

Counties Manukau District Health Board

**A Report by the
Health and Disability Commissioner**

(Case 13HDC00343)



Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. In 2011, Mr A, aged in his early 60s, was recovering well at home from recent back and shoulder surgery. However, a few weeks after the most recent surgery, he experienced sudden severe back pain.
2. Mr A was taken to a public hospital by ambulance. At 10.12am he was assessed in the emergency care department. Later that day he was diagnosed with musculoskeletal back pain. Emergency senior medical officer (SMO) Dr B told HDC that Mr A was stable on physical examination. His findings included that Mr A had sudden onset of pain but did not have a fever, and that he had satisfactory vital signs, normal sensation in his legs, and an improvement over six hours of observation.
3. No blood tests or X-rays were performed. Mr A was given analgesia and discharged.
4. Four days later, Mr A experienced back pain and dizziness, and was again taken to the public hospital by ambulance. He was assessed in the emergency care department and found to have low blood pressure and an elevated heart rate. Blood samples were taken and X-rays were performed.
5. At 11am, emergency care medical officer special scale (MOSS) Dr I reviewed Mr A and the results of initial investigations, and queried sepsis. His plan included giving Mr A antibiotics. However, Dr I discussed Mr A's presentation with the orthopaedic team, and they asked to review Mr A before antibiotics were given.
6. Following this, Mr A was reviewed by an Intensive Care Unit SMO, Dr C, to determine whether Mr A was eligible for a trial of patients with sepsis that was being undertaken at the public hospital. Dr C noted that Mr A's high INR¹ discounted him from the trial. Dr C felt that Mr A did not need intensive care unit (ICU) care, and noted that his blood pressure had improved.
7. Mr A was reviewed by an orthopaedic registrar between 1.15pm and 2.15pm, but no antibiotics were given at that time. Mr A was then reviewed medically at 2.15pm and noted to be hypoxic and in acute renal failure.
8. At approximately 4.30pm, Mr A had an MRI of his lumbar spine, which showed a large inflammatory mass and discitis. At 7.15pm, Mr A received intravenous antibiotics.
9. At 11.03pm, Mr A was transferred to the orthopaedic ward, but shortly afterward was transferred to the high dependency unit (HDU), as he was in respiratory distress. Mr A's INR was still high despite the administration of Vitamin K on three occasions. His INR was finally corrected at 3.50am following the administration of Prothrombinex.

¹ International normalised ratio. The INR is a test of blood clotting, which is primarily used to monitor warfarin therapy, where the aim is to maintain an elevated INR in a certain range, eg, 2.0 to 3.0.

10. At 4.30am, Mr A was transferred to ICU. However, he continued to deteriorate and developed multiple organ failure. Mr A died that evening.

Findings summary

11. On his second presentation to the public hospital, Mr A was promptly identified as having sepsis. However, he should have received antibiotics shortly after his admission, and the decision to withhold them was inappropriate, as he was not stable. The lack of clear understanding in emergency care regarding when it is appropriate to withhold antibiotics contributed to this delay. In addition, given Mr A's presentation and concerning blood test results, including an INR over 10, he should have been transferred to ICU from emergency care. The lack of effective communication among teams and across teams compromised Mr A's care. Counties Manukau District Health Board (CMDHB) is responsible for the multiple failures of its staff, and breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights.²
12. Adverse comment is made about CMDHB regarding the management of Mr A's pain, and for the delay in managing Mr A's concerning INR result. Criticism is also made about CMDHB's record-keeping.
13. Adverse comment is made about Dr B in relation to Mr A's first presentation to the public hospital.

Complaint and investigation

14. The Commissioner received a complaint from the family of Mr A about the services provided by CMDHB to Mr A. The following issue was identified for investigation:

The appropriateness of the care provided to Mr A by CMDHB in 2011.

15. An investigation was commenced on 26 May 2014.
16. The parties directly involved in the investigation were:

The family of Mr A	Complainants
CMDHB	Provider

17. Information was reviewed from ACC.

18. Also mentioned in this report:

Dr B	Emergency senior medical officer
Dr C	Intensive Care Unit senior medical officer
Dr D	Orthopaedic senior medical officer

² Right 4(1) of the Code states: "Every consumer has the right to have services provided with reasonable care and skill."

Dr E	Intensive Care Unit senior medical officer
Dr F	Specialist anaesthetist
Dr G	Intensive Care Unit senior medical officer
Dr I	Emergency Care medical officer special scale
Dr J	Emergency Care senior medical officer
Dr K	Orthopaedic registrar
Dr L	Orthopaedic house officer
Dr M	Medical registrar
Dr N	Intensive Care Unit registrar
Dr O	Medical registrar
Dr P	Orthopaedic senior medical officer

19. Independent expert advice was obtained from emergency medicine specialist Dr John Chambers (**Appendix A**), and expert nursing advice was obtained from registered nurse Ms Dawn Carey (**Appendix B**).

Information gathered during investigation

20. Mr A, aged in his early 60s, had a number of medical conditions, including chronic atrial fibrillation (AF),³ severe pulmonary hypertension,⁴ moderate–severe valvular heart disease, and hypertension. He was on warfarin therapy⁵ to prevent thrombosis.⁶
21. In the two months leading to the events complained of, Mr A had undergone lumbar fusion surgery at the public hospital, and shoulder surgery at a private hospital.

Lumbar fusion surgery

22. Mr A underwent lumbar fusion surgery at the public hospital and was discharged a few days later.
23. Preoperative clinical notes read, “Postop Kefzol 48HR,” which indicates that Mr A would need antibiotics (cephazolin) for 48 hours postoperatively.
24. The anaesthetic record does not show administration of any antibiotics, although the surgical safety checklist indicates that antibiotics were given. The anaesthetist (Dr F) told HDC that it is his normal practice (and routine) in this scenario to administer antibiotics at the time of induction,⁷ and cannot explain why this is not recorded.

³ An abnormal heart rhythm.

⁴ A lung disorder characterised by increased pressure in the arteries carrying blood to the lungs.

⁵ Anticoagulant therapy. Warfarin is the most widely used anticoagulant in New Zealand, having a key role in preventing thrombosis. International normalised ratio (INR) testing is used to maintain warfarin response within a therapeutic window, as maintaining the INR within the target range (2–3) is vital in minimising the risk of bleeding while providing anticoagulation benefits.

⁶ Blood clots.

⁷ Induction is the period between initial administration of the sedatives and loss of consciousness.

25. Additionally, CMDHB could not find some of the postoperative Intensive Care Unit (ICU) clinical records and, therefore, could not verify whether postoperative antibiotics were administered. However, the “Transfer of Care to GP” form states “24hrs iv abx” under the heading “Clinical Management/Summary”.

First presentation — the public hospital

26. Mr A’s family told HDC that he had been “recovering well with no complaints of pain until [the day before this presentation]”.
27. Mr A began to experience back pain which worsened overnight. The following day, Mr A experienced sudden severe back pain at the site of his lumbar fusion surgery on standing up. Early in the morning, Mr A took two paracetamol tablets. At 8.00am, he took two further paracetamol tablets and Voltaren. He was taken to the public hospital by ambulance. He was in severe pain (10/10 as documented by the ambulance staff) but was able to walk with crutches to the ambulance. Mr A was admitted to Emergency Care (EC) at 10.10am.
28. The “EC Assessment Form” records that Mr A had experienced a “sharp shooting pain” the previous night across his buttocks and the bottom of his spine. The form also records no spasms, and no numbness, but that Mr A had pins and needles in both feet. There is no record on this form of Mr A taking warfarin.⁸ At 10.30am, Mr A reported his pain to be 5/10, and his vital signs were unremarkable.⁹
29. Emergency senior medical officer (SMO) Dr B assessed Mr A and carried out a physical examination. Dr B’s statement, which was provided to HDC, records: “[Mr A] complained to me of moderate, non-specific lower lumbar back pain and of exacerbation of the pain with walking though he was able to walk with crutches.”
30. CMDHB’s guideline “Low Back Pain — Acute Assessment”¹⁰ covers the assessment and acute management of patients presenting to EC with acute low back pain. It states that patients should have an appropriate clinical examination guided by the presence of “Red Flags”, and analgesia should be provided. It also states that patients who present with acute low back pain and who are over the age of 50 should have blood tests and an X-ray, as this age is considered to be a “Red Flag”.
31. Dr B recorded a diagnosis of musculoskeletal back pain in the notes. Dr B advised HDC that Mr A was stable on physical examination. Dr B’s findings included that Mr A had sudden onset of pain;¹¹ a lack of fever; satisfactory vital signs; normal sensation in his legs; and that he improved over a six-hour period of observation.

⁸ Intensive Care Unit SMO Dr E stated that Mr A’s regular medications on presentation were warfarin, metoprolol, allopurinol, Inhibace Plus and diltiazem, and Mr A had been taking diclofenac, tramadol and paracetamol for pain.

⁹ Blood pressure 141/83mmHg; oxygen saturation 95% (on oxygen therapy); temperature 36.7°C; heart rate 76 beats per minute.

¹⁰ Last updated 7 January 2010. This document was reviewed on 30 August 2012.

¹¹ Dr B noted that sudden onset of pain is not suggestive of discitis or epidural abscess, which typically have a much more indolent (causing little or no pain) initial presentation.

32. Mr A was given analgesia shortly before midday. A physiotherapist assessed Mr A and documented that he was struggling to walk. According to the notes, the physiotherapist's treatment consisted of Mr A mobilising with crutches, and providing education regarding repositioning. The physiotherapist recorded that Mr A would be safe to discharge once pain relief was provided. At 11.55am a nurse documented 5/10 pain at rest and higher when mobilising. Mr A was given analgesia and, by 4.30pm, his pain score had dropped to 3/10. In response to my provisional opinion, Mr A's family noted that it was concerning that Mr A was still unable to mobilise without crutches despite the reduction of his pain following the analgesia.
33. Dr B did not order blood tests, X-rays or an orthopaedic consultation as, based on the available clinical information, he did not believe such testing was required.
34. Mr A was discharged with prescriptions for analgesia, and the "Transfer of Care to GP" form records advice to return "for much worsened pain, or for numbness or weakness in legs, or loss of bladder control".

Second presentation — the public hospital

35. Four days later, Mr A experienced back pain and dizziness. He was taken to the public hospital by ambulance.
36. Mr A arrived at EC complaining of back and shoulder pain. He was monitored half hourly by nursing staff for the majority of his time in EC.
37. At 10am, Mr A was triaged, and the triage nurse queried sepsis.¹² He had a pain score of 1–3/10. Mr A's heart rate was elevated at 120 beats per minute (bpm),¹³ and his oxygen saturations were 90%.¹⁴
38. At 10.12am, another nurse assessed Mr A and recorded a pain score of 6/10, low blood pressure (90/62mmHg), elevated heart rate (114bpm), and oxygen saturations of 91%. The nurse noted that he was alert but looked pale, and that he felt dizzy and unwell. The nursing plan included an ECG¹⁵ to check Mr A's heart, and oxygen therapy. At 10.20am, blood samples were taken and, at 11.30am, Mr A had X-rays.
39. At 11am, EC Medical Officer Special Scale (MOSS) Dr I assessed Mr A and completed an acute assessment form. This form records initial test results, which included elevated INR,¹⁶ elevated urea,¹⁷ elevated creatinine,¹⁸ and elevated white blood count.¹⁹ Dr I queried sepsis. Dr I discussed Mr A's care with EC SMO Dr J. Dr

¹² Sepsis is the systemic inflammatory response to infection caused by any class of microorganisms, with the invasion of these microorganisms or their toxins in the bloodstream causing illness. Sepsis may be graded as mild, moderate or severe according to the associated damage or failure of organ(s).

¹³ The normal range is 51–100bpm.

¹⁴ Normal blood oxygen levels in humans are considered to be 95–100%.

¹⁵ An electrocardiogram (ECG) records the electrical activity of the heart.

¹⁶ >10.

¹⁷ 28.3mmol/L, normal range 3.2–7.7.

¹⁸ 296µmol/L, normal range 60–105.

¹⁹ 13.8(x10⁹/L), normal range 4.0–11.0. White blood cells (leukocytes) help to fight infection.

J advised giving Mr A antibiotics. Dr I's plan detailed a number of interventions, including analgesia, IV fluids, and ordering more blood cultures. His plan also included intravenous (IV) "flucloxacillin/gentamicin". Dr I then discussed Mr A's care with orthopaedic registrar Dr K, and the notes record: "[Discussion with orthopaedics] > will see first — hold off antibiotics." The notes show that Dr I did not chart antibiotics. CMDHB explained to HDC that there was a verbal understanding in EC that antibiotics would be withheld until any aspiration²⁰ had been completed.

40. At the time of Mr A's presentations to the public hospital, no written policy or guideline existed in relation to the withholding of antibiotics in suspected spinal infections.

ICU review

41. ICU SMO Dr C assessed Mr A to see if he was eligible to participate in a sepsis trial. Although the time of this assessment is not recorded, Dr C told HDC that it was "after midday". Mr A's INR result showed that he was over-anticoagulated (>10), and Dr C therefore felt that it was not in Mr A's best interests to have a central venous catheter inserted (as required in the trial). Dr C noted that Mr A's blood pressure had improved with fluid administration, and he was "responding well to resuscitation". Dr C told HDC: "I was happy for [Mr A] to remain under the care of the Emergency Team. I did not feel that his condition was such that I should circumvent the normal process for Emergency Care to refer him for Intensive Care Unit assessment." Mr A remained in EC.
42. At 12.28pm, Mr A received 1mg of IV Vitamin K²¹ to correct his raised INR. Mr A received paracetamol (orally) at 12.30pm, and IV morphine at 12.31pm, 12.35pm, 12.48pm and 12.55pm for pain relief.
43. At 1.15pm, nursing notes document that Mr A was hypotensive,²² and that IV fluids were being given.²³ However, there is no record of IV fluids being charted or the fluid balance being recorded until later.
44. At some point between 1.15pm and 2.15pm, an orthopaedic review was carried out. Dr K reviewed Mr A, and the record of this includes Mr A saying that he had a 17-day history of increased lower back pain. Dr K examined the surgical site on Mr A's back and documented that it was not red or tender. He documented that Mr A's blood test results included an INR of >10, C-Reactive protein²⁴ was elevated,²⁵ his white blood cell count was elevated,²⁶ and his liver function test was raised. The documented plan was to admit Mr A to the orthopaedic ward, and for him to be reviewed medically

²⁰ This refers to the removal of tissue for pathological evaluation.

²¹ Phytomenadione, a procoagulant factor.

²² Abnormally low blood pressure.

²³ CMDHB could not produce the IV fluid charts for Mr A's stay in EC.

²⁴ A protein produced by the liver. Levels rise in response to inflammation.

²⁵ >320mg/L. Normal concentration in healthy human serum is usually lower than 10mg/L, slightly increasing with aging.

²⁶ $14 \times 10^9/L$.

because he was hypoxic.²⁷ The orthopaedic team ordered an MRI. There is no mention in this record of Mr A needing antibiotics.

45. At 2.15pm, medical registrar Dr M reviewed Mr A. At this time, Mr A's blood pressure was 100/60mmHg, his heart rate was 114bpm, temperature 37.2°C, oxygen saturation 91%. Dr M's impression was that Mr A had acute renal failure secondary to dehydration and sepsis. Dr M also noted that Mr A was hypoxic and had a high INR. Dr M's plan included IV fluids and further review of Mr A's notes. At 2.20pm, Mr A was given further morphine (IV). Again, there is no mention in this record of Mr A needing antibiotics.
46. At 4.50pm, Mr A's INR was still >10, and the laboratory result records that the house surgeon was notified.
47. At approximately 5pm, Mr A returned from having an MRI of his lumbar spine. The MRI report (which is timed 4.29pm) notes a "large inflammatory paravertebral²⁸ mass" and discitis.²⁹ The report also notes that the results were discussed immediately with the team registrars. CMDHB told HDC that the results were not read until 6pm, when Dr K reviewed the MRI.³⁰ Dr K discussed the MRI result with orthopaedic SMO Dr D who, although not at the public hospital, reviewed the films online and recommended IV antibiotics (the record does not specify the antibiotic to be used).
48. Orthopaedic house officer Dr L charted the antibiotic augmentin, which was administered intravenously at 7.15pm. Dr L noted that Mr A's urine output was only 18ml per hour. Between 6pm and 11pm Mr A's urine output was consistently poor at less than 30ml per hour. Mr A continued to have fluid challenges³¹ and IV hydration.

Transfer to orthopaedic ward

49. At 8.10pm, ICU registrar Dr N reviewed Mr A and documented his impression: "Sepsis/SIRS³² [secondary] to likely discitis." Dr N discussed Mr A's care with ICU SMO Dr G. They agreed that Mr A was suitable for transfer to the ward with support from the Patient at Risk team, and with an ICU team review overnight. Mr A's blood pressure was 117/60mmHg, and his heart rate was 110bpm. CMDHB provided information that noted that Mr A had an acute kidney injury at this time.³³
50. The nursing staff observed that Mr A was becoming slightly more agitated, and that he had fresh blood on his arm and a bloodstained mouth. At 8.15pm, Mr A was given 2mg of Vitamin K, and a further 2mg was given at 9.30pm.

²⁷ Deprived of adequate oxygen supply.

²⁸ The area alongside the spinal column or near a vertebra.

²⁹ An infection in the intervertebral disc space.

³⁰ At this time, Mr A's blood pressure was 100/60mmHg, and his heart rate was 90bpm. His oxygen saturation was 92%.

³¹ A fluid challenge is where large amounts of fluid are administered in a short space of time to monitor a patient's response.

³² Systemic Inflammatory Response Syndrome — an inflammatory state affecting the whole body.

³³ This information was provided to HDC in the form of a report by Dr E to CMDHB as part of its internal review.

51. The patient management system shows that Mr A was discharged from EC to the orthopaedic ward at 11.03pm.
52. At 11.35pm, Mr A was in respiratory distress and had a PUP score of 4.³⁴ An emergency call was made, and medical registrar Dr O responded. At this time, Mr A's blood pressure was 122/74mmHg, and his heart rate was 120bpm (AF). His temperature was raised slightly at 37.7°C. CMDHB provided information that noted that Mr A had a significant metabolic acidosis³⁵ and an elevated lactate.³⁶ The documented plan was for an ICU registrar to review him, with a view to admission to the High Dependency Unit (HDU).

Transfer to High Dependency Unit

53. At 11.53pm, ICU registrar Dr N reviewed Mr A. Mr A was transferred to the HDU for invasive monitoring, respiratory support, and vasopressor support for his blood pressure.³⁷ Several different antibiotics were given to broaden the microbiological coverage, and flucloxacillin was added once his blood culture showed the presence of *Staphylococcus aureus* bacteria.
54. Mr A's INR was still high despite earlier attempts at reversing this. He was given two units of Prothrombinex at 3.00am to address this. By 3.50am his INR was within the normal range.

Transfer to ICU

55. At 4.30am the following day, Mr A was transferred to the ICU for intubation, ventilation, and renal dialysis. Mr A required ventilation and inotrope³⁸ support. Despite these measures, Mr A continued to deteriorate and developed multiple organ failure.
56. At 8.45am, orthopaedic SMOs Dr D and Dr P reviewed Mr A and recorded: "Nil operative management at present."
57. At 6.25pm, Mr A died.
58. The post mortem report refers to a large abscess in the psoas muscle (in the lumbar region). Mr A's cause of death was recorded as multi-organ system failure, with *Staphylococcus aureus* osteomyelitis and septicaemia, ischaemic heart disease, and chronic systemic hypertension.

³⁴ The PUP (physiologically unstable patient) scoring system is designed to ensure that information obtained through the patient observations is collated clearly, and that physiologically unstable patients are identified as early as possible. A PUP score of 4 means that a medical review should occur within an hour, and observations should occur within 30 minutes.

³⁵ A condition that occurs when the body produces excessive quantities of acid, or when the kidneys are not removing enough acid from the body.

³⁶ 5.4mmol/L. Lactate levels may be ordered at intervals to help monitor hypoxia and response to treatment in a person being treated for an acute condition, such as sepsis.

³⁷ The timing of this transfer is unclear. The clinical record states "2.20 admission to HDU", but the DHB database records that it was at 12.30am.

³⁸ Inotropes are medications that increase the pumping of the heart.

Subsequent events

59. CMDHB provided a statement from orthopaedic SMO Dr D (who had reviewed the file after the events). Dr D considered that there was no indication on the first presentation that there was significant active infection in Mr A's spine. Dr D also noted that following spinal surgery many patients experience intermittent episodes of back pain.
60. CMDHB acknowledged that the decision to withhold antibiotics on the second presentation was regrettable and that, in hindsight, Mr A should have been transferred directly to the Critical Care Complex³⁹ rather than being transferred to the orthopaedic ward.
61. CMDHB has:
 - a) apologised in writing to Mr A's family on two occasions;
 - b) clarified EC's standing on withholding antibiotics for patients with suspected spinal infection (the draft document "Withholding of antibiotics in suspected spinal infections" was discussed with all orthopaedic registrars and house officers at an orthopaedic clinical meeting);
 - c) reviewed and updated the Back Pain Guideline in EC; and
 - d) begun work on improving response times to sepsis and severe sepsis in EC. This work began with a review of patients admitted to the ICU with sepsis between July and November 2012. CMDHB is working on improving response times in relation to identifying patients with sepsis and commencing antibiotic therapy. This review identified delays in commencing antibiotic therapy, and delays in identifying patients with sepsis.

The resulting goal was that 70% of patients with probable severe sepsis would have a door to antibiotic time of <60 minutes by July 2014. In March 2013, a sepsis screening tool was developed in the form of a flowchart for the EC nursing staff.

Response to provisional report

Counties Manukau District Health Board

62. CMDHB stated, in response to my provisional report, that it "accepts that some aspects of our care and treatment failed [Mr A] ... We apologise unreservedly to the family for those failures, and for the distress that [Mr A's] death has caused them."
63. On his second admission, Mr A spent 13 hours in EC while a definitive diagnosis was sought. CMDHB advised that it was deemed clinically appropriate that Mr A remain in the monitored area of EC until the MRI was completed and he was re-assessed by the orthopaedics team and then by the medical team.

³⁹ Critical Care Complex includes the HDU and ICU.

64. In response to my expert's query as to whether a SAC⁴⁰ 1 inquiry was ever conducted, CMDHB stated that:

- There were two incident reports about Mr A's care.
- The first report (graded as a SAC 3) related to Mr A's transfer in an unstable condition to the ward when he was admitted to hospital on the second presentation.
- The second report was provisionally rated as a SAC 1 and was then reviewed by a team in EC and staff from ICU and Medicine. The outcome of this review was presented at a Serious and Sentinel Event (SSE) Committee meeting, the minutes of which state that the case was discussed at length and no SSE was identified, and a Mortality and Morbidity review was suggested.
- Mr A's case was presented at a Combined Surgical and Medicine Mortality and Morbidity meeting and generated much discussion.
- A case study was completed on Mr A in EC and was the impetus for the Sepsis Campaign which was launched in late 2012. The aim of the campaign is to reduce the time between presentations to EC and the time of antibiotic administration in patients with sepsis. In April 2015, 63% of patients (with sepsis) were given antibiotics within one hour of presenting to EC, and work is continuing to improve this with a clinical KPI (key performance indicator) of 80% of patients (with sepsis) receiving antibiotics within one hour of presenting to EC.
- CMDHB's SSE process has been amended so that ACC treatment injuries, major complaints, deaths and incidents involving patient harm are now all reported to the SSE Committee for further review and follow-up as indicated.
- In line with Health Quality and Safety Commission recommendations, CMDHB is initiating a Perioperative Mortality Committee to oversee and review all mortality cases that individual services currently review. This committee will ensure that cases that require referral to the SSE Committee are identified in an appropriate timeframe.

Mr A's family

65. Mr A's family was given the opportunity to comment on the "Information gathered during investigation" section of my provisional report. Their responses have been incorporated into my report as appropriate.

66. In addition, the family stated that they believe that the ambulance service patient report form, EC assessment form, acute assessment and discharge letter from the first presentation all identified "red flags", which indicated the need for further investigations. They also stated that they believe that Mr A should not have been discharged because he was unable to mobilise to the extent he had been able to prior to the onset of the pain, and that the "red flags" were not excluded.

⁴⁰ Severity Assessment Code.

Opinion: Counties Manukau District Health Board

Overview

67. My investigation focused on Mr A's two admissions to the public hospital in 2011, and I find that he did not receive appropriate care and treatment. CMDHB and the staff involved in Mr A's care had a responsibility to take all reasonable steps to ensure that services were provided to him with reasonable care and skill. District health boards are responsible for the operation of clinical services within hospitals, and can be held responsible for any service-level failures. The individual health professionals who provided care to Mr A bear some responsibility for the failures, but I am of the view that these failures were a result of systems and cultural issues at the public hospital: a lack of clarity regarding the circumstances in which it would be appropriate to withhold or delay the administration of antibiotics; and a pattern of errors by CMDHB staff, who failed to realise that Mr A was unstable and needed to be on antibiotics and admitted to ICU.
68. I am most concerned about the delay of nine hours before Mr A received antibiotic treatment during his second admission. My expert advisor, emergency medicine specialist Dr John Chambers, advised that once shock develops, mortality can increase by 7.6% for each hour that antibiotics are delayed. The increase in mortality with each hour that antibiotics are delayed makes this a critical time. There were missed opportunities for clinicians to recognise that because Mr A was unstable, antibiotics should not have been withheld. Clinicians were reliant on an unwritten understanding that antibiotics should be withheld until any aspiration was completed. On his second admission, Mr A spent 13 hours in EC while a definitive diagnosis was sought. CMDHB stated that it was deemed clinically appropriate that Mr A remain in the monitored area of EC until the MRI was completed and he was re-assessed first by the orthopaedics team, and then by the medical team.
69. However, I am also concerned about the delay in transferring Mr A to ICU, and the delay in correcting his coagulation abnormality. Given his blood test results, including an INR over 10, Mr A should have been transferred directly to ICU, but he was transferred to the orthopaedic ward, where he continued to deteriorate.
70. The above issues, as well as other aspects of the care provided to Mr A, are addressed in more detail below.

Standard of Care — Breach

Delay in commencing IV antibiotics

71. At 11am on Mr A's second presentation, EC MOSS Dr I reviewed Mr A, queried sepsis, and had a discussion with EC SMO Dr J. Dr J instructed the administration of antibiotics to Mr A for the treatment of sepsis. Dr Chambers advised that the direction to administer gentamicin and flucloxacillin was "appropriate and timely".
72. However, Dr I also discussed Mr A's care with orthopaedic registrar Dr K, who had not reviewed Mr A, but advised withholding the antibiotics until he was reviewed by orthopaedics. CMDHB advised HDC that there was a verbal understanding in EC that

antibiotics would be withheld until any aspiration had been completed. Dr I did not chart any antibiotics.

73. Dr Chambers advised that withholding antibiotics until culture specimens are obtained is appropriate, but only if patients are stable. Mr A was not stable (he had low blood pressure and low oxygen saturations).⁴¹
74. Despite further reviews of Mr A, including an orthopaedic review, he did not receive antibiotics until 7.15pm that day. The reviewing clinicians missed opportunities to recognise that Mr A was medically unstable and therefore should have been on antibiotics.
75. CMDHB did not have a clear policy in place regarding the withholding of antibiotics in this situation, and in my view this was a relevant factor in the suboptimal care in Mr A's case.
76. DHBs are responsible for providing clear direction to staff, who are guided by departmental policies (whether they are written or unwritten). In this case, staff were reliant on an unwritten policy, which did not provide guidance regarding unstable patients. Furthermore, the reviewing clinicians missed opportunities to realise that Mr A was unstable and that antibiotics should not have been delayed.
77. I consider that CMDHB's failure to provide clear direction and guidance to its staff, together with the failures by multiple clinicians to assess that Mr A required antibiotics, led to Mr A not receiving IV antibiotics in a timely manner.

Delay in escalation of care

78. Mr A was showing signs of severe sepsis from the time of his second admission. During his time in EC, he developed septic shock with hypotension, which did not stabilise after fluid resuscitation and antibiotics.
79. Although Mr A was recognised as being very unwell early on in his admission, he did not receive appropriate, timely treatment. He underwent an intensive care review, to see if he was eligible to be selected for a trial aimed at evaluating the best treatments for sepsis, but was discounted due to his high INR. He was subsequently seen by a number of registrars and house surgeons, and was not seen by the orthopaedic consultant until the next morning.
80. Dr Chambers was of the view that “[t]he step wise escalation in care over many hours and by multiple clinicians was not appropriate to the clinical situation”. Dr Chambers advised that when Mr A was identified as having severe sepsis and in the context of his comorbidities and blood results, including an INR of >10, he should have been given IV antibiotics, and should have been admitted to ICU from EC. I accept this advice, and CMDHB acknowledged that this should have occurred.

⁴¹ CMDHB describes medically unstable patients (in the context of withholding antibiotics) as being febrile and toxic, or having new onset of single or multiple organ failure (hypoxia, acute renal failure, decreased level of consciousness or confusion, tachycardia, hypotension).

81. Dr Chambers advised: “If [Mr A] had been admitted at an early stage to an Intensive Care area for treatment and observation there could have been the option of de-escalation had he responded to antibiotic and fluid regimes and not required inotropic and respiratory support.” I find that the delay in transferring Mr A to ICU was unacceptable. Although he was reviewed by multiple clinicians during his time in EC, no one individual identified that the seriousness of Mr A’s condition required him to be admitted to ICU, and advocated for him for this to occur. No single person had the full picture of Mr A’s condition.
82. In my view, CMDHB is responsible for the pattern of errors by its staff, which raises concerns about the culture within EC at that time with regard to the lack of senior clinician oversight and the failure of staff at all levels to exercise critical thinking.

Conclusion

83. CMDHB’s failure to provide clear direction and guidance to its staff regarding withholding antibiotics, together with the failure of multiple clinicians to exercise critical thinking, led to Mr A not receiving antibiotics when indicated, and not being admitted to ICU from EC in a timely manner. I consider that CMDHB did not provide Mr A with services with reasonable care and skill and, therefore, breached Right 4(1) of the Code.

Delay in correcting coagulation abnormality — Adverse comment

84. Mr A was over-anticoagulated for many hours. A number of clinicians recorded this (as early as 11am on the second presentation), and Vitamin K was administered on a number of occasions in an attempt to correct this. However, it was not until 3.30am on the following day that Mr A’s INR was corrected following the administration of Prothrombinex at 3am.
85. I consider that the delay in recognising that the Vitamin K was ineffective, and in correcting Mr A’s INR, is concerning. Dr Chambers advised that this delay could have been of critical importance if haemorrhage had been identified, or if early surgical intervention was necessary.

Initial lumbar fusion surgery — Adverse comment

86. Prior to his hospital admissions, Mr A had lumbar fusion surgery. At the time of his lumbar fusion surgery at the public hospital, Mr A should have received antibiotics (cephazolin) and postoperative IV antibiotics.
87. There is no record of the antibiotics being administered, although they are ticked as having been administered on the surgical safety checklist and on the discharge summary (“Transfer of Care to GP” form). Additionally, CMDHB was unable to provide HDC with some of the postoperative records to verify that Mr A received postoperative antibiotics. I am unable to make a finding on whether or not Mr A received antibiotics on this occasion, but am critical of this poor record-keeping.

Initial assessment in Emergency Care on second presentation — Adverse comment

88. My in-house nursing advisor, RN Dawn Carey, reviewed the nursing care, and considered that the care provided to Mr A was in the most part appropriate. In relation to the management of Mr A's pain, my nursing advisor is critical of the delay in Mr A receiving analgesia. At 10.12am, Mr A told staff that his pain was 6/10. It was not until 12.30pm that he received paracetamol then morphine. RN Carey is of the view that a reported pain score of 6/10 should be managed with analgesia in less time than two hours. In this case I agree that the delay is concerning. It is not clear when the analgesia was charted, so it is unclear whether the medical or nursing team were responsible for this delay.
-

Opinion: Dr B

Care on first presentation — Adverse comment

89. Mr A first presented to the public hospital with lower back pain.
90. Emergency SMO Dr B diagnosed musculoskeletal back pain, and did not order any blood tests or X-rays. Following a period of monitoring and a physiotherapist review, Dr B discharged Mr A with a prescription for analgesia. His rationale was that Mr A did not have a fever, his pain was of sudden onset, he was stable on physical examination, had satisfactory vital signs and normal sensation in his legs, and he had improved over a six-hour period of observation.
91. Dr Chambers advised me that in light of Mr A's age, his recent surgery, and his warfarin therapy, Dr B should have requested blood tests (including a full blood count, C-Reactive protein, and INR) and plain X-rays. Dr Chambers said that based on the results of these, Mr A may have needed an orthopaedic consultation. Dr Chambers advised that back pain in patients who are on warfarin raises the possibility of other diagnoses, including haemorrhage, but other possible diagnoses are not documented. Further, CMDHB's guideline "Low Back Pain — Acute Assessment" states that patients over the age of 50 years who present with acute low back pain should have blood tests and an X-ray.
92. I am concerned that blood tests and X-rays were not requested by Dr B. In my view, Dr B should have considered and recorded the differential diagnoses, obtained the necessary test results, and formulated a treatment plan in light of those results.
-

Recommendations

93. CMDHB has apologised on two occasions to Mr A's family.
94. I recommend that CMDHB:
- a) Report back on whether the target (that 70% of patients with probable severe sepsis will have a door to antibiotic time of <60 minutes) has been reached, by one month from the date of this report.
 - b) Evaluate the effectiveness of its guideline on withholding of antibiotics in suspected spinal infections, and any other relevant guidelines and/or policies, within three months of the issue of this report, and report back to HDC within three months of the date of the report.
 - c) Review its documentation management procedures, to ensure safe storage and monitored access of documentation, and report back to HDC with any changes made, within three months of the date of this report.
 - d) Review the clarity of, and its compliance with, the thresholds for undertaking critical event reviews, and report back to HDC within three months of the date of this report.
-

Follow-up actions

95. • A copy of this report will be sent to the Coroner.
- A copy of this report with details identifying the parties removed, except Counties Manukau District Health Board and the experts who advised on this case, will be sent to the Australasian College for Emergency Medicine and the New Zealand Orthopaedic Association, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A — Independent emergency medicine advice to the Commissioner

The following expert advice was obtained from Dr John Chambers:

“I was asked to provide an opinion to the Commissioner on case number C13HDC00343 and prepared a report having read and agreed to follow the Commissioner’s Guidelines for Independent Advisors.

I am Dr John A. Chambers MBChB 1978 (Glasgow), FRCS 1984 (Edinburgh) FACEM (1996). I have been employed as a specialist in Emergency Medicine in Dunedin Hospital since 1993 and continue to work as a full time specialist in the Emergency Department. I held the position as Head of Department/Director from 1993 till 2011. I regularly supervise and take part in the care of emergency patients who present to a general Emergency Department. During my time as an Emergency Department doctor I have looked after patients with septicaemia and shock including a small number with spinal sepsis, lumbar discitis and psoas abscess.

The opinion and advice provided is with regard to the care of [Mr A].

The purpose of this advice is to enable the Commissioner to determine whether, from the information available, there are concerns about the care provided by [the public hospital’s] Emergency Department (CMDHB).

The particular matters I was asked to consider in a preliminary report and comment on were detailed in the correspondence I received from the office of the HDC:

- The standard of care offered to [Mr A] on [his first presentation] and report for the treating ED doctor.
- The appropriateness of the Triage category of T3 allocated to [Mr A] when he arrived at the ED on [his second presentation].
- The standard of his initial assessment in ED on [his second presentation] and timeliness of sub-specialty involvement.
- The standard of documentation regarding IV fluid administration, urinary output and physiological parameters.
- Whether the time delay to performing an MRI was excessive.
- To comment on the timing of antibiotic administration and the choice of antibiotic.
- The assessment in ED by the ICU team and decision to admit him to an orthopaedic ward with outreach input.
- The timeliness of escalation of care as his illness progressed.
- The appropriateness and adequacy of the DHB response to these events and remedial measures taken.
- Make any further comments or recommendations based on my review of the events and documents submitted.

The information supplied to me by the office of the Commissioner for review consisted of photocopies of the following.

- Complaint from family members and responses from CMDHB.
- Autopsy report and ACC Treatment Injury Advice report.
- Clinical notes regarding [first] attendance at ED.
- Clinical notes regarding [second] admission to [the public hospital].
- Clinical notes regarding lumbar spine surgery.
- Cardiology clinic notes.

BRIEF FACTUAL SUMMARY

[Mr A], [aged in his early 60s], presented to [the public hospital] Emergency Department ([the public hospital] ED) via ambulance with sudden severe back pain following lumbar fusion surgery approximately 10 weeks previously. His pain was diagnosed as musculoskeletal without any specific investigations and he was discharged home with analgesia. He re-presented to [the public hospital] ED via ambulance [four days later] following a general deterioration in his condition and was diagnosed with likely sepsis. MRI results indicated this was probably originating from the site of his previous surgery) later confirmed at post mortem.

OBJECTIVE FINDINGS FROM MY REVIEW OF THE DOCUMENTATION SUPPLIED

I will now list a number of points from my examination of the material provided which are in my opinion of relevance to my opinion on the issues of concern in the order in which I have come across them:

1. [Mr A], [aged in his early 60s], had preexisting health problems including an Atrial Septal Defect for which he had an implanted cardiac device and chronic atrial fibrillation for which he was on warfarin to prevent thrombosis.
2. Family comments express concern that no blood tests or x-rays were performed [at the first visit to ED with severe back pain and reduced mobility].
3. Family were aware that [Mr A] was showing evidence of severe sepsis when assessed for eligibility to be entered in [a] sepsis trial within a short time after arrival on [the second presentation].
4. Family are concerned that he had to wait many hours for an MRI scan.
5. Family are concerned that a decision was made to withhold antibiotics and that they were not administered till 9 hours after arrival.
6. Family have concern regarding some of the points made by the ICU consultant shortly prior to [Mr A's] death and the recording of the note "RIP [Mr A]" on the discharge summary.
7. HDC response indicates that an orthopaedic registrar made a decision to withhold antibiotics.
8. The MRI scan was performed at 1429.
9. The registrar who recommended withholding antibiotics was 'unable to be contacted' in the course of the inquiry.

10. **The post mortem report notes that ‘L3 and L4 appeared softened and oozed purulent fluid. The left psoas muscle contained a large abscess’.**
11. [In the] initial assessment notes at [the first attendance] there is no nursing or medical documentation regarding current medications and specifically no mention that the patient was on warfarin.
12. The medical notes do not indicate that any differential diagnosis was considered. He was discharged with a script for paracetamol and tramadol.
13. The clinical notes on arrival at [the public hospital] [on the second occasion] indicate that [Mr A] was given the Triage priority code of T3.
14. **After initial assessment by an ED doctor he was assessed by an ICU consultant at 11am with a view to entry into [the sepsis trial].**
15. **It is noted that he was ‘eligible’ but that his INR >10 was a ‘contraindication to CVL (central venous line) @ present’.** The ED Doctor was notified.
16. **The ED notes written some time after 11 am record that ‘DW Dr (illegible) — IV Flucloxacillin/Gentamicin’ below this entry ‘DW ortho — will see first — hold off antibiotics’.**
17. At 13.15 it is recorded ‘Pt. remains hypotensive’.
18. A medical registrar review at 14.15 includes concerns about hypoxia, acute renal impairment and supratherapeutic INR.
19. Patient returned from MRI at 17.05.
20. MRI result discusses with orthopaedic consultant at 1800 and noted that ‘No gadolinium given due to (increased) Cr’.
21. IV Augmentin charted at 18.30 and given at 1900.
22. ICU assessment at 2010 note INR > 10 despite earlier vitamin K and more was charted. Patient admitted to orthopaedic ward with ICU oversight and involvement. ‘PAR and ICU outreach.’
23. Deteriorated at 23.35 with PUP score 4 and ICU review arranged.
24. Noted had been taking ‘diclofenac for back pain’.
25. Additional antibiotics were prescribed plus further vitamin K and Prothrombinex (to correct the INR). Prothrombinex issued from lab at 02.30.
26. INR measured at 2.6 at 03.30.
27. He was transferred to ICU at 04.30 and placed on a ventilator.
28. A CT scan of the abdomen was arranged.
29. **CT scan provisional report at 07.45 included ‘fluid largest on iliacus 4.5cm x1.4cm x 6 cm — otherwise no drainable collection’.**
30. Reviewed by orthopaedic team at 08.45 and it is noted ‘Nil collection on MRI’.
31. Blood culture suggested Staphylococcal sepsis and Flucloxacillin was added to the antibiotic regime at 09.30 on [date].
32. Patient died at 18.25.
33. **Formal MRI report included the extracts ‘Large paravertebral mass’ ‘measuring 9.6 x 6 cm’ ‘assessment of drainable abscess is restricted due to a lack of gadolinium’.**
34. It is noted that ‘Kefzol’ (cephazolin) was advised to be given at the time of the initial spinal surgery on [date of surgery] and ‘IV antibiotics for 24 hrs’ in the preadmission note.

35. I could not confirm that this medication was administered from the notes supplied.
36. I did not have access to the notes regarding the shoulder surgery performed shortly before [Mr A's] final illness to establish whether prophylactic antibiotics were given at that time.

DISCUSSION REGARDING THE CONDITIONS CONCERNED

I have used as reference texts Tintinalli's Emergency Medicine and UptoDate an online source used in most hospitals in New Zealand plus an internet search on the conditions concerned.

[Mr A] had septicaemia and multi-organ failure due to infection related to his previous spinal surgery. The diagnoses of note are discitis, osteomyelitis and secondary psoas abscess (secondary to spinal surgery and instrumentation). The post mortem findings suggest that osteomyelitis and psoas abscess were the pathological findings.

These diagnoses can complicate spinal surgery and staphylococcus would be [the] likely organism. Treatment is generally with intravenous antibiotics and in selected cases by guided drainage via a percutaneous route or open surgery. However despite difficulty in diagnosis overall **mortality if treated is quoted in UptoDate as 5% for osteomyelitis/discitis and 19% for secondary psoas abscess.**

Age, other co-morbidity and atypical organisms could contribute to a higher mortality.

Reference sources do recommend directed antibiotic therapy and withholding antibiotics until culture specimens are obtained but only if patients are stable.

C-reactive Protein (CRP) is a recommended blood investigation in these conditions and of note tends to fall quite rapidly after uncomplicated spinal surgery. It is typically 180+ in patients who develop spinal infections and abscesses.

[Mr A] at his second presentation was showing signs of severe sepsis. That is sepsis plus organ dysfunction. During the period of his investigation and observation in the ED/assessment ward this evolved into septic shock with hypotension which did not stabilise after fluid resuscitation and antibiotics treatment. As noted in the ACC treatment injury report on this case, in the material supplied to me, research suggests that once shock develops **mortality can increase by 7.6% for each hour that antibiotics are delayed.**

Back pain in patients who are on warfarin raises the possibility of other diagnoses including intramuscular/retroperitoneal or renal haemorrhage especially if levels are supratherapeutic. Such possibilities were not documented during his attendances.

Research papers in the orthopaedic literature suggest that cephazolin may not reach therapeutic levels in vertebral discs and recommend gentamicin and cefuroxime as an alternative regime to prevent post operative infection and discitis.

COMMENTS REGARDING THE SPECIFIC ISSUES RAISED BY THE COMPLAINTS ASSESSOR OF THE HDC

I have highlighted my comments with regard to the particular questions asked by the Office of the Commissioner.

- The standard of care offered to [Mr A] on [the first presentation] and report from the treating ED doctor.

The standard of care was below that required. In view of his age, recent surgery and current therapy with warfarin he should have had blood tests including FBC [full blood count], CRP and INR and plain x-rays performed. Based on results an orthopaedic consult may have been required. This would have been the appropriate advice had a junior doctor in ED discussed the case with a senior colleague.

- The appropriateness of the Triage category of T3 allocated to [Mr A] when he arrived at the ED on [the second presentation].

The initial Triage category of T3 was appropriate in keeping with the guide on the Triage documentation.

- The standard of his initial assessment in ED on [the second presentation] and timeliness of sub-specialty involvement.

The initial assessment in ED on [the second presentation] was of good standard. It was rapidly realized the patient was unwell and suffering severe sepsis. As well as orthopaedic referral within an hour he was referred to the team undertaking research into the treatment of severe sepsis.

Advice was given by the senior ED doctor to administer IV gentamicin and flucloxacillin.

- The standard of documentation regarding IV fluid administration, urinary output and physiological parameters.

I did not receive a copy of [Mr A's] IF fluid administration chart. His observation charts indicate that observations were written down approximately hourly with a break at the time of transfer to MRI. It is possible that there were many or frequent electronic recordings obtained. I would consider that the paper record is not a true reflection of all the information available to staff. The clinical notes record on going concern regarding [Mr A's] low blood pressure (for his age and body habitus) during his period in the ED /assessment ward and orthopaedic wards.

Although charts are not of the standard or frequency which would be found in an intensive care unit they are, as presented, of reasonable standard in the setting of the ED/assessment area.

- Whether the time delay to performing an MRI was excessive.
The time till performing an MRI scan was reasonable in the setting of a busy hospital. He arrived in ED at 09.45 and the MRI was performed about 3 pm. In a patient who was receiving ongoing medical treatment for suspected spinal sepsis this time frame would be acceptable. It is of concern that the patient's condition and abnormal scan findings were not discussed with the lead orthopaedic specialist till 6pm and that due to technical limitations the scan did not demonstrate clearly that an abscess had formed.
- To comment on the timing of antibiotic administration and the choice of antibiotic.
[Mr A] presented at 10 am with a history and physical signs of severe sepsis statistically likely due to a staphylococcus infection. The recommendation at 11 am by the senior ED doctor that he be given IV gentamicin and flucloxacillin was appropriate and timely.

Unfortunately this was halted on the advice of the orthopaedic registrar who had not seen the patient and who was giving advice which would have been appropriate were the patient in a stable condition. [Mr A] was administered IV augmentin at 1900. I note that the organism cultured subsequently was sensitive to this drug. The 9 hour time delay before the administration of any antibiotic was a critical factor in the care of [Mr A].

- The assessment in ED by the ICU team and decision to admit him to an orthopaedic ward with outreach input.
The ICU specialist who assessed [Mr A] for entry into the [sepsis] trial agreed that he was 'eligible for entry'. At that point [Mr A] should have been given intravenous antibiotics and given his other co-morbidities and blood results including an INR of > 10 should have been seriously considered for admission to the Intensive Care Unit. Subsequently he was cared for by a succession of junior doctors from various teams in the ED and assessment unit then ward, then HDU before being transferred to ICU in the middle of the night.
- The timeliness of escalation of care as his illness progressed.
The step wise escalation in care over many hours and by multiple clinicians was not appropriate to the clinical situation. The correction of his coagulation abnormality was delayed until the administration of prothrombinex in the early hours of [date]. This could have been of critical importance had haemorrhage been identified clinically or on his MRI or CT and/or if early surgical intervention been considered.

If [Mr A] had been admitted at an early stage to an Intensive Care area for treatment and observation there could have been the option of de-escalation had he responded to antibiotic and fluid regimes and not required inotropic and respiratory support.

- The appropriateness and adequacy of the DHB response to these events and remedial measures taken.

It is now two years since [Mr A's] death and there has been considerable correspondence. I have not seen any evidence that an SAC 1 or 2 inquiry was undertaken at the time or that this event was classified as sentinel or serious in the annual report for the year [...].

I am sure that the case has been widely discussed and in institutional memory will have led to increased vigilance when patients present with back pain of any causes and in particular with risk factors for spinal sepsis.

- Make any further comments or recommendations based on my review of the events and documents submitted.

[Mr A] was seen by an ED specialist on his first attendance and not investigated. Early in his care at his second attendance he was identified as seriously unwell and discussed with an ICU specialist and an ED senior. Subsequently his assessment and care was devolved to a variety of RMOs [Resident Medical Officers] with telephone advice until his eventual and critical deterioration in the early hours. His treatment was inadequate and investigations were abnormal but inconclusive. He was not seen by an orthopaedic consultant till the following day.

I do not believe that this course of events was of an acceptable standard and recommend that those most senior doctors on duty must accept responsibility for the decisions made and delays encountered.

I do not believe the responsibility for delays can fall on the shoulders of the orthopaedic registrar. Antibiotics could have been given earlier and his advice could have been identified as inappropriate and overridden.

Despite available therapeutic options and advanced investigations [Mr A's] septic shock evolved until fatal and the secondary psoas abscess was only clearly identified at post mortem.

CONCLUDING REMARKS

Given the complexity of the clinical situation and the relatively high mortality (19+%) of the underlying pathology I would classify the deficiencies in [Mr A's] standard of care at both attendances as **moderate**.

It is difficult to accept that [Mr A] presented to a hospital which at the time was taking part in a study which had the aim of evaluating the best treatments for sepsis. He did not receive antibiotics for nine hours nor was he admitted to the

highest level of care from the outset. **If he had been in the sepsis study he would have received antibiotics immediately before randomization for further care.**

[Mr A] ticked the boxes for inclusion in the severe sepsis study where he would have been studied intensely and treated optimally in either study ‘arm’ but when he ticked a box for exclusion his care was devolved to the usual system. He then fell through the cracks for many hours despite the efforts of multiple mainly junior doctors and the presence of senior doctors on site.

I have no specialized knowledge on the relative contraindications or risks of using gadolinium when performing an MRI scan. An expert MRI radiologist would be best to advise on this matter. Had this been given it is possible that an abscess would have been identified on the day of admission and this could have had a bearing on subsequent resuscitation and treatment.

It is most likely that the cause for [Mr A’s] staphylococcal spinal infection was the introduction of organisms either at the time of initial surgery or by haematogenous spread during the more recent shoulder surgery. This case will have given rise to discussion regarding the use and type of prophylactic antibiotics required in these situations. An orthopaedic spinal specialist might be best to advise in this regard.

With regard to admission to Intensive Care this case does demonstrate the dilemma of deferring admission of a seriously unwell patient to the environment with the best facilities available only when they have deteriorated to the point of needing ventilation. By this stage the clinical situation may be irreversible.

Had the course and timing of events in [the public hospital] been different research would suggest that [Mr A] could have survived this serious infective complication of an elective surgical procedure.”

Appendix B — Independent nursing advice to the Commissioner

The following expert advice was obtained from Dawn Carey:

- “1. Thank you for the request that I provide clinical advice in relation to the complaint from the family of [Mr A] (deceased) about the care provided by staff at [the public hospital] Emergency Department. In preparing the advice on this case to the best of my knowledge I have no personal or professional conflict of interest. I agree to follow the Commissioner’s Guidelines for Independent Advisors.
2. I have reviewed the following documentation: complaint and correspondence from the family; responses from CMDHB including statements from relevant medical and surgical staff members, organisational policies, Chart review report by [two people], [Mr A’s] clinical notes from [both admissions]. I note that no responses have been sought from the nurses involved in [Mr A’s] care.
3. Reported summary of events
On [the first occasion], [Mr A] [aged in his early 60s], presented to [the ED] via ambulance with sudden onset of severe back pain following lumbar fusion surgery approximately 10 weeks previously. His pain was diagnosed as musculoskeletal without any specific investigations (such as blood tests or X-rays) and he was discharged home with analgesia.

[Four days later], he re-presented to [the public hospital] ED via ambulance following a general deterioration in his condition and was diagnosed with likely sepsis. MRI results indicated this was probably originating from the site of his previous surgery (later confirmed via post-mortem).

The complaint outlines that there were delays in commencing antibiotics (as these were withheld during [the second presentation]), as well as delays in escalating [Mr A’s] level of care.

4. I have been asked to review the nursing care provided to [Mr A] for his two [ED presentations].
5. The DHB has provided multiple responses in relation to this complaint. For the purposes of brevity I have chosen not to detail the DHB response in this advice. Relevant to the focus and scope of my clinical advice, the response reports that the internal DHB inquiry highlighted no concerns about the provided nursing care for either presentation.
6. Review of clinical records focusing on nursing care

[First presentation]

[Mr A] presented to the ED via ambulance with acute onset of lumbar back pain, arriving at approximately 10.10am. Unremarkable vital signs observations are recorded for 10.30am, 11.25am and 3pm. Nursing

assessment reports normal neurology with bladder and bowel voiding post onset of pain.

Nursing documentation at 11.55am reports [Mr A] having had a Physiotherapist review and a reported pain score 5/10 at rest. The Adult Medication Chart (AMC) shows that 60milligrams (mgs) Codeine Phosphate orally was administered at 11.20am. At approximately 12midday, further oral analgesia — 1 gramme Paracetamol and 100mgs Tramadol — was administered. At 4.30pm [Mr A's] pain is reported as having reduced to 3/10 when walking and that following a medical review he was discharged approximately 30 minutes later.

Comment: In my opinion, the nursing care provided to [Mr A] on [the first presentation] is consistent with the accepted standards.

[Second presentation]

- (i) [Mr A] represented to [the ED] via ambulance with a history of back pain and dizziness, arriving at approximately 10am. Nursing assessment queries sepsis and he is allocated triage code 3.

Comment: The allocation of triage code 3 is consistent with the Australian Triage Scale (ATS) Guidelines.

- (ii) A more detailed nursing assessment is recorded for 10.12am, which records [Mr A's] blood pressure (BP) 90/62mmHg, pulse 114, oxygen saturations (SpO₂) 91% and a pain score 6/10. The nursing plan is *ECG, O₂, IV luer, bloods, observe, analgesia*. Documentation shows prompt completion of ECG and bloods, and 2litres O₂ therapy being administered to [Mr A].

- (iii) The AMC shows administration of analgesia — intravenous (IV) Morphine and oral Paracetamol — at 12.30pm.

Comment: In my opinion a reported pain score 6/10 should be managed with the administration of analgesia in a timescale quicker than two hours. I am unaware at what time [Mr A's] analgesia was prescribed.

- (iv) Vital signs continued to be monitored at 30 minute intervals until 1.15pm. In total 8mgs Morphine IV had been administered at this time. An updated pain score is not available. Nursing clinical notes entry reports [Mr A] lying supine, having had a chest xray, a urinary catheter inserted and blood cultures taken and ... *IVF continues as per chart*.

Comment: There are no prescription or administration charts for IV fluids included in the submitted clinical notes. I note these documents were also not available to the authors of the Chart review report.

- (v) At 2.20pm [Mr A] was administered a further 2mgs IV Morphine. Nursing documentation at 2.42pm reports *Pt is alert ... PUP 1 ↑HR*.

IDC patent draining well. Pt awaiting MRI and repeat INR at 16:00. I note that [Mr A] was reviewed by Medical Registrar. Documentation for this review is timed 2.15pm and reports ... not for morphine given acute renal failure — have charted fentanyl and oxynorm. On the reviewed AMC, Morphine is crossed out but without identification of the time of discontinuation or by whom.

Comment: In my opinion, it can take a number of minutes to complete the necessary checks to obtain a controlled medication for administration to a patient. This could explain the discrepancy between the decision of the RN to administer Morphine to [Mr A] and being informed/realising that Morphine was discontinued.

- (vi) [Mr A] returned from his MRI scan at approximately 5pm. It is reported that he was commenced on IV fluids at 100mls/hour and his urine bag was changed to an hourly monitoring bag. He remained hypoxic with 6litres of O₂ now being administered. IV antibiotics were prescribed at 7pm with nursing staff reporting administration at 7.15pm.
- (vii) From 6pm to 11pm [Mr A's] urine output is consistently poor at less than 30mls/hour. Fluid challenges and ongoing IV hydration continues. Nursing staff report liaising with Orthopaedic and Patient At Risk (PAR) Team about low urine output, drips of fresh blood loss from his mouth and right arm and an increase in his level of agitation.
- (viii) At approximately 11.10pm [Mr A] transferred from ED to [the Ward].

7. Clinical advice

Following a review of the clinical documentation, I am of the opinion that the nursing care provided to [Mr A] on [the first presentation], was consistent with the accepted standards.

On [the second presentation], I consider that there was a delay in administering analgesia to [Mr A]. I cannot determine to what extent this delay was shared across the healthcare team rather than solely apply to the ED nurses. I also consider that there were aspects of monitoring and documentation — pain assessment and fluid status — that should have been better maintained for [Mr A]. The standard within the file is inconsistent. Whilst I am critical of these omissions my criticism is tempered by the opinion that [Mr A] should have been transferred from the ED monitoring area earlier than he was. I acknowledge that he remained in the ED for approximately 13 hours receiving nursing input at 30 minute intervals for a significant proportion — 8 hours — of his stay. I also acknowledge that there was good evidence of nursing staff reporting changes in a prompt manner. This is expected.

In my opinion, the overall standard of provided emergency department nursing care on [the second presentation] was consistent with the accepted standards.”