Southern District Health Board

A Report by the
Deputy Health and Disability Commissioner

(Case 19HDC02279)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided to a man (now deceased) by Southern District Health Board (SDHB) in 2019.

2. The man presented to the Emergency Department (ED) at the public hospital with back pain. During the initial evaluation, the man was feverish and had an elevated body temperature of 38°C. Blood cultures, blood tests, and X-rays of the chest and lower spine were ordered.

3. The man was admitted to the Orthopaedic Ward. However, owing to a lack of inpatient hospital bed capacity, the man was unable to be physically transferred to the Orthopaedic Ward and was required to remain in ED overnight. The man received care from both the ED and the Orthopaedic Department while he was "boarding" in the ED.

4. The man was found to have tested positive for a bacterial infection, and his condition continued to deteriorate overnight. He had low blood pressure that remained untreated, and his urine output was not measured overnight. Medical staff also had difficulty locating the observation chart in ED.

5. These failures are service delivery failures attributed to the man's prolonged stay in the ED, and a lack of understanding by staff as to their responsibilities for the man's care.

Findings

6. The Deputy Commissioner found that SDHB breached Right 4(1) of the Code as it is responsible for the service delivery failures, and thereby failed to provide the man services with reasonable care and skill.

7. The Deputy Commissioner recommended that SDHB provide a written apology to the family for the failings identified in this report.

8. The Deputy Commissioner also recommended that SDHB provide HDC with an update on the development, implementation, and effectiveness of the escalation plan for the public hospital. It is recommended that SDHB also develop a formal policy and procedure in relation to access block, ensuring alignment with the ACEM guidelines to define the responsibility between different teams and to manage risk.

9. Further, the Deputy Commissioner recommended that SDHB review its current system for storing of observation charts in ED, and implement a system for storage of observation charts in ED so that these can be easily located and readily available to medical staff.

10. The Deputy Commissioner also recommended that SDHB provide training to staff on the importance of assessing a patient's vital signs, the recognition of critical illness and symptoms of septic shock, and the escalation of care and coordination between departments.

11. The Deputy Commissioner recommended that this report be used as a basis for staff learning at SDHB.

Complaint and investigation

12. The Health and Disability Commissioner (HDC) received a complaint referred from the Office of the Ombudsman. The complaint was made by Mrs A (now deceased) and Mrs B, about the services provided to Mr A (deceased) by Southern District Health Board (SDHB). The following issue was identified for investigation:

- *Whether Southern District Health Board provided Mr A with an appropriate standard of care in 2019.*

13. This report is the opinion of Deputy Commissioner Deborah James, and is made in accordance with the power delegated to her by the Commissioner.

14. The following parties were directly involved in the investigation:

Mr A	Consumer
Mrs A	Complainant/Mr A's wife
Mrs B	Complainant/Mr A's daughter
Southern District Health Board	Provider

15. The following people are also referred to in this report:

Dr C	Medical officer special scale (MOSS)
RN D	Registered nurse (RN)
Dr E	Emergency medicine consultant
Dr F	Senior house officer (SHO)
Dr G	House officer
Dr H	Senior registrar
RN I	Registered nurse
RN J	Registered nurse
Dr K	Registrar
RN L	Registered nurse
Dr M	ED consultant
Dr N	ED consultant
Dr O	ED consultant

16. Independent expert advice was obtained from an emergency medicine specialist, Dr Tom Jerram (Appendix A).

Information gathered during investigation

Introduction

17. This case concerns the care provided to Mr A, aged in his seventies at the time of events, during his admission to a public hospital in 2019 with sepsis.[1] The public hospital is managed and funded by SDHB. Sadly, Mr and Mrs A have both since passed away. I take this opportunity to extend my sincere condolences to the family.

Care in Emergency Department

11 March 2019

18. On 11 March 2019 at approximately 10am, Mr A presented to the Emergency Department (ED) at the public hospital by ambulance with back pain after some heavy lifting the previous day.

19. Mr A had a complex medical history, including, but not limited to, valvular heart disease,[2] an irregular heart rhythm, and high blood pressure.

20. At 10.23am, Mr A was reviewed by Dr C, an ED MOSS.[3] During the initial evaluation, Mr A was feverish with a temperature of 38°C.

21. Dr C told HDC that Mr A's initial presentation had many potential different diagnoses, including back pain with a concurrent infection, infection within his abdomen, and the less common diagnosis of spinal abscess/discitis.[4] Initially, Mr A was treated with pain relief, and investigations were commenced.

22. Dr C ordered blood cultures at 10.58am. She also requested blood tests and X-rays of the chest and lower spine, the results of which were received at 12.11pm. Dr C documented the blood results at 1.04pm, which indicated an infection, but were not specific to any type of infection.

23. At 1.59pm, after having obtained approval from the on-call radiologist, Dr C submitted a request for a CT scan[5] of Mr A's abdomen to "look for [the] focus of infection". Dr C also recorded that an MRI[6] would possibly be required.

[1] Sepsis is a life-threatening complication of an infection.
[2] Valvular heart disease refers to several disorders and diseases of the heart valves, which are the tissue flaps that regulate the flow of blood through the chambers of the heart.
[3] A MOSS is a non-training position for a doctor who has yet to specialise or gain a postgraduate qualification, or an international medical graduate who has a postgraduate qualification from overseas but is not eligible for a consultant role because they do not meet the requirements for a vocational scope of practice.
[4] Discitis is an infection of the discs between the vertebrae of the spine.
[5] Computed tomography — used in radiology to obtain detailed images of the body non-invasively for diagnostic purposes.
[6] Magnetic resonance imaging — used in radiology to form pictures of the anatomy and the physiological processes of the body.

24. Dr C said that generally, antibiotics are not commenced in ED until such time as a clear focus of infection is known, or the patient becomes septic, neither of which had occurred while Mr A was under her care.

25. At 4.36pm, while awaiting the CT scan, RN D recorded in the clinical notes that two additional doses of morphine [7] were administered and intravenous (IV) fluids were requested. The clinical notes also record that Mr A's blood pressure had dropped from 105/60mmHg to 105/55mmHg at that time.[8]

26. The results of the CT scan were obtained at approximately 5.00pm, and Dr C handed over Mr A's care to Dr E, an ED consultant.

27. Dr E told HDC that the CT scan showed some fat stranding[9] around Mr A's kidneys, but there was no sign of infection in Mr A's urine. There was no mention of pneumonia or any cause for a fever or sepsis within Mr A's abdomen, and no discitis was seen on the CT scan.

28. Dr E said that the cause of Mr A's back pain and fever was not clear at that time, and he spoke to the radiologist regarding the CT scan findings. Dr E considered that Mr A's back pain could be explained by a musculoskeletal strain, as it had come on during lifting. However, Dr E noted that it was difficult to control Mr A's pain, and he also had a fever.

29. Dr E said that he was still concerned that Mr A might have discitis, but it was not clear whether he was septic at that time. Dr E explained that Mr A's low blood pressure was presumed to be from morphine and dehydration, and as the source of infection was not clear, "no antibiotics were considered" at that time.

30. As discitis or an epidural abscess had not been ruled out by the CT scan, Dr E arranged for an MRI to be completed the following morning. Dr E also recorded that Mr A would require ongoing morphine to control his pain. Dr E noted that he would ask the Orthopaedic Department to see and admit Mr A.

31. At 7.20pm, Mr A was examined by Dr F. Dr F was employed as a senior house officer in the Orthopaedic Department in March 2019, and was responsible for Mr A's admission under the Orthopaedic team. From this point, care of Mr A was officially transferred to the Orthopaedic team, and Mr A began "boarding" in the ED until he could be transferred to the Orthopaedic Ward.

32. Dr F did not assess Mr A's vital signs. She recorded that Mr A was not feverish, but noted his temperature of 38°C earlier in the day. Dr F told HDC:

[7] A drug used to relieve moderate to severe pain.
[8] A blood pressure reading lower than 90 millimetres of mercury (mmHg) for the top measurement (systolic) or 60mmHg for the bottom measurement (diastolic) is generally considered low blood pressure.
[9] "Fat stranding" is a term used to describe the appearance of fat on a CT scan. It is suggestive of inflammation.

> "I recall that it was often difficult to locate the observation chart for patients in ED but cannot recall if this omission from my notes is because I incorrectly assumed his observations were ok or whether I could not locate the observation chart."

33. Dr F's plan was to admit Mr A to the Orthopaedic Ward and await the results of the blood cultures ordered at 10.58am, and the results of the MRI, which was scheduled for the following morning. Dr F did not prescribe antibiotics, but noted: "[F]or abx [antibiotics] if becomes acutely unwell."

34. At 8.11pm, RN D recorded that Mr A had received two litres of IV fluids and no longer had low blood pressure. Mr A's blood pressure was 135/65mmHg at that time. At this point, RN D noted that the hospital was in "access block", meaning that no patients could be transferred from the ED because of a lack of inpatient hospital bed capacity. As a result, Mr A was required to remain in ED overnight, so that he could have his MRI the following day.

35. At 10.40pm, RN D noted that Mr A was feverish, and the Orthopaedic Department was made aware of this. RN D recorded in the clinical notes:

> "[H]ave informed ortho reg, [Dr F], of this. Blood cultures have already been done earlier so no need to do this; will just observe for now; have been told that as long as obs stay within normal limits then no IV abs [intravenous antibiotics]."

36. Dr F said that she was not made aware of Mr A's low blood pressure, and feels that she was not adequately informed of the deterioration in Mr A's vital signs when she spoke on the telephone to RN D. Dr F stated:

> "It is difficult due to poor documentation as I was not in the hospital at the time of the phone call and the nursing documentation of the phone call and the on-call house officer's documentation of the prescription of antibiotics was unclear. As per the guideline … I feel it [antibiotics] was considered but I was awaiting results of the blood culture … I was not made aware of [Mr A's] low blood pressure[10]. If I had been aware, I feel my usual practice would have been to review him prior to registrar handover at 0730."

37. RN D continued to observe Mr A. At approximately 11pm, the laboratory called the ED to advise that Mr A's blood cultures were positive for *Staphylococcus aureus*.[11] The laboratory also called Dr F to advise her of Mr A's positive blood culture results.

38. Dr F instructed Dr G, the on-call house officer at the time, to chart antibiotics, and Dr G charted IV Augmentin[12] at 11.17pm.

[10] This refers to Dr F's review of Mr A at 7.20pm on 11 March 2019.
[11] Bacteria that can cause a range of illnesses, from minor skin infections to life-threatening diseases such as sepsis.
[12] An antibiotic.

39. Dr F said that she did not start antibiotics prior to the positive blood cultures, which was in line with the antibiotic guidelines, but prescribed antibiotics once she became aware of the positive blood cultures. Dr F stated:

> "As per the local antimicrobial guidelines for vertebral osteomyelitis, the practice was to start antibiotics when an organism had been identified by blood culture or biopsy unless severe sepsis, septic shock or neurological deficits were present. [Mr A] had blood cultures pending at the time of my review. [Mr A] did not meet the criteria for severe sepsis or septic shock at the time of my review as defined by the antibiotic guideline, and had a normal neurological exam as documented by me."

40. Dr F said that she was regarded as the "first on call", and "ran" her decision-making past the senior registrar, Dr H. Dr F said that her plan was to commence antibiotics, and she sought clarification on this from Dr H before asking the house officer to chart antibiotics.

41. RN D then handed over Mr A's care to RN I. At this point, Mr A was still "boarding" in the ED, but the Orthopaedic Department remained responsible for his care.

12 March 2019

42. On 12 March 2019 at 1.30am, RN I recorded in the clinical notes that Mr A remained feverish with a temperature of 38°C. Mr A had an Early Warning Score (EWS)[13] of 2 due to a fast heart rate. At this point, Mr A's blood pressure was 105/50mmHg. RN I noted that IV morphine was given for pain and IV antibiotics were administered. This was Mr A's first dose of antibiotics since his admission to hospital.

43. At 5.09am, RN I noted that Mr A had been sleeping for a couple of hours and that morphine had been administered for pain. RN I recorded that Mr A had an EWS of 3 due to a fast heart rate and because he remained feverish.

44. At 6.09am, Mr A's observations were reviewed. RN I recorded that Mr A was no longer feverish and had an EWS of 1.

45. Care of Mr A was taken over by RN J at 7.00am. RN J recorded the following in the clinical notes:

> "Encouraging oral fluids, will discuss this with ED Dr. Afebrile[14] now. Patient states pain is okay sitting like he is currently but when he moves the pain comes back. Given IV Augmentin as charted."

46. The clinical notes record that at 7.30am, Mr A's blood pressure had dropped further to 80/40mmHg.

[13] The EWS is a guide used to determine the degree of illness and potential deterioration of a patient.
[14] Not feverish.

47. At 8.19am, Mr A had an EWS of 2 because his systolic blood pressure was low (78–80mmHg). RN J noted that Mr A's condition would be discussed with the ED medical staff.

48. Mr A's urine output was first measured on 12 March 2019 at 8.30am.

49. Due to his low blood pressure, Mr A was examined by the on-call orthopaedic registrar, Dr K,[15] at 9.14am. Dr K recorded his impression of Mr A as "acutely unwell with sepsis, fluid overloaded secondary to [heart failure] but dehydrated". Dr K noted that his plan was to "stop IVF [IV fluids] … [restrict] fluid" and to arrange an urgent medical review.

50. Dr K told HDC:

> "[T]he additional treatment [Mr A] required were vasopressors, which are highly specialist drugs, initiation of which falls well outside of my scope of practice as a surgical doctor. These drugs are administered, often via specialist central lines, by acute medical or intensive care specialists, hence my involving them as soon as possible."

51. Dr K said that he was not comfortable initiating further fluids as there were already signs of fluid overload and a history of cardiac impairment. Contrary to Dr K's plan to stop Mr A's IV fluid, shortly afterwards at 9.19am, one of the ED doctors charted a bag of IV fluid for Mr A's low blood pressure. RN J recorded in the clinical notes:

> "[Dr K] was in the Department, got him to review patient as was not happy with any of his progress — patient was reviewed and beside the back pain patient has a lot of co-morbidities and medical problems occurring in the background besides his back pain. Talked with co-ordinator and decided to move patient to resus for better observation and further reviewing. Handed over to [RN L] and moved to resus 2 …"

52. At 10.30am, RN L recorded in the clinical notes that Mr A was reviewed by the medical team and the orthopaedic doctor (Dr K). At that time, Mr A's blood pressure was "on the low side, 83/50 mmHg", and it was noted that he was to be transferred to the Critical Care Unit owing to his "worsening condition".

53. Mr A was reviewed by a Clinical Nurse Specialist at 11.15am. A central line[16] and an arterial line[17] were inserted and multiple infusions[18] were commenced, including noradrenaline infusion (to treat Mr A's low blood pressure) and Hartmann's infusion (to help restore Mr A's fluid levels and to correct his low blood pressure). Mr A's blood pressure then improved. A urinary catheter was inserted and 100ml of urine was drained. Mr A was then transferred to the Critical Care Unit.

[15] Dr K is no longer employed by SDHB.
[16] A tube inserted into a large, central vein of the body to administer fluids or medicines.
[17] A tube that is placed into an artery to assess a patient's blood pressure.
[18] Administration of fluids or medicines.

Subsequent care

54. Following his transfer to the Critical Care Unit on 12 March 2019, Mr A remained in hospital for treatment of his low blood pressure and ongoing sepsis.

55. Mr A's condition improved, and the clinical records on 25 March 2019 note that Mr A "appeared settled", that he was feeling well, and that he was "keen to go home". The records also document that Mr A had an EWS of 0–1 due to low blood pressure (95/50mmHg), but that all other observations were stable. Mr A was discharged by Dr G on 25 March 2019.

56. Dr G requested that Mr A's general practitioner follow up with Mr A within two weeks' time to check his blood pressure and fluid status, and to monitor his bloods while he was on antibiotics. Mr A's regular medications remained unchanged, apart from a decrease in the dose of his blood pressure medication (candesartan). Mr A was also to have follow-up appointments with cardiology services, and an appointment at the infectious diseases clinic.

57. Dr G noted that despite the investigations undertaken, Mr A's sepsis was of "unestablished origin". Subsequently, the infectious diseases clinic concluded that the source of the sepsis was "likely skin source" from a skin laceration that Mr A had sustained in the two weeks prior to his admission to hospital.

SDHB review

58. Mrs A raised a number of issues with SDHB about the care provided to Mr A in the ED. She was concerned that Mr A had remained in the ED without his blood pressure being monitored, there was a delay in antibiotic treatment being provided, Mr A's usual medications were being withheld, and Mr A was discharged from hospital while he was in poor health.

59. In response to Mrs A's concerns, a review of the care provided to Mr A was undertaken by three ED consultants — Dr M, Dr N, and Dr O. Their key findings have been appended (see Appendix B).

Further information

The family

60. Mrs A and her daughter, Mrs B, complained because they felt that Mr A did not receive the care he should have. Mrs A told HDC:

> "All we want is that we all get treated fairly, [and that it] does not matter how old you are or how far away you live and have any other underlying conditions … to look outside their bubble because not everyone has the text book symptoms."

61. Mrs B told HDC that whilst she understands that hospitals have budgets and limited capacity, she considers that "the standard of care in [southern] rural South [Island] is appalling".

SDHB

62. Following the review, SDHB acknowledged that it was "inevitable there may have been opportunity for treatment to be started sooner and more aggressively". SDHB stated:

> "[Mr A] was borderline as to whether the sepsis pathway should have been initiated. It was accepted that, regardless, it probably would have been beneficial had antibiotics been started sooner."

63. SDHB accepted that on Mr A's first admission in the ED, there was, with hindsight, opportunity to identify and treat his sepsis sooner. SDHB said that different actions could have been taken, which may have meant that Mr A would not have become so unwell on his first presentation. They offered their sincere apologies to Mr A's family.

64. With regard to the access block, SDHB explained that by 7.30pm on the evening of 11 March 2019, the hospital was in full access block. All the ED beds were full and they were utilising the corridor beds, which were also full. SDHB said that during this busy period, the Duty Manager, Charge Nurse Manager, and other staff were redeployed to help. The access block continued until 12 March 2019, when by 7.00am that morning, 11 patients were waiting in ED for inpatient beds.

65. SDHB said that it does not have a specific policy in place regarding access block, and that its response to access block is a "collaborative, whole of hospital process". SDHB stated that the following meetings are scheduled on a daily basis, irrespective of the hospital status:

- The daily "ED huddle", attended by all medical and nursing staff from ED and key operational staff; and
- The daily Operations Meeting, attended by Charge Nurse Managers from all services, the Director of Nursing, the Duty Manager, and key operational staff.

66. SDHB provided HDC with a copy of its ED Variance Response Action Plan, which categorises a response plan in accordance with hospital capacity levels. In the event that there is a significant care capacity deficit, some of the actions include, but are not limited to:

- Notifying all medical team registrars or consultants to aid in expediting discharges;
- Arranging for staff to stop all non-clinical activities (such as study days);
- The Coordinator or Duty Manager considers utilising staff from areas where capacity matches demand, calling in staff overtime, and/or extending shifts;
- Consideration for expanding into the Fracture Clinic;
- Ensuring that relatives of patients are aware of the hospital status; and
- Reassessing the status within one hour.

67. In the event that the hospital has a critical care capacity deficit, essential care is to be prioritised, and the status is to be reassessed within 30 minutes.

68. SDHB also said that the actions that occur as part of the variance response management include, but are not limited to, the following:

- Early review on the wards and re-review of patients throughout the day;
- Postponement of elective cases;
- Repatriation of other SDHB domiciled patients; and
- Collaboration with Clinical Leaders, Service Managers, the Director of Nursing, and the Duty Manager when assessments need to be undertaken throughout the day.

69. SDHB explained that during access block and from the time of triage onwards, the primary responsibility for care of a patient belongs to the ED. Responsibility for clinical decision-making resides with the most senior doctor on duty in the ED, or with the ED consultant on call overnight between 11.00pm and 8.00am. The responsibility of the ED ceases when the patient is discharged from ED, when the patient has died in ED, or when the patient physically leaves ED (by leaving against advice, being transferred to another facility, or being admitted by another service).

70. SDHB said that a patient is considered to be admitted by another service when they have been formally accepted for admission by the inpatient team. This can occur verbally, or following a review of the patient by the inpatient team.

71. SDHB stated that the ED nursing staff will report any clinical issues of inpatients who are boarded in ED, directly to the accepting inpatient medical team. SDHB said that in order to avoid confusion and conflicting management plans, the policy is for ED nursing staff to communicate directly with the admitting team, rather than with the ED doctors. Likewise, if inpatients who are boarding in ED experience clinical deterioration, ED nursing staff will also bring it to the attention of the inpatient team, but if that deterioration is urgent ("a threat to life and limb"), the ED medical staff will become involved immediately to provide life-preserving measures.

Dr F

72. Dr F told HDC that she was sorry to learn about Mr A's illness, and hoped her response would be of value to Mr A's family.

Responses to provisional opinion

73. Mr A's daughter, SDHB, Dr F, and Dr K were given an opportunity to respond to the provisional opinion.

74. SDHB has accepted the findings and recommendations.

75. Dr F offered her sincere condolences and unreservedly apologised to the family for the care provided to Mr A. Dr F told HDC that she has been proactively undertaking professional supervision to ensure a matter such as this does not happen again in her medical career. She said that this has been a "huge learning curve" for her and her career development.

76. Dr K expressed his condolences to the family.

Opinion: SDHB — breach

77. First, I want to acknowledge the distress that the services provided by SDHB have caused to the family.

Collaboration and escalation of care

78. Mr A received care from both the ED and the Orthopaedic Department following his admission to hospital with sepsis on 11 March 2019. Mr A was admitted to the Orthopaedic Department by Dr F at 7.20pm on 11 March 2019, but as the hospital then went into access block at approximately 8pm that evening, Mr A had to remain in the ED overnight (known as "boarding").

79. ED nursing care of Mr A was handed over by RN D to RN I in the ED at 11.00pm. At that time, RN I noted in the clinical records that Mr A remained feverish and had an EWS of 2 due to his fast heart rate. Mr A was administered IV fluids and morphine.

80. At 1.30am on 12 March 2019, RN I noted that morphine and antibiotics had been administered. This was Mr A's first dose of antibiotics since his admission. At 5.09am, RN I noted that Mr A had been sleeping "over [the] past couple of hours". At that time, Mr A was still feverish and had an EWS of 3, due to his fast heart rate.

81. RN I reviewed Mr A again approximately one hour later at 6.09am. He was no longer feverish and had an EWS of 1. Care of Mr A was then handed over to RN J at 7.00am.

82. SDHB undertook a review of the care provided to Mr A. Dr O, an ED consultant who took part in the review, considered that there was a lack of escalation of Mr A's care when he deteriorated overnight on 11 March 2019. Dr M, another ED consultant who reviewed the care provided to Mr A, advised that "there may have been some issues with the ED nurses recognising deterioration in an admitted patient boarding in the ED". She concluded: "I do think that boarding the patient in the ED contributed to delayed recognition and diluted care."

83. The third ED consultant who took part in the review, Dr N, also considered that there was a "failure to act on persistently abnormal vital signs both on original assessment and overnight". Dr N said that this case highlights the dangers of having "admitted patients boarding in the ED overnight". He concluded that "the impact of not being enrolled from the outset resulted in less opportunities to escalate [Mr A's] treatment and optimise his care".

84. I sought clinical advice from an emergency medicine specialist, Dr Tom Jerram, on whether Mr A's care was escalated appropriately on 11 March 2019, and whether there was adequate understanding of the responsibility of care between the ED and the Orthopaedic Department. Dr Jerram considers that the central issue in this case is the lack of understanding as to who was responsible for Mr A's care while he was in the ED. Dr Jerram said that it appears that the ED staff (both medical and nursing) felt that care had been handed over to the Orthopaedic Department following Mr A's admission into its care at

around 7.00pm on 11 March 2019, and that after this point, Mr A effectively became a hospital inpatient under the medical care of the Orthopaedic Department, while "boarding" in the ED due to the access block. Dr Jerram advised:

> "I think this was a reasonable position for ED staff to take, and falls within the standard of care in New Zealand … ED staff did (appropriately) intervene the next morning once [Mr A's] deterioration had been flagged to them, but I believe the responsibility for his overnight care, and missed opportunities for earlier interventions, fell clearly with the admitting orthopaedic service in this case."

85. Dr Jerram also advised:

> "This situation, where a patient is admitted under a team but is physically still in the Emergency Department is both very high risk and unfortunately common in New Zealand Emergency Departments, and becoming more so. It is unclear as to where the lines of responsibility for care lie, and the chance of errors of omission in patient care is increased. This is a consequence of running hospitals at high levels of elective surgical efficiency, with resultant lack of acute care surge capacity."

86. I accept Dr Jerram's advice. When a patient is being seen by different teams during the course of a hospital admission, it is essential that clear and effective communication occurs between all teams involved, and SDHB should have in place formal policies and processes to optimise that care.

87. SDHB told HDC that it does not have a specific policy regarding access block, but that to avoid confusion and conflicting management plans, the ED nursing staff communicate directly with the admitting team (in this case, the Orthopaedic Department), rather than with the ED doctors. SDHB said that if inpatients who are boarding in the ED experience any clinical deterioration, ED nursing staff will bring it to the attention of the inpatient team, but if the deterioration is urgent ("a threat to life and limb"), the ED medical staff will become involved immediately to provide life-preserving measures.

88. In Mr A's case, it appears that there was confusion between the ED and the Orthopaedic Department as to who was responsible for Mr A's care. Dr O advised that there was "blurred responsibility and inadequate oversight of a boarded patient". Dr M also advised that boarding patients in the ED is a "hazard", and that multiple studies have shown that patients boarded in the ED have increased morbidity and mortality. Dr M said that ED nurses are required to care for new arriving patients, and also for the boarded patients, such as Mr A.

89. Patients who are clearly unwell, as was Mr A, should not remain in the ED for more than 24 hours. The Australasian College for Emergency Medicine "Definition of an Admission Policy" provides that the ED is not an appropriate environment for the ongoing management of patients who require inpatient medical care. The policy states that the retention of admitted patients in the ED is a failure of access to care and is detrimental to ED functions. Procedures should be in place to monitor and action circumstances where admitted patients remain in the ED for prolonged periods.

90. I acknowledge that Mr A remained in the ED for a prolonged period because of significant resource constraints and because the hospital was in access block at the time. I am therefore not critical that Mr A was physically unable to be transferred to the ward following his admission. I do, however, consider that the collaboration between the ED staff and the Orthopaedic Department was inadequate.

91. The Australasian College for Emergency Medicine "Responsibility for Care in Emergency Departments Policy" (hereinafter referred to as the ACEM guidelines) provides that shared care will occur in circumstances where a patient has been admitted but transfer to the relevant inpatient clinical area cannot occur owing to a lack of bed capacity. In such circumstances, responsibility for the clinical care is shared between the ED and the admitting team.

92. The ACEM guidelines provide that with shared care, the ED retains the primary responsibility for the initial and emergency management of the patient, including observation, medication administration, nursing care, and the immediate response to any emergent situation. The admitting team is primarily responsible for the timely development, documentation, and communication of a treatment plan, medication review and reconciliation, specialist care, and planning of non-ED procedures and investigations.

93. While the ED will assist in co-ordination where possible, the ED remains responsible only for primary management and ongoing immediate response to unanticipated sudden deterioration. The ED will then provide immediate stabilisation until such time as the admitting team can respond. The ED must prioritise its resources to ensure that it retains capacity for immediate response to new arrivals.

94. Having considered the ACEM guidelines, in my opinion the ED did not provide an immediate response when Mr A deteriorated overnight on 11 March 2019. When Mr A deteriorated, it became an emergency situation, and the ED should have responded and taken over his care. However the ED nursing staff continued to refer Mr A's care to Dr K in the Orthopaedic Department, and Dr K had to arrange for an urgent medical review of Mr A.

95. In my view, there was a lack of understanding by staff as to their responsibilities for Mr A's care. It is SDHB's responsibility to provide clear guidelines to its staff and to ensure that staff understand the areas of clinical presentation for which they are responsible. This is a systems issue, for which I do not consider it would be reasonable to hold any individual staff members to account.

96. SDHB also needs to ensure that it has in place measures to mitigate risk to patient safety during access block. I acknowledge that SDHB had in place some guidance for staff, such as requiring the ED nursing staff to communicate directly with the Orthopaedic Department. However, I consider that SDHB should have been clearer on how the responsibility between the ED and the Orthopaedic Department should have been shared, to align with the ACEM guidelines. In my opinion, SDHB failed to ensure that there was continuity of services and coordination of Mr A's care between the ED and the Orthopaedic Department, and

accordingly I find that SDHB breached Right 4(5) of the Code of Health and Disability Services Consumers' Rights (the Code).[19]

Treatment of low blood pressure

97. The clinical records show that following Mr A's admission to the ED on 11 March 2019, he had low blood pressure at 4.36pm, but it had improved by 8.00pm.

98. On 12 March 2019, Mr A's blood pressure was again low at around 7.30am, when he was under the care of RN J, a nurse in the ED. RN J recorded in the clinical notes at 8.19am that she would escalate the matter to an ED doctor.

99. Just after 9.00am, Mr A was reviewed by Dr K, who was the orthopaedic registrar at the time. Dr K noted that Mr A looked acutely unwell with sepsis and fluid overload secondary to heart failure, and that he was was dehydrated. Dr K outlined a plan and arranged for an urgent medical review. Dr Jerram considers that Mr A should have received earlier treatment for his low blood pressure. Dr Jerram advised:

> "The period of untreated hypotension (low blood pressure) between 0730 and 11.15 falls outside the standard of care, and it is possible it contributed to worsened organ dysfunction. It is again unclear whose responsibility managing [Mr A] was in this situation, and this lack of clarity likely led to suboptimal treatment."

100. Dr Jerram advised that while treating Mr A's blood pressure was likely to have been complex, a four-hour delay in providing him with treatment was longer than expected. Dr Jerram considers that the delayed response to Mr A's blood pressure was likely the result of a "dysfunctional/overloaded" hospital system. He considers that therefore this was a systemic, rather than an individual issue.

101. I accept Dr Jerram's advice. I agree that Mr A's low blood pressure should have been treated earlier, and that the nearly four-hour delay for treatment to be provided was unreasonable. I agree that this is a systemic issue, rather than an individual one, which can be attributed to the overloaded hospital system and Mr A being required to "board" in the ED.

Urine output

102. Mr A's urine output was first measured at 8.30am on 12 March 2019.

103. Dr N, an ED consultant who took part in SDHB's review of Mr A's care, advised that while Mr A received chrystalloid therapy (fluid resuscitation) early in his ED stay on 11 March 2019, failing to place Mr A on the sepsis pathway at the outset resulted in his urine output not being measured for the duration of his overnight stay in the ED on 11 March 2019.

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

104. Dr Jerram advised that it was reasonable for Mr A's urine output not to have been measured by Dr E at 5.22pm on 11 March 2019, but said that it should have been measured at 7.22am on 12 March 2019, when it was clear that Mr A was in septic shock.

105. I consider that the failure to measure Mr A's urine output overnight on 11 March 2019 was another missed opportunity for his care to be escalated. In my view, this is a systemic issue, rather than an individual issue, which occurred because the hospital was overloaded at the time, and Mr A did not receive adequate care while "boarding" in the ED.

Observation chart

106. Dr F stated that she was not aware of Mr A's low blood pressure, and that she was not adequately informed of the deterioration in Mr A's vital signs when RN D called her on the evening of 11 March 2019.

107. Dr F told HDC that often it was difficult to locate the observation chart for patients in the ED.

108. It is concerning that medical staff are not able to easily locate the observation chart for patients in the ED. A patient's vital signs are of utmost importance in determining the clinical pathway and treatment options, particularly for patients in ED, who often require critical care. I consider this to be a systemic issue.

Conclusion

109. As set out above, during the time that Mr A was "boarding" in the ED, his condition deteriorated. His low blood pressure was left untreated, and his urine output was not measured overnight. Also, it can be difficult for medical staff to locate the observation charts for patients in ED. In my opinion, these failures occurred because Mr A had a prolonged stay in the ED while the hospital was in access block. This is a service delivery failure for which ultimately SDHB is responsible. Accordingly, I find that SDHB breached Right 4(1) of the Code.[20]

Opinion: Dr F — adverse comment

110. Dr F was responsible for Mr A's admission under the Orthopaedic team on the evening of 11 March 2019. Dr F's plan was to admit Mr A to the ward and await the results of blood cultures and an MRI.

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

Prescription of antibiotics

111. Dr F did not prescribe any antibiotics until approximately 11.00pm on 11 March 2019, which was shortly after the results of Mr A's blood cultures had been received and he was found to have tested positive for a bacterial infection.

112. Dr Jerram considers that it was reasonable for Dr F to have commenced antibiotic treatment only after Mr A's blood cultures had been received. He advised:

> "The local antibiotic guidelines state that antibiotics for vertebral osteomyelitis should be started when an organism had been identified by blood culture, or septic shock or neurological deficits were present. While I think the hypotension [low blood pressure] was a significant finding, it did not unequivocally represent septic shock, and thus her failure to prescribe antibiotics at that point does not fall clearly outside expected care based on the local guideline."

113. I accept Dr Jerram's advice. Dr F sought input from the senior registrar, Dr H, and acted in accordance with the antibiotic guidelines. Dr F prescribed antibiotics as soon as she became aware of the positive blood cultures. I consider that this was appropriate care, and that there was no undue delay in prescribing antibiotics.

Assessment of vital signs and location of observation chart — adverse comment

114. Dr F stated that she was not aware of Mr A's low blood pressure. She said that she was not adequately informed of the deterioration in Mr A's vital signs when RN D called her on the evening of 11 March 2019. Dr F told HDC that often it was difficult to locate the observation chart for patients in the ED. She cannot recall whether she incorrectly assumed that Mr A's vital signs were normal, or whether she did not assess them because she could not locate the observation chart.

115. Dr Jerram advised:

> "I think checking the vital signs on a febrile patient being admitted for potential epidural abscess/discitis forms an important part of the assessment by the admitting doctor, and ideally she would have made further efforts to seek out the patient's nurse. I appreciate that this was likely to have been challenging given the acuity of the department, and that in a well functioning system abnormal vital signs would be flagged up and easy to find. I would thus judge it a minor departure from the standard of care by [Dr F] in the context of systematic issues."

116. I accept Dr Jerram's advice. However, Dr F's failure to note Mr A's vital signs was a missed opportunity to recognise his persistently low blood pressure and to treat it.

117. I consider that Dr F should have taken further action to locate Mr A's observation chart and assess his vital signs. A patient's vital signs are of utmost importance in determining the clinical pathway and treatment options, and I find it concerning that this information could not be located. I do, however, acknowledge the challenging environment and the

overloaded hospital system at the time of events. In my opinion, this goes some way towards mitigating individual accountability on Dr F's part.

Opinion: Dr K — other comment

118. One of the issues identified in the care provided to Mr A was the delay in providing him with treatment for his low blood pressure.

119. The clinical records show that Mr A had low blood pressure at 4.36pm when he was admitted to the ED on 11 March 2019, but that at 8.00pm that evening, his blood pressure had improved.

120. On 12 March 2019, Mr A's blood pressure was again low at around 7.30am, when he was under the care of RN J, a nurse in the ED. RN J recorded in the clinical notes at 8.19am that she would escalate the matter to an ED doctor.

121. Just after 9.00am, Mr A was reviewed by Dr K, the orthopaedic registrar at the time. Dr K noted that Mr A looked acutely unwell with sepsis and fluid overload secondary to heart failure, and that Mr A was dehydrated. Dr K outlined a plan and arranged for an urgent medical review, but did not provide Mr A with any treatment for his low blood pressure. Dr Jerram considers that Mr A should have received earlier treatment for his low blood pressure Dr Jerram advised:

> "The period of untreated hypotension (low blood pressure) between 0730 and 11.15 falls outside the standard of care, and it is possible it contributed to worsened organ dysfunction. It is again unclear whose responsibility managing [Mr A] was in this situation, and this lack of clarity likely led to suboptimal treatment."

122. Dr Jerram advised that while treating Mr A's blood pressure was likely to have been complex, a four-hour delay in providing him with treatment was longer than expected. Dr Jerram considers that the delayed response to Mr A's blood pressure was likely the result of a "dysfunctional/overloaded" hospital system, and that therefore this was a systemic rather than an individual issue.

123. I accept Dr Jerram's advice and agree that Mr A's low blood pressure warranted earlier treatment. I also agree that this is a systemic issue, rather than an individual issue.

124. After his assessment of Mr A, Dr K arranged for an urgent medical review. This was appropriate care.

125. I accept Dr K's submissions that the treatment Mr A required at that time was highly specialised, and that administering this treatment fell outside of his scope of practice as a surgical doctor. I am therefore not critical of the care provided to Mr A by Dr K.

Changes made by SDHB

126. SDHB said that it is introducing a new national observations chart as part of the Health Quality & Safety Commission's deteriorating patient programme. SDHB stated that this chart is more sensitive, and would have enabled detection of Mr A's deterioration sooner. SDHB advised that staff have also received additional education.

127. SDHB told HDC that regarding access block, a patient flow taskforce has been set up to address the issue and work with staff. An immediate focus for the patient flow taskforce is to implement the SAFER principles systemically across inpatient wards, strengthen and refine the current reporting metrics, and support services to implement ways in which patient flow can be improved.

128. SDHB said that plans are underway to establish a working group and create and implement an escalation plan for the public hospital.

129. SDHB also said that approval has been obtained to increase nursing staff.

Recommendations

130. I recommend that SDHB:

a) Provide a written apology to the family for the services provided to Mr A. The apology is to be sent to HDC, for forwarding to Mrs B, within three weeks of the date of this report.

b) Provide HDC with an update on the development and implementation of the escalation plan for the public hospital, within six months from the date of this report, and provide HDC with an update on the effectiveness of the escalation plan within 12 months from the date of this report.

c) Develop a formal policy and procedure in relation to access block, ensuring alignment with the ACEM guidelines, to define the responsibility between different teams and to manage risk. SDHB is to report back to HDC on the access block policy and procedure within six months from the date of this report.

d) Provide training to staff on the following topics:

- The importance of assessing a patient's vital signs
- The recognition of critical illness and symptoms of septic shock
- Escalation of care and coordination between departments

Evidence that the training has been completed, and copies of the training materials used, are to be sent to HDC within six months of the date of this report.

e) Review the current system for storing of observation charts in ED, and implement a system for storage of observation charts in ED so that these can be easily located and readily available to medical staff. SDHB is to report back to HDC on the system that has been implemented within six months from the date of this report.

f) Use this report as a basis for staff learning at SDHB, and provide HDC with evidence that this has been completed within six months from the date of this report.

Follow-up actions

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

Appendix A: Independent clinical advice to Commissioner

Updated clinical advice dated 12 June 2021

Note: Changes to Dr Jerram's original advice dated 7 August 2020 are recorded in *italics.*

The following expert advice was obtained from an emergency medicine specialist, Dr Tom Jerram:

> "Thank you for your request to again review the above complaint.
>
> You have asked me to provide further advice after reviewing additional information provided by Southern DHB in response to my initial advice.
>
> In doing so I have reviewed the following documents
>
> 1. My original advice Dated 7 August 2020
> 2. Southern DHB's response and internal investigation
> 3. Appendix 1: Statement by [Dr C]
> 4. Appendix 2: Statement by [Dr E]
> 5. Appendix 3: Statement by [Dr F]
> 6. Appendix 4: Statement by [Dr G]
> 7. Appendix 5: MR54 showing [Dr G's] name
> 8. Appendix 6: [Electronic lab record] regarding gram-positive blood culture
>
> You have specifically asked whether any of this information causes me to change my original advice in any way, and the reasons for this.
>
> I am currently a Fellow of the Australasian College for Emergency Medicine (since 2011) and work full time as an Emergency Medicine Specialist at Nelson Hospital Emergency Department. I am also a Senior Clinical Lecturer with the Otago University Christchurch School of Medicine. I have been an HDC expert advisor since 2013. I have read the HDC guidelines for expert advisors. I have reviewed the persons and entities in this case, and can see no conflicts of interest.
>
> I will structure this document by restating my original opinions, then adding any changes in my advice (with reasons) in italics below**.**
>
> **Original advice with modifications in italics**
>
> 1. The appropriateness of care provided to [Mr A] for each ED presentation, particularly his presentation on 11 March 2019
>
> *[Dr C's] response is well organised, and clearly explains her thinking. I agree that the delay to requesting CT was not unreasonable in the context, and falls within expected standards of care. Similarly, not giving antibiotics in this clinical setting was reasonable and appropriate, given he had no signs of sepsis, and the diagnosis was unclear.*

[Dr E] notes that the hypotension around 1722 hrs was thought to be due to morphine administration and dehydration, rather than a manifestation of sepsis. In the clinical context, with diagnostic uncertainty and non specific inflammatory change on the CT, I think this was probably reasonable, and thus I don't think the decision not to give antibiotics at his stage fell clearly outside the expected standard of care. I also note his comment around not measuring the urine output 'we do not generally measure urine output for back pain and the ED does not have the staffing levels to measure urine output routinely'.

I would generally agree it was reasonable not to begin measuring urine output at 1722hrs, but ideally this would have happened once it was clear [Mr A] was in septic shock at 0722 (with positive blood cultures, and hypotension). I would judge the failure to do so to be indicative of the pressure the system was under. Patients who are clearly unwell should not be in ED for over 24h. It is likely that urinary monitoring would have happened had [Mr A] been on the ward at this point. I think it would therefore be unfair to hold ED staff to account for this — it reflects a system failure.

I do think the fact that it took 7 hrs and 22 minutes to make an orthopaedic referral, then a further 16 hours in ED before he went to a ward is highly likely to be a marker of an ED and hospital under stress, with inadequate staffing and significant hospital access block issues. This scenario is increasingly common in New Zealand Emergency Departments, and adverse events as a result are inevitable.

[Dr F] was the orthopaedic SHO. She notes that she did not start antibiotics when she initially saw [Mr A] based on the antibiotic guidelines. She also states that she was unaware of the hypotension, and cannot recall whether she had incorrectly assumed the vital signs were normal, or whether it was due to her being unable to find the observation chart at the time of her review. She notes that it is often difficult to find ED observation charts. While I empathise with this, I think checking the vital signs on a febrile patient being admitted for potential epidural abscess/discitis forms an important part of the assessment by the admitting doctor, and ideally she would have made further efforts to seek out the patient's nurse. I appreciate that this was likely to have been challenging given the acuity of the department, and that in a well functioning system abnormal vital signs would be flagged up and easy to find. I would thus judge it a minor departure from the standard of care by [Dr F] in the context of systematic issues. The local antibiotic guidelines state that antibiotics for vertebral osteomyelitis should be started when an organism had been identified by blood culture, or septic shock or neurological deficits were present. While I think the hypotension was a significant finding, it did not unequivocally represent septic shock, and thus her failure to prescribe antibiotics at that point does not fall clearly outside expected care based on the local guideline. I also don't think that giving the antibiotics 3 hours earlier was likely to have made a significant difference on the outcome in this case. [Dr F] states that she was not made aware of [Mr A's] hypotension between 1920 and 0730 the next morning. Again, I think this is a systematic failure attributable to access block and prolonged ED stays, when [Mr A] should have been on a ward. I think it would be unfair to hold ED staff accountable in this context.

[Dr F] was made aware of the blood culture results at 2306, and instructed the on call RMO to chart antibiotics. This is reasonable, and within the standard of care. [Dr F] states she was not made aware of the low blood pressure. I wonder if a more senior orthopaedic doctor would have considered reviewing [Mr A] (or at least ascertaining his observations) at this point, however I don't consider failure to do so a significant departure from the standard of care in context.

[Dr F] states she was not made aware of any hypotension overnight. If this is the case, she clearly could not have responded to it.

The DHB response doesn't give a clear answer as to why the hypotension remained untreated between 0730 and 1115. The CEO's letter states 'please refer to the response provided by [Dr F] (Appendix 3) as to why there was a delay in treatment of [Mr A's] hypotension'. On this specific point, [Dr F's] response was as follows: 'I was not aware of the hypotension and I understand at nursing shift changeover they initially made the ED doctors aware of [Mr A's] low BP [Dr K] was on call from 0800 and made aware of the low blood pressure early into his call.'

I don't believe this addresses what went on in the nearly 4 hour period of hypotension before 11.15. While treating this was likely to have been complex, a 4 hour delay to vasopressors while hypotensive is longer than would be expected. In [the CEO's] letter, he mentions Appendix 8, 9 and 10. These are reviews of the episode by 2 local FACEMs and the director of [the] Emergency Department. I would be interested to know what their findings were. I believe that the delayed response to the hypotension was likely as a result of dysfunctional/overloaded hospital systems. There were 11 patients (Including [Mr A]) waiting for inpatient beds in [the public hospital] ED at 0700 on 12 March. These patients required ED nursing care over and above the usual ED patient workload for which the ED is staffed. In addition, these patients generally have complex care needs that are not well addressed in the ED. There is clear evidence in the literature of increased morbidity and mortality in patients with prolonged ED length of stay after admission decisions have been made. Access block is a whole of hospital issue rather than an ED issue.

2. Whether there was clinical indication to place [Mr A] on the Sepsis pathway during the 11 March 2019 presentation

I have addressed this above. I think this issue is complex and difficult, and the relative hypotension overnight before 0730 was not a clear indication of septic shock. I have not changed my opinion that the hypotension between 0730 and 11.15 was significant, and that the response appears to fall outside the standard of care based on the information available. Again I would like to point out that I believe this is due to systematic rather than individual issues — [Mr A] would not have still been in an overloaded ED at that time in a well functioning system.

3. Whether there was appropriate escalation of care during the 11 March 2019 presentation given [Mr A's] clinical deterioration

As stated, I believe the team have explained their thought processes sufficiently for me to be confident that this did not fall outside the standard of care.

As stated above, I think there was a minor departure from the standard of care in the admitting orthopaedic doctor not checking the vital signs. However this is mitigated by systemic issues, and problems with locating the observations charts.

I have stated my thoughts on this above.

4. Whether there was adequate understanding of responsibility of care given that he was essentially an inpatient boarding in ED

There is a response to this in the DHB response letter. It is clear that there was significant access block, with 11 patients waiting to be admitted at 0700, and patients in corridors in the ED. In terms of hospital response/mitigating strategies, [the CEO] mentions a patient flow taskforce, hospital escalation plan trials, and the temporary employment of 4.7 FTE of nursing staff.

Unfortunately, access block is an increasing issue throughout New Zealand, and is likely to require a national approach which prioritises acute care and flow rather than elective care. I would reiterate that I don't think it's useful to hold individual clinicians to account in this case. All involved seem to have been hardworking diligent professionals doing their best within a pressured and dysfunctional system. A system wide approach is needed if delays in care like this are to be minimised in the future.

5. Any other matters in this case that I consider amount to a departure from accepted practice

Other than the issues outlined, I believe the care given to [Mr A] on 11/3/19 fell within accepted practice. I am truly sorry to hear of his ongoing health issues.

Please let me know if I can be of further assistance in this matter

Nga Mihi Nui

Dr Tom Jerram MBChB FACEM Senior Clinical Lecturer
Nelson Hospital Emergency Department"

Note: the advice below (addendum to initial expert advice dated 7 August 2020) was revised by Dr Jerram's advice dated 12 June 2021.

"Tēnā koe Tom

Thank you again for your Report dated 7 August 2020.

I note that you have identified several departures from accepted standards of care, as follows:

1. The ED team should have considered prescribing antibiotics at the time they referred [Mr A] to the Orthopaedic team on the evening of 11 March 2019. You stated that [Dr E] may have deferred this decision to the Orthopaedic team (not documented), but if it was not

specifically considered by the ED team at this point, you would judge this as a mild to moderate departure from accepted standards of care.

If it was considered and deferred to the orthopaedic team, but simply not documented, I would not consider this a breach of the standard of care. If it was not considered at all, I would consider it a mild departure from the standard of care, as care had been handed over to the orthopaedic team.

2. The orthopaedic team should have prescribed antibiotics for presumed discitis on the evening of 11 March 2019. The plan to not give antibiotics unless [Mr A] 'becomes acutely unwell' failed to appreciate that periods of relative hypotension, rigors, and fevers constituted an unwell patient. Can you please quantify the failure of [Dr F] to give antibiotics at this point as whether it is a mild, moderate or severe departure from accepted standards of care?

I would classify this as a moderate departure from the standard of care.

3. There was a significant delay in initiating treatment for persistent low blood pressure which was first recorded at 7:30 on 12 March 2019. Vasopressors were not started for approximately 4 hours after this. The majority of the blood pressure readings over this time were low. Can you also quantify the failure to treat [Mr A's] hypotension between 7:30 and 11:15 as whether it is a mild, moderate or severe departure from accepted standards of care?

I would classify this as a moderate departure from the standard of care."

Appendix B: SDHB Review — Dr M

"You asked that [Dr N] and I review the care of [Mr A], NHI …, who was in the ED on 11 March 2019. In summary, the care from the ED physicians was fine. There may have been some issues with the ED nurses recognizing deterioration in an admitted patient boarding in the ED. … is going to address nursing issues.

Briefly, the time line of his visit:

Arrival 11 Mar 2019 at 1006 as triage level 3

Seen by experienced ED MOSS [Dr C] at 1011

CT scan results by 1722 — no obvious discitis (not the test of choice)

Care assumed and first note written by experienced ED Consultant [Dr E] at 1722

Ortho referral 1727

Seen by ortho and for admission 1920 — for MRI the next day

Due to access block, stayed in ED until 1128 on 12 Mar — (over 24 hours in ED)

[Mr A], a [man in his seventies] with numerous chronic health problems including CAD, mitral regur, biventricular heart failure, atrial fibrillation, HTN, dyslipidemia and pre-diabetes, presented with back pain that he attributed to [heavy lifting] the day before.

He was however febrile at initially 38 then 38.3. The nurse noted that he had increased working of breathing which the patient said was due to his severe pain. He was in atrial fibrillation (chronic) with a heart rate of 115–120 with a normal blood pressure. He was noted to look clinically dehydrated and his UN was 136. CRP was 24 and WBC 12. Blood cultures were appropriately drawn and sent.

He was noted to be drowsy after receiving 18 mg morphine from between 1500 and 2000. Earlier he had received ketamine 10 mg IV twice and morphine via EMS and aliquots in the ED. Otherwise, he did not have any mental status changes. He had an episode of transient hypotension which responded to IV fluids. He did have persistent tachycardia attributed to pain.

He was under the care of ortho from 1920 on but was boarding in the ED. The ortho reg was notified that the patient was still febrile at 2220. She did not want antibiotics given at that point. The lab rang the ED at 2300 with positive blood culture from earlier in the day. It is not documented that the ortho team was advised of this — they may have chosen to give antibiotics had they known that the blood culture was positive.

The blood pressure declined the next morning to 80/ systolic at 0730. Ortho was informed and felt that the patient was fluid overloaded due to heart failure but also dehydrated. At that point, they stopped the fluids, ordered Augmentin for sepsis and asked for a medicine consult.

Lactate drawn at 0930 was normal but pH was low at 7.29. CRP was elevated at 152. ID of the blood culture showed Staph aureus.

Issues:
1) Patient was not initially placed on Sepsis pathway

Infection suspected as etiology but not known where. Given back pain, providers thought could be discitis or epidural abscess. SIRS criteria met

a. Temperature > 38 (38.3)
b. HR > 90 (115) — known chronic a fib and in pain
c. WBC 12 (criteria is > 12)
d. EWS 1–2 until the next morning
e. Initially no criteria for severe sepsis — MAP normal. Lactate normal when checked

Patient was borderline for being placed on sepsis pathway until he declared himself the next morning at 0730.

2) No antibiotics given. Patient was febrile but source was unclear. In retrospect, if considering discitis or epidural abscess it would have been reasonable to have given Ceftriaxone or other broad spectrum antibiotic that treats most bacteria. After lab called with a positive blood culture, in my opinion, antibiotics should have been given. It is not clear whether ortho knew of the positive blood culture. The nurse earlier documented that the ortho reg was informed that the patient was still febrile and said no antibiotics unless deterioration in condition.

3) Boarding patients in the ED is a hazard. The ED nurses are required to care for new arriving patients and also for the boarded patients. Multiple studies have shown that patients boarded in the ED have increased morbidity and mortality.

The patient was not under the care of the ED team when the nurse documented the low BP at 0819 yet the nurse wrote that she would discuss it with the ED doctor. The patient complained of being dizzy while sitting.

Seen by ortho reg [Dr K] with note written at 0914. He requested assistance of the medical team. Patient was started on noradrenalin, arterial line was inserted and patient went to the ICU.

4) MRI did not show discitis or epidural abscess. There was evidence of retroperitoneal inflammation but no growth on urine (and Staph aureus is not a typical urinary pathogen.) Urology, surgery, infectious disease and medicine were all consulted. MRI and aspiration of the shoulder were done. ECHO was done with no evidence of endocarditis. Ultimate diagnosis was sepsis of unknown etiology. He improved on IV flucloxacillin then cefazolin and was discharged on 2 more weeks of IV cefazolin.

In summary, I think that this was a difficult presentation and even after being in the hospital with multiple consults, the source of his bacteremia was not determined. The only real fault I see is that he should have received empiric antibiotics initially and certainly once the blood culture was called in as positive. I do not think putting him on the sepsis pathway would have made any difference except for giving him an empiric broad spectrum antibiotic. He received all the other components of the pathway except an initial lactate and the lactate was normal when it was checked the next morning. I do think that boarding the patient in the ED contributed to delayed recognition and diluted care.

[Dr M] — Consultant, ED"

Appendix C: SDHB Review — Dr N

"Case review:

[Mr A]

[NHI]

Date of presentation: 11/03/2019

Date of Review: 1/4/2019

ED Clinical Timeline:

11/03/2019

10:06: [Mr A] presented to [the] ED with severe back pain and fever.

He had been administered a total of 6mg IV morphine in the pre-hospital setting, was noted to be 'sleepy++' at triage and assigned an ATS 3 category.

10:11: He was seen by an ED MOSS, [Dr C], within 10min of his ED arrival (ATS recommends category 3 patients be seen within 30min).

Initial ED vitals signs were recorded as follows:

— BP:155/85mmHg

— HR:110bpm, Afib

— T:38.1 degrees Celsius

— RR:24

— SpO_2:97% RA

Contemporaneous notes from ED MOSS, [Dr C], note that he was alert, orientated but shaking in bed. Suggestive of rigors?

11:07: Subsequent ED RN assessment notes that he appeared mottled with cool peripheries and his saturations had dropped such that he required supplemental O_2. He was febrile at 38.3 following which blood cultures were drawn.

13:59: Decision made to perform CT abdomen for workup of non-specific back pain and fever

14:30: First episode of relative hypotension (100/60mmHg). Not overtly symptomatic in notes.

14:40: Noted to be focally tender in lumbar spine

Relative hypotension persisted before and after nursing handover

16:36: ED Evening RN assessment, notes declining BP, persistent pain. IV fluids requested.

17:00: Returned from CT

17:15: IV fluids commenced

17:22–17:35: Assessment by [Dr E], ED SMO. CT reviewed:-→Nil cause found. Recommended MRI as CT cannot exclude discitis/abscess. MRI arranged and referred to Orthopaedics.

Persistent hypotension: SBP 90–100mmHg

18:20: 2nd litre of crystalloid charted

19:20: Orthopaedic Registrar review, [Dr F]. Impression discitis. Nursing notes document persistent hypotension, not tachycardic, afebrile. Ortho impression: Not for Abs currently. Give antibiotics if he becomes acutely unwell.

21:07: Transient improvement in BP. Now febrile. Ortho contacted. Not for further cultures. Not for antibiotics unless obs outside normal limits.

23:00: Note on [electronic clinical record]. [Dr F] informed of blood cultures.

23:17: IV augmentin charted.

23:55: First dose given

12/3/2019

00:00–0730: BP improved somewhat overnight. SBP 100–115mmHg. Can still argue relative hypotension.

07:30: Hypotensive, symptomatic of same.

07:50: Second dose of IV augmentin

08:33: 3rd litre of IV fluid

09:14: Orthopaedic Registrar review, [Dr K]. Septic shock and requested Gen Med input.

10:50: Gen Med review. Septic shock. ICU contacted. Central access obtained.

12:30: IV noradrenaline commenced. ICU referral

Issues:

1. **Not initiated on Sepsis pathway at outset:**

a. ED Obs chart suggests he would have met SIRS criteria on arrival based on Temp and Resp rate

b. Knock on effect of this was delay to:

   i. Lactate being drawn until following morning

ii. Hourly urine output not measured for the duration of his ED overnight stay

iii. Delay to antibiotics being administered. **See point 2**

2. Delay to antibiotic administration

a. Met SIRs criteria on arrival**.**

b. Suspected intra-abdominal/bone/soft tissue source

c. Could argue that ED could initiate IV antibiotic therapy once he was cultured and certainly once he had relative hypotension in afternoon requiring IV fluids

d. Patient was unwell at time of Orthopaedic review based on the nursing obs. I would suggest that they didn't appreciate the significance of relative hypotension in an elderly septic patient despite 2L IV fluids and should have given empiric antibiotics

e. [Electronic clinical record] states that [Dr F] was informed of blood culture results at 23:00. IV Augmentin charted at 23:17. 1st dose not given until 23:55.

3. Failure to act on persistently abnormal vital signs both on original assessment and overnight. Dangers of ED boarding.

a. Significant, persistent hypotension overnight**.** Nil repeat Specialty review

b. Not on Sepsis pathway, therefore no urine output monitoring, and less data points for escalation/optimisation of care.

c. Does ED have a duty of care to unwell patients in our department even if boarding?

Summary:

Given [Mr A's] significant co-morbidities and medication use including beta blockade, he was at risk of presenting with less florid signs of sepsis. Whilst he did have SIRS criteria, he was technically beta blocked and less likely to mount a tachycardic response.

I agree that on arrival his focus of infection was unclear and the decision to perform a CT in the first instance was reasonable. His use of Dabigatran coupled with a recent fall and now back pain could certainly be due to pathology such as a psoas haematoma +/- infection for example. The ED SMO on shift correctly identified that a normal CT could not exclude discitis and appropriately requested an MRI as well as referring to Orthopaedics.

Whilst it would have been ideal for him to receive antibiotics earlier in his presentation, he did receive antibiotics once the blood cultures were reported positive.

His paper observation chart is quite concerning and paints a picture of persistent relative and actual hypotension however that is not reflected in his regular EWS scores. Whilst he did receive crystalloid therapy early in his ED stay, I do not think that the Orthopaedic Registrar[21] appreciated the significance of his vital signs on initial review and his persistent trends to hypotension overnight were not acted on. Some of this likely relates to failure to place him

[21] For clarification, the "Orthopaedic Registrar" referred to by Dr N is a reference to Dr F.

on the Sepsis pathway from the outset however it also highlights the dangers of having 'admitted patients' boarding in the ED overnight.

Overall, [Mr A] presented to ED with an infection of unclear focus (which was borne out by his subsequent hospital stay). He had a prolonged stay in the ED due to access block. The admitting service seem to have underappreciated his clinical signs at the time of admission and this contributed to the delay in antibiotic therapy. Whilst he did have concerning vital signs in my opinion, this does not seem to have been reflected in his formal EWS score which doesn't take into consideration this concept of relative hypotension for elderly patients. Though he did receive 4 out of 6 interventions from the Sepsis pathway eventually, the impact of not being enrolled from the outset resulted in less opportunities to escalate his treatment and optimise his care.

[Dr N], [Public hospital] Emergency Department"

Appendix D: SDHB Review — Dr O

"FYI for [Dr O's] contribution after reviewing our two reviews.

Hi [Dr N] [Dr M]

Thank you both very much for your excellent reviews of this man's care. We did not reach 100% agreement on everything, but three issues stood out:

- Failure to place him on the sepsis pathway, causing delayed antibiotics and possibly inadequate fluid resuscitation. In my opinion this could have contributed to the severity of his deterioration
- Failure to escalate his care when he deteriorated overnight (actually, to my eye his BP began dropping in the afternoon)
- Blurred responsibility and inadequate oversight of a boarded patient

What we need now are some remedial actions. Could you please consider this case for M&M and see if we can generate some recommendations?

Thanks
[Dr O]"