result in discharge summary.

[Day 3]
[Mr A] admitted as a voluntary admission to the [mental health facility].

[Day 3]
Consultant psychiatric review.
Severe depression, suicidal.

[Day 3]
Blood glucose 14.8 (elevated).
Insulin as per protocol.

[Day 3]
Nursing note, patient lying on bed. Weeping at times.
[Mr A] requested pain relief.
Given paracetamol, maxolon, zopiclone and lorazepam.

[Day 4].
Found unresponsive in bed by nurse.
No pulse present.
Bell rung and 3 other nurses summoned.

[Day 4]
Psychiatric registrar rung.

[Day 4]
Patient examined.
No response.
Pupils fixed and unreactive.
No carotid pulse, breath sounds or heart sounds.

[Day 4].
Declared deceased.
Note: No record of any resuscitation attempts.

[Day 5]
Vitreous glucose from sample collected earlier that day 1.0mmol/L (Consistent with normal glucose at the time of death).

Post mortem:
Performed [Day 5]
Heart: Weight 600gms. Increased size and rounded contour.
Coronary arteries: Stent left anterior descending artery. Moderate atheromatous plaque circumflex artery.
Histology: Sections of the myocardium show an acute inflammatory infiltrate comprising neutrophils with myocyte necrosis, in keeping with an acute myocardial infarction of 1–2 days in age.

Comments include: Recent myocardial infarction. […] Cause of death: Acute cardiac arrhythmia following recent myocardial infarction.

Coroner's Findings:
Direct cause of death: Cardiac arrhythmia.
Antecedent cause: Recent myocardial infarction.
Other significant conditions: Type 1 diabetes.

Reportable Event Brief from [Hospital 2]:
Summary:
This patient died within 24 hours of transfer [to the mental health facility] from CCU.

The death resulted from complications of a large myocardial infarction which had not been definitively diagnosed in the CCU setting prior to the patient transfer.

An abnormal laboratory result (extremely elevated troponin-T) was not sighted by the treating team prior to the patient's transfer from CCU.

Awareness of the above result would have significantly changed the medical diagnosis and patient management in that he would have remained in the CCU setting on telemetry for a further 24–48 hours and received appropriate treatment for his MI and associated complications.

The patient may have survived if he had remained in CCU.

Subsequent correspondence from [Hospital 2]:
12/03/2015: …
Summarising a meeting with [Mrs A] (widow of deceased) in early 2015.

12/03/2015:
Detailing the results of a further review of [Mr A's] care in mid 2015.
In this report are summarised:

The nature of the observations conducted in the mental health facility.

That these observations had been routinely destroyed.

That there were no concerns about [Mr A's] wellbeing overnight.

That transfer to the mental health facility is dependent on them being medically cleared. Furthermore that the staff do not have the expertise or resources to provide medical care.

That unexpected deaths are uncommon in the mental health facility. However the review reported that the correct procedures were followed following his death.

That the standard of care provided by the mental health facility met standards.

18/06/2015: Dr G, cardiologist […].
Noting that the elevated Troponin result on [Day 3] did not come to the attention of the treating team and was not considered in planning his care.

He also states that it is uncertain what response the treating team would have made if aware of the troponin result. He notes that it is possible that there would have been more weight to the arrhythmiogenic risks of transferring a patient to an unmonitored area and the patient would have been kept in CCU.

Comment:
[Mr A] suffered a major cardiac event on [Day 2]. In my opinion this was an ST elevation myocardial infarction. Whilst the treating team diagnosed Takotsubo cardiomyopathy in my opinion this is less likely than a myocardial infarction as this is a rare condition seen usually in women and usually without marked Troponin elevation (Journal of the American College of Cardiology Imaging 2010;3;641–649). Furthermore the patient had known coronary disease and was at risk of a coronary occlusion and acute myocardial infarction. The absence of a major coronary occlusion on the coronary angiogram is quite consistent with a coronary thrombosis that had been lysed by the thrombolytic therapy. However whether the diagnosis was myocardial infarction or Takotsubo cardiomyopathy the subsequent monitoring and management would be similar as both cause myocardial damage and are associated with the risk of subsequent complications. With myocardial infarction the risk of complications is dependent on the size of the myocardial infarction and the degree of myocardial dysfunction, and it is likely a similar relationship exists with Takotsubo cardiomyopathy. In [Mr A's] case this was a major myocardial infarction as evidenced by the marked ECG changes, the ventricular arrhythmias on presentation, the impairment of left ventricular function on the angiogram and the elevation of Troponin. This put him at high risk of subsequent complications including heart failure, shock, mechanical complications such as cardiac rupture, cardiac arrhythmias and death. Furthermore the sinus tachycardia noted on the ward round in ICCU was a warning sign of possible impending heart failure.

In my opinion he should not have been discharged from cardiology on [Day 3], but should have been closely monitored in cardiology, including continued telemetry (heart rhythm monitoring).

If this had occurred the presumed arrhythmia that caused his death would have been promptly detected and treated and he may have been resuscitated.

The patient died in a mental health facility that would not be able to offer the same level of care as a medical facility. If he had been on a medical ward, but was not being monitored he would have likely received an attempt at resuscitation unless he had clearly been dead for some time as evidenced by being cold (there is no mention of his temperature when found deceased). The probability of successful resuscitation would be dependent on the time from the onset of his presumed arrhythmic event to when resuscitation was commenced. As there are only a few minutes' delay before resuscitation would be futile the probability of resuscitation would be low in an unwitnessed event such as he suffered.

I would regard many aspects of his cardiac care as excellent.

The myocardial infarction was promptly diagnosed and he received the key time critical therapy directed towards reperfusion which minimalizes cardiac damage (thrombolytic treatment, transfer to [Hospital 2] and angiography) in an exemplary fashion.

Unfortunately he also had a major depressive illness with competing requirements for treatments that may have influenced the treating medical team to accelerate his medical discharge. I note that in the reply from [Hospital 2] it is their policy for a patient to be medically fit before the patient can be transferred to the mental health facility. In [Mr A's] case it would have been better if he had remained on the medial ward, but received input from the psychiatric service.

Specific advice required:

Was [Mr A] appropriately managed considering his presenting symptoms and known family history?
Whilst much of his medical care during his final admission was excellent, he was discharged from cardiology care prematurely, and should have remained under medical care with close observation for some days. [Mr A] had suffered a major myocardial infarction and was at risk of complications including the presumed cardiac arrhythmia which caused his death. Had he been monitored at the time of this event he may have survived.

Nelson Marlborough's response advising that in 2012, it was not routine to use troponin T testing as ongoing monitoring for patients post angiography. Please clarify if this was standard practice in New Zealand in 2012?
Disagree.

Troponin is used for both the diagnosis of myocardial infarction, and to estimate the size of myocardial infarction.

The management of ST elevation myocardial infarction has published guidelines for New Zealand that were current at the time of [Mr A's] admission. (NZ Medical Journal 2005;118:1–19). In these guidelines it is recommended that Troponin be measured twice in the first 24 hours, and at 24–36 hours for both diagnostic reasons and as a guide to infarction size.

The diagnosis of myocardial infarction requires a typical rise and gradual fall of troponin or other biochemical markers of myocardial necrosis with at least one of the following:

a) ischemic symptoms;
b) development of pathologic Q waves on the ECG;
c) ECG changes indicative of ischemia (ST segment elevation or depression); or
d) coronary artery intervention (e.g., coronary angioplasty).

(Journal of the American College of Cardiology 2000;36:959–969)

In [Mr A's] case cardiac injury, either myocardial infarction or Takotsubo cardiomyopathy was already highly likely with the clinical presentation and ECG changes. The elevated troponin confirmed the diagnosis.

Was it standard practice in 2012 to discharge a person with Takotsubo cardiomyopathy within 24 hours?
As noted previously whether the diagnosis is Takotsubo cardiomyopathy or myocardial infarction the risk of complications is related to the degree of damage.

In [Mr A's] case he had extensive cardiac damage and discharge at 24 hours was not appropriate.

Some patients with minor damage from Takotsubo cardiomyopathy were discharged with 24 hours during the Christchurch earthquakes, but apart from these extreme situations a patient would normally be monitored for a minimum of 48 hours, with a hospital stay comparable to patients with myocardial infarction.

In your opinion, was [Mr A] medically fit for discharge to the [mental health facility] on [Day 3]? If not please clarify.
No.

He had a major myocardial infarction and should have remained under medical care. Common practice in New Zealand for a major ST elevation myocardial infarction would be to monitor heart rhythm for a minimum of 48 hours, and longer if the myocardial infarction was large or arrhythmias had occurred and for an admission duration of 3–6 days. In the American College of Cardiology guidelines for ST elevation myocardial infarction (Journal of the American College of Cardiology 2004;44:e1–e211), the implied minimum length of stay for an uncomplicated ST elevation myocardial infarction is 3 days.

Did CCU provide an appropriate handover to [the mental health facility]?
No. The seriousness of the cardiac condition and the risk of complications was not stated.

In addition, we would appreciate it if you could clarify the following:
What is the standard of care/accepted practice?
As noted above the patient should be hospitalised under medical care for 3 to 6 days and heart rhythm monitored for a minimum of 48 hours.

If there has been a departure from the standard of care/accepted practice, how significant a departure do you consider it?
The care was a major departure from the standard of care for major ST elevation myocardial infarction.

How would it be reviewed by your peers?
I believe my colleagues would regard [Mr A's] discharge as premature."

The following further expert advice was obtained from Dr Crozier:

> "My name is Ian George Crozier;
> I am a registered medical practitioner and cardiologist.
>
> I have previously provided an opinion regarding [Mr A] and the circumstances leading up to his death on [Day 4].
>
> I have been asked to review the responses from Nelson Marlborough DHB (5 November 2015) and [Dr E] (25 November 2015).
>
> **[Dr E] (25 November 2015).**
>
> I note that [Dr E] reports 'There was only mild heart dysfunction with an estimated ejection fraction of 50% (normal 60%)'.
>
> In my report I concluded the patient had suffered a major myocardial infarction with extensive cardiac damage based on the report of the left ventricular angiogram, the ECGs and troponin elevation.
>
> A left ventricular ejection fraction of 50% would indicate that the degree of myocardial damage was not as extensive as I had concluded and would warrant a modification to my report.
>
> However it is difficult to reconcile the reported ejection fraction of 50% with the angiogram report of significant anterior myocardial infarction or Takotsubo cardiomyopathy. Furthermore the patient had previously had a reported left ventricular ejection fraction of 50% in 2012, and further myocardial damage would normally be expected to cause some further deterioration of left ventricular function.
>
> I would be happy to view the left ventricular angiogram to reconcile these incongruities, and amend my report if the left ventricular angiogram was consistent with a left ventricular ejection fraction of 50%.
>
> I note [Dr E's] comments regarding the difficulty of managing a cardiac patient with a serious psychiatric condition and that [Dr E] managed the patient in what [Dr E] believed were his best interests.
>
> I note that changes have been made to allow closer liaison between mental health services and the medical teams to allow for the former to be more actively involved in the care of patients who are on a ward.
>
> **Nelson Marlborough DHB (5 November 2015)**
>
> I note and concur that it is challenging to manage patients with multiple presenting issues."

The following further expert advice was obtained from Dr Crozier:

> "My name is Ian George Crozier;
> I am a registered medical practitioner and cardiologist.

I have previously provided an opinion regarding [Mr A] and the circumstances leading up to his death on [Day 4].

I have previously provided an addendum in response to Nelson Marlborough DHB (5 November 2015) and [Dr E] (25 November 2015).

I provide this further addendum following receipt and review of the left ventricular angiogram.

The left ventricular angiogram is recorded in a right anterior oblique view. It shows markedly reduced left ventricular contraction at the apex, infero-apical and antero-apical segments, whilst the basal left ventricular contraction appears normal. Overall the appearances are consistent with Takotsubo cardiomyopathy or an extensive anteroapical myocardial infarction. Overall the left ventricular function is significantly reduced. I estimate the left ventricular ejection fraction to be 30%.

In the addendum from January I made the following comments in response to [Dr E's] response.

I note that [Dr E] reports 'There was only mild heart dysfunction with an estimated ejection fraction of 50% (normal 60%)'.

In my report I concluded the patient had suffered a major myocardial infarction with extensive cardiac damage based on the report of the left ventricular angiogram, the ECGs and troponin elevation.

A left ventricular ejection fraction of 50% would indicate that the degree of myocardial damage was not as extensive as I had concluded and would warrant a modification to my report.

However it is difficult to reconcile the reported ejection fraction of 50% with the angiogram report of significant anterior myocardial infarction or Takotsubo cardiomyopathy. Furthermore the patient had previously had a reported left ventricular ejection fraction of 50% in February 2012, and further myocardial damage would normally be expected to cause some further deterioration of left ventricular function.

I would be happy to view the left ventricular angiogram to reconcile these incongruities, and amend my report if the left ventricular angiogram was consistent with a left ventricular ejection fraction of 50%.

Following viewing of the left ventricular angiogram I have not modified my report, and the conclusions reached."

Appendix B: Independent advice to the Commissioner

The following expert advice was obtained from psychiatric nurse Sally McPherson:

"Re [Mr A] (dec)/Nelson Marlborough District Health Board

C15HDC00111

1 — Review of nursing notes [Days 3-4]
There is an absence of referral to the B10 observation protocol in these notes that makes it impossible to comment on whether the regular checks were carried out as the only documented times are from cross referencing BSL and insulin administering times, and medication administration. Reference to B10 observations are made only following [Mr A's] death. The nocte note makes no reference to his sleep pattern following medication for anxiety and sleep. If he slept all night I would expect some note of his relaxation/agitation by comment on his sleeping position, toileting, response to room entrance, sleep noise/breathing/snoring. While I appreciate that staff would not want to disturb [Mr A's] sleep, I have no confidence that he was regularly observed. I would have expected a summary of the B10 observations to be made in the nursing notes (especially if it was known that such separate recording are not kept.)

2 — Mental health observation chart destruction on a monthly basis
It is now more common for DHBs moving to paperless/computer based documentation to remove paper work designated as not 'core' information. However it should be seen as necessary that this information is transcripted to the saved core document systems. It would be safe practice to summarize the B10 observations at the end of a shift to convey that an assessment of these has been made and to facilitate the next decision around risk assessment & monitoring. I am assuming that the B10 chart records more than sighting of the patient has occurred.

3 — Documentation to indicate that B10 protocol was followed
There is no documentation to give me confidence that [Mr A] was observed every 10 to 30 minutes. The inability to name a day of death indicates to me that observation skills need to be reviewed by the DHB.

4 — Standard of care/accepted practice
The least that would be expected is that at the start of each shift a note is made that the observation level was adhered to. (As contrasted to the medication comments.) It would be good and common practice to summarize the observations in the nursing notes to inform other staff, and to assist with reviewing the risk and risk management strategies.

5 — Departure from standard of care
I consider the omission of information being recorded in nursing notes from a regular plan of observations serious. This would be less serious if there existed a protocol stating when and how this information is assessed and how it is evaluated. And was used alongside the chart recording that observations were

made at the indicated times. However, observations are only pertinent to care when they are used to inform that care and I do not see an indication that shows thoughtful use of the observations. The protocols show that tasks can be checked but give little support to their content and process that reflects the mental health needs of patients/consumers. My thoughts are that these protocols are similar in many DHBs and are more focussed on outcome audits than guiding the process of care.

6 — Peer opinion
It would be perceived as poor care to not summarize or make sense of the information gained from the regular observations. I am unable to comment on the actuality of the observations or their quality as there is no record of them occurring or their content.

I am saddened that [Mr A's] family are not able to know when he passed, which may contribute to their concern about his care."

The following further expert advice was obtained from Ms McPherson:

"Addendum on [Mr A] (dec) reference C15HDC00111

1 — **The appropriateness of the [Hospital 1] ED assessment on [Day 1]**

The assessment was performed to a level satisfactory to peers in similar situations. It was completed using the prompted documentation of the NMDHB.

Appropriate risk assessment was carried out and documented.

Risk management was also appropriate and documented.

Eg […] minimal medication to help sleep was provided […] (2 x 7.5 mg Zopiclone).

There was appropriate on referral.

Omitted from the information was the type and provision of case review and supervision provided to clinicians. I am sure it occurs, but for fullness should be included in assessment information, as a support to the assessment. […]

ED care [Day 2]
An emergency department is not a locked unit, [Mr A] had agreed to be assessed there. After a disagreement about the use of his phone calling his wife, he left.

Issues — 1) Police were sent, why is not explained. Was it concern for [Mr A] or his wife?

— 2) [The DHB's] letter describes [Mr A] as 'escaped from department' which carries an inference that he was not free to do so, but there is no mention of concern for his capacity, or consideration of using the 'Mental Health Act'.

— 3) The level of 'watch' is not specified or documented except for the 10 minute observations documented over a 20 minute period and the use of Police to observe from his return.

I cannot find documentation of what constitutes 'being on watch' and wonder if it is ED culture rather than a formal protocol applied as individuals need. I suggest that conscious assigning of a patient to 'on watch' should include the nature of the contact/observations, and periodicity clarified, and a staff member assigned the task.

— 4) I note that he was returned by Police after being tackled and returned. At this point of use of force a decision should have been made about his consent, capacity and use of compulsion. [Mr A] does not seem to have been in a discussion about his behaviour and options available to him as treatment choices or staff's response in asking for police assistance. Many units use 'Duty of Care' as the reason for restraining patients in their best interests. This is a grey area and I think the issues around consent, capacity, judgement and agreeing/refusing care is a topic needing more robust medico-legal discussion. The role of Police also needs to be considered. Who asked them to return [Mr A], under what legal justification, and their subsequent role in maintaining an observation role.

— 5) Video surveillance is mentioned but does not explain what this entails nor who is responsible for checking it, nor whether it was involved in finding [Mr A] absent.

Response from NMDHB
Re nocturnal observation. I agree that it is reasonable not to wake someone who has had a stressful day. However no one stays in the same position all night and the restlessness or peacefulness of the sleep is usually noted.

Re response about the B10 observation chart. They seem a limited method of documenting the presence of patients but not their clinical wellbeing, meaning they serve as a way of allocating tasks not patient centred care.

Any observations recorded should reflect the reason for that patient receiving that level of monitoring.

The lack of knowledge about the troponin level seems to me to have been an important piece of information crucial to the overall risk management of [Mr A]. It is regrettable that it was not available for consideration before the priority was assigned to make the mental illness issue take precedence over his physical needs."