

Waikato District Health Board
Consultant Orthopaedic Surgeon, Dr C

A Report by the
Health and Disability Commissioner

(Case 14HDC01215)



Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Table of contents

Executive summary.....	1
Complaint and investigation	3
Information gathered during investigation.....	4
Opinion: Waikato District Health Board — breach.....	20
Opinion: Dr C — adverse comment	26
Recommendations.....	27
Follow-up actions.....	27
Appendix A: Orthopaedic surgeon’s advice to the Commissioner.....	28
Appendix B: Nursing advice to the Commissioner	39
Appendix C: General physician’s advice to the Commissioner	42

Executive summary

1. In 2013, on a Friday, Mr A, a 78-year-old man, was admitted to an emergency department (ED). He had fallen at his home. At 10.36am Mr A arrived at the hospital and was diagnosed with a displaced left neck of femur fracture. Mr A's clinical history included emphysema with alpha-1 antitrypsin deficiency (A1AD).¹
2. In the afternoon, Mr A was admitted to the Orthopaedic Service under the care of a consultant orthopaedic surgeon, Dr J. At 4.20pm Dr J decided that an acute total hip joint replacement (THJR) was the most appropriate procedure to treat Mr A. Dr J anticipated that Mr A would have surgery later that morning. At 6pm, Dr J finished his period on call. Consultant orthopaedic surgeon Dr C then commenced his weekend call.
3. At 8am on Saturday (Day 2²), Dr C decided that it would be preferable to wait until Monday (Day 4) to perform Mr A's hip replacement. Dr J said that the decision to defer surgery was in part because of the higher acuity of other patients awaiting surgery. While Dr C did not dictate a note recording his decision to delay, he stated that the medical and nursing staff present were aware of the decision, and that Dr J had dictated a note to Mr A's GP. Mr A's care was returned to the admitting surgeon, Dr J. Dr C was not rostered on for Day 4.
4. Late in the morning on Day 4, and then again at 3pm, it was noted that Mr A was still awaiting theatre. In the early evening of the same day, Mr A was then told that surgery would not proceed that day. Mr A had his left total hip joint replacement surgery on the evening of Day 5 — four days post-admission. This was over double the optimal time frame (up to 48 hours) for such acute surgery.
5. On the morning of Day 6, Mr A showed signs of deterioration. In response to Mr A's low blood pressure and low urine output, an initial decision made was to administer fluid resuscitation. Mr A did not make any sustained improvement in response to this approach, and then deteriorated further.
6. Waikato DHB utilises an Adult Deterioration Detection System (ADDS) — a standard observation chart tool to help identify adult patients at risk of deterioration. The ADDS scoring matrix measures six vital signs. The ADDS score for Mr A increased to 4 on the afternoon and evening of Day 6, and a nursing entry timed at 5.15am on Day 7 indicated that the ADDS score overnight had fluctuated between 3 and 7. While Mr A experienced a period of improvement in his observations during the day on Day 7, by 7pm he had deteriorated again.
7. According to the ADDS, a score of 6–7 indicates that escalation should occur and a registrar be contacted. A consultant would be contacted in the event that the patient is

¹ Alpha-1 antitrypsin deficiency (A1AD) is a genetic disorder that can produce emphysema (a chronic lung disease caused by damage to the tiny air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place), cirrhosis of the liver, and occasionally inflammation in the fat layer of the skin (called panniculitis). Alpha-1 antitrypsin (AAT) is a protein made in the liver that then circulates in the blood.

² Relevant dates are referred to as Days 1-13.

not able to be reviewed in 30 minutes and the ADDS score does not decrease. In this case, an orthopaedic registrar and a medical registrar were contacted at different times on the morning of Day 7. However, DHB policy also notes that senior medical officers (SMOs) should be contacted when any patient under their care “deteriorates unexpectedly”. Despite Mr A’s continued deterioration overnight on Day 6/Day 7 and his later deterioration in the early evening of Day 7, SMO assistance was not sought.

8. At 10.30pm, Mr A had a rise in the ADDS score to 11, owing to increasing shortness of breath, ongoing hypotension, and poor urinary output. Mr A was escalated to intensive care staff. At 10.50pm a portable chest X-ray showed a right apical pneumothorax. A needle decompression was undertaken by an intensive care registrar, and a chest drain placed for ongoing management.
9. Mr A was handed over to the High Dependency Unit (HDU) at 1am. Mr A continued to receive treatment up to Day 13, but his condition continued to deteriorate. On Day 14, Mr A was placed on a palliative care pathway and, sadly, died later that day.

Findings summary

10. Mr A’s case highlighted the following key deficiencies in the care provided by Waikato DHB:
 - A delay in undergoing total hip joint replacement surgery of over double the optimal time frame for such acute surgery.
 - Inadequate postoperative care, particularly a failure to escalate to an SMO appropriately when Mr A deteriorated during Day6/Day 7. This was contrary to DHB policy.
11. For the above reasons, Waikato DHB did not provide services to Mr A with reasonable care and skill and, accordingly, breached Right 4(1) of the Code of Health and Disability Services Consumers’ Rights (the Code).³
12. There is some criticism that Dr C did not document his rationale for the delay in surgery.

Recommendations

13. The Commissioner recommended that Waikato District Health Board:
 - a) Report to HDC the effect of the following on acute Orthopaedic Service waiting times and quality of patient care:
 - i. The recent dedicated orthopaedic operating theatre set-up over its initial six-month period.
 - ii. The triggering of an escalation process co-ordinated by Waikato DHB’s “Crisis Operation Group”.

³ Right 4(1) of the Code states: “Every consumer has the right to have services provided with reasonable care and skill.”

-
- iii. The Waikato DHB Orthopaedic Service subspecialising programme.
 - iv. The integrated orthogeriatric service at Waikato DHB.
- b) Conduct a scheduled audit of the standard of care provided to acute patients who have presented with a hip fracture, based on the Australian and New Zealand Guideline for Hip Fracture Care.
 - c) Provide evidence to HDC of a further up-to-date audit of staff compliance with the application of the ADDS protocol and relevant DHB policy, including the recognition of a deteriorating patient, and the escalation of care to senior doctors in the event of patient deterioration, with reference to the implementation of a national EWS observation chart in line with the Health Quality & Safety Commission (HQSC).
 - d) Provide a written apology to Mr A's family.
-

Complaint and investigation

- 14. The Commissioner received a complaint from Ms B about the services provided to her father, Mr A, by Waikato District Health Board.
- 15. The following issues were identified for investigation:
 - *Whether Mr A received care and services of an appropriate standard from Waikato District Health Board.*
 - *Whether Mr A received care and services of an appropriate standard from Dr C.*
- 16. The key parties referred to in the report are:

Mr A (dec)	Consumer
Ms B ⁴	Complainant, Mr A's daughter
Waikato District Health Board	Provider
Dr C	Consultant orthopaedic surgeon
Dr D	Orthopaedic registrar
Dr E	Medical registrar
Dr G	Anaesthetist
Dr F	Respiratory registrar
Dr H	Intensive care registrar
Dr I	Intensivist
Dr J	Consultant orthopaedic surgeon
Dr K	House officer

⁴ Mr A's wife, executor of her husband's estate, gave authority for his health information relating to this matter to be disclosed to their daughter, Ms B.

17. Independent expert advice was obtained from an orthopaedic surgeon, Simon McMahon (attached as **Appendix A**).
 18. Nursing advice was obtained from in-house nursing advisor Dawn Carey (**Appendix B**).
 19. Independent expert advice was obtained from a general physician, Denise Aitken (attached as **Appendix C**).
-

Information gathered during investigation

Introduction

20. Mr A, a 78-year-old man, was admitted to the ED. He had fallen at his home.
21. Prior to this incident, Mr A had been generally independent, mobile, and active while living at home with his wife.
22. At 10.36am Mr A arrived at the hospital and had clinical and radiological assessment by ED staff. He was diagnosed with a displaced left neck of femur⁵ fracture, as well as a laceration to his left elbow.

Initial assessment

23. At 12.15pm and again at 1.22pm, Mr A was assessed by the orthopaedic team. The fracture diagnosis was confirmed.
24. Mr A had a clinical history including chronic obstructive pulmonary disorder (COPD).⁶ Mr A also had a pre-existing problem of emphysema with alpha-1 antitrypsin deficiency (A1AD).⁷ This was noted and was discussed with an on-call anaesthetist. It was decided that a chest X-ray was the only additional respiratory work-up appropriate at that stage. The X-ray did not show any indication of pneumonia or pneumothorax.⁸ It was recorded that Mr A's medications were Seretide (inhaler), aspirin, and omeprazole.⁹
25. A femoral block¹⁰ was put in place to help with pain relief, the elbow wound was cleaned and closed with Steri-Strips (dressings), an intravenous (IV) cannula was

⁵ The neck of femur (the long thigh bone) is a flattened process of bone that connects the head of the femur with the shaft of the femur.

⁶ Obstructive respiratory disease, which makes breathing difficult.

⁷ Alpha-1 antitrypsin deficiency (A1AD) is a genetic disorder that can produce emphysema in the lungs, cirrhosis of the liver, and occasionally inflammation in the fat layer of the skin (called panniculitis). Alpha-1 antitrypsin (AAT) is a protein made in the liver that then circulates in the blood.

⁸ A pneumothorax occurs when air leaks into the space between the lung and chest wall. This air pushes on the outside of the lung and makes it collapse.

⁹ Used to treat a number of stomach-related conditions caused by too much acid (eg, indigestion, reflux, and ulcers).

¹⁰ A femoral nerve block is a specific regional anaesthetic technique providing anaesthesia to the anterior thigh.

inserted and, at 2.14pm, a urethral catheter was inserted to assist with urine output monitoring.

26. Mr A was prescribed his longstanding inhalers — Seretide 125/25 and Spiriva (tiotropium). An assessment of Mr A’s suitability to self-administer his inhalers was not completed.
27. On the afternoon of Day 1, Mr A was admitted to the Orthopaedic Service under the care of a consultant orthopaedic surgeon, Dr J. At 3pm Mr A arrived on the ward.

Planned treatment

28. At 4.20pm on Day 1 Mr A, with family members present, was seen by Dr J, who decided that an acute total hip joint replacement (THJR) was the most appropriate procedure to treat Mr A, and discussed this with him. Dr J told HDC that he elected to allow Mr A to eat and drink that evening.
29. Mr A was to be nil by mouth from 2am on Saturday, and Dr J anticipated that Mr A would have surgery later that morning. Mr A’s family said that they expected Mr A to have surgery on the Friday or Saturday. A nursing entry recorded at 10.15pm states:

“[Patient] for THJR [Day 2], NBM from 0200, has been consented, marked, etc [Visited by] family, they are aware of plan for [operating theatre] tomorrow.”

Guidelines

30. Waikato DHB told HDC that all acute theatre waiting lists are clinically assessed by anaesthetic staff and surgeons on a daily basis at an orthopaedic planning meeting, which is held each morning. The DHB said that as a public health organisation this means that the length of time each patient waits for a procedure is always dependent on who else requires surgery, and whether other patients are determined as being clinically more in need of surgery.
31. Waikato DHB stated that it endeavours to achieve 80% of acute patients’ surgery within 24 hours, and 100% within 48 hours of the decision to operate. Relevant guidelines for standard of care for the management of elderly patients with proximal femur fractures outline that surgical treatment should proceed as soon as safely practical, and preferably within 48 hours of admission to hospital. For example, the *National Institute for Health and Care Excellence (NICE)* from the UK (published in 2011) recommends that these patients are best operated on the day of or the day after admission. The *American Academy of Orthopaedic Surgeons Guidelines* for the management of hip fractures in elderly patients¹¹ recommends that for patients with hip fractures, surgical treatment within 48 hours is associated with better outcomes.

Decision to delay surgery — Saturday

32. At 6pm on Day 1, Dr J finished his period on call. Consultant orthopaedic surgeon Dr C then commenced his weekend call. He assumed oversight for the trauma list and orthopaedic patients over this period (until 6pm Sunday).

¹¹ September 2014.

33. At 8am on Day 2, Dr J discussed Mr A with Dr C. Dr C told HDC that Dr J advised him that Mr A was on the waitlist for a total hip replacement, and Dr J discussed his rationale for proceeding to surgery during the weekend, and advised that Mr A's comorbidities were stable at the time.
34. No concerns were noted by Dr C during a review of Mr A that took place on the morning of Day 2. The clinical record for the ward round (no time recorded) states:
- “[Left Neck of femur fracture]
awaiting [left] THJR — hopefully today
- Plan
[Nil by mouth] for [operating theatre]”
35. Dr J told HDC that Dr C indicated that he would not operate over the weekend. Dr J said that the decision to defer surgery was in part because of the higher acuity of other patients awaiting surgery, and also that hip replacements in patients such as Mr A are best performed during daytime hours when staffing levels are better suited to sicker patients and more complex procedures.
36. Dr J stated:
- “The decision to proceed with surgery is multifactorial and variables relating to this change on any given day.
- This decision is considered to be at the discretion of the Consultant surgeon on call at the time. On Saturday morning [Day 2], [Dr C] was aware of what cases had come in overnight, which operating room personnel were available to assist with the day's cases and which Registrar would be assisting him with the cases. On the morning of the [Day 2] [Dr C] was best placed at the time to make the decision to proceed with surgery or delay it. I respected his decision and dictated his decision into the patient electronic clinical record as well as instructing my team registrar to relay this to the nursing staff. [Dr C] then took over Mr A's care.”
37. There is nothing recorded by Dr C in the day-to-day clinical notes regarding the delay in surgery, although a nursing entry at 2.30pm on Day 2 states:
- “[Operating theatre] cancelled — [patient] fed. ? for [operating theatre] Monday.”
38. A letter dated Day 2 appears in the clinical record from Dr J to Mr A's GP, which includes:
- “... Co-morbidities include emphysema secondary to alpha 1 antitrypsin. [Mr A] is on the acute list for a total hip joint replacement and this has been delayed by the acute team until Monday.”
39. On the morning of Day 2, there is no record of Mr A receiving his prescribed inhalers — nurse administered or self-administered.

Rationale for delaying surgery

40. Dr C told HDC that he was aware that a dedicated orthopaedic theatre was unavailable over the weekend, and he discussed with Mr A his decision to delay the surgery. Dr C said that he decided that it would be preferable to wait until Day 4 to perform Mr A's hip replacement.
41. Dr C outlined his rationale for delaying the surgery as follows:
- Total hip replacement is a major procedure associated with increased clinical risk and thus requires optimal conditions and a dedicated orthopaedic theatre.
 - Theatres used for acute cases on the weekend (at that time) were not dedicated orthopaedic theatres. The available theatres were for general use and multiple different procedures.
 - He had concerns regarding the increased risk of complications of acute total hip replacement compared with a standard elective hip replacement (including infection and sepsis, and dislocation), and acute hip replacements are associated with instability.
 - Dislocation rate is higher with a posterior approach. He uses a lateral approach, which reduces the risk, but in his experience acute hip replacements are associated with instability.
 - For these reasons he considered it was in Mr A's interests to delay his surgery to the Monday so it could be carried out in the orthopaedic list in a dedicated orthopaedic theatre. In delaying the surgery to the Monday, it was his expectation that Mr A's surgery would be prioritised on the list for the Monday.
42. Dr C stated that while he did not dictate a note recording his decision to delay the surgery, the medical and nursing staff present were aware of the decision, and Dr J had dictated the note to Mr A's GP.
43. Mr A's family told HDC that they understood, and were informed that, there was an increased risk of infection and dislocation, among other things, as a result of the fracture, but said that they were not aware that the operation occurring in the weekend might be an additional risk.

Handover of Mr A — Day 3

44. By mid-morning on Day 3, Mr A's surgery scheduling had gone beyond 48 hours post-admission. Dr C told HDC that he was familiar with the guidelines, and agreed that it was ideal for patients to be operated on without undue delay and preferably within 48 hours. He said that this had to be balanced against the clinical risk to the patient. If appropriate conditions exist for a safe procedure in both the patient and the facility, surgery should be undertaken within 48 hours.
45. On Day 3, Dr C did not review Mr A personally, as he had no concerns about Mr A from the previous day. At 3pm on Day 3, a nursing entry in the record includes:

“... visited by family

ADDS score 0

For [nil by mouth] 0200hrs — [Day 4] for [operating theatre] [in the morning]
[patient] and family aware
Nil concerns”

46. There is nothing documented in the clinical notes regarding handover of Mr A by Dr C at completion of his weekend call at 6pm on Day 3, or any written communication of Dr C indicating that Mr A’s surgery should be prioritised on the Monday list.
47. In response to the provisional opinion, Dr C said that while prioritisation is not recorded in the clinical notes, he discussed with the surgical team his expectation that the surgery should be prioritised on the list for the Monday.
48. Mr A’s care was returned to the admitting surgeon, Dr J, after the weekend. Dr C was not rostered on for Monday.

Further delay in surgery — Monday

49. Late on Monday morning, Mr A was seen by a registrar. The entry reads:

“Await [operating theatre]
Nil concerns (having his breakfast)
IV fluids charted”

50. At 3pm, nursing records document that Mr A was still awaiting theatre.
51. In the early evening of Day 4, Mr A was told that surgery would not proceed and that he could eat and drink again, which he was reported as doing.

Explanation for delay

52. In relation to the further delay to Mr A’s surgery that day, Dr J told HDC that the delay was necessary owing to the urgency of other cases exceeding the seriousness of Mr A’s condition. Other cases included:
 - A 14-hour resection of a malignancy in concert with a visiting second orthopaedic spinal surgeon. This involved a consultant neurosurgeon and interventional radiologist pre-scheduled to support the case.
 - A compound forearm fracture and a staged acute procedure involving a Taylor Spacial Frame¹² adjustment and osteotomy in a child, performed in the other orthopaedic theatre. The case was, by necessity, more of a priority. If left, this patient would have had progression of tissue damage and a higher risk of infection with devastating consequences. The case required the specific skill set of the consultant on the acute list for that day, and could not have been performed by any other surgeon in the region for several weeks. Such a delay would have resulted in significant deformity, and increased risk of serious complication in this child.

¹² An external device for limb correction, lengthening, and/or straightening.

- An acute presentation of possible necrotising fasciitis and a necrotic wound.

Volume of acute patients

53. Dr C told HDC that at this time, Waikato DHB had an unusually high volume of acute patients requiring surgery across multiple specialties, and this contributed to Mr A's surgery being further delayed until Tuesday.
54. Waikato DHB provided data for the period Day 1 to Day 5 demonstrating that the hospital had a high volume of acute patients requiring surgery across multiple specialties.
55. On Day 1 there were 13 patients awaiting surgery at the end of the day. On Day 2, five acute patients had surgery completed, and there were 12 acute patients awaiting surgery. On Day 3, six acute patients had surgery completed, and there were 13 acute patients awaiting surgery. On Day 4, seven acute patients had surgery completed, and there were 12 acute patients awaiting surgery. On this day, an elective theatre involved a patient with a spinal tumour and multiple surgeons. On Day 5, nine patients underwent surgery (including Mr A) and, by the end of the day, 10 patients were awaiting surgery.

Surgery performed — Day 5

56. At 7.28pm on Day 5, Mr A had his left total hip joint replacement surgery — four days after his admission. He had postoperative IV antibiotics, blood tests and X-rays the next day, and his staples were due to be removed in 10 days' time.
57. Waikato DHB stated:

“We acknowledge that [Mr A] did not receive his surgery in the optimal timeframe for his diagnosis. The reasons for this are multifactorial including the high acute volume ... clinical requirements of other acute patients with more serious conditions, availability of specialist theatre staff, theatre availability, and elective surgery requirements. In retrospect, we acknowledge it would have been appropriate to cancel some elective surgeries on [Day 4] to free up theatre capacity and staff to undertake acute surgery on [Mr A's] fractured neck of femur. We are very sorry that this did not occur.”

Postoperative care — relevant DHB protocols and policies

Standard observation chart — Adult Deterioration Detection System (ADDS)

58. Waikato DHB utilises an Adult Deterioration Detection System (ADDS) — a standard observation chart tool to help identify adult patients at risk of deterioration. The ADDS scoring matrix measures six vital signs¹³ (plus four-hour urine output and oxygen flow rate where applicable), and a corresponding value (0–3) is assigned to each observation. A total ADDS score results from the sum of these values.

¹³ Specifically: level of consciousness, respiratory rate, oxygen saturation, heart rate, systolic blood pressure, and temperature.

59. Waikato DHB's policy "ADDS Adult Deterioration Detection System" states that staff undertaking vital sign assessment shall follow the "Actions Required" escalation protocol.
60. In summary, the "actions required" listed in the margin of an ADDS chart, as they relate to escalation to other staff, are as follows:
- ADDS score of 1–3: consider informing the nurse in charge and/or clinical resource nurse.
 - ADDS score of 4–5: notify the nurse in charge and clinical resource nurse and contact the house surgeon to review within 30 minutes (if the house surgeon is not able to attend or after 30 minutes the patient has not been reviewed and ADDS has not decreased, then contact the registrar to review in 20 minutes).
 - ADDS score 6–7: notify the nurse in charge and clinical resource nurse and house surgeon and contact the registrar to review in 20 minutes (if after 30 minutes the patient has not been reviewed and ADDS has not decreased, then contact the consultant.)
 - ADDS score ≥ 8 : notify the nurse in charge and clinical resource nurse and house surgeon, and contact the registrar to attend immediately (if the registrar is unable to attend, contact the consultant. If no response to request for review, and ADDS has not decreased then staff are to call a designated number and state "Cardiac Arrest" and exact location.) The registrar is to ensure that the consultant is notified.

Relevant DHB policy

61. In addition to the above, at this time there was a further relevant WDHB policy, "When a Resident Medical Officer (RMO¹⁴) should call the Senior Medical Officer (SMO) about inpatients under their care and about ward referrals: the principles of delegated responsibility". This notes under section 3, "When to contact the SMO regarding patients admitted under their care", that SMOs should be contacted when any patient under their care "deteriorates unexpectedly".¹⁵ The policy does not make specific reference to the ADDS.
62. The policy also states that the SMO caring for a patient must be contacted: if the patient is ill enough to require admission to ICU or HDU; requires acute transfer to another service or hospital; has a diagnosis or management that is unclear and for whom delay of management until the next ward round would be inappropriate; before making a decision to take a patient to theatre or for an invasive procedure; if requested

¹⁴ Resident Medical Officer (RMO) is a term covering resident doctors from their last year of undergraduate training until they complete their vocational training. The RMO workforce is not a homogenous group. RMOs range in age and include undergraduate students as well as those with six or more years' post-registration experience. Various job titles including trainee intern, intern, junior doctor, house officer, house surgeon, senior house officer/surgeon, registrar, and advanced trainee are used for RMOs at different stages of their training.

¹⁵ That policy has now been superseded by "Senior Medical Officer (SMO) Responsibilities and the Limits of the Delegation of Responsibility to Resident Medical Officers (RMO)". However, this policy has a similar statement that notes that SMOs should be contacted for any patient who deteriorates unexpectedly.

by the nurse in charge of the ward at the time; and if the patient has a complication following a procedure with which the RMO is not familiar.

63. Waikato DHB told HDC that in relation to standard practice overnight for deteriorating patients on the orthopaedic ward, “usual practice would be for the on call house surgeon to consult the orthopaedic registrar and then the medical registrar to review such a patient”.

Deterioration post-surgery —Day 6

64. At 1am on the morning of Day 6, the observation charts for Mr A record a change in the ADDS owing to increased oxygen requirement. The ADDS is recorded as 0–1.
65. At 9am on Day 6, Mr A’s blood pressure had decreased and he had reduced urine output. Mr A was reviewed on the orthopaedic morning ward round. Mr A was alert and talking, was not in any pain, and had slept well. He had no chest pain and no shortness of breath. His heart rate was regular. The documented plan was to stop giving opioids, and to increase IV fluids.
66. Over the next few hours, Mr A had reduced urine output (100ml for six hours) and he did not respond to the IV fluids with either an improvement in his blood pressure (recorded as 80–95/40–50mmHg) or urine output. At 2.30pm, a physiotherapist recorded that Mr A was sleepy.
67. Mr A scored at a higher level on the ADDS — increasing to a total of 4 by the afternoon.
68. At 3pm, as per the DHB protocol, the nursing records document that a house surgeon (unnamed) was informed. Intravenous fluids were charted and given. Mr A was on two litres of oxygen and was afebrile (no fever). Oral analgesia was administered. Mr A’s catheter was draining well. His surgical wound dressings were changed. Mr A was visited by his family.

Postoperative anaesthetist review

69. At 3.50pm, a postoperative anaesthetic review (given the fact that Mr A had been given a nerve block as part of his anaesthetic) was carried out by anaesthetist Dr G. Dr G noted the decreased urine output and blood pressure. He noticed that there had been a rise in creatinine¹⁶ to 113µmol/L. Mr A’s non-steroidal anti-inflammatory (NSAID) drugs and his diuretic medication were discontinued until the next team review. The impression formed was that there was worsening kidney function. The plan was to continue IV fluids at an increased rate of infusion, re-check urea and electrolytes the next day, and to monitor fluids and review the patient.

¹⁶ The creatinine blood test is used to assess kidney function. Normal range is 45–90µmol/L.

Further deterioration — overnight Day 6/Day 7

Early evening of Day 6, ADDS of 4

70. On the evening of Day 6/Day 7, Mr A's ADDS scores were affected by observations of hypotension (low blood pressure), increased oxygen requirement, tachycardia (rapid heart rate), and tachypnoea (rapid breathing).
71. At 7.20pm, when the ADDS reached 4, a house surgeon was contacted by nursing staff. The house surgeon reviewed Mr A at 8.20pm. Mr A reported no chest pain or shortness of breath. On examination, Mr A was alert, his chest was clear, and he reported being thirsty. His heart rate was 85bpm, blood pressure 85/40mmHg, and his oxygen saturation was 93% on two litres of oxygen. His fluid status was reviewed. The impression formed was possible kidney injury. The documented plan was to continue intravenous fluids, perform urea and electrolyte testing the next day, and to monitor this. Mr A was visited that evening by family.
72. At 11.10pm, the ADDS was recorded in the notes by nursing staff as 4, owing to decreased blood pressure and urine output. The house surgeon was informed, and he reviewed Mr A. IV fluids were charted and given by nursing staff. Medications were also given. Mr A was noted to be eating and drinking well. He was washed and turned. His catheter was maintained.

Early morning Day 7, ADDS of 6–7

73. At 2.05am on Day 7, the total ADDS score was recorded as 6 by nursing staff. The clinical notes document that orthopaedic registrar Dr D was contacted as per the ADDS protocol.
74. At 3.11am, house officer Dr K and Dr D discussed and reviewed Mr A. Mr A had lower blood pressure and decreased urine output, and decreased oxygen saturations. Mr A had no shortness of breath, no chest pain, no dizziness, no abdominal pain, and no cough. Mr A's temperature was 36.5°C, his pulse was 70bpm, his respiratory rate was 18–20 breaths per minute with no wheeze and no distress, his oxygen saturation was 88% on 5 litres, and his blood pressure was 84/40mmHg. Mr A was afebrile, and did not have tachycardia or signs of infection. The impression formed was renal injury. The plan included performing arterial blood gases (ABG), a chest X-ray, and ECG. Observations were to be hourly.
75. Mr A's ABGs had shown a pH of 7.42 (normal range is 7.35–7.45), pCO₂ of 30mmHg (normal range 38–42mmHg), pO₂ of 46mmHg (normal range 80–100mmHg), HCO₃ of 25.3mmol/L (normal range 22–29mmol/L), and lactate of 1.3mmol/L (normal range 0.5–1.6mmol/L). His haemoglobin (Hb) level had changed from 142g/L to 103g/L (normal range 125–170g/L) from a combination of fluids and blood loss postoperatively. An ECG did not show any acute changes that would have suggested ischaemia (diminished blood supply).
76. Once the ABG results were received, respiratory failure was diagnosed. The plan was to proceed with a chest X-ray, to continue with IV fluid, to improve saturations and systolic blood pressure, and to review and take blood tests in the morning.

77. The chest X-ray (taken at 3.55am) showed pulmonary congestion consistent with fluid overload. There was no pneumonic patch or pneumothorax present on the X-ray.
78. A nursing entry (timed at 5.15am) indicated that the ADDS score overnight had varied between 3 and 7. Around the same time (5am), house officer Dr K again reviewed Mr A and recorded the X-ray results. On examination, Mr A was comfortable with no shortness of breath, no dizziness, and no cough or chest pain. He was chatty and awake. His oxygen saturation was 89% on 5 litres of oxygen, his respiratory rate was 19 breaths per minute, his blood pressure was 96/50mmHg, and his pulse rate was 80bpm. The chest examination showed bi-basal crackles with adequate breath sounds and air entry.
79. The impression formed was renal injury, fluid overload (without symptoms other than requiring increased oxygen to maintain saturation), and hypotension due to earlier blood loss. The plan was to stop IV fluid, continue oxygen and observations, and consider administering frusemide¹⁷ once Mr A's blood pressure was well sustained.
80. At 7am, Mr A's blood pressure was 86/55mmHg, and his oxygen saturation was 88% on 5 litres of oxygen. The impression of hypotension and fluid overload remained. Dr K contacted medical registrar Dr E¹⁸ by telephone to discuss Mr A.
81. Dr E said that he was not aware of the previous ADDS score, and was not asked to review Mr A. Dr E told HDC that he was made aware by Dr K of the 5am review findings. Dr E said that he did not believe, based on what he was told by Dr K, and in view of an orthopaedic registrar having already been involved, that a physical review of Mr A was required.
82. Dr K made a detailed entry in the clinical record. It was recorded by Dr K that, in view of the urine output (50–60ml/hr) and systolic blood pressure, giving an approximate mean arterial pressure (MAP)¹⁹ of 60, and because Mr A was slightly anaemic and had an oxygen saturation of 88% on five litres of oxygen, the plan formulated by both doctors was to stop IV fluid, administer a small dose of IV frusemide (20mg) immediately to see if that improved Mr A's oxygenation, and then to review him.

Improvement — daytime hours Day 7

83. After half an hour (at 7.30am), Dr K informed Dr E that Mr A's oxygen saturations (90% on 5L oxygen) were stable, his blood pressure had improved (100/50mmHg), and he was not tachycardic (heart rate of 88bpm). Mr A's urine output over the hour post frusemide administration was 110ml/hr.

¹⁷ A diuretic medication. This helps to reduce the amount of excess fluid in the body via increased urine production.

¹⁸ At this time, Dr E was working at Waikato DHB as a medical registrar in neurology, covering the night shift from Day 1 to Day 8.

¹⁹ MAP, or mean arterial pressure, is defined as the average pressure in a patient's arteries during one cardiac cycle.

84. Dr E recommended that Mr A be observed and handed over to the primary team later that morning. Dr E told HDC that he felt confident that a formal SMO review was forthcoming, and hence he did not consider that involving an SMO at that point was required.
85. Dr E told HDC that he is confident that at the time of Mr A's case, he was very aware of DHB policy, and would therefore have been aware that seriously ill patients had to be brought to the attention of the SMO. However, as mentioned, Dr E stated that considering the time of the day when his input was required, he did not think that delay until the next ward round was inappropriate, given that it had been reported to him that Mr A's condition was improving, rather than deteriorating, after the administration of frusemide.
86. Throughout the daytime hours of Day 7 (until about 4pm), Mr A improved, to score 0–1 on the ADDS. It was documented at 10.30am that Mr A felt "ok". It was recorded that his oxygen saturation improved to 95% on five litres of oxygen, and he was not short of breath. His systolic blood pressure was 100mmHg. He was also mobilised out of bed for a short period.
87. In response to the provisional opinion, Ms B stated that the period of mobilisation was very short, and that at 5pm that day her uncle visited her father, but her father found it difficult to engage with him because of his breathing.

Deterioration — evening of Day 7

88. By 7pm on the evening of Day 7, Mr A's condition had worsened. The ADDS score had risen to 4.
89. A house officer reviewed Mr A. The final formal report from the chest X-ray performed in the early morning on Day 7 was available (having been uploaded at 3.23pm) and reviewed, and a finding of probable pneumonia was made. The final report for the X-ray stated: "Chest: COPD changes are noted. There is evidence of exacerbation with increased reticular changes in the right and left base. Finding is consistent with most probably pneumonia."
90. At 9pm on Day 7, the house officer discussed Mr A's condition with the on-call respiratory registrar, who advised undertaking further investigations (blood cultures, repeat arterial blood gas analysis, antibiotics, ECG, and chest X-ray). An ECG and a portable chest X-ray were performed at 9.15pm. Mr A was prescribed antibiotics for presumed infection.
91. At 10.30pm, Mr A had a rise in the ADDS score to 11, owing to increasing shortness of breath, ongoing hypotension, and poor urinary output. The house officer escalated Mr A to intensive care staff, and contacted intensive care registrar Dr H. Dr H attended within 20 minutes.
92. On the evening of Day 7, there is no record of Mr A receiving his prescribed inhalers — nurse administered or self-administered.

Intensive care review

93. At 10.50pm, Dr H attended Mr A on the ward. Dr H told HDC that he was aware that Mr A had been hypotensive and had had poor urine output since his operation, and that he had had a transient response to fluid therapy over that time. Mr A's respiratory rate was 28–32 breaths per minute, and his oxygen saturations were 50–60%. The portable chest X-ray showed a right apical pneumothorax, which had developed since earlier in the day.
94. Dr H told HDC that he believed that the cause of the hypotension was multifactorial — a combination of poor perfusion from hypovolaemia,²⁰ and low cardiac output due to a right-sided pneumothorax.²¹
95. Dr H proceeded to perform a needle decompression, which resulted in a hiss and reduction of the pneumothorax. Dr H also inserted a pigtail²² chest drain for ongoing management of the pneumothorax. Mr A's shortness of breath improved, although he remained hypotensive.
96. A High Dependency Unit (HDU) bed was being organised for Mr A, and he was awaiting a further medical review. Dr H made plans to review Mr A later in his shift.
97. At 12.15am on Day 8, Mr A was reviewed again by Dr E. Dr E reviewed the notes and was aware that Dr H had reviewed Mr A. Dr E noticed that fluid monitoring by nurses had revealed a fluid deficit, and so a 250ml fluid bolus was trialled, resulting in an improvement in blood pressure and heart rate.

Admission to HDU

98. Dr E recommended cautious IV fluids and moving Mr A to the HDU. An arterial line was placed for better monitoring of his hypotension. Mr A was handed over to HDU at 1am.
99. Overnight, Mr A was reviewed by HDU staff owing to hypotension and low oxygen saturations. A chest X-ray was repeated. The pneumothorax was slightly worse, with type 1 respiratory failure identified from arterial blood gas results. This was discussed with Dr E, who suggested inserting a larger chest drain, and having a discussion with the intensive care registrar.
100. Dr H reviewed Mr A a further two times during the rest of his shift, and noted that the chest drain was functioning appropriately. Dr H was satisfied that Mr A had made improvements since his first assessment, and that there were plans for further review and investigations by the medical team.
101. At 6am, given Mr A's minimal improvement with medical management, an HDU house officer discussed Mr A with Dr H and Dr E. Dr H and Dr E recommended a computed tomogram (CT) scan to rule out pulmonary embolism and more precisely

²⁰ A decreased volume of circulating blood.

²¹ A pneumothorax occurs when air leaks into the space between the lung and chest wall. This air pushes on the outside of the lung and makes it collapse.

²² A type of chest catheter.

delineate the pneumothorax anatomy. They also discussed this with the orthopaedic team.

Day 8 onwards

102. From 12 to Day 13,²³ consultants in HDU performed multiple reviews, and respiratory and orthopaedic staff undertook daily reviews. On the morning of Day 8, the impression formed was that of pneumonia, with the pneumothorax resolving and a pulmonary embolus less likely. Antibiotics and prednisone were given.
103. It was noted that Mr A's A1AD, which can weaken the lung tissue over time, may have contributed to his pneumothorax.
104. Due to signs of heart failure, Mr A was also seen by a cardiology registrar, and discussed with a consultant cardiologist.
105. On Day 9, Mr A had a marked deterioration in his respiratory function, and another chest drain was inserted at 1.30pm. A repeat chest X-ray showed incomplete right lung re-expansion, so a further chest drain was placed at 3.40pm.
106. In the early hours of the morning on Day 13, Mr A's condition deteriorated further, and treatment-resistant pneumonia was thought likely. He was considered for intensive care unit therapies, as he would not tolerate liberal administration of IV fluids. This was discussed directly with Mr A. On admission to ICU he was very hypotensive.
107. On Day 13, intensivist Dr I met with Mr A's family members and explained Mr A's deterioration, his poor prognosis, and why CPR was not indicated. On Day 14, Mr A was placed on a palliative care pathway. Sadly, Mr A died later that day.

Further information

108. Waikato DHB told HDC that Dr J (the admitting consultant orthopaedic surgeon) was not advised of Mr A's condition on Day 6/Day 7, and that Dr J would have expected to be advised. Dr J said that had he been advised, he would have either attended in person, and likely instructed his team to refer Mr A to the on-call medical team, or arranged for the on-call SMO to attend.
109. Waikato DHB stated: "Upon review of the clinical record, there is no evidence that [Mr A's] clinical deterioration was discussed with senior staff. We acknowledge that this is not acceptable."
110. A meeting was held between Mr A's family representatives and hospital staff (including Dr C and Dr I) to answer a number of questions posed by the family.

²³ From Day 8 onward, the records indicate that nursing staff consistently administered Mr A's inhalers.

111. It was stated in the minutes of the meeting that the reason for the original postponement and delay of surgery was that it was a high-risk operation, and that more specialist staff were available during business hours at the hospital.

112. The minutes also stated:

“[Dr C] apologised that [the delay] happened and explained that with an acute total hip replacement there is an increased risk of infection and dislocation among other things. This should have been communicated to the family that [Mr A] would not be operated on during the weekend for this reason. The mortality rate for elderly people in the 1st year following this type of operation is 30–50%. We do aim to get through 85% of acute patient operations within 24hrs however Orthopaedics very rarely achieve this but are consistently improving as more theatres become available.”

Subsequent events and changes to practice

Management of acute orthopaedic patients

113. Waikato DHB reported that since 2013 it has made significant changes to management of acute orthopaedic patients:

- In September 2013 Waikato DHB opened a new orthopaedic theatre suite. This resulted in the majority of outsourced elective work being brought back to Waikato DHB and four orthopaedic theatres being available for use on a daily basis for both elective and acute surgery.
- The Orthopaedic Department changed the structure of on-call and medical officer on-call hours. The consultants are now on call from 8am to 8am. Both the surgeon who has been on call and the oncoming on-call surgeon attend a 7.30am trauma/handover meeting each day, as well as the consultants working in theatre that day, all the orthopaedic registrars, and all the orthopaedic house surgeons.
- Waikato DHB reviewed the operational management of surgical services. A new structure includes an Assistant Group Management position and a Business Manager for Orthopaedics.
- Access to acute theatres for orthopaedic patients was reviewed, particularly over the weekend and on a Monday. There are now two acute orthopaedic theatres every Monday.
- The Orthopaedic Department developed an access database into which all acute patients awaiting surgery are entered. The database forms the basis of the trauma/handover meeting each morning at 7.30am. Documentation on this database includes specialist equipment and planned dates for surgery. The database also calculates the hours of patients awaiting surgery (based on average theatre operating minutes). When the volume exceeds 18 hours of operating time, an escalation plan is implemented. The Orthopaedic Department has developed an escalation plan for when to cancel elective surgery. The escalation plan was

approved by the Theatre Interventional Governance Group, and has been in practice since 1 August 2014.²⁴

- Management and clinicians have access to the Orthopaedic database. Daily discussions take place regarding acute theatre volumes, and plans to ensure timely access to surgery occur between the on-call consultant and the Business Manager of Orthopaedics. The volume of acute patients awaiting surgery is also discussed daily at the organisational operational bed meeting.
- Waikato DHB has had an additional acute theatre approved for use by Orthopaedics for three days of the week.
- Consideration is given to whether patients with a fractured neck of femur can be scheduled for surgery on Monday, Wednesday, and Friday lists, to ensure that the patients are medically prepared appropriately, and operated on in a planned timely fashion in an appropriate environment with specialist staff and equipment — in line with the recommendations from the Australian and New Zealand Guideline for Hip Fracture Care.²⁵
- The Enhanced Recovery After Surgery (ERAS) National Collaborative has been implemented, and includes a bundle of care for acute patients with a fractured neck of femur.²⁶
- As part of the ERAS project, the Waikato DHB orthopaedic team reviewed the way in which it manages pain relief for patients with an acute fractured neck of femur, including implementing a new ERAS Orthopaedics-Analgesia for Older People reference.²⁷
- In June 2014, the hospital commenced an integrated Orthogeriatric Service, including an orthogeriatric consultant completing a ward round of orthogeriatric patients on orthopaedic wards, three days a week.
- A 2015 audit was completed by the DHB clinical audit support unit, auditing the standard of care provided to acute patients who present with a hip fracture, based on the Australian and New Zealand Guideline for Hip Fracture Care, to assess the baseline quality of care prior to the guideline being implemented. Draft results showed that 81% of Waikato DHB patients, randomly audited, went to theatre within 24–48 hours from admission.

Responses to provisional opinion

114. The parties provided responses to relevant sections of the provisional opinion. Where appropriate, those responses have been incorporated into the report.

²⁴ Copy provided to HDC.

²⁵ September 2014. See: <http://anzhfr.org/wp-content/uploads/2016/07/ANZ-Guideline-for-Hip-Fracture-Care.pdf>

²⁶ See: <http://www.health.govt.nz/our-work/hospitals-and-specialist-care/enhanced-recovery-after-surgery>. The National Orthopaedic ERAS Collaborative began in November 2013. Eighteen DHBs joined the quality improvement collaborative to implement the principles of patient-centred ERAS (which ensures that people are in the best possible condition prior to surgery, have enhanced management during and after surgery, and the best possible rehabilitation) as well as reducing orthopaedic waiting times.

²⁷ Copy provided to HDC.

115. Dr C said that in relation to his not documenting his rationale for the delay in surgery, while an additional note by him would have been ideal, there was communication to Mr A and the surgical team about the delay and that surgery was to proceed on the Monday. He noted that this was recorded in the notes.
116. Waikato DHB accepted the report's findings and provided a number of comments, including:
- The Surgical Division accepts that because of overloaded and under-resourced Orthopaedic and Acute Theatre Services in 2013, Mr A did not receive his surgery in an acceptable time frame.
 - It was not the delay that caused Mr A's unexpected death, but a postoperative acute medical event.
 - Verbal handover occurred at 6pm on Day 1 between Dr J and Dr C. In 2013, the under-resourcing of the Acute Orthopaedic Service meant that the then usual standard of handover practice at WDHB was centred around verbal briefing at handover between orthopaedic registrars and orthopaedic SMOs. As was departmental practice at the time, the handover comments were not recorded in written form.
117. Waikato DHB provided the following further update on changes it has made:
- In the last six months, three orthopaedic SMOs have been appointed. There are plans for a further two to three orthopaedic SMOs to be recruited.
 - In the last six months, a Theatre & Interventional Governance Group (TIGG), overseeing the governance of operating theatres, has recruited more orthopaedic scrub nurses, appointed clinical nurse co-ordinators to four out of five of the weekday orthopaedic theatres, and has rearranged senior nursing leadership in the operating theatres.
 - Wherever possible the orthopaedic acute theatres are "protected" because of the high volume of the acute orthopaedic workload.
 - Whilst overall numbers of orthopaedic acutes has increased significantly from 2013 to 2017, Waikato DHB's ability to improve its 24 and 48-hr KPIs has not. However, the increased number of dedicated orthopaedic operating theatres has only just occurred.
 - Where orthopaedics is "overwhelmed", this is managed at an early morning co-ordinator meeting. Usually it is immediately obvious when orthopaedic electives need to be cancelled to accommodate overwhelming orthopaedic acutes. A similar process occurs over the weekend. Currently, with 10 all-day acute orthopaedic theatre lists available Monday to Friday, and up to 4 all-day (but not dedicated orthopaedic) lists available on the weekend, there is an expectation that escalation will be required less frequently.

- Another scenario is where the total number of all acutes (in all specialties) is overwhelming, or even more commonly where Waikato DHB is overwhelmed in the Emergency Department, there is a well worked escalation process co-ordinated by a DHB “Crisis Operation Group”. When this is “triggered”, all non-emergent, non-cancer, non-paediatric surgical cases are postponed until “manageable levels” are achieved. This second scenario is vastly more common in winter.
 - The Waikato DHB Orthopaedic Service is in the process of subspecialising.
 - The ERAS was trialled for a six-month period in 2015 for total hip joint patients. ERAS, within the WDHB Orthopaedic framework, was not considered to be especially useful, mainly owing to the inability to provide Allied Health input over weekends and after hours. Currently Waikato DHB is not resourced appropriately to run an ERAS programme.
 - Where a pain relief “standard approach” is insufficient, Waikato DHB has a trained and organised Pain Service staffed by anaesthetic SMOs and dedicated pain nurse specialists. They have a complete range of options available including PCA (patient-controlled analgesia), selective blocks, and more selective and stronger analgesics. Currently the Pain Service does not use the ERAS orthopaedic analgesia for older people regimen.
 - There is an integrated orthogeriatric service at Waikato DHB. One specific clinician sees all the orthogeriatric patients on the respective wards three times per week and serves in a liaison role and as a resource for the RMO group.
 - WDHB has undertaken two DHB-wide audits regarding compliance with the EWS and ADDS process since this case. In April/May 2013, 594 patient charts were reviewed randomly over a two-month period. There was a very disappointing level of compliance. A governance group requested all services develop an action plan regarding this. An audit in 2015 of 381 patients showed improvement in regard to accuracy of total ADDS score. However, further actions were identified, including implementing a national EWS observation chart in line with the HQSC.
-

Opinion: Waikato District Health Board — breach

Introduction

118. District health boards are responsible for the operation of the clinical services they provide, and are responsible for service failures.²⁸ DHBs have a responsibility for the actions of their staff, and an organisational duty to facilitate continuity of care. This includes ensuring that all staff work together and communicate effectively, and comply with DHB policy and procedure.
119. Mr A’s case has highlighted particular hospital systems issues that contributed to him receiving suboptimal care. The main crux of this investigation is twofold: Mr A’s

²⁸ Also see Opinion 14HDC01187 (30 June 2016).

acute left total hip joint replacement surgery (due to a fracture) was delayed and eventually went ahead beyond recommended timeframes, four days post-admission; and when he deteriorated postoperatively on Day 6/Day 7, his care was not escalated to involve input from a consultant. I consider that these were service failures that are directly attributable to Waikato DHB as the service operator.

Delay in surgery

120. On Friday morning, Day 1, having fallen at home, Mr A (then 78 years old) was admitted to the ED. He was diagnosed with a left neck of femur fracture. In the afternoon, Mr A was admitted to the Orthopaedic Service under the care of Dr J.
121. At 4.20pm, Mr A was seen by Dr J, who decided that acute total hip joint replacement was appropriate. Initially, Mr A's surgery was planned by Dr J to go ahead on Saturday morning (at that stage approximately 24 hours after admission). An instruction was given for Mr A to be nil by mouth from 2am on Saturday.

Significance of surgery timing

122. In terms of the clinical significance of the timing of such surgery, my expert advisor, orthopaedic surgeon Dr Simon McMahan, advised:

“The standard of care in terms of timing for surgical treatment for elderly patients with proximal femur fractures is that this takes place as soon after admission as practicably possibly ... preferably done within 48 hours. Certainly numerous factors are taken into account for timing of surgery for these problems, both patient factors, for example the patient's condition may need to be improved with resuscitation prior to commencing surgical treatment, and secondly for operational hospital factors i.e. availability of appropriate surgical team and competition with other emergency cases.”

123. I am also mindful of Dr McMahan's advice in relation to the effect of delaying such surgery:

“The question as to the effect of delaying surgery for proximal femur fractures in elderly patients is not at this stage definitely established. There have been numerous scientific studies looking at this issue, some have concluded that delay in surgical treatment of these fractures increases the risk of morbidity and mortality and others have found no such association. In spite of this lack of definite scientific evidence there are guidelines which we use to help with decision making and these guidelines have been developed based on the best available scientific literature.”

124. On Saturday morning, Dr J discussed Mr A with the on-call consultant, Dr C. Dr J advised Dr C that Mr A was on the waitlist for a left total hip replacement, and explained the rationale for surgery during the weekend, and advised that Mr A's comorbidities were stable.
125. While the clinical record for Saturday morning indicates that surgery was still scheduled for that day, Dr J told HDC that Dr C decided that he would not operate

over the weekend. Dr J told HDC that Dr C's decision to defer surgery was in part due to the higher acuity of other patients awaiting surgery, and that hip replacements are best performed during daytime hours when staffing levels are better suited to more complex procedures.

126. Dr C told HDC that he was aware that a dedicated orthopaedic theatre was unavailable over the weekend, and said that he discussed with Mr A the decision to delay the surgery. Dr C said that he decided that it would be preferable to wait until Monday to perform Mr A's hip surgery.

127. Dr C outlined his rationale for delaying the surgery as follows:

- Total hip replacement is a major procedure associated with increased clinical risk.
- Theatres used for acute cases on the weekend (at that time) were not dedicated orthopaedic theatres.
- He had concerns regarding the increased risk of complications of acute total hip replacement compared with a standard elective hip replacement.
- Dislocation rate is higher with a posterior approach. He uses a lateral approach, which reduces the risk, but in his experience acute hip replacements are associated with instability.
- For these reasons, he considered that it was in Mr A's interests to delay his surgery to the Monday, so that it could be carried out in the orthopaedic list in a dedicated orthopaedic theatre.

128. In relation to the initial delay, Dr McMahon advised:

“In [Mr A's] case he was admitted on a Friday and his work up was completed by mid to late Friday afternoon. I believe it was proper to delay his surgery until the Saturday morning. The orthopaedic surgeon on call for the weekend felt that it would be most appropriate for [Mr A] to have his surgery on Monday after consideration of the other cases requiring surgery for the weekend as well as the team available. My opinion is that that decision was also reasonable however I would have expected that his surgery be prioritised for the Monday.”

129. Mr A's care was returned to the admitting surgeon, Dr J, after the weekend when Dr C had been on call. Dr C was not rostered on for Monday.

130. Late on Monday morning, and then again at 3pm, it was noted that Mr A was still awaiting theatre. Early on Monday evening, Mr A was told that surgery would not proceed, and that he could eat and drink again, which he was reported as doing. Mr A had his left total hip joint replacement surgery on Tuesday evening — four days post-admission.

131. Waikato DHB acknowledged that Mr A did not receive his surgery in the optimal timeframe for his diagnosis. The reasons for this are multifactorial, including the high volume of acute patients, the clinical requirements of other acute patients with more serious conditions, the availability of specialist theatre staff, theatre availability, and

elective surgery requirements. Waikato DHB acknowledged that it would have been appropriate to cancel some elective surgery on Day 4 to free up theatre capacity.

132. In relation to relevant guidelines,²⁹ discussed above, Dr McMahon stated:

“[T]he guidelines for standard of care for the management of elderly patients with proximal femur fractures is that surgical treatment should proceed as soon as safely practical and preferably within 48 hours of admission to hospital. Having said that delay beyond that is frequent for both patient related (e.g. patient requiring treatment to optimise their fitness for surgery) and hospital operational reasons (e.g. competing with other cases deemed of higher priority, availability of appropriate surgical team).”

133. In relation to the further delay in this case, Dr McMahon advised:

“My opinion is that delaying his surgery further was a departure from the standard of care. I do note in the comments from the orthopaedic surgeons involved that this [surgery] did not occur because of the multiple other competing commitments for the operating theatre team however in spite of that I still believe that this was a departure from the accepted standard of care.”

Conclusion — delay in surgery

134. While I acknowledge the stated clinical rationale for the delay, as well as the competing volume of acute serious cases that occurred, I am nevertheless concerned about the significant delays Mr A experienced as an elderly acute orthopaedic patient who had originally been prepared for Saturday morning surgery. Waikato DHB has acknowledged that elective surgery could have been cancelled to create theatre capacity for Mr A. Instead, he did not undergo surgery until Tuesday evening — over double the optimal time frame for such acute surgery. I accept Dr McMahon’s advice that delaying the surgery further on Monday was a departure from the standard of care. In my view, this represents a service-level failure that could and should have been avoided.

Postoperative care

135. Mr A first showed signs of deterioration on the morning of Day 6. Dr McMahon advised that in response to Mr A’s low blood pressure and low urine output on Day 6, the decision to administer fluid resuscitation initially was appropriate. Dr McMahon noted that preferably this would have been done with a fluid bolus, but acknowledged that the treating doctors would have been anxious not to overload Mr A and produce pulmonary congestion in someone who already had compromised lung function.

136. However, Mr A did not make any sustained improvement in response to this approach, and then deteriorated further. The ADDS score for Mr A increased to 4 on the afternoon and evening of Day 6, and a nursing entry timed at 5.15am on Day 7 indicated that the ADDS score overnight fluctuated between 3 and 7.

²⁹ See paragraph 31.

137. According to the ADDS, a score of 6–7 indicates that escalation should occur and a registrar be contacted. A consultant would be contacted only in the event that the patient is not able to be reviewed in 30 minutes, and ADDS does not decrease. In this case, orthopaedic registrar Dr D and medical registrar Dr E were contacted at different times on the morning of Day 7.
138. However, as outlined above, the DHB policy, “When a Resident Medical Officer (RMO) should call the Senior Medical Officer (SMO) about inpatients under their care and about ward referrals: the principles of delegated responsibility”, notes that SMOs should be contacted when any patient under their care “deteriorates unexpectedly”.
139. I acknowledge that while the ADDS is explicit in outlining clinical parameters that would lead to a consultant being contacted, the above DHB policy does not cross-reference the ADDS. However, the policy is nevertheless clear that an SMO should be contacted when any patient deteriorates unexpectedly.
140. Despite the continued deterioration overnight on Day 6/Day 7, with ADDS scores up to 6–7 being recorded overnight, senior medical (SMO) assistance was not sought. While I note that Mr A had a subsequent period of improvement in his observations during the day on Day 7, he had deteriorated again by 7pm that evening. SMO input was still not sought.
141. Dr J, the admitting consultant, was not advised of Mr A’s condition overnight on Day 6/Day 7, and told HDC that he would have expected this to happen. Dr J said that had he been advised, he would either have attended in person, and likely either instructed his team to refer Mr A to the on-call medical team (which I note was what eventuated) or arranged for the on-call SMO to attend.
142. Waikato DHB told HDC: “Upon review of the clinical record, there is no evidence that [Mr A’s] clinical deterioration was discussed with senior staff. We acknowledge that this is not acceptable.”
143. Dr McMahon is of the view that there was a failure by the junior orthopaedic team to request senior review of Mr A’s condition after he failed to respond to IV fluid treatment instituted to address his deterioration on Day 6, and that this was a departure from the standard of care. Dr McMahon advised:
- “It seems to me from the hospital records that in spite of this deterioration in his condition [Mr A] was managed by the junior orthopaedic staff throughout [Day 6] and into the evening of [Day 7] ... I can not find any evidence in the records that he was actually reviewed by a senior clinician until he was reviewed by an intensive care registrar at 2150 on [Day 7]. My opinion is that the failure of the junior orthopaedic team to request a senior review of [Mr A’s] condition on [Day 6] was a departure from the standard of care.”
144. My expert advisor, consultant physician Dr Denise Aitken, advised that there was a failure to notify the SMO of the patient’s deterioration, as required by the DHB policy

guidance that an SMO should be contacted about any patients who deteriorate unexpectedly. She further advised that there was a failure to consider the underlying diagnosis and treat the cause of Mr A's initial deterioration in a timely manner, and that the failure to escalate resulted in the delay of appropriate referral and senior medical review and treatment. Dr Aitken stated:

“It is not clear whether this was because of resource constraints, knowledge deficit or a culture of non escalation or a combination of the above. The above is a failure of standard of care. It is a moderate failure. I expect that my peers would have viewed this as a failure but they would also consider such failures may be repeated in many hospitals.”

Conclusion — postoperative care

145. I am concerned about the postoperative care Mr A received, particularly after he failed to respond to IV fluids after initial signs of deterioration on Day 6, and overnight on Day 6/Day 7 when he showed signs of further deterioration. While escalation by nursing staff and the reviewing junior doctors resulted in orthopaedic and medical registrar input, largely in line with usual hospital protocols, no senior (SMO) doctor was alerted to Mr A's deterioration. I accept the advice of both my expert advisors that this failure to notify an SMO of Mr A's deterioration was a departure from the standard of care. It was also inconsistent with DHB policy.
146. A number of nursing and medical staff were involved in Mr A's postoperative care. This persistent failure by DHB staff to notify a senior doctor of his deterioration between Day 6 and Day 7 represents a pattern of deficiency and non-compliance with DHB policy. In my view, this indicates systems issues for which the DHB is responsible.

Conclusion — breach

147. Mr A's case highlighted the following key deficiencies in the care provided by Waikato DHB:
- A delay in undergoing total hip joint replacement surgery of over double the optimal time frame for such acute surgery.
 - Inadequate postoperative care, particularly a failure to escalate to an SMO appropriately when Mr A deteriorated during Day 6/Day 7. This was contrary to DHB policy.
148. In my opinion, for the above reasons, Waikato DHB did not provide services to Mr A with reasonable care and skill and, accordingly, breached Right 4(1) of the Code.

Inhalers — adverse comment

149. On admission to hospital, Mr A was prescribed his longstanding inhalers — Seretide 125/25 and tiotropium. However, an assessment of Mr A's suitability to self-administer his inhalers was not completed at admission.

150. My in-house nursing advisor, Ms Carey, advised that while she agreed that it would have been prudent for nursing staff to have documented an assessment of Mr A's ability to self-administer, the absence of such an assessment is not unusual in the context of this case, and does not constitute a departure from accepted standards of nursing care.
 151. The medication charts show that Mr A received his inhalers — nurse administered or self-administered — as prescribed on all but two occasions, on the morning of Day 2 and the evening of Day 7.
 152. Ms Carey advised that she is mildly critical that there are two incidences when it is unknown whether Mr A received his prescribed Seretide inhaler, as she considers that prior to administering a medication it is necessary to review when it was administered previously, and that this is a fundamental part of safe medication administration practice.
 153. I am critical of the shortcoming identified in relation to Mr A's inhaler medication.
-

Opinion: Dr C — adverse comment

154. Dr C was the orthopaedic consultant on call for the weekend, and was responsible for Mr A at that time.
 155. As described earlier, on Saturday morning, Dr J discussed Mr A with Dr C and advised Dr C that Mr A was on the waitlist for hip surgery. Dr J discussed his rationale for arranging surgery for the weekend, and informed Dr C that Mr A was stable.
 156. The clinical record for Saturday morning (no time recorded) indicates that surgery was still scheduled for the Saturday. However, Dr C decided that he would not operate over the weekend. Dr C was aware that a dedicated orthopaedic theatre was unavailable over the weekend, and decided that it would be preferable to wait until Monday.
 157. Dr J outlined that the decision to delay surgery until the Monday was at the discretion of the consultant surgeon on call at the weekend, in this case Dr C.
 158. Considering that the decision made was his, and differed to that of the admitting consultant's initial plan for weekend surgery, I remain critical that Dr C did not himself document his rationale for the delay in surgery.
 159. As described earlier, Waikato DHB has acknowledged that organisationally it would have been appropriate to cancel some elective surgery on Monday to free up theatre capacity and staff to undertake acute surgery on Mr A.
-

Recommendations

160. I recommend that Waikato District Health Board:

- a) Report back to HDC, within five months of the date of this report, the effect of the following on acute orthopaedic waiting times (including reference to 24 and 48-hr KPIs) and quality of patient care:
 - i. The recent dedicated orthopaedic operating theatre set-up over its initial six-month period.
 - ii. The triggering of the escalation process co-ordinated by Waikato DHB's "Crisis Operation Group".
 - iii. The Waikato DHB Orthopaedic Service subspecialising programme.
 - iv. The integrated orthogeriatric service at Waikato DHB.
- b) Conduct the scheduled audit of the standard of care provided to acute patients who have presented with a hip fracture, based on the Australian and New Zealand Guideline for Hip Fracture Care, and report back to HDC within five months of the date of this report with the results of the audit.
- c) Provide evidence to HDC, within five months of the date of this report, of a further up-to-date audit of staff compliance with the application of the ADDS protocol and relevant DHB policy, including the recognition of a deteriorating patient, and the escalation of care to senior doctors in the event of patient deterioration, with reference to the implementation of a national EWS observation chart in line with HQSC.
- d) Provide a written apology to Mr A's family within three weeks of the date of this report. This is to be sent to HDC in the first instance, for forwarding.

Follow-up actions

161. An anonymised copy of this report with details identifying the parties removed, except the experts who advised on this case and Waikato DHB, will be sent to the Medical Council of New Zealand.
162. An anonymised copy of this report with details identifying the parties removed, except the experts who advised on this case and Waikato DHB, will be sent to the Royal Australasian College of Surgeons, and the Health Quality and Safety Commission (HQSC), and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Orthopaedic surgeon's advice to the Commissioner

The following independent expert advice was obtained from an orthopaedic surgeon, Simon McMahon:

"I have been asked to provide an opinion to the Commissioner on Case No: C14HDC01215 and I have read and agreed to follow the Commissioner's guidelines for Independent Advisors.

My qualifications are MBCHB (Otago) 1981, FRACS (Orthopaedics) 1991. I have been a consultant orthopaedic surgeon from mid 1993 until the present time, continuously involved in the care of patients with fractures including proximal femoral fractures during that period.

My instructions are to provide an opinion on the following issues:

1. Whether it was appropriate to delay [Mr A's] surgery until [Day 5];
2. Whether the management of [Mr A's] food and fluid intake was appropriate;
3. Whether it was reasonable to prescribe [Mr A] Tramadol;
4. Whether the deterioration in [Mr A's] health from [Day 6] was adequately investigated by the orthopaedic team and whether he received appropriate and timely treatment for pneumonia and pneumothorax from the orthopaedic team;
5. Any other comments on the care provided.

For each question I have been asked to advise:

- a. What is the standard of care/accepted practice?
- b. If there has been a departure from the standard of care or accepted practice, how significant a departure do you consider it is?
- c. How would it be viewed by your peers?

To prepare this report I have been provided with and have reviewed the following:

Copy of the Commissioner's Guidelines for Independent Advisors dated 31/07/2014

Copy of [Ms B's] complaint dated [...], including meeting minutes

Copy of Waikato District Health Board's first response dated 29 October 2014

Copy of Waikato District Health Board's second response dated 05 January 2015

Copy of [Mr A's] clinical records from the Waikato District Health Board dated [Day 1]–[Day 14]

I have also reviewed the following:

The National Institute for Health Care Excellence (NICE) published in 2011 guidelines for the management of proximal femoral fractures in elderly patients.

The American Academy of Orthopaedic Surgeons guidelines for the management of hip fractures in elderly patients published in September 2014.

I have been provided with the following background information by the Commissioner to help prepare this report.

[Mr A], a 78 year old was admitted to [the DHB] with a neck of femur fracture on [Day 1]. Surgery did not occur until [Day 5], because Dr C, orthopaedic surgeon, preferred to operate on a weekday, when more specialist staff were available. This was not communicated to the family or other staff, so [Mr A] was nil by mouth at various times over the four days. His IV fluids were also difficult to manage and he fluctuated between fluid overload and dehydration.

[Mr A] was prescribed Tramadol for his pain, despite his age and respiratory problems. He suffered side effects, including blood in his urine, dark-coloured urine and confusion. The orthopaedic team has now implemented a new policy where Tramadol is avoided in older people.

[Mr A's] health began deteriorating post-operatively on [Day 6]. A chest X-ray was taken and showed pneumonia, but took 12 hours to be reported. Antibiotics were not given until six hours after that, despite [Mr A's] increased shortness of breath. It was then discovered that he had a pneumothorax and a small drain was inserted. However, [Mr A] passed away the following week.

1. WHETHER IT WAS APPROPRIATE TO DELAY [MR A'S] SURGERY UNTIL [DAY 5]?

[Mr A] was admitted to [the] Emergency Department on [Day 1] after falling at home. He arrived at the hospital at 1036 hrs and had clinical and radiologic assessment by the Emergency Department staff. He was diagnosed with a left neck of femur fracture as well as a laceration to his left elbow.

He was assessed by the orthopaedic registrar at 1322 hours and the above diagnosis was confirmed. The pre-existing problem of emphysema with alpha 1 antitrypsin deficiency was noted and this was discussed with the on call anaesthetist and after this discussion it was decided that a chest x-ray was the only extra respiratory work up appropriate at that stage. A femoral block was placed for help with pain relief, the elbow wound was cleaned and closed with steri-strips, a urethral catheter was placed for urine collection and urine output monitoring. He was admitted to the orthopaedic service under the care of [Dr J] and [Mr A] arrived on the Orthopaedic Ward at 1500 hours.

He was seen by [Dr J] at 1620 hours and it was decided that the most appropriate surgical procedure to treat his left femoral neck fracture was a total hip replacement. [Dr J's] instructions were for [Mr A] to be made nil by mouth from 0200 the following morning, [Day 2] anticipating that he would have surgery later that day.

[Mr A] was reviewed by [Dr J] on the morning of [Day 2] and his instructions were to keep [Mr A] nil by mouth so that hopefully he would have his hip replacement that day.

[Mr A] at that stage was transferred to the care of [Dr C] the orthopaedic surgeon on call for the weekend. I understand that [Dr C] decided that it would be preferable to wait until [Day 4] to do [Mr A's] hip replacement. He was next nil by mouth on Monday morning awaiting total hip replacement surgery, there is a note in the chart timed at 2100 hours [Day 4] documenting that surgery had been postponed once again and that [Mr A] was to be nil by mouth from 0200 on [Day 5]. A further entry in the notes on the morning of [Day 5] indicates that [Mr A] was allowed to have clear oral fluids until 1030 in the morning [Day 5] awaiting surgery later in the afternoon on [Day 5]. [Mr A] finally had his surgery on the evening of [Day 5] the operation commencing at 1928 hours.

Opinion — Question 1

The question as to the effect of delaying surgery for proximal femur fractures in elderly patients is not at this stage definitely established. There have been numerous scientific studies looking at this issue, some have concluded that delay in surgical treatment of these fractures increases the risk of morbidity and mortality and others have found no such association. In spite of this lack of definite scientific evidence there are guidelines which we use to help with decision making and these guidelines have been developed based on the best available scientific literature.

The National Institute for Health and Care Excellence (NICE) from the UK (published in 2011) recommends that these patients are best operated on on the day of or the day after admission.

The American Academy of Orthopaedic Surgeons Guidelines for the management of hip fractures in elderly patients from September 2014 recommends that surgical treatment for patients with hip fractures within 48 hours is associated with better outcomes.

I understand that the guidelines at the Waikato District Health Board are that these fractures are preferably treated within the first 48 hours post-admission.

The consensus then is that it is preferable to proceed with surgical treatment of these patients without undue delay and preferably within 48 hours.

In [Mr A's] case, he was reasonably well worked up for his hip replacement surgery by late afternoon on [Day 1]. If a slot on the operating list was not imminently available I believe that the decision to postpone his surgery until the next day was appropriate and in fact probably preferable.

On [Day 2] [Dr C] decided that it would be preferable to delay [Mr A's] hip replacement surgery until [Day 4]. This would put [Mr A's] surgery beyond the recommended 48 hours post-admission. From the minutes of the meeting [after

these events] between [Mr A's] family representatives and [hospital] staff it was stated that the reason for the postponement was that 'it is a high risk operation and that more specialist staff are available during business hours at the Hospital'.

My opinion is that most orthopaedic surgeons involved in the care of patients with hip problems consider total hip replacement to be a standard procedure with acceptable risks though it does require an experienced surgical, anaesthetic and nursing team. If [Dr C's] assessment of the available team on call at [the hospital] that such an experienced team was not available, and [Mr A's] pain was well controlled, was able to sit up for chest care then I believe that postponing the surgery until [Day 4] was reasonable though I would have expected that his surgery be prioritised for preferably Monday morning or at worst during day time hours on Monday [Day 4]. Unfortunately this did not occur and in fact he went on to have his surgery in the evening of Tuesday [Day 5].

As stated above, the guidelines for standard of care for the management of elderly patients with proximal femur fractures is that surgical treatment should proceed as soon as safely practical and preferably within 48 hours of admission to hospital. Having said that delay beyond that is frequent for both patient related (e.g. patient requiring treatment to optimise their fitness for surgery) and hospital operational reasons (e.g. competing with other cases deemed of higher priority, availability of appropriate surgical team). As noted above I believe that postponing [Mr A's] surgery from [Day 1] to [Day 2] was appropriate. I believe that postponing [Mr A's] surgery from [Day 2] until [Day 4] may have been reasonable.

My opinion is however that postponing his surgery beyond [Day 4] was a departure from the accepted standard of care.

2. WHETHER THE MANAGEMENT OF [MR A'S] FOOD AND FLUID INTAKE WAS APPROPRIATE?

I will review this on a day by day basis.

Day of admission [Day 1]

As detailed above [Mr A] was admitted to [the DHB] on Friday [Day 1] with his fractured neck of femur, he I understand had his last oral food and fluid intake at midnight the night prior to his admission. He arrived in the Emergency Department at 1036 hrs and was assessed by the orthopaedic house officer at 1215 and subsequently the orthopaedic registrar at 1322 hours. He was reviewed by the orthopaedic consultant [Dr J] at 1620 and at that stage the decision was made to postpone surgery until the following morning and from that time on [Mr A] was given oral food and fluids until 0200 on [Day 2]. In summary on [Day 1] [Mr A] had no oral food or fluids from midnight until 1620 hours or soon after. I can't find any record of him receiving intravenous fluids for this time period, his observations were however very stable, he had a urethral catheter inserted at 1414 hours and for the 24 hours beginning 0800 [Day 1] until 0800 [Day 2] 800 mls of

urine output were recorded so at worst he produced 33 mls of urine per hour for this period (a satisfactory urine output).

He did have an IV cannula inserted in the Emergency Department and as mentioned above I cannot find any record of him receiving intravenous fluids.

I think it would have been preferable for [Mr A] to receive maintenance intravenous fluids on the day of admission while nil by mouth to prevent further dehydration, however he was noted to have peripheral oedema and the caring doctors would have been anxious not to overload [Mr A] potentially causing pulmonary congestion.

My opinion is that his food and fluid management for the day of admission was appropriate.

Food and fluid intake 0800 [Day 2] until 0800 [Day 3]

[Mr A] was made nil by mouth at 0200 hours and from that time he was prescribed and received intravenous fluids (Hartmanns solution) at a rate of 100 mls per hour. These were continued until about 0800 hours. IV fluids it seems were stopped at this stage presumably after it was decided to postpone [Mr A's] surgery until [Day 4]. He was subsequently allowed oral intake with first oral fluid intake being recorded at 1000 hours. He was reviewed by the house surgeon at 1610 hours because of reduced urine output (he produced 25 mls of urine per hour for the period 0800 to 1400). This assessment suggested he was probably a little dehydrated and he was prescribed intravenous fluids (Hartmanns solution) at 125 mls an hour and the nursing staff were to encourage oral intake. The plan was to aim for at least 30 mls of urine per hour. This intervention resulted in improved urine output (average of 38 mls per hour over the next 17 hours). [Mr A's] total fluid intake for the 24 hours from 0800 [Day 2] until 0800 [Day 3] was 2000 mls intravenous fluid with a further 1070 mls oral fluids.

My opinion is that [Mr A's] food and fluid management for the 24 hours from 0800 [Day 2] until 0800 [Day 3] was appropriate.

Food and fluid intake for the period 0800 [Day 3] until 0800 [Day 4]

For this period [Mr A] was permitted to eat and drink without restriction. The nursing notes timed at 1500 hours indicate that he was eating and drinking well. His fluid balance chart shows that he received intravenous fluids (I think Dextrose saline with some added potassium chloride) at a rate of 125 mls an hour from 0800 until 1200 hours and this was then stopped.

Total intravenous fluid intake during this period was 625 mls plus a further oral fluid intake of 1500 mls so a total of 2125 mls of fluid in total. His urine output for the period from 0800 hours [Day 3] until 0800 hours [Day 4] was 1800 mls (average 75 mls per hour).

My opinion is that [Mr A's] food and fluid intake for the period 0800 [Day 3] until 0800 [Day 4] was appropriate.

Food and fluid intake for the period 0800 [Day 4] until 0800 [Day 5]

[Mr A] was reviewed by a dietitian late in the morning of [Day 4]. The assessment was that [Mr A] had a low BMI of about 20. That his sodium was a bit low at 127 mmol/L but that all other nutritional parameters were normal. The plan was for him to use Fortisip (a high energy high protein nutritional supplement) post-operatively once he was allowed oral intake.

A nursing note made on [Day 4] notes that [Mr A] was able to eat until 1200 hours and could then have clear oral fluids until 1400 and he was then to be nil by mouth. At 1900 hours surgery was postponed and he was once again allowed to eat and drink.

From the fluid balance record [Mr A] had no oral fluids from 2100 on [Day 3] until 1000 hours on [Day 4]. He was then allowed to eat and drink until 1200 hours midday and was allowed oral clear fluids until 1400 hours. He was then nil by mouth until 1900 hours, after which he was able to eat and drink normally. He was then made nil by mouth again from 0200 hours [Day 5].

He was prescribed intravenous fluids at a rate of 100 mls an hour from 1700 hours until 1900 hours on [Day 4] and this was then stopped. He was then given further intravenous fluids from 0200 to 0800 hours [Day 5] at a rate of 80 mls per hour.

Total fluid intake for the 24 hours from 0800 [Day 4] until 0800 [Day 5] was 2280 mls (780 mls intravenous fluids and 1500 mls oral fluids). Total urine output was 3280 mls for this period.

My opinion is that [Mr A's] food and fluid intake for the period 0800 [Day 4] until 0800 [Day 5] was appropriate.

Food and fluid intake for the period 0800 [Day 5] until 0800 [Day 6]

Initially [Mr A] was made nil by mouth at 0200 hours on [Day 5], however when reviewed in the morning he was allowed to have clear oral fluids until 1030 hours and then made nil by mouth. He did finally have his operation on the evening of [Day 5].

[Mr A] was given intravenous fluids at a rate of 80 mls an hour (normal saline) from 0800 hours until 1500 hours. The rate was then increased to 100 mls per hour from 1500 until 1900 hours when [Mr A] went to the operating theatre.

It is not clear to me from the records what the blood loss was intra-operatively nor what fluid [Mr A] was given intra-operatively however his observations remained very stable throughout the procedure.

After the operation he continued to receive intravenous fluids (Hartmanns solution) at a rate of 80 mls per hour from 2300 [Day 5] until 0800 hours [Day 6]. He also started drinking again at about midnight [Day 5].

His total fluid intake for the 24 hour period 0800 [Day 5] until 0800 [Day 6] was 3840 mls (2820 mls intravenously and 1020 mls orally). His total urine output for this period was 3100 mls.

My opinion is that [Mr A's] food and fluid intake for this period was appropriate.

Food and fluid intake for the period 0800 [Day 6] until 0800 [Day 7]

[Mr A's] condition deteriorated on [Day 6], he developed low blood pressure and low urine output. He was seen by an anaesthetist at 1550 hours who also noted that [Mr A's] creatinine had doubled to 113 suggesting that his kidney function had also deteriorated.

In response to the reduced urine output and low blood pressure [Mr A's] intravenous fluid infusion rate was increased, the assessment suggesting that the cause of the problem was hypovolaemia. No bolus of fluid was given but rather the rate of infusion was increased to 125 mls/hour.

His blood pressure did improve temporarily with this.

Hourly urine output measurements were not recorded from 0800–1400 on [Day 6] but at 1400 hours it was recorded that [Mr A] had produced 100 mls of urine in the previous 6 hours, an average of 16–17 mls per hour. Over this period it would have been expected that he would produce at least 30 mls of urine per hour. From 1400 hours, hourly urine output measurements were made and these varied from a low of 7 mls/hour to a high of 23 mls/hour until 0300 hours when [Mr A] did start to produce more satisfactory urine output.

During the period from 0800 [Day 6] until 0800 [Day 7] [Mr A] received 3680 mls of fluid intravenously and a further 3300 mls of oral fluids.

My opinion is that in response to [Mr A's] low blood pressure and low urine output the decision to initially go for fluid resuscitation was appropriate. I think however it would have been preferable to do this quickly with fluid bolus and prompt reassessment of his response rather than with just an increase in the rate of fluid administration.

I believe that the failure to respond to the lack of sustained improvement with the increased fluids was not appropriate.

Food and fluid intake for the period 0800 [Day 7] until [Mr A] died on [Day 14]

[Mr A's] situation became very complex from this point with multi organ dysfunction. I do not believe I am competent to comment on his food and fluid management for this time period.

3. WHETHER IT WAS REASONABLE TO PRESCRIBE [MR A] TRAMADOL

I am not a pharmacologist nor a pain specialist but I am involved in the

management of elderly patients pre and post fracture surgery.

Pain management is an important part of peri-operative management. All pain killers do have side effects all of which seem to be more common in elderly patients. Tramadol has become an important drug in the management of peri-operative pain. It certainly does cause confusion, agitation and even hallucinations in some patients however the alternative stronger pain killers have similar problems. One advantage in [Mr A's] situation is that Tramadol causes less respiratory depression than traditional opioid drugs.

My opinion is that it was reasonable to prescribe [Mr A] Tramadol in the circumstances. It is evident that measures were taken to limit the prescription of strong pain killers for [Mr A] by the use of femoral block for pre-op analgesia.

4. WHETHER THE DETERIORATION IN [MR A'S] HEALTH FROM [DAY 6] WAS ADEQUATELY INVESTIGATED BY THE ORTHOPAEDIC TEAM AND WHETHER HE RECEIVED APPROPRIATE AND TIMELY TREATMENT FOR PNEUMONIA AND PNEUMOTHORAX FROM THE ORTHOPAEDIC TEAM

[Mr A's] condition was noted by the orthopaedic team to be deteriorating by 0900 hours on [Day 6], in particular he was noted to have a low blood pressure and reduced urine output. The assessment at that time was that this was most likely to be caused by some dehydration and his IV fluids were increased. Over the next few hours he was noted to continue to have reduced urine output and he failed to respond to the increased fluid with either an increase in his blood pressure or urine output. [Mr A] was reviewed by an anaesthetist at 1550 hours. His non-steroidal anti-inflammatory drug and his diuretic medication were discontinued. He was noted to have developed a deterioration in his kidney function, however no other measures were instituted apart from the continued increased fluid management.

The orthopaedic team continued to manage [Mr A] throughout [Day 6] without any further assistance. Advice was sought from the on call medical registrar at 0700 hours on [Day 7] though I can't see any record in the notes that [Mr A] was actually reviewed by the medical team at that time.

[Mr A's] condition was discussed with the on call respiratory registrar at 2100 hours on [Day 7] who advised further investigations (blood cultures, repeat arterial blood gas analysis, antibiotics and an ECG and chest x-ray) and [Mr A] was given Gentamicin, Augmentin and Erythromycin for presumed infection. I also can't find any record in the notes that [Mr A] was actually personally reviewed by the respiratory registrar. [Mr A] was reviewed by the intensive care registrar at 2250 hours on [Day 7].

My opinion regarding [Mr A's] care with regards his deterioration from [Day 6] is that it was appropriate for the orthopaedic staff to start initially with fluid

resuscitation. As noted above I think this would have best been done with fluid bolus, however the treating doctors would have been anxious not to overload [Mr A] producing pulmonary congestion in someone who already had compromised lung function, and so I think the approach taken was acceptable.

The failure to identify that [Mr A] made no sustained improvement in response to the increased intravenous fluids however is a departure from the accepted standard of care.

The standard of care for a surgical patient who is not progressing as expected is for the patient to be assessed promptly in a systematic manner, any emergency resuscitation measures instituted during the assessment with repeat assessment of the response to these measures. After full assessment both clinical and with any appropriate investigations a definitive diagnosis can hopefully be made and further management instituted. Regular review is then necessary to ensure the patient has responded to the treatment prescribed.

If the patient fails to respond to the treatment instituted reassessment is required to determine why this is so. Generally in the scenario of a post operative patient being managed by the junior staff on the surgical/orthopaedic ward this will require senior help.

From [Day 7] [Mr A's] condition deteriorated further with the development of multi organ dysfunction. I am not competent to comment on his management over this time period.

Summary

My opinion is that over the time period from his admission on [Day 1] until [Day 7] there were two departures from the accepted standard of care which [Mr A] received.

- 1. The extended delay in [Mr A's] surgery.**
- 2. The failure to obtain timely senior assistance in [Mr A's] management after he failed to respond to the treatment instituted to address his deterioration on [Day 6].**

My opinion is that these are both significant departures from the accepted standard of care, both of which I think may have affected [Mr A's] outcome.

Yours faithfully

Simon McMahon”

Following receipt of further information, Dr McMahon provided the following further advice:

“Your ref: C14HDC01215

I have been provided with and have reviewed the following documents:

Folder A: My initial advice

Copy of Waikato District Health Board's second response dated 5th January 2015

Folder B:

Response from Waikato District Health Board dated 28th May 2015

Response from [Dr E], Medical Registrar

Response from [Dr G] Anaesthetic Registrar dated 27th September 2015

Response from [Dr H] Intensive Registrar dated 8th July 2015

Response from [Dr I] Intensive Care Specialist 15th May 2015

Response from [Dr J] Consultant Orthopaedic Surgeon 26th May 2015

Response from [Dr C] Consultant Orthopaedic Surgeon 26th May 2015.

I have reviewed the above information and my opinion is unchanged.

It is my opinion that there has been a departure from the standard of care on two counts.

- 1. The extended delay in [Mr A's] surgery.**
- 2. The failure to obtain timely senior assistance in [Mr A's] management after he failed to respond to the treatment instituted to address his deterioration on [Day 6].**

The standard of care in terms of timing for surgical treatment for elderly patients with proximal femur fractures is that this takes place as soon after admission as practicably possible. As indicated in my previous report this is preferably done within 48 hours. Certainly numerous factors are taken into account for timing of surgery for these problems, both patient factors, for example the patient's condition may need to be improved with resuscitation prior to commencing surgical treatment, and secondly for operational hospital factors i.e. availability of appropriate surgical team and competition with other emergency cases. In [Mr A's] case he was admitted on a Friday and his work up was completed by mid to late Friday afternoon. I believe it was proper to delay his surgery until the Saturday morning. The orthopaedic surgeon on call for the weekend felt that it would be most appropriate for [Mr A] to have his surgery on Monday after consideration of the other cases requiring surgery for the weekend as well as the team available. My opinion is that that decision was also reasonable however I would have expected that his surgery be prioritised for the Monday. My opinion is that delaying his surgery further was a departure from the standard of care. I do note in the comments from the orthopaedic surgeons involved that this did not occur because of the multiple other competing commitments for the operating theatre team however in spite of that I still believe that this was a departure from the accepted standard of care.

I believe the second departure from the accepted standard of care was the failure of the junior staff to seek senior help in a timely fashion when [Mr A's] condition deteriorated in the morning of [Day 6]. It seems to me from the hospital records that in spite of this deterioration in his condition [Mr A] was managed by the junior orthopaedic staff throughout the [Day 6] and into the evening of [Day 7]. During this time he was reviewed by an anaesthetist in the afternoon of [Day 6], phone advice was sought from a Medical Registrar at 0700 hours on [Day 7], his condition was also discussed I understand on the phone with the Respiratory Registrar at 2100 hours on [Day 7] and I can not find any evidence in the records that he was actually reviewed by a senior clinician until he was reviewed by an intensive care registrar at 2150 hours on [Day 7]. My opinion is that the failure of the junior orthopaedic team to request a senior review of [Mr A's] condition on [Day 6] was a departure from the standard of care.

My opinion is that these are significant departures from the standard of care and may well have affected [Mr A's] outcome.

Yours faithfully

Simon McMahon"

Appendix B: Nursing advice to the Commissioner

The following nursing advice was provided by in-house nursing advisor Dawn Carey:

“1. Thank you for the request that I provide clinical advice in relation to the complaint from [Ms B] about the care provided to her father, [Mr A] during a hospital admission at [Waikato DHB]. 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 documents: complaint and supporting documentation from [Ms B]; responses from Waikato District Health Board (WDHB) including [Mr A’s] clinical notes.

3. Complaint and background

[Mr A] (78 years old) was admitted to [WDHB] with a neck of femur fracture on [Day 1]. He had emphysema and chronic obstructive pulmonary disease (COPD) secondary to alpha-1 antitrypsin deficiency but reported being able to walk for approximately an hour without shortness of breath. On [Day 5] he underwent a left hemiarthroplasty. His post operative period was complicated by acute kidney injury, spontaneous pneumothorax, pneumonia and heart failure. Due to ongoing deterioration and development of multi-organ failure, [Mr A’s] care focus moved to end of life on [Day 13]. [Mr A] died on [Day 14] at [WDHB]. His daughter has complained that

- [Mr A] was nil by mouth at various times over a four day period.
- [Mr A] was prescribed tramadol despite his respiratory problems and experienced side effects from this medicine. [Ms B] reports that this was mentioned to nursing staff who ‘brushed’ off concerns and did not investigate further.
- [Mr A] was prescribed twice daily inhalers but could not access or administer them due to experiencing confusion from the administered tramadol.

I have been asked to provide clinical advice on the nursing care provided to [Mr A] and to specifically consider:

- whether there was adequate investigation of the side effects [Mr A] experienced from tramadol;
- whether the administration of [Mr A’s] asthma inhalers were appropriate; and
- whether the preoperative food and fluid management of [Mr A] was appropriate.

4. WDHB has provided a comprehensive response to [Ms B’s] complaint issues. I have reviewed the response and supporting documentation and note that it is consistent with the contemporaneous documentation. For the purposes of brevity the response details have not been repeated in this advice.

5. Review of clinical records focussing on the nursing care and the scope of my clinical advice

(i) Tramadol administration and side effects

On [Day 1], [Mr A] was prescribed tramadol capsules 50–100milligrams (mgs) three times per day as a regular analgesia. Tramadol is a synthetic opioid analgesia. Dosage and administration guidelines advise that those older than 75 years should receive a maximum of 300mgs daily. A reduction in dosage/frequency is also advised in the case of renal impairment.¹ I note that when this medication was prescribed, [Mr A's] renal function as indicated by his serum creatinine was within normal adult parameters. I also note that [Mr A] was never administered more than 300mgs/daily and generally received 200mgs/day maximum. Tramadol was last administered to [Mr A] on [Day 9] at 6am when he received 50mgs. Documentation shows nursing staff completing regular pain assessment observations with [Mr A] reporting mild–moderate pain.

Prior to the physiotherapist noting [Mr A] was ... *hazy* ... during the afternoon of [Day 6] I can determine no reportage of confusion or disorientation being documented. I note that post this he was reviewed by an anaesthetist at 3.50pm and noted to be alert and orientated.

I note that there is nursing documentation reporting family queries and the actions taken in response. This is appropriate. In my opinion, there is evidence of appropriate monitoring and communication of concerns from nursing staff to the orthopaedic team about [Mr A's] episodes of hypotension and poor urine output. In my opinion these symptoms are more readily attributable to other factors rather than caused by [Mr A] receiving tramadol medication.

(ii) Administration of inhalers

On admission to [WDHB], [Mr A] was prescribed his longstanding inhalers — Seretide 125/25 inhaler and tiotropium. The reviewed medication charts report that [Mr A] received — nurse administered or self administered — his inhalers as prescribed on all but two occasions, morning [Day 2] and evening [Day 7]. On these two occasions there is no documentation verifying administration of his Seretide inhaler and I am mildly critical of this. From [Day 8], nursing staff consistently administered [Mr A's] inhalers. As documentation from this date reports episodes of confusion and hypoxia, I consider this appropriate and necessary.

In my opinion, it is important that competent patients are supported to retain control of medications that manage chronic health conditions. Whilst I agree with the provider response that it would have been prudent for nursing staff to have documented an assessment of [Mr A's] ability to self administer his inhalers, I consider that the absence of such an assessment is not unusual in the context of this case and does not constitute a departure from accepted standards of nursing care. I base this opinion on the facts that [Mr A] was not commencing new treatments or a new delivery system to manage his emphysema and COPD, he had been successfully managing to

¹ Tramadol. (2014). In MIMS new ethicals (Issue 14, p. 211). Auckland, New Zealand: MIMS NZ Ltd.

administer his inhalers at home, there is an absence of reportage of confusion during the period of time that [Mr A] was self administering his inhalers at [WDHB], his reason for admission did not preclude him from self administration of inhalers, and documentation for the relevant time period reports [Mr A] managing drinks etc without requiring assistance.

(iii) Preoperative nutrition and hydration

Initial plan upon admission to the ward was for [Mr A] to be nil by mouth from 2am on [Day 2] in preparation for surgery later that day. Nursing documentation at 2.30pm reports that [Mr A's] surgery was cancelled until Monday, [Day 4] and that he could eat and drink in the interim period. A referral to the dietician was faxed and he was reviewed Monday morning. Dietician's assessment noted that [Mr A] reported eating well when not fasting for surgery and recommended Fortisip supplements post operatively, which I note did commence on [Day 6].

On [Day 4] documentation reports [Mr A] having breakfast. The pre surgical plan was no further diet from 12md with clear oral fluids allowed until 2pm. At some stage he was notified that surgery would not proceed that day and that he could eat and drink, which he is reported as doing. On [Day 5] [Mr A] was again fasted from 2am and proceeded to surgery at approximately 6.30pm.

Documentation shows [Mr A] was prescribed regular intravenous fluid therapy and that these were administered as prescribed. I note that fluid balance monitoring of intake and output was maintained. This is expected and appropriate.

6. Clinical advice

- In my opinion, the nursing care in relation to administration of tramadol to [Mr A] and monitoring for adverse symptoms was appropriate and consistent with accepted standards of nursing care.
- I am mildly critical that there are two incidences when it is unknown whether [Mr A] received his prescribed Seretide inhaler. I consider that prior to administering a medication it is necessary to review when it was previously administered. I consider this act a fundamental part of safe medication administration practice. Such practice captures incidences of non administration of a prescribed medication, documentation omissions etc. I would recommend that administration/documentation inconsistencies on medication charts are proactively managed as part of safe medication practice and quality control activities.
- In my opinion, nursing staff provided care consistent with accepted standards in relation to fluid and hydration management in the preoperative period.

Dawn Carey (RN PG Dip)

Nursing Advisor

Health and Disability Commissioner, Auckland"

Appendix C: General physician's advice to the Commissioner

The following advice was provided by a general and respiratory physician, Denise Aitken:

“I have been asked to provide an opinion to the Commissioner on case number 01215. I have read and agree to follow the Commissioner's guidelines for independent advisors.

I am trained as a General and Respiratory Physician and have been working as a Consultant Physician since 1997. I practise solely in an Acute General Hospital and see general medical patients as well as surgical consults in the Orthopaedic and Surgical Services. I am a Fellow of The Royal Australasian College of Physicians. I have provided previous reports to the Health and Disability Commissioner.

I have been asked to provide comment on the standard and appropriateness of care provided by DHB staff (including medical and respiratory care) after [Mr A] began to deteriorate and before Intensivists were involved. I have been asked to address my comments to oversight and continuity of care between specialties and teams, the standard of care and accepted practice, if there is a departure how significant it is and any comments related to systems and processes of care.

I have available to me photocopies of the clinical notes including the Standard observation chart with the Adult Deterioration Detection System (ADDS), blood test results, drug charts and reports from the doctors involved in [Mr A's] care.

[Mr A] a 78yr old man with known background respiratory disease sustained a fractured neck of femur on [Day 1].

He was admitted to [WDHB] that same day which was a Friday. His surgery was planned for the weekend. It was performed after hours on [Day 5], a Tuesday, 4 days after his admission.

Current standards of care regarding timing of surgery for fractured neck of femur exists because of concerns that delay increases the risk of respiratory complications.

[Mr A's] in hospital course was relatively uneventful apart from the delay in surgery until the afternoon of [Day 5] when his family expressed concern that he was increasingly short of breath. He was reviewed at that time by the Orthopaedic House Officer who did not identify significant concerns and adjusted his deteriorating patient score to lower the scoring for oxygen saturations.

He went to theatre in the evening of [Day 5]. A significant deterioration in his condition occurred post operatively and is documented in the Standard observation chart by a change in the ADDS score at 1am in the morning of [Day 6]. This was for an increased oxygen requirement.

During daytime hours on [Day 6] both the Orthopaedic Registrar noted that [Mr A] was asleep and the Physiotherapist described him as sleepy. Throughout the day he persistently scored at a higher level on the ADDS at 2–3 increasing to a score of 4 at 1330hrs in the afternoon.

A routine postoperative anaesthetic review was carried out at 1330hrs around the time of this deterioration and the doctor performing this noted the decreased urine output and blood pressure contributing to the increased score. He also noted a rising creatinine and made the diagnosis of acute kidney injury. The underlying cause of the hypotension was not addressed at that point in time.

Overnight on the evening of [Day 6/Day 7] there were 4 house officer reviews for triggering of the ADDS with scores between 3–7 occurring. These scores were for persistent hypotension, increased oxygen requirement, tachycardia and tachypnoea. Type 1 respiratory failure was diagnosed on the basis of a blood gas. A chest x-ray and ECG were requested. In the early hours of the morning of [Day 7] the patient was discussed with the Medical Registrar but not physically reviewed by that person. The ADDS scoring 6–7 should trigger a registrar review. Presumably this would normally be the on call Orthopaedic registrar, but this is not explicit and I do not know what the standard practice overnight was for deteriorating patients on the Orthopaedic Ward at [WDHB] in 2013.

On the morning, in working hours of [Day 7] it does not appear that the senior medical officer responsible for [Mr A's] care was aware that he had experienced 4 house officer reviews overnight or that he triggered a score of ADDS = 7. He was not seen by the Consultant Surgeon or the Orthopaedic Registrar. There is a house officer ward round, but no new plans were made despite these 4 overnight reviews. Through this day [Mr A] improved somewhat to score 0–1 on the ADDS. I note that the [WDHB] guidelines require daily Registrar review by Orthopaedic Registrars.

At 1830hrs in the evening of [Day 7] [Mr A's] condition deteriorated and a further House Officer review occurred. The chest x-ray performed early on [Day 7] at approximately 0400hrs is reviewed and a diagnosis of pneumonia is made, antibiotics are planned. At 2230hrs he deteriorates further and very significantly with a rise in the ADD score to 11. The ICU Registrar attends in a timely manner after discussion between another Medical Registrar and himself and a further chest x-ray is done. It appears that he attends within 20 minutes of being called, which is within guidelines. A pneumothorax is identified and a thoracic tube is placed appropriately. At this point [Mr A] is admitted to the High Dependency Unit at 2250hrs on [Day 7]. He is further reviewed at 0015hrs on [Day 8] by the Medical Registrar and then again 30 minutes later.

The next day he is reviewed by [the Respiratory Consultant] and at that time the first dose of intravenous Augmentin is given and a dose of stat Gentamycin given. This was planned the evening before at around 1800hrs but apparently not given. This occurs at 0845hrs on the morning of [Day 8].

From [Days 8-13] there are multiple reviews by Consultant staff in the High Dependency Unit. Daily reviews by the Respiratory Specialist and Orthopaedic Registrar. Repeated reviews by the ICU Consultant. He is seen by the Cardiology Registrar and discussed with the Consultant Cardiologist. Seen by the Cardiothoracic Registrar, a chest drain replaced and seen by the Cardiothoracic surgeon and through this period from [Day 8-13] his condition stabilises. His ADDS scores settle to 2.

In the early hours of the morning of [Day 13] his condition deteriorates further with what appears to be treatment resistant pneumonia leading to [his death]. This was treated appropriately.

I have been specifically asked to address the period prior to the involvement of ICU doctors which is essentially from the [Day 5] through to [Day 8].

I have identified:

1. Failure to appropriately escalate as per the ADDS criteria. It is not clear on the evening of [Day 5/Day 6] whether the Registrar was requested to review and did not or the request was not made.
2. Failure to notify the SMO responsible for care of the patient's deterioration (refer to Waikato DHB principles of delegated responsibility document reference 2172). Under this guidance the SMO should be contacted regarding 'any patients who deteriorate unexpectedly'. It does not appear that this occurred on the day of the 10th following the overnight review 4 times by the House Officer on [Day 5/Day 6].
3. Failure of senior review to occur on the [Day 6].
4. A failure to consider the underlying diagnosis and treat the cause of [Mr A's] initial deterioration in a timely manner.

I also note that despite the on call House Surgeon stating on the evening of [Day 7] at 1830 a need for antibiotics, these do not appear to have been prescribed or given until the morning of [Day 8], 12 hours later.

The repeat failure to escalate resulted in the delay of appropriate referral and senior medical review and treatment. This occurred despite appropriate guidelines being in place. These are:

1. The ADDS 'Actions Required' on the side of the Standard Observation Chart
2. Waikato DHB SMO guidelines for principles of delegated responsibility
3. The Orthopaedic Registrar handbook.

It is not clear whether this was because of resource constraints, knowledge deficit or a culture of non escalation or a combination of the above.

The above is a failure of standard of care. It is a moderate failure. I expect that my peers would have viewed this as a failure but they would also consider such failures may be repeated in many hospitals. I comment that 'failure to rescue' is

an issue being addressed by the NZ Health Quality and Safety Commission currently with its deteriorating patient programme.

Care co-ordination, such as that provided by an Orthogeriatric Service is now an accepted standard of care (Australian and NZ society for Geriatric position statement on Orthogeriatric care September 2011). The assessment and oversight such a service would have provided would have allowed early intervention, appropriate assessment and earlier treatment of [Mr A's] deterioration.

Yours sincerely

Denise Aitken

CONSULTANT PHYSICIAN'