MidCentral District Health Board

Orthopaedic Registrar, Dr G

House Officer, Dr F

Anaesthetist, Dr E

Orthopaedic Surgeon, Dr D

Medical Registrar, Dr K

A Report by the

Health and Disability Commissioner

(Case 14HDC00134)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. In 2011 Mr A (then aged 75 years) was referred by his GP to consultant orthopaedic surgeon Dr D at a public hospital owing to knee pain. Mr A had a complex medical history. On 28 November 2008, Mr A had been admitted to the public hospital for reduction of a hip dislocation. During that admission Mr A had a large gastrointestinal (GI) bleed secondary to use of non-steroidal anti-inflammatory drugs (NSAIDs). Mr A's GP, Dr C, was unaware of the 2008 GI bleed as he was not sent a copy of the discharge summary.

2. On 9 Month1[1] Mr A attended an outpatient appointment with registrar Dr G and completed a patient questionnaire. On 6 Month3 Mr A attended a pre-admission clinic, where he was assessed by a house officer, Dr F, and a consultant anaesthetist, Dr E. Neither Dr G, Dr F, nor Dr E reviewed the previous clinical records or documented that previously Mr A had suffered a severe acute GI bleed.

3. On 18 Month4 Mr A underwent total knee joint replacement surgery at the public hospital undertaken by Dr D, who had previous knowledge of Mr A and his history. A surgery checklist and a surgical time-out protocol were completed but neither recorded Mr A's GI history. The anaesthetist on the day of surgery was not made aware of the history of a GI bleed. Postoperatively, with Dr D's knowledge, the anaesthetist charted analgesia including ibuprofen (an NSAID).

4. On 19 Month4 Dr D reviewed Mr A and expected him to be discharged home in four or five days' time. On 20 Month4 Dr D went on leave, but a handover was not documented. No other orthopaedic staff member is specified in the records as being the responsible clinician during Dr D's leave. At the time, the DHB Orthopaedic Department did not have a policy in relation to handover of patients including when consultants are on leave.

5. Mr A showed signs of deterioration. At 4.30pm on 22 Month4, the on-call house officer, Dr I, was paged. Dr I reviewed Mr A at 5.40pm and 8.30pm, and queried a peptic ulcer. Dr I stopped the ibuprofen and diagnosed renal impairment. At 3am on 23 Month4, house officer Dr J reviewed Mr A. Dr J documented: "[U]nwell patient ? cause, need to rule out bleed plus in acute renal failure." Dr J telephoned the on-call medical registrar, Dr K.

6. At 6.05am Dr J reviewed the chest X-ray and considered pneumonia. She telephoned Dr K. He considered that Mr A required further fluid resuscitation and reassessment prior to any escalation of care. At 6.25am Dr K was the first doctor in a role above house officer to review Mr A. No examination findings are recorded. Dr K concluded that Mr A had sepsis secondary to pneumonia and acute kidney injury. Dr K did not seek advice from a more senior clinician. No follow-up plans, further investigation, or recommendations to the orthopaedic team were documented. At 7am the renal team was contacted by a house officer, and it requested a review by a medical registrar.

[1] Relevant months are referred to as Months 1-4 to protect privacy.

7. At 9.40am, registrar Dr L performed an examination. He concluded that Mr A was acutely unwell with chest sepsis and renal injury. Dr L anticipated that Mr A might need higher care intervention and planned further review. By 12pm Mr A had deteriorated further, and Dr L queried a perforated peptic ulcer. Dr L escalated Mr A's case and telephoned a consultant. A transfer to ICU was agreed verbally over the telephone.

8. The ICU consultant contacted at 12pm agreed to attend as soon as possible. Mr A was transferred to ICU from the ward at approximately 1pm. Mr A had a cardiac arrest and CPR was performed. He was intubated and invasive monitoring commenced. However, owing to multi-organ failure, a decision was made to discontinue resuscitation. Sadly, Mr A died.

Findings summary

9. Dr G is criticised for not reviewing the clinical records or entering into the contemporaneous record the relevant 2008 clinical history, which included a major GI bleed.

10. The pre-admission clinic should glean information important for the continuity of anaesthetic and surgical care. Dr E did not perform the anaesthesia on the day of surgery in this case. Dr E is criticised for not reviewing the clinical records and entering the relevant 2008 clinical history into the contemporaneous pre-admission anaesthetic record.

11. There was an expectation that review of the clinical records formed part of the house officer duties in this case, and adverse comment is made regarding Dr F for not performing such a review.

12. Dr D, the responsible consultant surgeon, acknowledged that he was familiar with Mr A's clinical history and that he proceeded cognisant of that. However, Dr D did not enter Mr A's gastrointestinal history into the contemporaneous record. Mr A was later prescribed NSAID medication with Dr D's oversight, without the relevant past clinical history having been documented, or having evidence of being communicated by Dr D. On 20 Month4 Mr A's handover was not documented by Dr D or by other medical staff under his supervision. This adversely affected Mr A's care. Accordingly, Dr D failed to ensure quality and continuity of services to Mr A and, therefore, breached Right 4(5) of the Code of Health and Disability Services Consumers' Rights (the Code).[2]

13. Dr K did not provide appropriate telephone advice or perform an adequate initial assessment of Mr A in a timely manner, and failed to seek advice from a senior colleague when Mr A's condition warranted that he do so. Given these clinical

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

deficiencies, Dr K did not provide services to Mr A with reasonable care and skill and, therefore, breached Right 4(1) of the Code.[3]

14. At 9.40am, Dr L conducted a thorough initial review of a complex patient with an atypical presentation. He documented the review in detail and included a review of the patient history. He made contact with a consultant at around 12pm, and facilitated Mr A's transfer to ICU. However, Dr L is criticised for not making contact with a senior colleague earlier during the initial morning review.

15. Mr A's case highlighted the following systems issues, which contributed to his suboptimal care:

- The DHB records system did not assist staff to facilitate effective review of patient history and significant patient comorbidities.
- The wording and nature of several of the questions on the DHB pre-assessment patient questionnaire may have been subject to misinterpretation.
- Postoperatively:

a) There was a lack of clarity about the person to whom oversight of Mr A's care had passed, particularly once Dr D went on leave on 20 Month4 and Mr A began to deteriorate and require medical team input. At that time the Orthopaedic Department did not have a policy regarding the handover of patient care by consultants, including when going on leave.

b) Subsequently, after 20 Month4 there was no consultant or registrar level orthopaedic involvement in Mr A's care until the orthopaedic team was paged about the impending transfer to ICU on 23 Month4.

c) Many staff in this case did not adhere to Early Warning Score (EWS) protocols appropriately.

d) Escalation to more senior staff did not occur appropriately when Mr A deteriorated.

16. For the above reasons, MidCentral DHB did not provide services to Mr A with reasonable care and skill and, accordingly, breached Right 4(1) of the Code.

Recommendations

17. It is recommend that MidCentral DHB:

a) Prepare or modify a policy or guideline (such as the "Preadmission Clinic" Guideline) to clarify roles and responsibilities of staff and outline precisely when in the patient surgical pathway, and by whom, the patient's clinical history and records are reviewed and communicated.

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

b) Provide a detailed update in relation to its development of electronic patient records.

c) Implement an electronic alert process or system in the patient record for clear flagging of significant patient comorbidities and clinical history.

d) Provide a copy of the critically appraised and modified preoperative screening questionnaire form.

e) Provide details of the steps taken to allow treating clinicians to recheck all patient hard copy records, electronic records, and medications immediately prior to surgery.

f) Provide further explanation regarding the apparent evidence against establishing a rapid response team at MidCentral DHB, and detail the other mechanisms being pursued for ensuring an appropriate medical response to an EWS trigger, and for ensuring that MidCentral DHB junior doctors are confident and supported to escalate concerns about deteriorating patients to their senior colleagues.

g) Detail the changes made to increase the robustness of transfer of care within the Orthopaedic Service, including extra medical and elder health support for orthopaedic patients.

h) Provide a formal written apology to Mr A's family.

18. It is recommended that Dr D:

a) Provide details to HDC on steps he has taken to formalise handover of his own surgical inpatients to orthopaedic colleagues in the event of taking leave, to include a process of clear instructions for patient oversight.

b) Provide an update on his active participation in the changes made to the surgical safety checklist and procedures.

c) Provide an update on the changes made to the mechanisms of handover between consultants and the documentation of patient management instructions.

d) Provide a formal written apology to Mr A's family.

19. It is recommended that Dr K:

a) Provide evidence to HDC of undertaking further education in the application of EWS scores, the recognition of a deteriorating patient, and the escalation of care to senior colleagues in the event of patient deterioration.

b) Provide a formal written apology to Mr A's family.

Complaint and investigation

20. The Commissioner received a referral from the Coroner in relation to the care provided to Mr A (dec) by MidCentral DHB. Mr A's daughter, Ms B, supported the complaint.[4] The following issue was identified for investigation:

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

21. On 24 July 2015 the investigation was extended to include the following:

- *Whether Dr D provided an appropriate standard of care to Mr A in 2012.*
- *Whether Dr G provided an appropriate standard of care to Mr A in 2012.*
- *Whether Dr F provided an appropriate standard of care to Mr A in 2012.*
- *Whether Dr E provided an appropriate standard of care to Mr A in 2012.*
- *Whether Dr K provided an appropriate standard of care to Mr A in 2012.*

22. The key parties referred to in the report are:

Mr A (dec)	Consumer
Ms B	Complainant/Mr A's daughter
MidCentral DHB	Provider
Dr C	General practitioner (GP)
Dr D	Orthopaedic surgeon
Dr E	Anaesthetist
Dr F	House officer
Dr G	Orthopaedic registrar
Dr H	Anaesthetist
Dr I	House officer
Dr J	Senior house officer
Dr K	Medical registrar
Dr L	Medical registrar
Dr M	Physician
Dr N	Anaesthetist

Also mentioned in this report

Dr O	Emergency physician

23. Information from the Coroner was also reviewed.

24. Independent expert advice was obtained from an orthopaedic surgeon, Dr Denis Atkinson (**Appendix A**).

[4] The executors of Mr A's estate advised HDC that they gave authority for Mr A's health information as it relates to this matter to be disclosed to his daughter.

25. Independent expert advice was obtained from an anaesthetist, Dr Andrew Love (**Appendix B**).

26. Independent expert advice was obtained from a physician, Dr Richard Shepherd (**Appendix C**).

Information gathered during investigation

Relevant clinical history

27. Mr A had a complex medical history that included ongoing issues with osteoarthritis and iron deficiency anaemia.[5]

28. In 1996 Mr A (then aged 60 years) underwent a right hip joint replacement. Mr A suffered some postoperative ankle swelling and oedema.

29. In 1999 Mr A underwent a gastroscopy, the results of which were normal.

30. Mr A was referred to a gastroenterology clinic at MidCentral DHB for further investigation of his anaemia in 2005 and 2008, but he declined to have further gastroscopies. Mr A's GP (since 2002), Dr C, told HDC that Mr A had no epigastric pain or change of bowel motion, and occult bloods and tumour markers were normal, so his anaemia was attributed to his dietary intake.

31. Dr C told HDC that Mr A was not a good historian and often refused or did not attend referral appointments.

Left hip replacement, 2008

32. Early in the New Year, Mr A experienced osteoarthritic symptoms in his left hip. Dr C referred him for orthopaedic review.

33. In June 2008 consultant orthopaedic surgeon Dr D[6] postponed a scheduled left total hip joint replacement procedure for Mr A (then aged 72 years) owing to Mr A's preoperative blood results, particularly his low haemoglobin, indicating iron deficiency anaemia. Dr C placed Mr A on oral iron.

34. In November 2008 Mr A was able to undergo a left total hip joint replacement at a private hospital, performed by Dr D under contract from MidCentral DHB. The procedure was complicated by a number of postoperative dislocations of the hip.

[5] Iron deficiency anaemia is a condition in which the blood lacks adequate healthy red blood cells, which carry oxygen to the body's tissues.
[6] A Fellow of the Royal Australasian College of Surgeons (RACS).

Gastrointestinal bleed

35. In November 2008, Mr A was admitted to the public hospital for reduction of a hip dislocation. During this admission Mr A had a large recurrent gastrointestinal (GI) bleed. (Mr A had two further dislocations and reductions in December 2008.)

36. Dr C advised HDC that until contact from this Office on this issue, he had been unaware of the 2008 gastrointestinal bleed, and he had no record of it. Dr C said that he did not receive a copy of the discharge summary.

Gastroscopy, 2008

37. In December 2008 Mr A had a gastroscopy,[7] which confirmed that he had two chronic gastric ulcers and an acute bleeding duodenal ulcer.[8] Mr A underwent a blood transfusion. His discharge medication included omeprazole. Mr A's joint pain relief at the time (indomethacin[9]) was discontinued.

2009 rehabilitation

38. In January 2009 Mr A was transferred from the surgical ward to another ward.[10]

39. Mr A's electronic[11] surgical ward discharge summary makes reference to his haemoglobin level being 62g/L.[12] In the "problem list" it refers to the chronic gastric ulcers and acute bleeding duodenal ulcer being identified by gastroscope. The summary also states that the "[patient] advised [that he had] no GP". The surgical ward discharge summary was not copied to the GP.

40. Mr A had a lengthy stay on the ward (including review by Dr D on 29 January 2009), rehabilitating until his discharge home in February 2009. The ward discharge summary "problem list" includes the hip problems, lower leg cellulitis, anaemia, chronic gastric ulcers, acute duodenal ulcer, heart murmur, and gout. The summary also records: "Pt advised no GP."

41. The body of the discharge summary notes also detail that Mr A had had a chronic gastric ulcer and an acute duodenal ulcer.

42. In August 2009 Mr A endured a spontaneous left-sided deep vein thrombosis (DVT)[13] extended above the knee. He was treated with subcutaneous heparin and warfarin therapy[14] by the Haematology Department at the public hospital.

[7] A gastroscopy visualises and investigates the oesophagus, stomach, and the first part of the small bowel (the duodenum), using a long, thin, flexible telescope.
[8] A crater (ulcer) in the lining of the beginning of the small intestine (duodenum).
[9] Indomethacin is a non-steroidal anti-inflammatory medication for pain relief and fever. NSAIDs cause an increased risk of adverse gastrointestinal side effects.
[10] The patient admission details documented on file list "Pt advised no GP".
[11] Available through Éclair, the MidCentral DHB electronic records system.
[12] Normal range for an adult male is 125–170g/L.
[13] Deep vein thrombosis is a blood clot that forms in a vein deep in the body.
[14] Warfarin and heparin are anticoagulant medications that decrease the ability of the blood to clot.

DHB clinical records

43. Dr D told HDC that Mr A's public hospital records were in three volumes: 1995 to 2008; 2009 to 2012; and investigation and outpatient records.

44. Electronic records were available through the MidCentral DHB clinical portal application from Month1. The electronic record did not contain an alert process or system for significant patient comorbidities.

Referral to Orthopaedic Service, April 2011

45. In April 2011 Dr C referred Mr A to Dr D at the Orthopaedic Service at the public hospital owing to knee pain. At that time, Mr A's long-term medications were listed in the letter as aspirin 100mg daily, omeprazole 40mg daily,[15] cilazapril for blood pressure, paracetamol, and doxazosin (for hypertension). No other co-morbidities were mentioned in the referral letter. The referral did not include any reference to Mr A experiencing any gastrointestinal symptoms at that time.

46. The referral letter stated:

> "I would be grateful if you could see [Mr A]. He has had increasing problems with both of his knees, more so the left. He has chronic pain, no night pain, he is limited by knee pain especially if there is any incline or stairs. I referred him for X-ray … This shows there is an obliteration of the lateral compartment in the left side consistent with a genu valgum[16] deformity. He also has moderate degenerative changes on the medial compartment of the right knee also. As this is now significantly impinging on [Mr A's] day to day life I would appreciate your expert assessment, query need for a knee replacement."

Orthopaedic outpatient clinic assessment — 2012

Dr G

47. On 9 Month1 Mr A was assessed at the MidCentral DHB orthopaedic outpatient clinic. Dr G, an orthopaedic registrar to consultant orthopaedic surgeon Dr D, assessed Mr A.

48. Dr G told HDC that the assessment process at MidCentral Health at that time worked as follows:

- A patient would be referred to the Orthopaedic Clinic and an initial assessment would be performed by either the consultant and/or his registrar.
- If the patient was offered a surgical procedure then he/she would attend a separate pre-assessment (pre-admission) clinic appointment performed by the orthopaedic house surgeon and an anaesthetist. Specifically this would be to evaluate the patient's overall medical health prior to his/her procedure.

49. Dr G said that the outpatient clinic establishes whether or not there is an orthopaedic problem requiring surgery or treatment, whereas the pre-admission clinic is to

[15] Used for the relief of reflux.
[16] A "knock-kneed" deformity.

establish the patient's general health in preparation for the surgery. Dr G said that he was involved in the first consultation under the supervision of his consultant.

50. Dr G stated that his consultations included taking a detailed and comprehensive orthopaedic history, performing a directed orthopaedic-specific physical examination, X-ray evaluation (where applicable) and discussion of the planned procedure, including details of the operation, risks and possible complications, as well as a discussion of aftercare.

51. Dr G said that as a matter of course he asks about other medical and surgical history, and discusses the case with the supervising consultant, and a decision is made as to whether or not a procedure is offered. The patient is then given a questionnaire to complete, and this document is reviewed at the second appointment — a pre-assessment clinic performed by the house surgeon and anaesthetist.

52. MidCentral DHB told HDC that in relation to initial assessment of patients in the orthopaedic outpatient clinic, patients assessed as requiring a joint replacement are automatically streamed as requiring anaesthetic assessment, and are booked for pre-assessment (see below). The questionnaire is provided to the pre-assessment clinic nurses.

53. There was no specific DHB policy document governing expectations surrounding the review of patient history and clinical notes in an outpatient context.

54. Mr A completed a "preassessment patient questionnaire" template form. Among other things, Mr A ticked "no" boxes to indicate that he had no bleeding disorder, hernia, heartburn, indigestion, acid reflux, or kidney disease.

55. In the section regarding skin conditions, the questionnaire form also asks: "Do you have any sores/boils/ulcers?" Mr A crossed out sores and boils and ticked the "yes" box. Mr A did suffer from leg ulcers.

56. The other "yes" boxes ticked by Mr A indicate that he wore dentures, lenses, or a hearing aid, one indicating that he experienced shortness of breath or chest pain with activity such as climbing stairs, and one indicating that he lived alone.

57. No peptic ulcer symptoms were recorded by Mr A anywhere on his pre-assessment questionnaire.

58. The questionnaire does not ask specifically what medical conditions the patient has experienced in the past.

59. On 9 Month1 Dr G dictated a clinic letter back to Dr C. Dr G's letter indicated that Mr A had moderate to severe arthritis of the left knee, mainly laterally. His knee was painful, and he required a walking frame and regular analgesia. He could walk only limited distances. The previous hip replacement was noted. The range of motion was recorded as 0–90 degrees, and his ligaments appeared to be stable.

60. Dr G considered it reasonable to offer a total knee replacement. It was suggested by Dr G that Mr A obtain a long leg view X-ray of the left leg when attending the preoperative assessment clinic.

61. Dr D was present in the outpatient clinic on the day Mr A was reviewed by Dr G. Mr A's written clinical records were available at the outpatient clinic that day.

62. Dr D told HDC:

> "The outpatients clinic load is shared between consultant and registrars with a common workstation to allow for oversight and discussion of patients. The delegation of patient consultation is done as an 'entrusted clinical activity' based on the experience of the registrar. My expectation would be that [Dr G] would peruse the medical records, take a thorough history, examination and dictate the findings, consent and discussion for the medical record as a matter of good medical practice …"

63. Dr D acknowledged that the information contained in the previous medical records had not been translated into the contemporaneous record.

64. Dr G stated:

> "Usual practice at the orthopaedic assessment clinic is to obtain a verbal background medical and surgical history from the patient as it will be important in considering the appropriateness of surgery. It would seem I was able to elicit quite some detail on pain, walking aids, and general mobility and his history of a previous hip replacement, so it would not appear that he was a particularly bad historian in other respects. Nevertheless, the purpose of the subsequent pre-operative [pre-admission] assessment clinic is that the medical history is obtained in more detail where for example past medical files can be perused for relevant history."

65. Dr G respectfully disagreed with Dr D's comment that his expectation of his registrars is that they would peruse the medical records, take a thorough history and examination, and dictate the findings, consent and discussion for the medical record as a matter of good medical practice. Dr G said that had he been the doctor performing the pre-assessment clinic evaluation then he would have been reasonably expected to establish the history of pre-existing pathology, as that is the purpose of that clinic, but he did not perform that role.

66. Dr G told HDC: "My letter of 9 [Month1] shows that I conducted my consultation in the manner outlined above. With respect to previous medical and surgical history … his previous total hip replacement is noted, however the history of his previous peptic ulcer disease was not forthcoming [from Mr A]."

67. On 9 Month1 Dr G completed a "Booking system for surgery" form for a total knee joint replacement owing to a valgus knee.[17] The surgery was to be under general anaesthetic. Under the "preadmission" section of the form, "yes" is circled for an anaesthetic opinion. "No" is circled for a specialist seeing Mr A at pre-admission. Pre-admission was scheduled for 6 Month3.

68. Dr D told HDC that the questionnaires are filed with the booking form for surgery, to be assessed later at the pre-admission clinic.

Pre-admission clinic — 6 Month3

69. On 6 Month3 Mr A attended the pre-admission clinic.[18] He was reviewed by a relieving house officer, Dr F,[19] and a consultant anaesthetist, Dr E.[20]

Recommendations for pre-anaesthesia consultation

70. The Australian and New Zealand College of Anaesthetists (ANZCA) has produced "Recommendations for the pre-anaesthesia consultation".[21] The College defines recommendations as an "advisable course of action".

71. Point 3 of the ANZCA recommendations states:

> "3. Guidelines
>
> The pre-anaesthesia consultation should include:
>
> …
>
> 3.3 An appropriate medical assessment of the patient including medical history (which may be assisted by a questionnaire and/or review of available patient notes), clinical examination, review of any medications, the results of any relevant investigations and arrangement for any further investigations or therapeutic measures which are considered necessary. This medical assessment may lead to delay, postponement or even cancellation of the planned procedure.
>
> …"

DHB guideline — pre-admission clinic

72. MidCentral DHB has a specific guideline, "Preadmission Clinic", which is applicable to both pre-admission clinics and day of surgery admissions (DOSA). The guideline outlines the roles and responsibilities of medical (including anaesthetists and house surgeons), nursing, clerical, and technical staff who provide services in the pre-admission clinic.

73. The guideline states that the purpose of the pre-admission clinic is "[t]o decrease patient cancellation on the day of admission, allow an opportunity for informed

[17] The booking process was governed by a DHB procedure document, "Outpatient Bookings".
[18] Sometimes referred to as the preoperative assessment.
[19] Registered with the Medical Council of New Zealand in general scope of practice.
[20] Vocationally registered with the Medical Council of New Zealand.
[21] Document PS7, August 2008 version.

consent and allow advance planning for anaesthetic, bed management, and surgery thus increasing patient safety, patient education, and orientation to hospital/operative process …".

74. In the roles and responsibilities section relating to pre-admission booking clerks, the guideline includes the following: "[E]nsure all clinical records have arrived in readiness for the clinic … [P]repare clinical records for daily clinics … [C]ollate patient notes that need to be taken up to the DOSA unit."

75. The guideline does not outline a specific expectation regarding the review of patient history and clinical notes in the pre-admission context for any of the above staff (ie, medical (including anaesthetists and house surgeons), nursing, clerical, and technical staff).

76. In relation to the role of the anaesthetist, the guideline includes:

> "… 3.2 Anaesthetist
>
> - Assesses all patients who:
> - are over 60 years of age
> - are booked for 'major' surgery
> - are referred specifically by the surgeon
> - request to see an Anaesthetist
> - requested to see following the H/S surgical assessment
> - If patient not optimised for surgery, will refer patient for further investigations or back to the GP for ongoing management
> - Provides patient with information on the different types of anaesthetic so informed choices could be made
> - Liaise with surgeons for optimisation of high risk patients …"

77. Dr D told HDC that the primary purpose of the pre-admission clinic is the anaesthetic assessment. The house officer attending the clinic may or may not be the house officer responsible for the patient's inpatient care, and the anaesthetist may or may not be the anaesthetist who is assigned to his surgery list on the day the patient presents for surgery.

78. Dr D said:

> "My expectation of the house officer is that they will peruse the medical records, take and document a brief history of the patient's condition, enquire as to past medical and social history, medications and social circumstances. In essence the pre-assessment clinic is for the purpose of preparing a risk assessment prior to surgery … The anaesthetist will undertake a risk assessment from an anaesthetic standpoint … My expectation is that if there is a surgical issue then this will be raised with me prior to the day of surgery."

Dr E

79. Specialist anaesthetist Dr E told HDC that the preoperative assessment process involves interviews with differing clinical staff, all with a particular emphasis towards their part of the provision of patient care, and that the consultant anaesthetist's predominant function is to ascertain a patient's fitness and suitability for surgery, then evaluate and discuss the risks involved as they pertain to the provision of an anaesthetic for that surgery.

80. Dr E's notes for 6 Month3 are recorded on the MidCentral DHB "Anaesthetic Record" template form, which has a large number of designated spaces for recording relevant clinical information. These include: observations, anaesthetic history, medical history and examination, medication, exercise tolerance, allergies, airway check, and a selection of blood test results. Dr E completed all spaces on the form.

81. Dr E does not recall Mr A specifically, and his response to HDC is based on the clinical notes. Dr E stated that in his interview with Mr A he recorded Mr A's previous operations as they were relayed to him. Dr E said that Mr A did not report any concerns to him about his previous surgeries.

82. Dr E said that he asked questions of Mr A as part of his routine survey of organ systems. Dr E documented in the relevant medical history and examination section that there was no IHD (ischaemic heart disease), no asthma, no reflux, and no bleeding disorders. Dr E said that Mr A disclosed to him that he was taking medication for his blood pressure.

83. In relation to any review of older clinical records, Dr E stated:

> "In the absence of any other specific cardiopulmonary limitations or concerns that I had revealed through my own enquiries and examination or brought to my attention by others, my natural tendency in reviewing [Mr A's] old notes would have been limited to information which had relevance to the provision of his anaesthetic i.e. anaesthetic charts. At a pre-assessment, typically the information that we look for in a patient's historical records is largely governed by the directions and nature of the information collected directly from the patient and through discussion with others involved at the pre-operative assessment. As is the case with [Mr A], the clinical records for a patient may reach several volumes … Each volume is up to one inch thick … and it is not uncommon for people to have up to 8 volumes of records. I have canvassed a number of colleagues who also conduct pre-assessment clinics and we all acknowledge the need to cherry-pick from the historical records for what we can assess is relevant to the provision of a safe anaesthetic for the proposed surgery. Previous anaesthetic records are a priority as is information about the patient's cardiorespiratory system. Neither my colleagues nor I routinely look specifically for previous post-operative complications, but of course if advised about these then we may then discuss with the surgical team. If it is information that affects anaesthesia/surgery then we record this information and deal with it appropriately according to protocols."

84. Dr E said that he discussed the nature and provision of anaesthesia with Mr A. Dr E recorded: "[S]pinal and sedations discussed and ok." Dr E said that he then would have told Mr A to take his antihypertensive medication on the morning of the surgery and offered him an information sheet related to "spinals" (regional anaesthesia) to read. The latter is not documented.

85. Dr E said that in the event that any concerns are raised about the reliability of a patient's responses, it is his practice to rebook the patient for another interview with family present. As he did not do so in this case, he said that he had not perceived there to be any problem or that Mr A was a poor historian.

86. There was no documentation at this assessment relating to the past history of duodenal ulcer, DVT, or leg ulceration.

87. Dr E said that Mr A's previous surgical postoperative gastric complications and DVT should have been noted at his surgical and/or anaesthetic pre-assessments for the surgery. Dr E said, however, that he did not elicit anything in his discussion or review of the previous records that identified this information, and it was not raised with him by anyone else who met with Mr A in the pre-assessment clinic.

Dr F

88. Relieving house officer[22] Dr F does not recall Mr A, and his response to HDC is based on the clinical notes. Dr F's 6 Month3 entry in the clinical records is headed "H/S Clerking — Pre-op".

89. Dr F told HDC that he saw Mr A in the anaesthetic pre-assessment clinic after the anaesthetist had seen and assessed him. Dr F said that his involvement was to do the clerking and the "paper-work".

90. In relation to the role of the house surgeon, the DHB guideline includes:

> "… 3.6 House Surgeon
>
> - Requests specific investigations e.g. bloods, ECG, Spirometry, X-rays.
> - Completes a surgical assessment, performing examinations if necessary
> - Education to patient/support person about operation, discusses risks/benefits of operation and signs surgical consent form with patient
>
> …
>
> - Discuss patient with anaesthetist if necessary …"

91. Dr F stated:

> "I saw him for a short time and I had asked him whether he knew what operation he was having … I had confirmed it with the notes provided to me at the time. I had then proceeded to ask him about his past medical history. He had responded that he had hypertension only. I then had proceeded to ask him whether he had any

[22] Posted to the orthopaedic team to fill in for house surgeons on leave.

> other medical issues from the past … he had denied any other medical issues. I then had specifically asked him for any cardiac or respiratory disease, and diabetes, which he had denied. His answers must have satisfied me as I wrote down that he was generally fit and well.

92. Dr F said that Mr A must have come across convincingly enough for him not to worry that there was anything amiss.

93. Dr F told HDC:

> "His pre-assessment patient questionnaire answers had reassured me as well that he was generally a well person with no significant medical issues. I had then asked him about what medications he was meant to be taking. Referring to my notes, [Mr A] must have responded that he was only on an antihypertensive but he did not know the name of it. I had confirmed with him that he was not taking any other medications which he had denied. I had asked [Mr A] to bring in his medications with him on the day of the operation. However, I had crossed this note out as I had found out that he was on Inhibace 2.5mg daily … I had then asked [Mr A] about any allergies and whether he was a smoker. I then proceeded to perform a systemic examination and found no issues in his cardiovascular, respiratory and abdominal examination.
>
> I then did the routine administrative tasks that were required of me, which included requesting an X-ray of his knee and giving [Mr A] phlebotomy forms … I charted his regular medications and as required 'PRN' post operative analgesia, anti-emetics and laxatives. I note from the drug chart that I had not prescribed him any NSAIDs. I can only presume that this was because of his age. And finally I provided [Mr A] with an appointment for the Joint Care clinic. That was the end of my interaction with [Mr A] and the extent of the care that I provided to him."

94. Dr F did not review Mr A's previous clinical records. There was no documentation at this assessment relating to any past history of duodenal ulcer, DVT, or leg ulceration.

95. Dr F said that these clinics were busy ones with a pressure to see and move patients along. There was seldom time to look in any great detail at a patient's notes, and, as in most clinical interaction, there was a significant amount of dependence on patient-supplied information when medical histories were taken.

96. Dr F said:

> "As with any clinical encounter, you tend to accept patient reported information instead of looking at any great detail into their medical notes, unless that patient reports they are unsure about some information or there are obvious discrepancies … However, in retrospect, I should have confirmed what [Mr A] had told me by looking through his medical notes."

97. On 19 Month3, knee joint replacement surgery was postponed because of a recurrence of a left leg ulceration.[23]

Left knee joint replacement surgery

98. On 18 Month4 Mr A was admitted to the public hospital and underwent a total left knee joint replacement that day.[24] The responsible clinician was consultant operating surgeon Dr D. Dr D had previous knowledge of Mr A, having operated on him in 2008.

99. Dr D's response to HDC notes that Mr A was not taking omeprazole at the time of this admission.

100. In the DHB document "Patient Admission Details" for this admission, the second and third pages of the clinical records list coding of patient events for previous admissions. None of the "Diagnosis Description" columns specifically mentions a major upper GI bleed, although an entry for December 2008 notes: "UGI symptoms with no GE Spec."[25]

101. Dr D told HDC that Mr A was well known to him, having treated him over a 20-year period.

102. Dr D told HDC that Mr A's medical records were available to him on the day of the 18 Month4 surgery. Dr D stated:

> "[Mr A's] past medical history was well known to me from previous contact with him.
>
> …
>
> At various stages in [Mr A's] preoperative workup for total knee replacement, his past medical history and comorbidities were not documented in the contemporaneous record. They were available however, in his medical records. I was aware of [Mr A's] past medical history and proceeded notwithstanding this history and with the relevant perioperative measures instituted."

103. Dr D told HDC that Mr A did not have such poor communication skills that an appropriate past medical history could not have been taken, and that all appropriate details were available without recourse to Mr A's GP or family.

104. Dr D said that Mr A's past medical history was not considered to be a contraindication to proceed with the planned knee surgery.

105. Dr D told HDC that Mr A's relative risk is acknowledged. He said that in retrospect, if a recognised risk calculator[26] had been used, there was data to suggest that Mr A

[23] Consent for anaesthesia was obtained on 19 Month3.
[24] Consent for the surgery was obtained on 18 Month4.
[25] Upper gastrointestinal symptoms with no gastroenterology specified.
[26] Such as the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) risk calculator.

was around a 4% (average) risk of serious complication, a 1% (above average) risk of blood clot, and a less than 1% risk of pneumonia, kidney failure, and death.

Time-out protocol

106. There is a clinical record on file of a MidCentral DHB "surgical safety checklist" being completed, and a peri-operative "time out" protocol being undertaken at the time of the surgery. It is also recorded on the intra-operative nursing record: "Time out and surgical safety checklist completed and agreed by team."[27] There is no record of Mr A's preoperative co-morbidities being considered during the checklist completion or the surgical time-out protocol.

107. In response to the provisional opinion, Dr D said that a verbal conversation took place during the surgical checklist process, but acknowledged that the conversation was not documented fully in the contemporaneous medical record.

Anaesthesia

108. The procedural anaesthetist present at the time of the knee replacement surgery, Dr H, was not the same anaesthetist who saw Mr A at the earlier pre-admission clinic (ie, Dr E) on 6 Month3.

109. Dr H told HDC that when assessing a patient preoperatively she reviews medical assessments done by the specialist anaesthetist, surgeon, and house officer, as well as the patient pre-anaesthetic questionnaire, medications, allergies, lab results, and any other investigations. She takes a limited history from the patient and assesses whether anything has altered since the pre-assessment clinic. A limited physical examination is also performed. If there is anything of concern, she will carry out a more detailed review of the old medical notes on paper or electronically if these are available.

110. Dr H told HDC that the past medical assessments by the anaesthetist and house officer had identified few medical concerns. The only medication Mr A was on at the time was Inhibace, and "there was no mention of any history of peptic ulcers or GI bleeding in the anaesthetist or house officer assessments".

111. Dr H said that she always asks patients about gastrointestinal symptoms. She did not document anything additional to the earlier assessment in relation to the GI system, so she assumes that she was not aware of the history of peptic ulcers or gastrointestinal bleeding. Dr H did not consider there to be any concern about Mr A's cognition or reliability of information obtained.

112. The operative anaesthetic record confirmed preoperative anaemia. Haemoglobin (Hb) was 112g/L (normal range 125–170). Dr H documented that Dr D was aware of the anaemia. Dr D told HDC that this result was not a contraindication to proceed.

[27] Time out is a pre-procedure protocol to help ensure that all members of a procedural team are in agreement as to what is to occur — a final safety stop before a procedure begins. The time-out procedure at MidCentral DHB involves the surgical and anaesthetic teams, and is carried out in the operating theatre after the patient has been anaesthetised, prepped and draped, and before knife-to-skin contact begins. The paper checklist is an adjunct to the verbal conversation held at the time.

113. The anaesthesia was routine and uncomplicated. Intra-operatively, Mr A received a spinal block and supplemental sedation. A femoral block was done to reduce postoperative pain.

114. The left knee joint replacement surgery itself was uneventful.[28]

Subsequent medications

115. Mr A was given antibiotic prophylaxis (cefuroxime) peri-operatively. For prophylaxis against DVT, Mr A was placed on low molecular weight heparin (an anticoagulant) and aspirin. Dr D gave written instructions for anti-thromboembolism stockings.

116. One unit of red blood cells was administered in the post-anaesthesia care unit (PACU). Mr A had no adverse issues in PACU, and was discharged to the surgical team.

117. For postoperative pain relief, the surgical team charted Mr A paracetamol 1gram four times a day.

118. Dr H told HDC that postoperative analgesia is best managed with multi-modal agents. For the acute postoperative period Dr H ordered slow-release tramadol 100mg twice a day, tramadol 50–100mg as required (with a maximum total of 400mg/day), and ibuprofen 400mg orally four times a day. The therapeutic range for ibuprofen (a NSAID) is 1200–2400mg/day. (Mr A also received morphine and the nerve block.)

119. Dr H stated:

> "[T]otal knee replacements are extremely painful … Most acute pain services worldwide recommend multi-modal analgesic therapy, including anti-inflammatory medication, in the management of acute post-operative pain, particularly total knee replacements. Non-steroidal anti-inflammatory medications do have a known risk of gastrointestinal irritation and bleeding. A remote history of GI bleeding (3 years prior) in the absence of recent symptoms is not an absolute contraindication to the use of [NSAIDs] for treating acute post-op pain … My management decision about whether to use an anti-inflammatory medication would have depended on the details of the GI bleed … I can only presume that I was not aware of any history of significant gastric ulcers or gastrointestinal bleeding as I did not make any notation of such, which was also consistent with the two previous preoperative assessments."

120. Dr D was of the view that these dosage regimens were appropriate. He stated:

> "This prescription was weighed up against the risk of postoperative bleeding into the knee joint. Postoperative analgesia with a non-steroidal anti-inflammatory drug is standard practice. Ibuprofen was chosen for its low incidence of gastrointestinal side effects. It was [three and a half] years since the gastrointestinal bleed and the previous ulcer had been treated and was asymptomatic at the time of the surgery."

[28] Dr D was assisted by an orthopaedic registrar.

121. Dr D said that there were multiple contributing factors to Mr A's perforated ulcer, all of which are a calculated risk when undergoing a surgical procedure. Dr D believed that the medications used in this case were the best peri-operative options used for a patient with Mr A's risk profile.

122. Dr D stated:

> "The use of non-steroidal anti-inflammatory drugs in the presence of a past history of gastrointestinal ulcer is not contraindicated per se but a relatively lower dose and a shorter period of administration was considered here. Professional judgement in this case was used and the medications prescribed."

Postoperative period

123. Dr D told HDC that initially there were no particular concerns about Mr A's recovery. Nursing entries for the afternoon shift on 18 Month4 and the evening shift for 19 Month4 record that on occasion Mr A declined pain relief medication, stating that he had no pain.

124. The medication records show that Mr A received ibuprofen three times on 19 Month4 (and one dose was declined), three times on 20 Month4 (and one declined), twice on 21 Month4 (and one declined) and twice on 22 Month4.

125. On 19 Month4 Dr D reviewed Mr A during a 3.30pm ward round. Mr A was progressing well, and had good urine output and minimal pain. Dr D said that he expected Mr A to be discharged home on day four or five postoperatively.

126. On 20 Month4 Dr D went on leave overseas. He told HDC that Mr A was handed over verbally on the ward round to the care of Dr D's house officer and registrar, with support from on-call orthopaedic staff at the public hospital. Dr D said that his consultant colleagues were aware of his leave. The standing arrangement of cover for leave is that there is an orthopaedic registrar and an orthopaedic consultant available on call 24 hours a day.

127. The handover is not documented. No other orthopaedic consultant is specified in the notes as being the responsible clinician once Dr D went on leave.

128. In response to the provisional report, Dr D said that he did not consider that his handover was suboptimal. Dr D stated that, at that time, Mr A was not a patient about whom he felt sufficiently concerned to contact the orthopaedic consultant on call to hand over more formally, including handover in the clinical record.

129. At that time, the Orthopaedic Department did not have a policy governing handover of patient care by consultants, including when going on leave.

130. Dr D said that while he was overseas he was available by telephone, and during that time he was not contacted in relation to Mr A.

131. On the evening of 20 Month4 a nursing entry records Mr A having a marginally low blood pressure reading of 101/57mmHg.

132. On the evening of 21 Month4 Mr A was noted by nursing staff to be "vague", and it was recorded that his cognition was to be monitored.

DHB Early Warning Score Policy

133. The use of early warning scores is governed by a MidCentral DHB policy entitled "Patient Observation and Early Warning Score (EWS) (Adults)". Its purpose is to "improve patient outcomes by identifying patients who are clinically deteriorating and at risk of developing critical illness and to ensure that early changes in patient observations are communicated to the appropriate personnel as per escalation protocol thereby reducing the delay in interventions".

134. Patient observations monitored for EWS use are respiratory rate, level of consciousness, pulse, systolic blood pressure, four-hour urine output, and temperature. A number from 0 to 3 is ascribed to each observation taken, and is then totalled.

135. The Early Warning Score Escalation Protocol outlines that a score of 1 should result in a review of the care plan, and that the frequency of observations should become two hourly. A score of 2 should result in assessment of the patient with a shift leader, assessment of the care plan, review of the urine output, and one-hourly observations. A score of 3 to 5 means that the shift leader should be liaised with, a house officer should be paged to attend within 20 minutes, and observations should be at least hourly. If the house officer is unable to attend within 20 minutes, the registrar is to review the patient with ward staff. A score of 6 or more should result in liaison with a shift leader, and a registrar being paged to attend within 10 minutes. If the registrar is unable to do so, the consultant should be contacted. A patient who scores 3 in any single parameter must be referred to, and reviewed by, the clinical team.

22 Month4

136. On the morning nursing shift of 22 Month4, Mr A's behaviour was noted to "seem spaced out", be "un-cooperative", and to have "blank moments". The EWS score for confusion is recorded as zero, which is not consistent with the EWS guideline that new confusion (as in this case) in itself warrants an EWS of 2.

137. The fluid balance chart for 22 Month4 records that urine had not been passed. However, the urine output EWS is recorded as zero (which is not consistent with the EWS guideline that a score of 3 should occur for no urine output).

138. At 4.30pm on 22 Month4, Mr A's EWS was recorded as being 3 in relation to an irregular, rapid pulse (at 107bpm), and again at 5.20pm when his pulse was 111bpm. As a result, the on-call house officer covering the orthopaedic ward, Dr I, was paged.

139. Dr I reviewed Mr A at 5.40pm. Mr A was tachycardic (abnormally rapid heart rate) and he had abdominal pain. Dr I recorded that Mr A was a vague historian, and that he had "a history of peptic ulcer in past not on omeprazole". Mr A was afebrile, his blood pressure was 106/61mmHg, and his oxygen saturation was 98%.

140. Dr I told HDC that his impression was possible gastritis. He prescribed analgesia, and a "stat" dose of Gaviscon and omeprazole, and asked the nursing staff to call him again if Mr A worsened.

141. At 8pm, taking into account the absence of urine output, the EWS was recorded as 4. However, the EWS for urine output was calculated as 2, which is not consistent with the EWS guideline of 3 for no urine output.

142. At 8.30pm Dr I reviewed Mr A again. Mr A was clammy but had no fever. He had a heart rate of 100bpm and blood pressure of 95/52mmHg. Dr I queried a peptic ulcer and stopped the ibuprofen. A full blood count was done, along with renal function tests. An IV line was inserted for fluid resuscitation, and another review planned.

143. At 9pm the EWS score was 4. At 9.10pm test results showed a haemoglobin of 110g/L (normal range 125–170), an elevated creatinine of 229µmol/L (normal range 74–107), and a potassium level of 5.7mmol/L (normal range 3.6–5.2). CRP was elevated at 323 (normal result is < 5mg/L).[29] Dr I reviewed Mr A and made a diagnosis of renal impairment, with a plan to continue IV fluids, withhold nephrotoxins, repeat the creatinine test in the morning, and obtain a urine sample. There is no documentation recording any assessment of urine output.

144. The EWS at 10.30pm was 4. Further EWS scores were documented at 1am (score 6), 2am (score 3), and 3am (score 4). A registrar was not called at 1am when the EWS was 6.

23 Month4

145. At 3am on 23 Month4, Mr A was reviewed by surgical house officer Dr J, in response to the above EWS.

146. Dr J was aware of earlier reviews and recorded hypertension and the history of peptic ulcer disease. Mr A was noted to be feeling "not too bad", but he was clammy (with a temperature of 36.3°C). His blood pressure was 96/58mmHg and his pulse was 113bpm. Mr A had epigastric tenderness and a low urine output.

147. Dr J documented: "[U]nwell patient ? cause, need to rule out bleed plus in acute renal failure." She told HDC that her plan was to do venous blood gas, continue IV fluids, and repeat a bladder scan and an ECG. Repeat blood tests were also requested.

Telephone advice — registrar

148. Dr J telephoned the on-call medical registrar (Dr K).[30] He advised her to repeat the blood tests and perform a chest X-ray, and to insert an indwelling catheter (IDC). The IDC was inserted at 4.20am.

149. Further Early Warning Scores were calculated at 5am (score 5) and 6am (score 6). At 6.05am Dr J reviewed Mr A's chest X-ray and considered that it possibly showed

[29] The C-reactive protein (CRP) test is used to detect inflammation.
[30] Dr K has been employed since 2011. He was on call from 11pm on 23 Month4 until 8am on 24 Month4.

pneumonia. She called Dr K and he "advised to stop fluids and give frusemide if [blood pressure] ok". Mr A's blood pressure was 90/50mmHg, so frusemide was not given.

150. In response to the provisional report, Dr K said that given the limited information he had to hand, he is of the view that his initial telephone advice was appropriate.

151. Further blood test results were reviewed. The BNP (brain natriuretic peptide, a blood test to assess for heart failure/fluid overload) level was documented as mildly raised at 346pmol/L.[31] This was discussed with Dr K, and "BNP ok, to restart IV fluids" documented.

152. Dr K told HDC:

> "I considered that [Mr A] required further fluid resuscitation and then reassessment prior to further escalation of care. His condition had deteriorated but I considered that further ward based input prior to escalating his care was appropriate."

Registrar review — Dr K

153. At 6.25am Mr A was reviewed by Dr K, who was the first doctor in a role above house officer to review Mr A.

154. In response to the provisional report, Dr K said that in relation to investigating the possibility of a GI bleed, clinically none of the doctors had found any convincing evidence of peritonism.

155. Dr K documented a brief entry of "ARF [acute renal failure] secondary to NSAID" and "sepsis likely secondary to LRTI [lower respiratory tract infection]". The entry does not document his designation and is not signed. The patient history is recorded as "as per [Dr J]". No examination findings are recorded. Mr A's vital signs including urine output are not recorded, and there is no interpretation of Mr A's investigations to that point.

156. Dr K told HDC:

> "I concluded that [Mr A] had sepsis secondary to pneumonia and acute kidney injury … My impression was that he needed further volume repletion and broad spectrum antibiotics. I recommended additional intravenous fluids, in addition to antibiotics, to assess his response to volume loading. I requested repeating arterial blood gases a little later in the morning when the day team would resume his care at 0800 hrs …"

157. Dr K stated that he was of "the understanding that the morning team would review Mr A with the additional information [repeat blood tests] to assist in further decisions".

[31] BNP is useful in ruling out heart failure in a patient with an atypical presentation or a patient with respiratory co-morbidities.

158. A reference to "bacteraemia"[32] has been crossed out in the clinical record (this is not initialled by Dr K). Dr K told HDC that he crossed it out because it was the wrong medical terminology, as "bacteraemia would imply a positive blood culture which this gentleman didn't have".

159. The plan documented "IV fluids 2 hourly", but no volume or specific fluid was recommended. Hourly urine outputs were requested and IV ceftriaxone (an antibiotic) advised.

160. The fluid balance chart indicates that the IV fluids continued unaltered (and did not increase until later, at 8am).

161. A further plan documented to "repeat bloods mane [in the morning] including lactate". An entry "will ask renal team or medical team" has been crossed out but not initialled by Dr K. He told HDC that it was crossed out because when he reviewed Mr A, he had an acute renal impairment that did not require acute dialysis. Dr K said that he was expecting the renal impairment to improve with the management plan he had formulated overnight and, therefore, the referral to the renal team was not required.

162. Dr K did not seek advice from, or escalate the matter to, a more senior clinician.

163. In response to the provisional report, Dr K accepted that his documentation could have been better and he should have sought advice from a senior colleague, but said that there were workload demands on him as a sole medical registrar on call overnight. He said that in this situation he was dependent on information presented to him by junior colleagues.

164. No follow-up plans, further investigation, recommendations, or guidance to the orthopaedic team were documented. The referring doctor's concerns of the "need to rule out bleed" were not specifically addressed by Dr K.

165. At 7am the nursing notes record an EWS of 4–6, a respiratory rate of 20bpm, and a heart rate 115bpm, and that Mr A was cold and clammy. At 7.45am a house officer was paged.

Morning team

166. A medical house officer noted (time unclear) a creatinine result of 271µmol/L (up from 229 and from 73 on admission).[33] The renal team was contacted, and it requested a review by a medical registrar. At 8.15am Mr A's urea was noted as 217 and his potassium as 5.7mmol/L (normal range 3.6–5.2mmol/L). At 9am the EWS score was 8.

Review

167. At 9.40am, medical registrar Dr L[34] detailed an extensive entry in the clinical records and performed a physical examination. Mr A's documented background included an

[32] The presence of viable bacteria in the circulating blood.
[33] A kidney function test. Normal range is 74–107µmol/L.
[34] At the time of writing, Dr L is not practising in New Zealand.

acknowledgement of his "chronic peptic ulcer disease" and anaemia. At 9.50am the EWS score was recorded as 7.

168. In response to the provisional report, Dr L said that the documentation overnight was unclear, but he felt that minimal interventions had been instigated to allow any clinical improvement by the time of his review.

169. Dr L told HDC:

> "[Mr A] appeared to have several issues at this point, namely a hospital acquired/aspiration pneumonia and an acute kidney injury. I reviewed his past medical history including the details of his recent surgical intervention … He appeared to have several possible drug causes of pre-renal failure including Inhibace and Ibuprofen, both of which had recently been stopped."

170. Mr A's heart rate was 110bpm, his blood pressure was 98/50mmHg, his respiratory rate was 20bpm, and his oxygen saturation was 93% on five litres of oxygen. He was cool and clammy, and had epigastric tenderness. His CRP was 370mg/L (normal result is <5mg/L), and a chest X-ray showed left mid-lung opacification. His haemoglobin was 100g/L (normal range is 125–170), and his arterial blood gases (ABGs) showed a pH of 7.21 (normal range is 7.35–7.45), pCO_2 of 36.3mmHg (normal range is 38–42), and bicarbonate of 13.9mEq/L (normal range 22–28), with a base excess of –12.8.

171. Dr L told HDC that Mr A was fully alert and orientated with no focal neurology. An abdominal examination indicated mild epigastric tenderness, but Mr A denied having any abdominal pain at that stage.

172. Dr L told HDC that his conclusion was that Mr A was acutely unwell with chest sepsis and renal injury of multiple aetiology. A problem list was recorded in the notes, including: severe left pneumonia, acute kidney injury (with a differential diagnosis of acute interstitial nephritis secondary to NSAIDs), and possible concomitant fluid overload.

173. A plan was made to continue IV fluids. The need for a further large bore IV cannula was recorded, with a request for "preferably central venous access". Oral ranitidine twice daily was prescribed,[35] and a broad-spectrum antibiotic (Tazocin) recommended to treat the pneumonia.

174. A number of additional investigations were advised, including a urine sample, blood cultures, a sputum culture, further blood tests, and an abdominal X-ray. Dr L said that he anticipated that Mr A might need higher care intervention, but felt that he did not require it at that precise moment, and a plan was made to re-review Mr A.

175. In response to the provisional report, Dr L said that his review suggested a patient who was unwell but not requiring any form of higher care input at that stage. He said

[35] Commonly used in the treatment of peptic ulcer disease and gastro-oesophageal reflux.

that he was aware that Mr A had potential to deteriorate, and that is why he made the comment regarding anticipating a higher level of care if there was no clinical improvement.

176. Dr L said that his review highlighted an acutely unwell patient who had received suboptimal intervention in the preceding hours/days. There was nothing to suggest an acute intra-abdominal event at that stage in his opinion. He felt that given the observations and clinical examination, it was reasonable to instigate the measures taken first and observe closely for clinical improvement. If there had been no clinical improvement despite this, or any deterioration, he would have discussed it further with senior colleagues. At that stage he did not believe that Mr A required consultant input.

177. At 11am and 11.55am, EWS scores were recorded as 8. The further review is documented as having been done by Dr L at 12pm.[36] Dr L recorded that there had been a sudden rapid deterioration, with Mr A "exhausted" and requiring higher volumes of oxygen.

178. Dr L documented the possibility of an intra-abdominal event and queried perforated peptic ulcer disease. He recommended immediate IV fluids, although specific orders regarding the type of fluid, quantities or rates were not documented. Mr A's blood glucose was low, and he was given IV dextrose and intramuscular glucagon.

179. Early Warning Scores are recorded at 5am (score 5), 6am (score 6), 9am (score 8), 9.50am (score 7), 11am (score 8), and 11.55am (score 8), but the clinical record documents the paging of a house officer only at 7.45am.

180. In total, 14 Early Warning Scores were documented on the observation chart over the period 1630hrs on 22 Month4 to 1155hrs on 23 Month4.

ICU

181. Mr A's case was escalated by Dr L.[37] A transfer to ICU was verbally agreed over the telephone by consultant physician Dr M. This is the first documented senior medical contact being sought prior to ICU input. Dr M did not review Mr A.

182. Dr M told HDC that Internal Medicine provided a liaison consultation service to other departments in the hospital. Dr M said that in Mr A's case:

> "[T]he registrar associated with my team [Dr L] assessed him in the morning, initiated treatment and organised some other tests, with a plan to return to further review the patient. When he returned to assess the patient, it was apparent that he required ICU care."

183. Dr L paged the ICU registrar three times without response. At 12pm an ICU consultant anaesthetist, Dr N, was contacted and agreed to attend as soon as possible.

[36] This was documented in retrospect. The entry is signed but Dr L's name has not been printed, and his identification and designation do not appear at the start of the entry.
[37] This is recorded in a retrospective entry at 9.30pm.

184. The orthopaedic team was also paged about the impending transfer to ICU. This is the first documented contact with the orthopaedic team since Dr D's contact on 20 Month4, three days previously.

185. A repeat portable chest X-ray (reported by radiology at 12.36pm) identified left-sided opacification[38] and queried free air under the diaphragm. At 12.40pm a Glasgow Coma Scale score was recorded as 11.[39]

186. Mr A was transferred to ICU at approximately 1pm, and his care was taken over by ICU. (A retrospective entry outlining this was documented in the clinical records at 2.20pm by Dr N.) Dr N said that Mr A was transferred to ICU in an attempt to stabilise his condition and then consider further treatment options. Mr A's progress was documented together with the differential diagnoses and plans to intubate and stabilise him and consider performing a CT scan.

187. The ICU discharge summary states that Mr A arrived in ICU after "acute deterioration over the last 24 hours with anuria, lactic acidosis, hypotension, tachycardia, and increased oxygen requirements". He was unwell with a weak pulse.

188. Mr A had a cardiac arrest and CPR was performed. He was intubated and invasive monitoring commenced with an arterial line placement, central venous line placement and an adrenaline infusion.

189. A discussion between Dr N and an intensivist was documented, and a decision was made to discontinue resuscitation, owing to multi-organ failure.

190. Sadly, Mr A died. An autopsy report stated that the cause of death was a perforated gastric ulcer associated with peritonitis.

Further information

191. Dr D has acknowledged that there were several opportunities to document Mr A's past medical history in the contemporaneous medical notes.

192. Dr D said that a national and universal electronic patient record with an appropriate alert system would have been of assistance had it been available at the time. He said that paper-based medical records are not easy to peruse for the relevant information on each occasion on which a patient is seen, especially when that patient's medical notes run to several volumes. Dr D concluded that although having to transcribe relevant information into the current record at every encounter is time-consuming and inefficient, failing to do so places the patient at increased risk of an adverse event.

[38] Pulmonary opacification represents the result of a decrease in the ratio of gas to soft tissue in the lung.

[39] The Glasgow Coma Scale (GCS) consists of a rating between 3 and 15, 3 being the worst, and 15 the best. The score is composed of three parameters: Best Eye Response (1–4), Best Verbal Response (1–5), and Best Motor Response (1–6). A GCS of 13 or higher correlates with a mild brain injury; 9 to 12 is a moderate injury; 8 or less is a severe brain injury.

Subsequent events

193. MidCentral DHB undertook a review of Mr A's care. The Chief Medical Officer (CMO) commissioned a report from Dr O (an emergency physician) dated 15 November 2013. The CMO also initiated a review of the administrative aspects of the case, and reviewed Mr A's file himself.

194. Dr O was critical of Mr A's care. He made the following key points:

- The patient questionnaire about bleeding disorders is quite unclear, with its parenthetical phrase immediately underneath stating "are you on warfarin". In Dr O's view, it is easy to see how a patient not on warfarin but with a history of bleeding problems might tick "no" to that question.
- Mr A's past clinical records were readily available to staff electronically and on paper.
- The handover of Mr A on 20 Month4 was not documented and, therefore, there was a lack of clarity about a specified consultant to whom care and oversight had been passed. Subsequently there was no documented orthopaedic input obtained by the medical team into Mr A's care between 20 Month4 and 23 Month4.
- There was some indication as early as 20 Month4 as to Mr A's clinical decline.
- There was some indication to transfer Mr A to a higher level of care at least six hours before the 9.40am review on 23 Month4.

195. Dr O made the following suggestions:

- Alter the preoperative screening forms to include separate questions regarding bleeding disorders and the use of warfarin.
- Consider the establishment of a "rapid response team" — a group of nurses and a doctor or doctors able to be activated at any time in response to a clinically declining patient on the ward.
- Consider alternative models of care for orthopaedic patients when outside of theatre (such as orthopaedic teams employing their own Medical Officer Special Scale (MOSS)).
- Perform screening time out before a patient arrives in theatre (including checking that the patient's paper and electronic records have been reviewed for relevant history) — this is best performed by an admitting medical team.

196. The CMO noted the following key areas of concern:

- Mr A's history of major gastro-intestinal bleeding was not clearly evident on the preoperative screening form. The wording and nature of several of the questions on the form may have been subject to misinterpretation.
- Recognition of Mr A's history did not occur at several points in his care.
- Mr A's clinical deterioration may not have been acted on in a timely manner.
- The level of general medical support for orthopaedic patients and the referral mechanisms between the services may not have been optimal.
- Processes in place in the Orthopaedic Service for transfer of care may not have been optimal.

197. Subsequently, The CMO developed a set of four key recommendations:

1. Critically appraise and modify the preoperative screening form as necessary, to ensure that previous GI bleeding is signalled and recognised.
2. Explore the establishment of a "rapid response" team that can be activated to attend to a deteriorating patient, using a (to be determined) threshold of the EWS for activation.
3. Consider the adequacy of the process in place in the Orthopaedic Service for transfer of inpatient care when consultants are on leave, and explore the level of general medical support required for orthopaedic patients and whether referral mechanisms to General Medicine are adequate.
4. Ensure that there is opportunity for treating clinicians to recheck all patient hard copy records, electronic records, and medications immediately prior to surgery.

198. Following these events:

- MidCentral DHB instituted an additional sign-in procedure in the anaesthetic room, with the surgical team and the patient participating in verbal discussion of the surgical procedure and any events including risks particular to the patient.
- The Orthopaedic Department instituted a policy of documenting the handover of patients about whom there are concerns outside of normal working hours, or when consultants are on leave.
- The preoperative form was modified appropriately, and other electronic tools used by clinicians have been appraised and modified as necessary.
- The evidence was not supportive of establishing a rapid response team at MidCentral DHB. Other mechanisms for ensuring medical response to EWS triggers have been pursued.
- Transfer of care within the Orthopaedic Service was considered, and changes made to increase its robustness. Senior clinicians have explored extra medical, and specifically elder health, support for orthopaedic patients. Referral mechanisms to General Medicine are functioning well.
- Opportunities were put in place for treating clinicians to recheck all patient hard copy records, electronic records, and medications immediately prior to surgery.

Responses to provisional opinion

Ms B

199. Ms B's response to the "information gathered" section of the provisional report has been incorporated where appropriate.

MidCentral DHB

200. MidCentral District Health Board had no further comments to make regarding the report.

Dr G

201. Dr G responded that, in the circumstances, he did not consider that his failure to record past history was a departure from standards, given his description of the way he understood the service to operate.

Dr E

202. Dr E told HDC that he considers that an adverse comment is harsh, in light of the circumstances of this case. Dr E stated that he is familiar with ANZCA's recommendations for the pre-anaesthesia consultation regarding appropriate medical assessment of the patient and the patient's medical history, and constantly strives to meet these recommendations. However, he considers that HDC's implied expectations are not practical or reflective of the realities of everyday practice.

203. Dr E said that in the short space of an interview with a patient, often it is very difficult to know whether one has all the information that can be gained, despite having procedures in place to elicit such information. He reiterated that he did not elicit anything in his discussion with Mr A, or from review of his medical records, that identified previous surgical postoperative gastric complications and DVT.

204. Dr E acknowledged that this was a truly tragic outcome, and it is most unfortunate that the hospital's comprehensive preoperative system failed to identify the previous postoperative events in 2008. He said that this case has been a salutary lesson, which resulted in modification to his strategy when interviewing patients, particularly if unaccompanied, and he continues to be more vigilant when scrutinising a patient's medical history. He is confident that these changes, coupled with changes to hospital systems, will prevent such an event from happening again.

Dr F

205. Dr F said that this case was a failure of care not only on an individual basis but also as a systemic one. Dr F said that he should have checked the patient's notes for his past medical history, and that this was not carried out on multiple occasions, by multiple clinicians. Dr F said that he was sad to have contributed to this failure.

206. With more clinical experience and the improvements made since these events, Dr F said that he now makes a point of using electronic patient records and GP shared care records, when available, to supplement the history taken from the patient.

207. Dr F said he felt that ambiguity of specific roles of individuals in the team contributed to the outcome. He stated that the house surgeon is the last person to see the patient in this preoperative assessment clinic process, and that the mismatch in perceived expectations of each team member is further widened owing to no specific department guideline. Dr F said that he has done some significant soul searching and has learnt a significant amount from this unfortunate circumstance.

Dr D

208. Dr D agreed with HDC's expert advisor that his failure to document Mr A's past medical history in the contemporaneous notes was a minor departure from the normal standard of care. Dr D acknowledged that there were lost opportunities for him to ensure that the past medical history was entered into the contemporaneous record, and he regrets this. He noted that all Mr A's previous records and history were available to other staff.

209. Dr D acknowledged that as the responsible clinician he had overall responsibility for the quality of the medical record, but queried to what extent he was liable for the actions of other staff. He felt that transcribing the past medical history would require meticulous review of three volumes of old notes, consideration and judgement as to what was thought to be relevant, and transcription of this into the current notes. Dr D said that there was no effective system in place to provide alerts for past medical events.

210. Dr D does not consider that his handover of Mr A was suboptimal. Dr D reiterated that he handed over verbally to other staff who were aware of the arrangements for cover after hours and for leave. Dr D said that such a standing arrangement is, as far as he is aware, in place for all DHBs in New Zealand, and he considers that this and a roster of available cover published throughout the hospital, fulfils Medical Council of New Zealand guidelines relating to going off duty. Dr D said that, at that time, Mr A was not a patient about whom he felt sufficiently concerned to contact the orthopaedic consultant on call to hand over more formally, including in the clinical record.

211. Whilst Dr D does not accept that the handover was suboptimal, he has reflected on his personal handover process and made some changes to his practice. When he takes leave, he now discusses all his remaining inpatients with one of his consultant orthopaedic colleagues and documents this conversation. For patients of concern, he discusses this with the patient and documents the handover in the records. He also documents in the operation notes who is responsible for the patient after hours and when he is on leave.

Dr K

212. Dr K accepts that his documentation was poor and that his 6.25am review was brief, and that he could have taken more time and noted the situation in detail. Dr K, having reflected on the care he provided, agrees that he should have sought advice from the medical consultant on call when Mr A's condition warranted that he do so. Dr K acknowledged that this was a tragic outcome, and he has spent considerable time reviewing his involvement in Mr A's care. Dr K now ensures that he is more vigilant and takes time to note his advice and plan in detail in the clinical notes, and considers whether more assistance is required.

Dr L

213. Dr L said that his review of Mr A was comprehensive, including thorough review of potential causes for his clinical deterioration. Dr L stated that he was not made aware of Mr A's deterioration until he became unwell enough to require ICU care. Dr L said that he appropriately escalated promptly to ICU and discussed Mr A with the consultant on call.

Opinion

Preliminary comment

214. I have carefully considered both the standard of care provided to Mr A by a number of individual DHB staff whom he saw along his clinical pathway, as well as the hospital system in which his care took place.

215. It is not my role to make findings as to cause of death. Accordingly, the findings in this report should not be interpreted as having any implication as to the cause of Mr A's death.

216. At the outset, it is clear that Mr A's electronic surgical ward discharge summary, dated January 2009, makes reference to chronic gastric ulcers and an acute bleeding duodenal ulcer being identified by gastroscopy in 2008.

217. Mr A had lengthy rehabilitation until he was discharged home in February 2009. The rehabilitation ward discharge summary "problem list" includes mention of chronic gastric ulcers, and an acute duodenal ulcer. The notes in the body of the discharge summary also detail Mr A's chronic gastric ulcers and an acute duodenal ulcer.

218. The relevant gastrointestinal clinical history was therefore within the DHB system and available to the clinicians who reviewed Mr A from Month1 onwards.

219. Mr A's care demanded careful consideration of his clinical history (particularly his major GI bleed) and effective communication of that history between staff, to ensure that clinical decision-making was clear and informed. This failed to occur in Mr A's case.

220. This case is a salutary reminder of the importance of due consideration of a consumer's clinical record and past clinical history, and clear and accurate communication and documentation.

221. I am concerned that a number of individual staff failed to review the clinical record, set in the context of a primarily paper-based records system that did not easily facilitate review of, or alerts in relation to, patient history — an issue characterising Mr A's case — for which MidCentral DHB must bear responsibility.

222. I am mindful of a comment made by my expert advisor, orthopaedic surgeon Dr Denis Atkinson:

> "On multiple occasions during [Mr A's] pre-assessment and hospital admission for elective knee surgery, there was a failure to document his significant past history of a bleeding peptic ulcer. Failure to access hospital records and document his past history in the contemporaneous record is a departure from the normal standard of care. This departure is both an individual and a systemic level within the Hospital environment."

223. I note that it was not until 5.40pm on 22 Month4, when Mr A was reviewed postoperatively by house officer Dr I, that it was appropriately documented in the

contemporaneous record for the surgical admission that Mr A had "a history of peptic ulcer in [the] past …".

Postoperative care

224. I note expert general physician Dr Richard Shepherd's comment:

> "This is a complex and multifactorial case with a large number of individuals involved. [Mr A's] deterioration was associated with a less than typical presentation of gastric ulcer perforation and peritonitis leading to sepsis and multi-organ failure. I believe making the correct diagnosis at an early enough stage to have altered the outcome would have been challenging for any clinician involved."

225. However, healthcare teams must consistently communicate well with one another, and ensure that there is accurate documentation. These functions form two of the layers of protection that aid the delivery of seamless care. When any one or more of those layers do not operate optimally, there is potential for the patient to be harmed.

226. There were deficiencies in Mr A's postoperative care that highlight the importance of:

- Clarity of oversight of patients, and communication between specialties;
- The appropriate application of early warning sign systems; and
- Seeking timely advice from senior clinicians when a postoperative patient deteriorates.

227. These issues are examined in more detail below.

Opinion: Dr G — adverse comment

228. On 9 Month1 Mr A was assessed at the MidCentral DHB orthopaedic outpatient clinic by Dr G, an orthopaedic registrar to consultant Dr D.

229. Dr G told HDC that the initial assessment at the outpatient clinic is to establish whether there is an orthopaedic problem requiring surgery.

230. MidCentral DHB told HDC that in relation to patients in the orthopaedic outpatient clinic, patients assessed as requiring a joint replacement are automatically streamed as requiring anaesthetic assessment, and are booked for pre-assessment. The patient is then required to complete a pre-admission health questionnaire at the outpatient clinic, and this questionnaire is then provided to the pre-assessment clinic nurses.

231. I note that there was no specific DHB policy or procedure document governing expectations surrounding the review of patient history and clinical notes in the outpatient context.

232. Dr G said that if a patient is offered a surgical procedure, then he/she later attends a separate pre-admission clinic appointment performed by an orthopaedic house surgeon and an anaesthetist. Dr G considered it to be the latter pre-admission appointment that would specifically evaluate the patient's overall medical health prior to a procedure. Dr G said that the purpose of the subsequent pre-admission assessment clinic is to obtain the medical history in more detail and peruse past medical files for relevant history.

233. Dr G stated that generally his consultations include taking a detailed and comprehensive orthopaedic history, performing an orthopaedic-specific physical examination, evaluating X-rays (where applicable), and discussing the procedure. He stated that as a matter of course he would have asked about other medical and surgical history.

234. Dr G said that he was able to elicit from Mr A some detail on pain, walking aids, and general mobility, and Mr A's history of a previous hip replacement, so it did not appear to him that Mr A was a particularly bad historian. Dr G told HDC that the history of Mr A's previous peptic ulcer disease was not forthcoming from him.

235. I acknowledge that Dr G considered that the purpose of the initial assessment at the outpatient clinic was to focus on establishing whether surgery was indicated, and that he distinguished this from the focus of the pre-admission clinic. As a result, Dr G did not review Mr A's past clinical records. In his response to the provisional report, Dr G reiterated this point.

236. However, I am concerned that Dr G's understanding of his role at an outpatient appointment differs from that of his consultant, Dr D, who told HDC that his expectation of his registrars would be that they would peruse the medical records, take a thorough history and examination, and dictate the findings, consent, and discussion for the medical record as a matter of good medical practice.

237. I acknowledge that there was no DHB policy or guideline clarifying expectations about the review of patient clinical records at the outpatient clinic assessment.

238. Mr A completed the MidCentral DHB "preassessment patient questionnaire" form. Mr A ticked "no" boxes to indicate that he had no bleeding disorder, hernia, heartburn, indigestion, acid reflux, or kidney disease.

239. In the skin condition section of the form, the questionnaire asks: "Do you have any sores/boils/ulcers?" Mr A crossed out "sores and boils" and ticked the "yes" box.

240. No peptic ulcer symptoms were recorded by Mr A anywhere on his pre-assessment questionnaire. The questionnaire does not specifically ask what medical conditions the patient has experienced in the past.

241. Dr G then offered Mr A a total knee replacement and completed a "Booking system for surgery" form. Dr D told HDC that the questionnaires are filed with the booking form for surgery, to be assessed later at the pre-admission clinic.

242. Dr Atkinson advised:

> "I would consider the care provided to Mr A and the Out Patient appointment of 9 [Month1] to meet adequate standard … I would expect the significant history of gastric bleeding in 2008 to be recorded in his contemporaneous records. I would consider the failure to enter this significant past history event and contemporaneous record to be a minor departure from the normal standard of care.

243. As I have emphasised in previous cases, it is important for a patient to take some degree of responsibility for his or her treatment and well-being by giving clinicians as full and accurate information as he or she is able. However, as I have commented previously, in my opinion there is an onus on clinicians to review the clinical records, ask the relevant questions, and keep accurate records.[40] I remain critical of Dr G for not reviewing the clinical records and consequently not entering the relevant 2008 clinical history, which included a major GI bleed, into the contemporaneous record.

Opinion: Dr E — adverse comment

244. On 6 Month3 Mr A attended the pre-admission clinic.[41] He was reviewed by consultant anaesthetist Dr E, and relieving house officer Dr F.

245. Dr D told HDC that the primary purpose of the pre-admission clinic is the anaesthetic assessment — preparing a risk assessment from an anaesthetic standpoint. Dr D said that his expectation is that if there is a surgical issue, then this will be raised with him prior to the day of surgery.

246. Dr E also told HDC that the consultant anaesthetist's predominant function at this clinic is to ascertain a patient's fitness and suitability for surgery, then evaluate and discuss the risks involved as they pertain to the provision of an anaesthetic for that surgery.

247. Dr E's notes for 6 Month3 are recorded on the MidCentral DHB "Anaesthetic Record" template form, which has a large number of designated spaces for recording relevant clinical information, including observations, anaesthetic history, medical history and examination, medication, exercise tolerance, allergies, airway check, and a selection of blood test results.

248. Dr E completed all spaces on the form. He stated that Mr A did not report any concerns to him about his previous surgeries.

249. Dr E said that he queried Mr A as part of his routine survey. Based on his discussion with Mr A, Dr E documented that there was no IHD (ischaemic heart disease), no

[40] See Opinion 09HDC01505, 17 October 2011.
[41] Sometimes referred to as the preoperative assessment.

asthma, no reflux, and no bleeding disorders, and that Mr A was taking blood pressure medication. Dr E said that he did not perceive Mr A to be a poor historian.

250. In relation to review of the clinical records, Dr E stated that his review of Mr A's notes was limited to information that had relevance to his anaesthesia (ie, anaesthetic charts), because at a pre-assessment, typically the information looked for is largely governed by the direction and nature of the information collected directly from the patient and through discussion with others involved at the preoperative assessment.

251. At the 6 Month3 assessment, nothing was documented relating to Mr A's past history of duodenal ulcer, DVT, or leg ulceration.

252. Dr E said that, as was the case with Mr A, the clinical records for a patient may reach several volumes, each volume can be up to one inch thick, and it is not uncommon for people to have up to eight volumes of records.

253. Dr E said that he canvassed a number of colleagues, who all acknowledged the need to cherry-pick from the historical records what is relevant to the provision of safe anaesthetic for surgery. Previous anaesthetic records are a priority, and so is information about the cardiorespiratory system. He said that neither he nor his colleagues routinely look specifically for previous postoperative complications, but if advised about these then they may then discuss them with the surgical team.

254. Dr E acknowledged that Mr A's previous surgical postoperative gastric complications and DVT should have been noted at the surgical and/or anaesthetic pre-assessments for the surgery. Dr E said, however, that he did not elicit anything in his discussion or review of the previous records that identified this information, and it was not raised with him by anyone else who met with Mr A in the pre-assessment clinic.

255. I note that the DHB pre-admission clinic guideline does not outline a specific expectation regarding the review of patient history and clinical notes in the pre-admission context for any particular staff, ie, medical (including anaesthetists and house surgeons), nursing, clerical, and technical staff.

256. Expert anaesthetist Dr Andrew Love advised:

> "[Mr A] had had multiple admissions to hospital. Even with the knowledge that the information was there, it was difficult to find reference to the episode in his 2008–2009 admissions, because of the volume of information …"

257. Dr Love also stated:

> "The fact that there was no record in the pre-anaesthetic notes of the previous upper gastrointestinal bleed was not as a result of a failure on the part of [Dr E] or [Dr F], the [house officer], but an understandable event given that the patient was a poor historian, did not mention the episode when questioned about previous anaesthetic complications, did not report any dyspeptic symptoms, and the large volume of old notes."

258. I acknowledge my expert's advice, and that a key purpose of the pre-admission clinic is an assessment prior to surgery, which the anaesthetist undertakes from an anaesthetic (as opposed to a surgical) viewpoint. I also note that the earlier surgical outpatient review of 9 Month1, and Mr A himself, had not communicated to Dr E the relevant GI clinical history.

259. However, the Australian and New Zealand College of Anaesthetists (ANZCA) recommendations for the pre-anaesthesia consultation include performing an "appropriate medical assessment of the patient including medical history (which may be assisted by a questionnaire and/or review of available patient notes) …". In response to the provisional report, Dr E stated that he is familiar with ANZCA's recommendations regarding appropriate medical assessment of the patient and the patient's medical history, and constantly strives to meet these recommendations, but feels that criticism in this light should consider the practical realities of everyday practice.

260. Dr E did not administer anaesthesia, or postoperative pain relief, on the day of the surgery, and therefore it was, in my view, important to glean accurate information at the pre-admission clinic for continuity of anaesthetic and surgical care. I remain critical of Dr E for not reviewing the clinical records adequately, and not entering the relevant 2008 gastrointestinal clinical history into the contemporaneous anaesthetic record.

Opinion: Dr F — adverse comment

261. On 6 Month3, relieving house officer Dr F saw Mr A in the anaesthetic pre-assessment clinic after Dr E had seen him. Dr F said that his involvement was to do the "paper-work".

262. Dr D said that his expectation of a house officer in this context is that he or she will peruse the medical records, document a brief history of the patient's condition, and ask about past medical and social history, medications, and social circumstances.

263. I note that the MidCentral DHB's guideline "Preadmission Clinic" includes (in relation to booking clerks) the following: "[E]nsure all clinical records have arrived in readiness for the clinic" and "[P]repare clinical records for daily clinics …"

264. As mentioned earlier, I note that the DHB guideline does not outline a specific expectation regarding review of patient history and clinical notes in this context.

265. Dr F stated that he asked Mr A about his past medical history, and Mr A responded that he had hypertension and denied any other medical issues. Dr F documented that Mr A was generally fit and well.

266. Dr F told HDC that Mr A's pre-assessment patient questionnaire answers reassured him that Mr A was generally a well person with no significant medical issues. Dr F elicited that Mr A was on Inhibace medication.

267. Dr F then performed a systemic examination and found no issues. Mr A was considered fit for knee joint replacement surgery.

268. Dr F did not review Mr A's previous clinical records. There was no documentation at this assessment relating to any past history of duodenal ulcer, DVT, or leg ulceration.

269. Dr F said that the clinics were busy with a pressure to see and move patients along, and that there was seldom time to look in any great detail at a patient's notes, and, as in most clinical interactions, there was a significant amount of dependence on patient-supplied information when medical histories were taken.

270. Dr F said:

> "As with any clinical encounter, you tend to accept patient reported information instead of looking at any great detail into their medical notes, unless that patient reports they are unsure about some information or there are obvious discrepancies … However, in retrospect, I should have confirmed what [Mr A] had told me by looking through his medical notes."

271. In response to the provisional report, Dr F said that he should have checked the patient's notes for his past medical history, and that this was not carried out on multiple occasions, by multiple clinicians. Dr F acknowledged that he contributed to this failure.

272. While acknowledging that the primary purpose of the pre-admission clinic is the anaesthetic assessment, it was an expectation that review of the clinical records formed part of the house officer clerking duties, and I am critical of Dr F for not performing such a review.

Opinion: Dr D — breach

Review and awareness of patient history

273. After Mr A had been seen by Dr G, Dr E, and Dr F — and after the completion of the pre-anaesthetic questionnaire in which Mr A gave a negative response to a past history of bleeding disorders, hiatus hernia, heartburn, indigestion or acid reflux — he was admitted to the public hospital on 18 Month4 and underwent a total left knee joint replacement.

274. Dr D was the consultant operating surgeon at this time, and had overall responsibility for Mr A.

275. Dr D said that Mr A's medical records were available to him on the day of the surgery, and that Mr A's past medical history was well known to him from his previous contacts (which included Dr D being Mr A's surgeon at the time of his 2008 GI bleed).

276. The Medical Council of New Zealand's *Good Medical Practice* (2011) states:

> "**Medical care**
>
> …
>
> 2. Good clinical care includes:
>
> - adequately assessing the patient's condition, taking account of the patient's history and his or her views …"

277. I note that Dr D did not document in the contemporaneous records that he was aware of Mr A's past clinical history and any implications for ongoing management.

278. In addition to the discharge summary information that contained details of Mr A's 2008 and 2009 gastrointestinal issues, in the DHB document "Patient Admission Details" for this admission, the second and third pages of the clinical records list coding of patient events for previous admissions. The "Diagnosis Description" column for 22 December 2008 notes: "UGI symptoms with no GE Spec."

279. I note that there was no alert sheet or similar at the front of the DHB clinical record, which would include issues such as drug allergies, medication intolerances, etc.

280. Dr D acknowledged that the information contained in the previous medical records (including the 2008 GI bleed) had not been introduced into the 2012 contemporaneous record.

281. Dr D stated:

> "At various stages in [Mr A's] preoperative workup for total knee replacement, his past medical history and comorbidities were not documented in the contemporaneous record. They were available however, in his medical records. I was aware of [Mr A's] past medical history and proceeded notwithstanding this history and with the relevant perioperative measures instituted."

282. Dr D told HDC that Mr A did not have such poor communication skills that his past medical history could not have been elicited from him appropriately, and that all details were available without needing to contact his GP or family.

283. Dr D said that Mr A's past medical history was considered not to be a contraindication to proceed with the planned knee surgery.

284. Expert orthopaedic surgeon Denis Atkinson advised:

> "From the information provided it appears the symptoms of [Mr A's] previous peptic ulcer disease were quiescent at the time of pre-admission for surgery.
>
> [Dr D] [told HDC] he was cognisant of [Mr A's] past history and in particular he was aware of his previous peptic ulcer disease and deep vein thrombosis. He notes both of these conditions were assessed at the time of his surgery. His operative and post-operative instructions were tailored to [Mr A's] past history. This included the use of peri-operative anti-inflammatories and the use of peri-operative anticoagulants."

Checklist and time out

285. The MidCentral DHB "surgical safety checklist" was completed, and a peri-operative "time out" protocol was undertaken at the time of the surgery. It is recorded on the intra-operative nursing record: "Time out and surgical safety checklist completed and agreed by team."

286. There is no record of Mr A's preoperative co-morbidities being discussed or considered as part of the checklist completion or the surgical time-out protocol. Dr D said that he was present and aware of Mr A's past history at the time the time-out and safety check were performed.

287. In response to the provisional opinion, Dr D said that a verbal conversation took place during the surgical checklist process, but he acknowledged that the conversation was not documented fully in the contemporaneous medical record.

288. As mentioned earlier, Dr Atkinson advised that he expected the significant history of gastric bleeding in 2008 to be recorded in the contemporaneous records, and he considered the failure to enter this significant past history event into the contemporaneous record to be a departure from the normal standard of care.

289. I am critical of Dr D, the responsible clinician, who has acknowledged that he was familiar with Mr A's history, for not entering the relevant GI clinical history into the contemporaneous record.

Pain relief medications

290. The left knee joint replacement surgery itself was uneventful.

291. Dr D told HDC that there were no particular initial concerns about Mr A's recovery from surgery. Mr A was given antibiotic prophylaxis peri-operatively. For prophylaxis against DVT, Mr A was placed on low molecular weight heparin and aspirin.

292. Mr A was prescribed pain relief that included ibuprofen, an NSAID, charted by anaesthetist Dr H. Dr D was aware of this and was of the view that the dosage regimens were appropriate. He stated:

> "This prescription was weighed up against the risk of postoperative bleeding into the knee joint. Postoperative analgesia with a non-steroidal anti-inflammatory drug

> is standard practice. Ibuprofen was chosen for its low incidence of gastrointestinal side effects. It was [three and half] years since the gastrointestinal bleed and the previous ulcer had been treated and was asymptomatic at the time of the surgery."

293. Dr H told HDC that she was not made aware of any history of significant gastric ulcers or gastrointestinal bleeding as she did not make any notation of such, which she said was also consistent with the two previous preoperative assessments.

294. Nursing entries for the afternoon shift on 18 Month4 and the evening shift for 19 Month4 record that on occasion Mr A declined pain relief medication, stating that he had no pain. The medication records show that Mr A received ibuprofen three times on 19 Month4 (and one dose was declined), three times on 20 Month4 (and one dose was declined), twice on 21 Month4 (and one dose was declined) and twice on 22 Month4.

295. Dr D said that there were multiple contributing factors to Mr A's perforated ulcer, that all the factors are a calculated risk when undergoing a surgical procedure, and that he believed that the medications used in this case were the best peri-operative options for a patient with Mr A's risk profile.

296. Dr D stated:

> "The use of non-steroidal anti-inflammatory drugs in the presence of a past history of gastrointestinal ulcer is not contraindicated per se but a relatively lower dose and a shorter period of administration was considered here. Professional judgement in this case was used and the medications prescribed."

297. Dr Atkinson advised:

> "I would consider the perforation of [Mr A's] peptic ulcer to have multiple contributing factors. The stress of a major surgical procedure is probably the most significant contributing factor. The use of intravenous corticosteroids, anti-inflammatory and oral anti-inflammatory medication in the immediate post-operative period would add to this risk.
>
> The documentation provided suggests that these medications were administered without the knowledge of the past [history] of dyspepsia, peptic ulceration and a bleeding duodenal ulcer.
>
> The use of oral Ibuprofen is common and standard practice in the peri-operative period for total knee replacements. The risk of peptic ulceration is low. The drug would often be administered with a past history of dyspeptic symptoms. In such instances the Ibuprofen would be given with a Proton-pump inhibitor. In the presence of a past history of peptic ulceration or dyspepsia, there would be a heightened awareness of possible complications of using the drug."

298. I accept my expert's advice that prescription of oral ibuprofen is common for this surgery and in a patient with a past history of a gastrointestinal ulcer is not necessarily

contraindicated. I also accept that the clinical mechanism for Mr A's eventual perforated ulcer is not definitive.

299. However, Mr A was prescribed and administered the medication with Dr D's oversight and awareness as the responsible clinician, without any contemporaneous record of the relevant gastrointestinal history having been documented by Dr D. This was suboptimal on his part.

Handover

300. On 19 Month4 Mr A was reviewed by Dr D during a 3.30pm ward round. Mr A was progressing well, and Dr D expected Mr A to be discharged home on day four or five postoperatively.

301. On 20 Month4 Dr D went on leave overseas. He told HDC that Mr A was handed over verbally on the ward round to the care of more junior staff, and with support from on-call orthopaedic staff at the public hospital. Dr D said that his consultant colleagues were aware of his leave. The standing arrangement for cover for leave at that time was that there was an orthopaedic registrar and orthopaedic consultant available on call 24 hours a day.

302. In response to the provisional report, Dr D said that, as far as he is aware, such a standing arrangement is in place for all DHBs in New Zealand, and he considers that this and a roster of available cover published throughout the hospital (but not on the patient record) fulfils Medical Council of New Zealand guidelines relating to going off duty.

303. Dr D said that, at that time, Mr A was not a patient about whom he felt sufficiently concerned to contact the orthopaedic consultant on call to hand over more formally, including in the clinical record.

304. I note that, at the time, the MidCentral DHB Orthopaedic Department did not have a policy in relation to the handover of patients, including when consultants went on leave.

305. While Dr Atkinson considered the handover of care by Dr D on 20 Month4 to be appropriate, I note that the review of Mr A's care by Dr O, commissioned by MidCentral DHB in relation to the issue, made the following points:

- The handover of Mr A on 20 Month4 was not documented and therefore there was a lack of clarity about a specified consultant to whom care and oversight had been passed. There was subsequently no documented orthopaedic input obtained by the medical team into Mr A's care between 20 Month4 and 23 Month4.

- The Chief Medical Officer concluded that processes in place in the Orthopaedic Service for transfer of care may not have been optimal, and he recommended that the DHB consider the adequacy of processes in place in the Orthopaedic Service for transfer of inpatient care when consultants are on leave.

306. As I have stated previously, good handover is essential when different doctors and nurses take over responsibility for a patient's care.[42] I consider that good handover involves clear documented communication.

307. As stated in *Cole's Medical Practice in New Zealand*: "You must be satisfied, when you are off duty, that suitable arrangements are made for your patients' medical care. These arrangements should include effective handover procedures and clear communication between relevant doctors."[43]

308. I acknowledge that Dr D considered that Mr A was progressing well, and expected him to be discharged four or five days after his 19 Month4 review, and that Dr D did not feel this warranted a more formal transfer of care. However, at handover no orthopaedic staff member was clearly specified and communicated in the clinical records as being the overall responsible clinician with oversight for Mr A once Dr D went on leave. I remain of the view that this was suboptimal.

Conclusion — Dr D

309. Dr D, the responsible consultant surgeon, acknowledged that he was familiar with Mr A's clinical history, and that he proceeded cognisant of that. However, Dr D did not enter Mr A's gastrointestinal history into the contemporaneous record. Mr A was later prescribed an NSAID medication, with Dr D's oversight, without the relevant past clinical history having been documented, or having evidence of being communicated by Dr D or by other medical staff under his supervision. On 20 Month4 Mr A's handover was not documented by Dr D. This adversely affected Mr A's care.

310. Accordingly, I consider that, overall, Dr D failed to ensure quality and continuity of services to Mr A and, therefore, Dr D breached Right 4(5) of the Code.

Opinion: Dr K — breach

Standard of care

311. At 3am on 23 Month4, Mr A was reviewed by house officer Dr J after EWS activation. Commendably, Dr J was aware of the earlier reviews, and documented hypertension and peptic ulcer disease as being part of Mr A's history. Dr J also documented: "[U]nwell patient ? cause, need to rule out bleed plus in acute renal failure."

Telephone advice

312. Dr J telephoned the on-call medical registrar, Dr K. He advised to repeat blood tests, perform a chest X-ray, and to insert an indwelling catheter (IDC).

[42] Opinion 09HDC01146 (28 April 2011).
[43] *Cole's Medical Practice in New Zealand* (2011) at p129.

313. Further EWS activations took place at 5am (score 5) and 6am (score 6). At 6.05am Dr J reviewed a chest X-ray that she felt showed possible pneumonia. She called Dr K. It is documented that he "advised to stop fluids and give frusemide if [blood pressure] ok". Mr A's blood pressure was 90/50mmHg, and therefore frusemide was not given.

314. In response to the provisional report, Dr K said that given the limited information he had to hand, he is of the view that his initial telephone advice was appropriate.

315. Further blood test results were reviewed. The BNP level was documented as mildly raised. Further discussion was had with Dr K regarding this.

316. Dr K said that he considered that Mr A required further fluid resuscitation and then reassessment prior to further escalation of care. Dr K considered that further ward-based input prior to this was appropriate.

317. Expert consultant general physician Dr Richard Shepherd advised that, in his opinion, Dr K's earlier telephone advice to stop IV fluids and give frusemide was inappropriate in the circumstances.

Review

318. At 6.25am Dr K reviewed Mr A. Dr K was the first doctor in a role above house officer to review Mr A since Dr D had gone on leave.

319. Dr K documented a brief entry that does not state his designation and is not signed. The patient history was recorded as "as per [Dr J]". No examination findings, vital signs (including urine output) or interpretation of Mr A's investigations to that point are documented.

320. Dr K documented "ARF [acute renal failure] secondary to NSAID" and "sepsis likely secondary to LRTI [lower respiratory tract infection]".

321. Dr K told HDC that he concluded that Mr A had sepsis secondary to pneumonia and acute kidney injury, and that his impression was that Mr A needed further volume repletion and broad-spectrum antibiotics. Dr K also requested repeating of arterial blood gases a little later in the morning when the day team would resume Mr A's care at 8am.

322. Dr K stated that he understood that the morning team would review Mr A with the additional information (repeat blood tests) to assist in further decisions.

323. Dr K crossed out a reference to "bacteraemia" in the clinical record because he considered that it was the wrong medical terminology, as bacteraemia would imply a positive blood culture, which Mr A did not have. (This deletion is not initialled by Dr K.)

324. A plan was documented in the record as "IV fluids 2 hourly", but no volume or specific fluid was recommended. Hourly urine outputs were requested and IV ceftriaxone (an antibiotic) advised.

325. The fluid balance chart indicates that IV fluids continued unaltered (and did not increase until later at 8am).

326. Further plans were documented to "repeat bloods mane including lactate". An entry "will ask renal team or medical team" has also been crossed out. This was not initialled by Dr K.

327. Dr Shepherd was of the view:

> "A limited meaningful outcome to [Mr A's] care resulted following [Dr K's] medical consultation … No follow-up plans, meaningful further investigation recommendations or guidance to the orthopaedic team were documented."

328. At 7am the nursing notes record an EWS of 4–6,[44] a respiratory rate of 20bpm, a heart rate of 115bpm, and that Mr A was cold and clammy.

329. Dr Shepherd stated: "Poor documentation relating to complete absence of physical examination findings, investigation interpretation, the lack of explained clinical reasoning and a cursory problem list … creates doubt as to the provision of adequate care and attention to detail." I agree.

330. Dr K did not seek advice from, or escalate the matter to, a more senior clinician. The referring house officer's initial concerns of "need to rule out bleed" had not been specifically addressed by Dr K, who said that the morning team would review Mr A and take into account the repeat blood test results.

331. In response to the provisional report, Dr K accepted that his documentation was poor and that his 6.25am review was brief, and that he could have taken more time and noted the situation in detail. Dr K, having reflected on the care he provided, agreed that he should have sought advice from the medical consultant on call when Mr A's condition warranted that he do so.

332. Dr Shepherd's advice, which I accept, is:

> "Had [Dr K's] documented diagnoses proved to be [Mr A's] only issues then initial ward based care may have been a reasonable course of action … In my opinion that does not appear to have happened. The poor standard of his documentation makes an assessment of his clinical reasoning challenging. Had there been an appreciation that [Mr A] was likely suffering from a perforated gastric ulcer with early peritonitis then more aggressive intervention would certainly have been mandated. In either event, in my opinion [Mr A's] ongoing and significant deterioration to that point should have prompted a call to his supervising Consultant — if not at the time of his review at 0625hrs then certainly

[44] As outlined earlier, a score of 3 to 5 means that the shift leader should be liaised with, a house officer should be paged to attend within 20 minutes, and observations should be at least one hourly. If the house officer is unable to attend within 20 minutes, the registrar is to review the patient with ward staff. A score of 6 or more should result in liaison with a shift leader, and a registrar being paged to attend within 10 minutes. If the registrar is unable to do so, the consultant should be contacted.

at the 0800hrs morning handover. I would consider this to be a moderate deviation from the expected standard of care."

Conclusion — standard of care

333. Dr K did not provide appropriate telephone advice or perform an adequate initial assessment of Mr A in a timely manner, and failed to seek advice from a senior colleague when Mr A's condition warranted that he do so. Given these clinical deficiencies, in my view Dr K did not provide services to Mr A with reasonable care and skill and, therefore, breached Right 4(1) of the Code.

Opinion: Dr L — adverse comment

334. At 9.40am on 23 Month4, medical registrar Dr L reviewed Mr A. Dr L detailed an extensive entry in the clinical records and performed a physical examination. Dr L reviewed Mr A's past history and acknowledged Mr A's chronic peptic ulcer disease and anaemia. Dr L told HDC that Mr A was fully alert and orientated. An abdominal examination indicated mild epigastric tenderness.

335. In response to the provisional report, Dr L said that the documentation overnight was unclear, and he felt that minimal interventions had been instigated prior to his review.

336. Dr L told HDC that Mr A appeared to have hospital acquired/aspiration pneumonia and an acute kidney injury, and appeared to have several possible drug causes of pre-renal failure. Dr L told HDC that his conclusion was that Mr A was acutely unwell with chest sepsis and renal injury.

337. A management plan was made to continue IV fluids. A request was documented for central venous access. Oral ranitidine was prescribed for the gastrointestinal issue. A broad-spectrum antibiotic was recommended to treat the pneumonia. A number of additional investigations were advised, including a urine sample, blood cultures, sputum culture, further blood tests, and an abdominal X-ray.

338. Dr Shepherd advised that, in his opinion, Dr L's documentation of his review at 9.40am met the expected standard of documentation.

339. Dr L said that he anticipated that Mr A might need higher care intervention but felt that he did not require it at that precise moment, and he intended to review Mr A again soon.

340. In response to the provisional report, Dr L said that his review suggested a patient who was unwell but not requiring any form of higher care input at that stage. He was aware that Mr A had the potential to deteriorate, and that is why he made the comment regarding anticipating a higher level of care if there was no clinical improvement. Dr L said that, in his opinion, there was nothing to suggest an acute intra-abdominal event at that stage. He felt that it was reasonable to instigate the

measures taken first, and to observe closely for clinical improvement. If there had been no clinical improvement despite this, or any deterioration, he would have discussed it further with senior colleagues. At that stage he did not believe Mr A required consultant input.

341. Dr Shepherd advised:

> "The underlying correct diagnosis was ultimately not reached at that stage but with [Mr A's] ongoing deterioration things had become more complex and clouded than earlier assessments when aspects of the correct diagnosis had been entertained. The identification of his acute kidney injury and diagnosis of pneumonia appears to have distracted the attending doctors from further consideration of the underlying pathology."

342. However, Dr Shepherd was also of the view that at that stage Dr L should have made contact with, or updated, a consultant colleague. I agree.

343. Dr L conducted a further review at around 12pm. He recorded that there had been a sudden rapid deterioration, with Mr A "exhausted" and requiring higher volumes of oxygen. Dr L documented the possibility of an intra-abdominal event and queried a perforated peptic ulcer. He recommended immediate IV fluids. Dr L then made telephone contact with a senior colleague, Dr M, and transfer to ICU was facilitated.

344. Dr Shepherd advised that by that stage the most appropriate course of action was for intensive care treatment, and that consultant physician direct clinical review prior to ICU contact would have likely led to more delays. Dr Shepherd considered that, given the circumstances, there did not appear to have been adequate communication with senior colleagues at an early enough stage.

345. I am mindful that Dr L conducted a thorough initial review of a complex patient with an atypical presentation at 9.40am, which was documented in detail and included a review of the patient history, and ultimately he made contact with consultant Dr M at around 12pm and facilitated ICU transfer. However, Dr L did not make contact with a senior colleague earlier during the morning review, and I am critical of this.

Opinion: MidCentral District Health Board — breach

346. I am critical of the care provided to Mr A by individual staff of MidCentral DHB, as set out above. As I have stated previously, while individual clinicians need to be competent in their clinical management of patients, staff also need to be supported by systems that guide and facilitate good decision-making and promote a culture of safety.

347. District health boards are responsible for the operation of the clinical services they provide, and are responsible for service failures.[45] 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.

348. Mr A's case has highlighted particular hospital system issues that contributed to him receiving suboptimal care. There were a number of areas that could have been improved and where opportunities existed to intervene meaningfully.

DHB clinical records

349. Mr A's public hospital records were in three paper volumes: 1995 to 2008, 2009 to 2012, and investigation and outpatient records. Electronic records for Month1 onwards were available through the MidCentral DHB clinical portal application.

350. While I have made the point earlier that the relevant clinical gastrointestinal history was available to clinicians who reviewed Mr A from Month1 onwards (for example, in relevant discharge summaries and in coding lists of patient events), in my view the primarily paper-based records system did not lend itself to enabling staff to review the patient history effectively, and did not contain an alert process or system for significant patient co-morbidities, such as an alert sheet at the front of the clinical record.

Patient questionnaire

351. On 9 Month1 Mr A completed a MidCentral DHB "preassessment patient questionnaire" template form at the outpatient clinic appointment.

352. MidCentral DHB's review of Mr A's care, and my expert advisors in this case, have all identified that Mr A's history of major gastrointestinal bleeding was not on the pre-assessment questionnaire form. The wording and nature of several of the questions on the form may have been subject to misinterpretation.

353. As identified in MidCentral DHB's review, the question on the form about bleeding disorders is unclear, having a phrase immediately underneath asking "are you on warfarin", which could result in a patient not on warfarin but having a history of bleeding problems ticking "no". The questionnaire does not specifically ask what medical conditions the patient has experienced in the past.

Postoperative care

354. On 18 Month4 Mr A underwent his elective total knee joint replacement surgery, which was itself uneventful. He had no adverse issues while in the PACU. He was then discharged to the surgical team. However, Mr A began to show signs of postoperative deterioration, more markedly on 22 Month4, activating early warning scores, and leading to input being sought from the medical team.

[45] See also Opinion 14HDC01187 (30 June 2016).

355. Dr Shepherd advised me that, in his view, the overall care provided to Mr A by the medical team in this period was suboptimal.

356. I am concerned at the system deficiencies particularly evident in Mr A's postoperative care.

Orthopaedic/medical interface

357. As described earlier, on 20 Month4 Dr D went overseas. His handover was not documented, and no orthopaedic staff member was specified in the clinical records as being the overall responsible clinician with oversight for Mr A once Dr D was on leave.

358. The MidCentral DHB Orthopaedic Department did not at that time have a policy relating to the handover of patients, including when consultants are on leave. The MidCentral DHB's review identified that there was, as a result, a lack of clarity about a specified consultant to whom care and oversight had been passed, and Dr Atkinson advised that the absence of orthopaedic involvement in Mr A's care after 20 Month4 was a departure from the normal standard of care.

359. I am critical that there was no subsequent orthopaedic involvement obtained by the medical team at consultant or registrar level after 20 Month4, until the orthopaedic team was paged about the impending transfer to ICU on 23 Month4. Hospital specialties need to work together effectively, foster good working relationships and clear lines of communication, and be guided by appropriate protocols. I have placed a very clear emphasis on provider organisations ensuring that they have in place "cultures that empower people; cultures that embody transparency, engagement, and seamless service as they put consumers at the centre of services".[46] I reiterate that message here.

DHB Early Warning Score

360. As set out earlier, the use of Early Warning Scores is governed by MidCentral DHB's policy "Patient Observation and Early Warning Score (EWS) (Adults)", which details actions to be taken in reaction to patient observations and resulting scores.

361. Over the period from 4.30pm on 22 Month4 to 11.55pm on 23 Month4, 14 Early Warning Scores were documented on the observation chart.

362. Dr Shepherd identified occasions on which he considered that the EWS was not calculated correctly, meaning there were lost opportunities to trigger a request for the attendance of an appropriate doctor, and within the specified time frames set out in the EWS policy. He advised that, in his view, the calculation of many of the particularly early Early Warning Scores were inaccurate, and aggregate underscoring is likely to have resulted.

363. For example:

[46] Hill, A., "Systems, Patients, and Recurring Themes", *New Zealand Doctor* (9 March 2011). Available at: www.hdc.org.nz.

- On the morning shift of 22 Month4, Mr A's behaviour was noted to "seem spaced out", be "un-cooperative", and to be having "blank moments". The EWS for confusion was recorded as zero, when new confusion should mean an EWS of 2 in itself.
- The fluid balance chart for 22 Month4 records that urine had not been passed. This would indicate a score of 3 in itself, but the urine output EWS was recorded as zero.
- At 8pm the EWS was recorded as 4, including the absence of urine output. However, the urine output score was calculated as 2, which is not consistent with the EWS guideline of a score of 3 for no urine output.

364. In addition:

- When an EWS of 6 was activated at 1am on 23 Month4, a registrar review was not requested within 10 minutes, as required by the protocol. A review by the on-call house officer occurred two hours later.
- Early Warning Scores on 23 Month4 were recorded at 5am (score 5), 6am (score 6), 9am (score 8), 9.50am (score 7), 11am (score 8), and 11.55am (score 8). However, a house officer was paged on only one occasion in response to these, at 7.45am.

365. Dr Shepherd stated:

> "The management of patients in such circumstances should be regarded as a team effort … In essence the default safety thresholds inherent in a protocol based EWS system appear to have been circumvented. Had these been followed senior medical notification would have occurred at an early stage in [Mr A's] deterioration. That said, recurrent review by attending junior doctors still occurred within a not entirely unreasonable timeframe over a weekend night shift and Monday morning … Whilst ultimately a matter of judgement by the attending junior medical staff, I consider the failure of [Mr A] to improve despite treatment, the complexity of his case and his recurrent increasing EWS scores should have mandated the seeking of senior advice at a much earlier stage."

366. I am critical that EWS protocols were not adhered to appropriately by many DHB staff in this case.

Escalation of care

367. Despite the above EWS shortcomings, there were still other potential opportunities for intervention.

368. The DHB and Dr O's review identified that there was some indication to transfer Mr A to a higher level of care before late morning on 23 Month4.

369. Dr Shepherd was of the view that much of the correct diagnosis was actually identified on review by the house officer, Dr I, at 8.30pm and 9.10pm on 22 Month4, but this was lost sight of at subsequent reviews. Dr Shepherd stated:

> "In my opinion there was a lack of appreciation of [Mr A's] ongoing deterioration which occurred over a period of some 20 hours beginning from [4.30pm on 22 Month4] to approaching critical deterioration by [12pm on 23 Month4]."

370. Dr Shepherd also advised:

> "… This was a team effort … Given the numbers of staff involved, many of whom practised in a similar manner, systemic root causes need to be considered. Direct clinical oversight particularly over weekends and nightshifts will always be a challenge with senior staff relying on the judgement of junior staff on when it is appropriate to seek guidance. Factors such as organisational culture, perceived approachability of senior staff and junior staff awareness of any delegated authority policy can all be influencing factors. Safety 'check points' such as the EWS which allow for a protocol driven backup outside of individuals' judgement should be well understood by clinical staff using such tools and not circumvented."

371. Dr Shepherd concluded:

> "In my considered opinion appropriate overall escalation and senior staff involvement did not occur. I would regard this as a moderate to serious departure from the expected standard of care. I believe such a departure would be similarly regarded by my professional peers."

372. There were many staff involved in Mr A's postoperative care. When there is a pattern of deficiencies (the orthopaedic/medical interface and the escalation of care outlined above) and a lack of compliance with policy (in this case the EWS policy) exhibited by a large number of staff, this indicates systems issues for which the DHB is responsible.

Conclusion — MidCentral DHB

373. Mr A's case highlighted the following systems issues that contributed to him receiving suboptimal care:

- The DHB records system did not assist staff to facilitate review of patient history and significant patient co-morbidities effectively.
- The wording and nature of several of the questions on the DHB pre-assessment patient questionnaire may have been subject to misinterpretation.
- Postoperatively:
  a) There was a lack of clarity about to whom oversight of Mr A's care had passed once Dr D went on leave on 20 Month4 and Mr A began to deteriorate and required medical team input. The Orthopaedic Department did not at that time have a policy relating to the handover of patients, including when consultants went on leave.

b) Subsequently, there was no orthopaedic involvement at consultant or registrar level in Mr A's care after 20 Month4, until the orthopaedic team was paged about the impending transfer to ICU on 23 Month4.

c) EWS protocols were not adhered to appropriately by many staff in this case.

d) Escalation to more senior staff did not occur appropriately when Mr A deteriorated.

374. In my opinion, for the above reasons, MidCentral DHB did not provide services to Mr A with reasonable care and skill and, accordingly, breached Right 4(1) of the Code.

Other comment

375. While MidCentral DHB's review has indicated that it has taken remedial steps to improve care as a result of this case, I am not yet reassured from the information gathered from the DHB in the course of this investigation that these steps have been completed and implemented fully, and are effective.

Recommendations

376. In my provisional report, I recommended that Dr D report on the effectiveness of the additional sign-in procedure adopted in the anaesthetic room, with the surgical team and the patient participating in verbal discussion of the surgical procedure and any events including risks particular to the patient.

377. In response, Dr D reported that since Mr A's case, there have been a number of changes made in relation to the surgical safety checklist and procedures. These include the additional sign-in procedure in the anaesthetic room with patient participation and the institution of pre-list briefing and post-list debriefing. The fact that such verbal conversations occur is documented.

378. In the provisional report, I recommended that Dr D provide HDC with information about the Orthopaedic Department's instituted policy of documenting the handover of patients about whom there are concerns outside of normal working hours or when consultants are on leave.

379. In response, Dr D reported that in June 2015 the mechanism of handover between consultants and the documentation of this was discussed by the Orthopaedic Department. It was noted that the documentation process is important. It was decided that consultant staff would dictate patient management instructions during rounds, and have this entered into the current medical record. When formal leave is taken from the DHB, any remaining inpatients for whom there is a concern over their ongoing management will be discussed with an appropriate senior colleague, and this handover documented in the record. For those patients for whom there is no ongoing concern, the consultant named on the on-call roster will be the point of contact.

380. I recommend that Dr D:

a) Provide details to HDC on steps he has taken personally to formalise handover of his own surgical inpatients to orthopaedic colleagues in the event of taking leave, to include a process of clear instructions for patient oversight.

b) Provide an update on his active participation in the changes made to the surgical safety checklist and procedures.

c) Provide a further update on the changes made to the mechanisms of handover between consultants and the documentation of patient management instructions.

d) Provide a formal written apology to Mr A's family. The apology is to be sent to HDC for forwarding, within three weeks of the date of this report.

381. I recommend that Dr K:

a) Provide evidence to HDC of undergoing further education in the application of Early Warning Scores, the recognition of a deteriorating patient, and the escalation of care to senior colleagues in the event of patient deterioration.

b) Provide a formal written apology to Mr A's family. The apology is to be sent to HDC for forwarding, within three weeks of the date of this report.

382. I recommend that MidCentral DHB:

a) Prepare or modify a policy or guideline (such as the "Preadmission Clinic" guideline) to clarify roles and responsibilities of staff and outline precisely when in the patient surgical pathway, and by whom, the patient's clinical history and records are to be reviewed and significant issues communicated.

b) Provide a detailed update in relation to its development of electronic patient records.

c) Implement an electronic alert process or system in the patient record for clear flagging of significant patient co-morbidities and clinical history.

d) Provide a copy of the critically appraised and modified preoperative screening questionnaire form.

e) Provide details of the steps taken to allow treating clinicians to re-check all patient hard copy records, electronic records, and medications immediately prior to surgery.

f) Provide further explanation regarding the apparent evidence against establishing a rapid response team at MidCentral DHB, and detail the other mechanisms being pursued for ensuring an appropriate medical response to an EWS trigger, and for ensuring that MidCentral DHB junior doctors are confident and supported to escalate concerns about deteriorating patients to their senior colleagues.

g) Detail the changes made to increase the robustness of transfer of care within the Orthopaedic Service, including extra medical and elder health support for orthopaedic patients.

h) Provide a formal written apology to Mr A's family. The apology is to be sent to HDC for forwarding, within three weeks of the date of this report.

Follow-up actions

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

384. An anonymised copy of this report with details identifying the parties removed, except the experts who advised on this case and MidCentral DHB, will be sent to the Medical Council of New Zealand, and it will be advised of the names of Dr D and Dr K in covering correspondence.

385. An anonymised copy of this report with details identifying the parties removed, except the experts who advised on this case and MidCentral DHB, will be sent to the Royal Australasian College of Surgeons, and it will be advised of Dr D's name in covering correspondence.

386. An anonymised copy of this report with details identifying the parties removed, except the experts who advised on this case and MidCentral DHB, will be sent to the Royal Australasian College of Physicians, the Health Quality and Safety Commission, and HealthCERT (Ministry of Health), and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent orthopaedic advice to the Commissioner

The following expert advice was obtained from an orthopaedic surgeon, Denis Atkinson:

"I am in receipt of your request to provide expert advice on the care provided to [Mr A].

Expert Advice and the standard and appropriateness of care provided to [Mr A] by the MidCentral DHB and Orthopaedic Staff, with particular reference to:

Advice requested:

- Standard and appropriateness of the Orthopaedic Out Patient Clinic of 9 [Month1].
- The appropriateness and responsible Surgeon's assessment in care of [Mr A] post operatively.
- The quality and appropriateness of patient hand over prior to [Dr D's] leaving the country 20 [Month4].
- The standard of Orthopaedic Staff's documentation and communication with colleagues.
- The extent of Orthopaedic clinical input and involvement of care once [Mr A] deteriorated.
- The nature and appropriateness of the organizational structure in place at the time and the Orthopaedic Team's interaction with the Medical team.

Documents Reviewed:

- [Mr A's] [GP records] and [Dr C] (A).
- DC letter of notification dated 7 July 2014 (B).
- Autopsy report (C).
- [Dr D's] letter to Coroner, [2012] (D).
- [The CMO's] letters to Coroner, 21 August 2013, and 12 December 2013.
- [Mr A's] GP referral letter, 14 April 2011 (F).
- MidCentral DHB Clinical Records (G).
- MidCentral DHB response to HDC dated 7 August 2014 (H).
- MidCentral DHB Clinical Records (I).

The summary of the complaint fairly represents the documentation provided to me. I add the following historical details.

HISTORY:

1.0 [Mr A] had long standing history of osteoarthritis, anti-inflammatory use and iron deficiency anaemia.

1.1 A gastroscopy was performed in 1999 which was normal. [Mr A] declined further recommendations for gastroscopy in 2005 and 2008.

1.2 A planned total hip replacement in 2008 was postponed because of iron deficiency anemia.

1.3 Left hip replacement was performed [in late] 2008. This hip replacement was complicated by recurrent post-operative dislocations requiring admission to the public hospital.

1.4 During [the admission] [Mr A] had a gastrointestinal bleed. Gastroscopy was performed confirming a chronic gastric ulcer with an acute bleeding duodenal ulcer. [Mr A] received a blood transfusion. He was discharged from the public hospital [in January 2009]. The discharge noted that [Mr A] had no General Practitioner.

1.5 The Hospital Records confirm that [in August 2009] [Mr A] suffered an extensive left sided deep vein thrombosis extended above the knee. He was treated with subcutaneous Heparin and Warfarin therapy.

1.6 [Dr C] referred [Mr A] to the Orthopaedic Service at the public hospital [in April] 2011. [Dr C] noted [Mr A] was on Aspirin and using Omeprazole, 14 mg daily. No other comorbidities were mentioned in the referral letter.

1.7 [Mr A] was assessed at [the public hospital] Out Patients on 9 [Month1]. His deteriorating symptoms of osteoarthritis of the left knee were confirmed. His symptoms were considered severe enough to justify recommending total knee replacement.

1.8 On 9 [Month1] [Mr A] completed a pre assessment questionnaire. On this questionnaire he gave a negative response to questions relating to bleeding disorders, hiatus hernia, heartburn, indigestion, acid reflux or kidney disease.

1.9 [Mr A] attended a pre assessment clinic 6 [Month3]. He was reviewed by a House Officer and Consultant Anaesthetist. [Mr A] was considered fit for the planned knee replacement surgery. No documentation was made regarding the past history of chronic iron deficiency anaemia, bleeding duodenal ulcer, deep vein thrombosis or leg ulceration.

1.10 [Mr A] was admitted to the public hospital on 18 [Month4]. He underwent a left total knee joint replacement on the day of admission.

1.11 Operative anaesthetic record confirms pre-operative anaemia with a hemoglobin of 112 gram per litre (normal range is 125–170), MCV of 75 (normal range 80–100). The Anaesthetist has recorded [Dr D] was aware of the pre-operative anemia.

1.12 There is no record of a peri-operative time out protocol being undertaken at the time of the knee replacement.

1.13 Apart from noting the pre-operative anemia, there is no record of [Mr A's] pre-operative comorbidities including a bleeding duodenal ulcer and an

extensive deep vein thrombosis to the left leg.

1.14 [Mr A's] anaesthetic was uncomplicated. Intra-operatively he received Parecoxib, 40 mg IV and Dexamethasone, 8 mg IV. Immediately post-operatively he received 1 unit of Pack Cells of blood.

1.15 For post-operative pain relief [Mr A] was administered Paracetamol, Tramadol and Ibuprofen 400 mg tds.

1.16 [Mr A] was reviewed by [Dr D] in a post-operative ward round of 1530 hours on the 19 [Month4]. [Mr A] was making good progress, he had a normal urine output and minimal pain.

1.17 [Dr D] left for overseas leave on the 20th [Month4] leaving [Mr A] in the care of his House Surgeon and Registrar with support from the on call Orthopaedic Service at the public hospital.

1.18 Medical staff records of the 20 [Month4] confirmed [Mr A] was progressing well with minimal pain and good urine output.

1.19 On the evening of 21 [Month4] he was noted to be somewhat vague, there was concern regards his cognition. He was reluctant to mobilise.

1.20 Following an early warning score activation, [Mr A] was reviewed by [Dr I], House Surgeon at 1720 hours. [Mr A] was tachycardic, he had epigastric pain, he was noted to be a vague historian. [Dr I] noted the past history of peptic ulcer disease.

1.21 [Mr A] was afebrile with a blood pressure of 106/61 with ninety eight percent (98%) oxygen saturation. [Dr I] felt the abdominal pain was secondary to gastritis, he did not think [Mr A] had an acute abdomen. He prescribed simple analgesia with Gaviscon and Omeprazole.

1.22 [Mr A] was further reviewed by [Dr I] 2030 hours because of nursing request concern that [Mr A] was clammy. Persistent epi-gastric tenderness is recorded.

1.23 Blood tests were performed which confirmed a hemoglobin of 110 with an elevated creatinine of 229, with a potassium of 5.7. His CRP was elevated at 323. No urine output was recorded. The EWS remained elevated at 4.

1.24 At 2100 hours he was concerned there was acute renal impairment. [Dr I] recommended intravenous fluids. He withheld any renal toxic drugs. He recommended a mid-stream urine to be performed the following day.

1.25 [Mr A] was reviewed by [Dr J] SHO at 0300 hours, 0420 hours and 0600 hours. [Dr J] confirmed the low urine output. The patient remained clammy, tachycardic with a thready pulse. There was persistent epigastric tenderness.

1.26 [Dr J] contacted an On-Call Registrar. The diagnosis of renal failure was confirmed.

1.27 There was further concern regards [Mr A's] condition on the morning of 23 [Month4]. The absence of urine output was confirmed. A Medical Registrar review was obtained, there was concern regards a left lower lobe pneumonia with acute renal failure.

1.28 Despite resuscitative measures, [Mr A's] condition deteriorated, and he was transferred to the Intensive Care Unit. [Mr A] was reviewed by a Consultant Anaesthetist, Dr N. Further resuscitative measures failed. [Mr A] died.

1.29 The post mortem confirmed death from a perforated gastric ulcer with peritonitis and multiple organ failure and acute renal failure.

1.30 [Dr C] records in correspondence 13.7.2014 that [Mr A] was not a good historian noting that he often refused or did not attend referral appointments.

OPINION:

2.0 At various stages in [Mr A's] pre-operative workup for total knee replacement, his past medical history and comorbidities were not identified.

2.1 [Mr A] had a history of chronic iron deficiency anaemia, gastric ulceration with a history of major duodenal ulcer bleed, deep vein thrombosis, leg ulceration. This past history was well documented and freely available within [public hospital] records. [Mr A's] General Practitioner had not been notified of the previous duodenal ulcer bleed.

2.2 [Mr A] did not identify these significant comorbidities in his self-completed pre-operative questionnaire.

2.3 [Mr A] was noted to be a poor historian who often did not comply with medical instructions.

2.4 [Mr A's] past medical history was significant and relevant, and this history should have been obtained at the time of pre-operative assessment.

2.5 In the presence of a patient with poor communication skills, the standard of enquiry in obtaining a past history is of a higher standard. Details of the past history can be obtained from the patient's General Practitioner, family members and the Hospital records.

2.6 [Mr A's] past history was significant and of high relevance to the knee replacement he was to undertake. In light of his past history, [Mr A] had a greater risk of peri-operative morbidity and mortality relating to his knee replacement surgery. This is of particular relevance to the history of gastric and duodenal ulceration, peri-operative bleeding and the risk of

thromboembolism.

2.7 These heightened risks should have been discussed with [Mr A] in the pre-operative period as part of the general process of obtaining informed consent to proceed with the treatment of total knee replacement.

2.8 The significant pre-operative history should also have been discussed as part of the **Time Out** procedure performed at the time of his surgery.

2.9 I would consider the perforation of [Mr A's] peptic ulcer to have multiple contributing factors. The stress of a major surgical procedure is probably the most significant contributing factor. The use of intravenous corticosteroids, anti-inflammatory and oral anti-inflammatory medication in the immediate post-operative period would add to his risk.

2.10 The documentation provided suggests that these medications were administered without the knowledge of the past [history] of dyspepsia, peptic ulceration and a bleeding duodenal ulcer.

2.11 The use of oral Ibuprofen is common and standard practice in the peri-operative period for total knee replacements. The risk of peptic ulceration is low. The drug would often be administered with a past history of dyspeptic symptoms. In such instances the Ibuprofen would be given with a Proton-pump inhibitor. In the presence of a past history of peptic ulceration or dyspepsia, there would be a heightened awareness of possible complications of using the drug.

2.12 The hand-over care performed by [Dr D] on the 20th [Month4] is consistent with standard practice. [Dr D] reviewed [Mr A] post-operatively and left his care under the supervision of his Junior Staff and the On-Call Orthopaedic Surgeon at the public hospital. There were no concerns at the time of the hand-over.

2.13 [Mr A's] condition deteriorated in the weekend following surgery. His care was supervised by the On-Call Surgical House Surgeons and later Medial Registrars.

2.14 Following [Dr D's] review there is no documentation of further review of [Mr A] by the Orthopaedic Service at either Registrar or Consultant levels.

2.15 [Mr A's] post-operative recovery was uncomplicated until deterioration was noted on the 22nd [Month4]. At that time the Early Warning Score was activated. He was noted to be oliguric and suffering from upper abdominal pain.

2.16 I would consider the House Surgeon's assessments of the 22nd [Month4] and the early hours of the 23rd of [Month4] to be appropriate and meeting an adequate standard of care.

2.17 The diagnosis of acute renal failure was made on the 23rd [Month4] but the House Surgeon sought more senior advice regards management. The Medical team were notified however [Mr A's] condition rapidly deteriorated.

2.18 I am not in a position to comment regards the standard of care provided by the Medical Services on the 23rd [Month4].

2.19 Despite the low EWS score on 22 [Month4] the oliguric state of the patient should have initiated more vigorous intervention with escalation to more Senior Medical Care from the Medical or Intensive Care service. However it is unclear that the outcome would have been altered.

2.20 Perforation of a peptic ulcer and other acute abdominal complications are not uncommon in the elderly population undergoing total joint replacement surgery. There should be a heightened awareness of this risk in the elderly population. This risk is heightened in the presence of a relevant past history. Diagnosis is often difficult in the elderly confused patient who is receiving post-operative pain relief with ongoing effects of neural axial anaesthesia.

2.21 I consider the standard of the post-operative documentation by the Medical Staff to be of an adequate standard.

2.22 The failure to access and document [Mr A's] past medical history at the Out Patient Clinic of 9 [Month1] and subsequent pre-operative assessments, I consider to be a departure from an accepted standard of care. It is standard for a patient's past history and medical records to be available at the time of pre-operative assessment. Review of the patient's past history and comorbidities forms an important part of the informed consent process prior to proceeding with elective surgery. Significant comorbidities should be addressed as part of the Surgical **Time Out** protocol.

2.23 It would be an accepted standard for [Mr A] to have been reviewed by an Orthopaedic Registrar or Consultant in the period from the 20th to 23rd [Month4]. There is no documentation to support that this review occurred. The absence of such review is a mild departure from the normal standard of care.

2.24 [Mr A's] condition deteriorated rapidly from the 22nd to 23rd of [Month4]. Earlier involvement of more Senior Medical Staff in [Mr A's] management during this period may have altered the outcome. The rapidly deteriorating renal function should have initiated a more aggressive intervention. Protocols to deal with rapid deterioration in the status of a post-operative patient in a General Orthopaedic Ward should be established.

Yours sincerely

Mr Denis Atkinson
ORTHOPAEDIC SURGEON"

On receipt of further information, Dr Atkinson provided the following further advice:

"… **Further Documents Reviewed include:**

- [Mr A's] [GP records] and [Dr C]
- HDC letter of notification dated 7th July 2014
- Autopsy report
- [Dr D's] letter to Coroner, [December], 2012
- [The CMO's] letter to Coroner, 21 August, 2013, and 12 December, 2013
- [Mr A's] GP referral letter, 14 April, 2011
- MidCentral DHB Clinical Records
- MidCentral DHB response to HDC dated 7 August, 2014 (incorporating comments from [three Anaesthetist staff including Dr N, and [Dr E]
- MidCentral DHB Clinical Records

Any further [comments after] I have reviewed the responses provided by the following:

- Response from [Dr E], dated 20 August, 2015
- Response from [Dr F], undated
- Response from [Dr G], dated 24 August, 2015
- Response from [Dr D], dated 1 September, 2015
- Response from [Dr K], dated 24 August, 2015
- Response from [Dr J], undated
- Response from MidCentral DHB incorporating comments from [Dr I]
- MidCentral DHB document MDHB275 — Guideline Preadmission clinic
- MidCentral DHB document MDHB5842 — Policy: Patient Observations and EWS (Adults)
- Additional page from MCDHB clinical records

New Information:

1.0 I note from [Dr E's] response that he directly questioned [Mr A] regards the past history of bleeding ulcers and gastro oesophageal reflux. [Mr A] gave negative responses to these questions.

[Dr E] notes that he did not consider [Mr A] to be a poor historian, he felt he provided him with accurate information.

'He had no reason to doubt the voracity and reliability of his responses.'

1.1 [Dr E] records he has a well-established protocol for dealing with 'the reluctant and less forthcoming historian'.

1.2 [Dr E] notes the establishment of electronic record to tag critical pre-operative information.

1.3 [Dr G's] response relates to his interaction with [Mr A] in the Out Patient assessment of 9 [Month1].

1.4 [Dr G] confirms that [Mr A] was a good historian.

1.5 [Dr G] recommended that [Mr A] proceed to knee replacement surgery. Following his assessment he did not recognise any pre-operative contraindication to surgery. [Dr G] noted he was aware [Mr A] would undergo a pre anaesthetic assessment.

1.6 [Dr F's] response noted that he confirmed that [Mr A] was a reliable source of information. [Dr F] confirmed he reviewed [Mr A's] pre-assessment questionnaire. He questioned [Mr A] regards his past medical history. He is unclear whether the Hospital Records were accessed.

1.7 [Dr D's] response confirms that at the time of the Out Patient assessment of 9 [Month1], that [Mr A's] pre-anaesthetic questionnaire had been reviewed. He noted there was a negative response to a part history of 'bleeding disorders, hiatus hernia, heartburn, indigestion or acid reflux …'.

1.8 [Dr D] records that [Mr A's] past history was well known to him. He notes he reviewed [Mr A's] past history. He noted he saw no contraindication to [Mr A] proceeding to knee replacement surgery. He notes his operative and post-operative were appropriate in light of [Mr A's] past history.

1.9 [Dr D] confirms that a time out and safety check list was completed pre operatively on 18 [Month4]. [Dr D] was present and aware of [Mr A's] past history at the time the time-out and safety check was performed.

1.10 [Dr D] records at the time of his post-operative review on 19 [Month4] there were no concerns regards [Mr A's] progress. All Orthopaedic staff involved with [Mr A's] care were aware that [Dr D] was travelling overseas on the 20th [Month4]. The care of [Mr A] was left in the hands of his Registrar with on-call consultant cover. [Dr D] reports he was available by telephone.

1.11 [Dr D] notes the bleeding risk associated with the peri-operative use of anti-coagulants was assessed at the time of surgery. [Dr D] records the risk of the use of peri-operative anti-inflammatories was also assessed at the time of the surgery. [Dr D] notes [Mr A's] gastrointestinal bleed had been some six years previous and at the time of the admission he had no gastrointestinal symptoms. [Dr D] records, although not documented into contemporaneous records, he was aware of [Mr A's] past history and its implications for his ongoing management. [Dr D] confirmed that it is likely that he discussed with [Mr A] the relative risks of surgery pre-operatively. [Dr D] records that [Mr A] had three volumes of hospital notes, noting salient information was not easily accessible.

OPINION:

2.0 The further information provided confirms [Mr A] was a reliable historian.

2.1 At the time of his pre-operative assessment of 9 [Month1], his past medical history and comorbidities were assessed as part of the consent process for knee replacement surgery.

2.2 The General Practitioner referral of 2011 noted no ongoing upper gastro intestinal symptoms. No active symptoms of peptic ulcer disease were apparent following direct interrogation with [Mr A] at pre-assessment. No symptoms were recorded by [Mr A] himself in his pre-operative self-

assessment questionnaire. [Mr A] was not on Omeprazole treatment at the time of admission for surgery.

2.3 From the information provided it appears the symptoms of his previous peptic ulcer disease were quiescent at the time of pre-admission for surgery.

2.4 [Dr D] records he was cognisant of [Mr A's] past history and in particular he was aware of his previous peptic ulcer disease and deep vein thrombosis. He notes both of these conditions were assessed at the time of his surgery. His operative and post-operative instructions were tailored to [Mr A's] past history. This included the use of peri-operative anti-inflammatories and the use of peri-operative anticoagulants.

2.5 I would consider the care provided to [Mr A] and the Out Patient appointment of 9 [Month1] to meet [an] adequate standard. From the information provided to me, it is unclear whether his previous [hospital] records were accessed at the time of this assessment. I would expect the significant history of gastric bleeding in 2008 to be recorded in his contemporaneous records. I would consider the failure to enter this significant past history event and contemporaneous record to be a minor departure from the normal standard of care.

2.6 I consider the care provided by [Dr D] to [Mr A] to reach an appropriate standard of care.

2.7 I consider the handover of care by [Dr D] on the 20th [Month4] to be appropriate. I consider it reaches a suitable standard of care.

2.8 As noted in my previous report, there is no documentation of orthopaedic involvement at Consultant or Registrar level in [Mr A's] care after the 20th [Month4]. [Dr D] suggested this communication may have occurred verbally or by telephone.

2.9 The standard practice is for Orthopaedic inpatients to be visited on a daily basis by the Orthopaedic Registrar or Consultant. A contemporaneous note of this visit should be made in the patient's records. The absence of Orthopaedic involvement in [Mr A's] care after the 20th [Month4], or the failure to document orthopaedic involvement is a departure from the normal standard of care.

2.10 House Surgeons should have a low threshold for notifying on call orthopaedic staff of the deteriorating status of an inpatient. Documentation of the deterioration and the communication with a more senior staff should be made in the hospital records. In this instance it is unclear whether this communication occurred.

2.11 As I previously commented, [Mr A's] oliguric state and confusion on the 21st of [Month4] justified early referral for more senior medical staff involvement. This would include notification of the on call orthopaedic service. Early warning system protocols should involve notification of the senior orthopaedic medical staff involved with the patient's care.

2.12 On multiple occasions during [Mr A's] pre-assessment and hospital admission for elective knee surgery, there was a failure to document his significant past history of a bleeding peptic ulcer. Failure to access hospital records and document his past history and the contemporaneous record is a

departure from the normal standard of care. This departure is both an individual and a systemic level within the Hospital environment.

2.13 The current pre-assessment protocol recognises the need to identify and record significant past history events. The proposed electronic record will also aid in highlighting and identifying significant past history events.

Yours sincerely

Mr Denis Atkinson
ORTHOPAEDIC SURGEON"

Appendix B: Independent anaesthetist advice to the Commissioner

The following expert advice was obtained from a specialist anaesthetist, Andrew Love:

"1. My full name is Andrew James Love. I am a vocationally registered Anaesthetist. I live in Auckland.
2. I am currently a Consultant Anaesthetist at Waitemata District Health Board (WDHB), working at North Shore and Waitakere Hospitals.
3. I qualified in medicine in 1975 at the University of the Witwatersrand, Johannesburg, South Africa, trained in Anaesthesia at the University of Natal Medical School, Durban, South Africa, and finished my training as a specialist (vocationally registered) anaesthetist there in 1984. I immigrated to New Zealand in 1996 and was appointed to my current post at WDHB. I was admitted as a Fellow of the Australian and New Zealand College of Anaesthetists in November 2012.
4. Between 1998 and 2011 I was Head of the Department (HOD) of Anaesthesiology and Perioperative Medicine at Waitemata District Health Board (WDHB). WDHB is the largest DHB in New Zealand and has the second biggest obstetric service in the country. I was Clinical Director (CD) between 2003 and 2011. In 2011 I finished my rotation as Clinical Director. As CD I was involved in the investigation of critical incidents within our department and other hospitals.
5. Since I stepped down as Clinical Director, I have been involved at DHB level in investigating critical incidents, and reviewing incident reports, as a member of the WDHB Serious and Sentinel Events Committee.

You have asked a number of questions about the care of [Mr A]. The history of his admission and subsequent care is well covered in your letter and I will not repeat it here.

1. The standard and appropriateness of the pre-operative anaesthetic assessment and history taking of [Mr A].

    a. I have taken note of the following documents:

        i. The note made when a house officer saw [Mr A] for 'H/S clerking-Pre-op' on 6th [Month3].

        ii. A 'Preassessment patient questionnaire' dated 9 [Month1] and signed by [Mr A]. I have presumed that this was available to the house surgeon and [Dr E] at the consultation on 6 [Month3].

        iii. The anaesthetic record dated 18 [Month4], which includes a pre-anaesthetic assessment by [Dr E] dated 6 [Month3], and consent to anaesthesia form dated 19 [Month3] signed by [Mr A] and countersigned by a person whose signature appears to be '[signature]. The consent appears to have been completed during the admission on

the 19th [Month3] when surgery was postponed because of an open wound on his leg.

iv. [Dr E's] letter dated 17/7/14 where he outlines his assessment made on 6 [Month3].

v. [Dr C's] letter dated 13th July 2014.

vi. The file of notes labelled '2009 Admission (I)'.

vii. [Dr E's] letter dated 20th August 2015.

b. The relevant professional standard in 2012 was the ANZCA Policy document PS7 (1), particularly S 2.4 and S 3.3.

c. S 2.4 was complied with as the consultation took place some time before the day of surgery.

d. S 3.3 recommends an appropriate medical assessment.

e. [Dr E] provided a summary of his review in his letter dated 17/7/14. While he did not record an examination of the respiratory or cardiovascular systems in his note, the house officer has recorded this in his note, and I think [Dr E's] acceptance of the normal finding was appropriate.

f. It has been noted that [Mr A] ticked 'yes' to a history of ulcers. The word ulcer is in the same group with 'sores, boils' and [Mr A] had been suffering from recurrent ulcers on his left leg, and surgery was postponed 2 weeks later on the 19th [Month3] because of 'open wounds on his leg' and [Mr A] may have been referring to these ulcers rather than stomach ulcers.

g. [Mr A] ticked 'no' to all the questions with regard to dyspepsia on the following page.

h. [Dr C] notes in his letter that [Mr A] was a poor historian. It is probable that [Mr A] did not mention his episode of gastrointestinal bleeding.

i. [Mr A] had had multiple admissions to hospital. Even with the knowledge that the information was there, it was difficult to find reference to the episode in his 2008–2009 admissions, because of the volume of information. [Dr C] also noted he had not found a record of the bleed in the summaries he had received from the hospital.

j. In the document 'Patient Admission Details', in the final admission notes, the second and third pages list what appear to be coding of patient events. None of the 'Diagnosis Description' columns mentions a major upper GI bleed, although the line for [December 2008] notes 'UGI symptoms with no GE Spec'.

k. The fact that there was no record in the pre-anaesthetic notes of the previous upper gastrointestinal bleed was not as a result of a failure on the part of [Dr E] or [Dr F], the HO, but an understandable event given that the patient was a poor historian, did not mention the episode when questioned about previous anaesthetic complications, did not report any dyspeptic symptoms and the large volume of old notes.

2. The standard and appropriateness of the anaesthetist's assessment and care of [Mr A] on the day of surgery.

a. I have again taken note of the documents listed in 1a above and [Dr H's] letter dated 2nd December 2015.

b. She explains in detail her practice with regard to assessing patients, on the day of surgery, who have been seen by a specialist colleague in the pre-anaesthetic clinic.

c. [Dr H] made additions to [Dr E's] pre-anaesthetic assessment with regard to relevant new information (the haemoglobin and haematocrit levels), and added a femoral nerve block to the anaesthetic consent, which [Mr A] countersigned.

d. The standard against which practice is measured is ANZCA PS7, 2008.

e. Her practice was appropriate given the systems in place at the time, and the other limitations listed in section 2 above.

3. The standard and appropriateness of the anaesthetist care of [Mr A] once he had deteriorated and when he was transferred to ICU.

a. The standard of anaesthetic care when [Mr A] deteriorated.

i. I can only find one note with regard to anaesthetic care once he deteriorated which was written in retrospect by an unidentified HO at 20:40 on 23 [Month4], where the HO notes that a 'Dr [X]' was asked to place a CVL (central venous line) because of poor venous access (time not recorded). 'Dr [X]' requested a registrar referral, and an 'Ortho reg ([name])' was asked to request the CVL from anaesthesia. There is no record as to whether this request was made.

ii. The placement of a CVL has significant potential for morbidity. It is unclear whether any clinical information was passed to the anaesthetist. The reason for the request for a registrar referral is not documented, but in my experience it is often because the HO is unable to explain the indication and urgency for the CVL, as difficult venous access is not necessarily an indication.

iii. It is difficult to comment on the standard of care provided on the morning of the 23rd [Month4] between 08:00 and 12:00 as the

documentation is limited, and the written statements I have seen appear to relate to his care overnight, and not on the last morning.

b. The standard of care when [Mr A] was transferred to ICU.

i. From the notes it appears that the ICU staff responded promptly when called around 12:00, and urgently transferred [Mr A] to ICU.

ii. Although I am not an intensivist, the management of [Mr A] recorded in the notes appears to follow standard anaesthetic resuscitation practice for a patient with severe sepsis, shock, respiratory and renal failure.

4. The standard of the anaesthetist staff's documentation and communication with colleagues.

a. I understand this refers to anaesthetic documentation and communication on the morning of the 23rd [Month4].

b. I could not find anaesthetic documentation of the request for a central venous line. This is not unusual as these requests are often telephonic, although some departments have a form, which is faxed to the on call anaesthetist, or more recently an electronic referral, which is easily auditable. An electronic referral system was unlikely to have been in place in 2012.

5. The nature and appropriateness of the organisational structure in place at the time.

a. There were two parts of the organisational structure at the time, which were reviewed and changed as a result of the Root Cause Analysis.

b. Pre-operative screening form.

i. The pre-operative screening form was critically appraised and modified to reflect the learning from the event. Although this is not stated, this should include an ability to identify clearly patients with a past history of peptic ulcers (gastric or duodenal).

ii. I would agree with this approach, as the form in use at the time was liable to misinterpretation as the word 'ulcers' was in the same section as other skin conditions, but not in the section on upper gastrointestinal symptoms and disease.

c. The early warning score system.

i. The organisational structure at the time in relation to the response to the EWS (Early Warning Score?) was reviewed in the RCA report on incident 2278, which is filed after the letter from [the] CMO, and dated 22nd April 2014.

ii. A further version of the RCA report, as part of the letter dated 2nd September 2015 (P).

iii. The report suggested that the establishment of a Rapid Response Team was not supported by current evidence.

iv. I am not an intensivist, but I am aware of evidence that supports the efficacy of rapid response teams, sometimes called Medical Emergency Teams (MET) (2).

6. Anaesthetist interaction with the orthopaedic team and the medical team.

   a. Anaesthetic interaction with both the medical and orthopaedic teams appears to have been minimal (request for a CVL only) until the referral to ICU. I am thus not able to comment on the interactions.

Because of the complexity of the presentation of [Mr A's] final illness, the multiple medical and other health professionals involved in his care and the volume of documentation, this has been a particularly difficult review.

If I have not answered fully any of your questions, or missed relevant facts or opinions in the documents you provided, I would be happy to expand on my comments above.

Once I have answered any additional questions, I will mail you a signed paper copy of the report.

Yours sincerely

Andrew Love
MB, BCh, FFA, FANZCA.
Specialist Anaesthetist

References

1. ANZCA Policy document PS7 (2008), Recommendations for the Preanaesthesia Consultation.

2. Effectiveness of rapid response teams on rates of in-hospital cardiopulmonary arrest and mortality: A systematic review and meta-analysis. J Hosp Med, 2016 Feb 1. doi: 10.1002/jhm.2554. (Epub ahead of print)"

Appendix C: Independent physician advice to the Commissioner

The following expert advice was obtained from a consultant physician, Richard Shepherd:

"My name is Dr Richard Shepherd. I have been asked to provide an opinion to the Commissioner on case number 14/00134 regarding the care of [Mr A]. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

I am a Consultant General Physician employed full-time by the Waikato District Health Board. I graduated from Otago Medical School in 1997 with Bachelor of Medicine and Surgery (MBChB). I have attained fellowships with the Royal New Zealand College of Urgent Care, The Division of Rural Hospital Medicine and the Australasian College of Physicians. I have subspecialty interests in nephrology, emergency medicine and palliative care. I have completed the Postgraduate Diploma of Community Emergency Medicine and the Clinical Diploma in Palliative Medicine. I have previously been involved in auditing medical emergency response teams' outcomes and in facilitating simulation training around the deteriorating patient. I have no conflicts of interest to declare in this case.

I have been requested by the Commissioner to provide expert advice on the overall standard of care provided to [Mr A] during his admission to the public hospital [in 2012] including reference to the following issues:

1/ The overall standard and appropriateness of [the public hospital] Medical Team care provided to [Mr A].

2/ Whether in my view, given [Mr A's] post-operative condition and Early Warning Score (EWS), did appropriate escalation and senior staff involvement occur?

3/ The standard of medical team documentation and communication with orthopaedic and other colleagues.

4/ The nature and appropriateness of the medical team process in place at the time to manage a deteriorating patient.

For each of the above issues raised, my advice has been sought regarding:

a) What is the standard of care/accepted practice?

b) If there has been a departure from the standard of care or accepted practice, and how significant a departure it is in my view.

c) How would the departure be viewed by my professional peers?

d) General comments regarding systemic and general oversight concerns, and my opinion on the appropriateness of remedial actions taken by the MidCentral District Health Board as a result of this case.

There is a significant amount of documentation associated with this case.

Sources of information reviewed in the preparation of this report:

[Mr A's] [GP records] and [Dr C] (A)

HDC letter of notification dated 7 July 2014 (B)

Autopsy report (C)

[Dr D's] letter to Coroner, [December] 2012 (D)

[The CMO's] letters to Coroner, 21 August 2013, and 12 December 2013 (E)

[Mr A's] GP referral letter, 14 April 2011 (F)

MidCentral DHB Clinical Records, 2012 (G)

MidCentral DHB response to HDC dated 7 August 2014 (incorporating comments from [three Anaesthetist staff including Dr N, and Dr E]) (H)

MidCentral DHB Clinical Records, historical (I)

Response from [Dr E], dated 20 August 2015 (J)

Response from [Dr F], undated (received 28 August 2015) (K)

Response from [Dr G], dated 24 August 2015 (L)

Response from [Dr D], dated 1 September 2015 (M)

Response from [Dr K], dated 24 August 2015 (N)

Response from [Dr J], undated (received 3 August 2015) (O)

Response from MidCentral DHB incorporating comments from [Dr I] (P)

Overview:

On 18 [Month4] [Mr A] underwent elective total knee joint replacement surgery at the public hospital. He was then admitted to the ward from the Post Anaesthetic Care Unit. The surgery was described as uneventful however later [Mr A] deteriorated and [he died]. A subsequent postmortem identified the cause of death as a perforated gastric ulcer with associated peritonitis. The mechanism of death included sepsis, dehydration and electrolyte imbalance.

Much of the correspondence referenced and reviewed above appears to relate to the issue that clinicians did not document (at orthopaedic outpatient, anaesthetic assessments and hospital admission assessments), and may therefore not have been aware (until [Mr A's] deterioration), that he had previously suffered a severe acute gastrointestinal bleed. This was secondary to non steroidal anti-inflammatory drugs (NSAIDs — Indomethacin) during a previous hospital admission [2008/2009]. Whether this additional medical history was taken into account in terms of [Mr A's] care and treatment leading up to his deterioration is not specifically documented in the clinical record.

I have not been asked to provide expert advice surrounding such issues. This includes the prescribing of NSAID use in [Mr A's] circumstances (known or unknown at the time of prescribing), gastrointestinal protection guidelines or his pre-operative medical assessment and investigation. By request my expert opinion is therefore limited to the period of involvement of the medical team involved in [Mr A's] care. Due to their relevance the events surrounding the use and assessments made as part of the early warning score (EWS), the on-call evening and night surgical House Officers' assessments and their interaction with the medical team have also been considered and are summarised below. *(EWS — a number from 0 to 3 being ascribed to each patient observation of respiratory rate, level of consciousness, pulse rate, systolic blood pressure, urine output and temperature which is then totalled.)*

Review of this case is also complicated by the large number of retrospective entries contained in the medical record. Times of discussions were often not recorded. In addition many of the sequential apparently contemporaneous entries do not have a time documented. The sequence of interactions between the orthopaedic, medical, anaesthetic, general surgical and intensive care teams are therefore difficult to piece together.

Summary of clinical events surrounding the medical team's involvement:

[Mr A's] deviation from his uneventful post-operative recovery appears (in retrospect) to have begun on the morning nursing shift on 22 [Month4] post-op day 4. It was anticipated he would be discharged the following day. His behaviour was noted to 'seem spaced out', 'un-cooperative' and had 'blank moments' with 'inappropriate comments at times'. The first EWS activation was documented at 1630hrs with a score of 3. *(On the back of the early warning score sheet, there are instructions that should the score deteriorate to 3 the House Surgeon is to be paged to attend within 20 minutes. For a score of 6 or more the Registrar is to be paged to attend within 10 minutes and if unable to attend the consultant is to be contacted.)*

The urine output score was recorded at 0 which appears to conflict with the fluid balance chart from 22 [Month4] which records 'HNPU for the day' (abbreviation for 'has not passed urine') *(attracting a score of 3 in itself).* The confusion score is recorded as 0. Both the morning and evening nursing shift entries described [Mr A] in addition to the above as 'vague' and 'not following instructions' *(new confusion would attract a score in itself of 2) (An aggregate score of 8 (3+3+2) might therefore have resulted.)* The on-call House Officer [Dr I] was paged as a result of this first EWS activation.

A second EWS was activated at 1720hrs with a score of 3 to the same on-call House Officer. Phone advice to the nursing staff was documented as 'encourage to give laxatives and tramadol PRN'.

[Mr A] was reviewed by the on-call House Officer at 1740hrs 'asked to review for abdominal pain'. A history of previous peptic ulcer is documented with 'not taking omeprazole' recorded.

A physical examination was performed documenting deep epigastric tenderness but 'not a surgical abdomen' and an assessment made of 'abdominal pain likely secondary to gastritis'. A 'Stat' (once only) dose of gaviscon and omeprazole orally were prescribed and documented as given at 1730hrs. Urine output and the patient's cognitive state are not specifically noted in the doctor's notes though he was recorded as a vague historian in that entry.

A third EWS was activated at 2000hrs with a score of 4 to the same House Officer. Absence of urine output was documented as part of this EWS. The no urine output score calculated as 2 appears inconsistent with the EWS chart guideline score of 3 for no urine output.

[Mr A] was reviewed by the same on-call House Officer again at 2030hrs. 'Nurse concerned patient clammy'. The patient was recorded by the doctor as 'feels fine' with 'abdominal pain settling down'. On physical examination he was noted to be pale and clammy. BP was recorded as 95/52. A diagnosis of peptic ulcer was made and the patient's recent use of ibuprofen noted. There is no documentation regarding an acknowledgement of the urine output. No rectal examination was performed to check for malena. A plan was made to perform a number of blood tests, obtain IV access, give IV fluids, stop the ibuprofen and review [Mr A] when the results of the investigations were available.

The fourth EWS was activated at 2100hrs (score 4).

[Mr A] was reviewed a third time at 2110hrs by the same surgical House Officer. Results of bloods taken earlier were documented as 'creatinine 229, potassium 5.7, haemoglobin 110, CRP 323'. A diagnosis of acute renal impairment was made with a plan made to continue IV fluids, withhold nephrotoxins, repeat the creatinine in the morning and obtain an MSU. There is again no documentation relating to an assessment of the urine output.

A fifth EWS was activated at 2230hrs (score 4).

Further EWS activations were performed at 0100hrs (score 6), 0200hrs (score 3), and 0300hrs (score 4). These were documented on the observation chart as having been actioned by the nursing staff.

[Mr A] was reviewed by the night surgical House Surgeon [Dr J] at 0300hrs for an EWS score of 6. *(This appears to be in response to the 0100 hrs EWS activation documented.)*

He was noted to be feeling 'not too bad' but very clammy and was documented as 'has not passed urine for days'. Fluid balance charts for the 19th, 20th, and 21st periods are missing from the clinical record provided to me but nursing entries

over the above periods document 'HPU' (has passed urine). Bladder scan was recorded as showing 150mls with the printed time recorded as 23:15. [Dr J] has documented 'unwell patient ? cause, need to rule out bleed plus in acute renal failure'. Repeat blood tests were requested and the night Registrar contacted for review. Phone advice appears to have been given with 'for catheter' only documented.

An indwelling urinary catheter (IDC) was inserted at 0420hrs. 100mls was documented as obtained on the fluid balance chart. The doctor's procedural note records clear urine but no volume obtained is documented. Urine output following IDC insertion was documented on the fluid balance chart as 0mls per hour until 45mls was recorded at 0800hrs, decreasing to 0 to 5mls per hour until the patient's death.

Further EWS activations at 0500hrs (score 5), 0600hrs (score 6), 0900hrs (score 8), 0950hrs (score 7), 1100hrs (score 8), and 1155hrs (score 8) occurred. An EWS activation sticker is recorded in the clinical record for only the 0745hrs period documenting [a House Officer] was paged. In total 14 EWS scores were documented as having been actioned on the observation chart over the period 1630hrs 22 [Month4] to 1155hrs 23 [Month4].

[Mr A] was reviewed by [Dr J] surgical House Surgeon again at 0605hrs. At some stage between her 0300hrs review and 0605hrs review a portable chest Xray was requested by [Dr J] and performed. This was interpreted by [Dr J] as '? right middle lobe pneumonia and slight fluid overload'. A call to [Dr K] is documented as 'advised to stop fluids and give frusemide if BP ok'.

BP was noted to be 90/50 therefore 'not for frusemide' was documented. Further blood test results were reviewed. BNP *(a blood test to assess for heart failure/fluid overload)* was documented as 346 with further discussion with the registrar regarding this documented as 'BNP ok, to restart IV fluids'.

[Mr A] was reviewed by [Dr K] at 0625hrs. A brief note is documented. The entry does not document his position and is not signed. The reason for his review is not clearly stated. History was recorded 'as per [Dr J]'. No examination findings are recorded, no acknowledgement of the patient's vital signs including urine output, and no interpretation of [Mr A's] investigations to that point were documented. Problems were listed as 'acute renal failure secondary to NSAID plus pre renal', and 'sepsis likely secondary to lower respiratory tract infection'. A problem of bacteraemia appears to have been crossed out (this is not initialled as an error). Plans were documented for 'IV fluids 2 hourly' (no volume or specific fluid was recommended) with hourly urine outputs requested and IV ceftriaxone advised *(which was documented as given at 0430hrs in the nursing notes)*. The fluid balance chart appears to show that the IV fluids continued at 167mls per hour until the rate was increased at 0800hrs. Further plans were documented to 'repeat bloods mane including lactate'. An entry 'Will ask renal team or medical team' has been crossed out. This was not initialled or explained. A 4th very short entry

under the plan list is illegible and consequently I have not been able to interpret its meaning.

Nursing notes recorded at 0700hrs document [Mr A's] ongoing EWS score of 4–6 and ongoing review by the House Surgeon and Surgical Registrar. There does not however appear to be any surgical Registrar review documented in the clinical record up to this stage.

The next entry in the clinical record was by [a] House Officer. No time or his attached team is recorded. Some events to that time were briefly summarised. Documentation records 'called Medical B Registrar [Dr L]' who advised 'renal team will come'. The 'renal team' appear to have then been contacted and are documented as having advised that [Mr A] was for medical team input. A return call to [Dr L] appears to have been made with an acceptance that 'will come and review patient'.

A brief day 5 post-op entry was made at 0815hrs by a TI *(Trainee Intern — affiliated team is not recorded)* which documents [Mr A's] acute renal failure, epigastric pain and 'has not passed bowels or wind'. The plan documents for 'medical review' and an 'abdominal Xray if not passing bowel motion'.

[Mr A] was reviewed by a Medical Registrar 'TIA (for [Dr M])' documented at 0940hrs with detailed notes recorded. The entry is signed but I am unclear as to the name of the doctor concerned. Review for acute kidney injury and decreased urine output was identified. A current history was recorded together with a review of [Mr A's] background including an acknowledgement of [Mr A's] 'chronic peptic ulcer disease'. A detailed examination was recorded including an assessment of fluid balance. Investigation results were reviewed and results documented. A problem list was generated including: '1/ Severe left pneumonia — hospital acquired, abdominal distension contributing to shortness of breath. 2/ Acute kidney injury — secondary to pre renal/nephrotoxins, and probable acute tubular necrosis with a differential offered of acute interstitial nephritis secondary to NSAIDs. 3/ Possibly concomitant fluid overload.' A plan was made to continue IV fluids with bolus fluids given. The need for further large bore IV cannula was recorded with a request documented 'also preferably central venous access'. Ranitidine orally twice daily was prescribed but never actually given (at 1215hrs the medication chart documented not given — as nil by mouth since 0830). It is unclear from the notes if this was communicated back to the doctor. A broad spectrum antibiotic (Tazocin) was recommended to cover hospital acquired pneumonia (dose documented as not given until 1215hrs) and a number of additional investigations advised including urine sample for casts and white blood cells, blood cultures, sputum culture, further blood tests and an abdominal Xray. 'No indication to transfer at this moment but anticipate CCU/ICU involvement' was documented and plans 'to re-review shortly'.

A further review appears to have been performed with an entry time of 1200hrs 23 [Month4]. This appears to be by the same medical registrar and was documented as 'written retrospect'. It is unclear specifically what time this entry relates to. The

entry is signed but the doctor's name is not legible, has not been printed and is not identified together with their designation at the start of the entry. 'Rapid deterioration' was noted with [Mr A] 'exhausted' and requiring high volumes of oxygen ('15L of oxygen via non rebreather mask'). A repeat portable CXRay was identified as showing left sided opacification and ? free air under diaphragm. It is not clear from the records supplied what time this CXRay was repeated but it was reported by a Consultant Radiologist at 1236hrs in keeping with the assessment of the attending medical registrar. An assessment was made of 'intra abdominal event ? perforated peptic ulcer disease'. Continued stat IV fluids were recommended though specific orders regarding type of fluid, quantities or rates were not specifically documented.

The ICU registrar was documented as 'paged three times presumed busy (no reply)' The ICU consultant was then contacted and agreed to attend as soon as possible. A check blood glucose level was recorded as 1.2 with glucagon and IV 50% dextrose given.

A further Registrar entry was noted on 23 [Month4]. No time is recorded or the registrar's designation but it appears to have been signed as [signature] (later referred to as the Orthopaedic Registrar in a retrospective entry 2040hrs 23/04 by [the] House Officer). This acknowledges [Mr A's] care had been taken over by ICU and that this was discussed with the General Surgical Registrar. There does not appear to be a General Surgical Registrar entry in the clinical notes.

A retrospective entry was then documented in the clinical records at 1420hrs by the ICU consultant. The attending doctor's name is not recorded at the beginning of the entry, which is signed at its conclusion but not legible. [Mr A] appears to have been transferred to ICU at 1300hrs. His progress is documented together with the differential diagnosis and plans to intubate and stabilise [Mr A] and consider performing a CT scan. On arrival in the ICU persistent hypotension despite medications to maintain his BP (metaraminol and adrenaline boluses) was documented and a brief cardiac arrest with CPR performed for one minute occurred. He was intubated and invasive monitoring commenced with arterial line placement, central venous line placement and an adrenaline infusion commenced. Discussion between the attending ICU consultant and [an intensivist] was documented with 'to discontinue resuscitation' and 'now multi-organ failure' recorded. A retrospective entry [at 2130hrs] is recorded but is unsigned and the doctor's name and designation are not recorded. This documents discussion with [Dr M] (General Medical Consultant) who agrees to ICU input and that the Orthopaedic Registrar was paged and updated regarding [Mr A's] deterioration and ICU transfer. This appears to be the first documentation of senior medical advice or input being sought before ICU Consultant input.

A further retrospective entry at 2040hrs was documented by [the] House Officer. Discussion with the on-call anaesthetist 'for central line placement to secure venous access as patient peripherally shut down and only had one 20G cannula' was documented. This request was documented as refused by Dr [X] with a request for a Registrar referral for central venous line. This refusal and advice for

a Registrar referral was documented as discussed with [the] Orthopaedic Registrar at approximately 11:30hrs.

Advice to the Commissioner:

1/ The overall standard and appropriateness of [the] Medical Team care provided to [Mr A].

It is my considered view that the overall care provided to [Mr A] by [the medical team] was likely suboptimal. On balance the care provided by [Dr I] Evening Surgical House Officer likely just met the expected standard of a House Officer. The Care provided by [Dr J] Night House Officer likely met the expected standard of a House Officer. The care provided by [Dr K] Night Medical Registrar was likely suboptimal. The care provided by the second consulting Medical Registrar was likely suboptimal. The application of the EWS activation policy was likely suboptimal by the nursing staff.

This is a complex and multifactorial case with a large number of individuals involved. [Mr A's] deterioration was associated with a less than typical presentation of gastric ulcer perforation and peritonitis leading to sepsis and multi-organ failure. I believe making the correct diagnosis at an early enough stage to have altered the outcome would have been challenging for any clinician involved. Within this framework however I believe there are a number of areas where care could have been improved and the opportunities to have intervened in a meaningful way strengthened. These can be specifically broken down into a number of areas which are specifically detailed below. Whether more timely involvement of senior staff and earlier escalation of care would have altered [Mr A's] outcome is unknown.

2/ In my view, given [Mr A's] post operative condition and early warning score, did appropriate escalation and senior staff involvement occur?

In my considered opinion appropriate overall escalation and senior staff involvement did not occur. I would regard this as a moderate to serious departure from the expected standard of care. I believe such a departure would be similarly regarded by my professional peers. A reluctance of junior doctors to ask for senior advice has previously been identified as endemic in the New Zealand healthcare system (see case 05/11908).

In total there were 14 activations of the EWS score over the period of [Mr A's] deterioration. In my opinion [Dr I] (evening House Officer) did go some considerable distance towards identifying the correct diagnoses at an early stage. Given the potential seriousness of these it would have been appropriate to have informed his evening supervising Registrar to review the adequacy of his investigation and management plan. There is no documentation from [Dr I] to suggest this occurred. At this early stage of [Mr A's] deterioration I would regard this as a minor deviation from the expected standard for escalation to a more senior doctor. The subsequent change of shift to new junior doctors unfamiliar with [Mr A's] progress may have contributed to further delays in his case being

discussed at a consultant level. No handover process was documented but I would regard this as not entirely unusual. In my opinion adequate handover is unlikely to have occurred however based on the actions of the involved doctors from one shift to another, who from their documented notes appear to have reviewed [Mr A] with a clean slate with each new interaction.

[Dr J] the night House Officer did appropriately escalate her concerns to a more senior doctor (the night Medical Registrar [Dr K]) in a timely manner once she had assessed the patient and reached the conclusion [Mr A] was unwell at 0300hrs. I would consider this met the expected standard of care.

There is no documentation in the clinical record to suggest that [Dr K] escalated his concerns to his supervising Consultant or that [Mr A's] overnight review was discussed at the morning handover.

In his submission to the Commissioner dated 24/08/2015 [Dr K] acknowledges that [Mr A's] condition had deteriorated but that he considered ward based input prior to escalating care was appropriate. Had his documented diagnoses proved to be [Mr A's] only issues then initial ward based care may have been a reasonable course of action *(provided aggressive fluid resuscitation, monitoring of his response and close medical followup could be assured).* In my opinion that does not appear to have happened. The poor standard of his documentation makes an assessment of his clinical reasoning challenging. Had there been an appreciation that [Mr A] was likely suffering from a perforated gastric ulcer with early peritonitis then more aggressive intervention would certainly have been mandated. In either event, in my opinion [Mr A's] ongoing and significant deterioration to that point should have prompted a call to his supervising Consultant — if not at the time of his review at 0625hrs then certainly at the 0800hrs morning handover. I would consider this to be a moderate deviation from the expected standard of care.

An alternative view was also offered by [Dr K] in his submission to the Commissioner. Here he states that, whilst he was unable to recall, it would be usual practice for patients seen by the overnight medical registrar to be handed over at the morning medical meeting and seen by the medical consultant on their post-take round that day.

The second Medical Registrar review occurred at 0940hrs. By this stage there was the recognition that [Mr A's] condition had deteriorated to the point of being 'severe' and that invasive intervention was recommended in the form of a central venous line with CCU/ICU involvement documented as being anticipated. In my opinion, at this stage the supervising consultant should have absolutely been informed (or updated) on [Mr A's] condition. If they were not I would consider this to be a moderate to severe departure from the expected standard of care. From the documentation it appears no consultant senior medical involvement was sought until a discussion was recorded as occurring with [Dr M] Consultant Physician on the day of [Mr A's death]. This clinical record entry was documented as 'written in retrospect (from 2nd entry earlier)' and written at

2130hrs. It does not specifically document the time of the phone call. The entry is not signed and does not identify the individual who made the entry. In my opinion this is likely an entry from the second medical registrar with the discussion likely to have been around the time of the last medical registrar review (documented as written in retrospect and at 1200hrs.) This entry does however include reference to severe hypoglycaemia with a blood glucose of 1.2 with glucagon and 50% dextrose being given. From the medication chart these appear to have been administered from 1250hrs (making rationalising these documented times difficult). By this stage [Mr A's] deterioration had reached the threshold of requiring intensive care unit input. The timing of consultant ICU review is also unclear but by 1300hrs [Mr A] was in the intensive care unit and had been given vasopressors.

[Mr A] was never seen by a consultant physician with phone advice given by [Dr M] that she was happy for ICU input. In my opinion, by this very late stage the most appropriate course of action was indeed for intensive care treatment and consultant physician direct clinical review prior to ICU contact would have likely led to even more delays.

Regardless of the exact time of the final medical Registrar review, given the circumstances in my opinion there does not appear to have been adequate communication with senior colleagues at an early enough stage.

With respect to the EWS, in my opinion the calculation of many of the particularly early EWS scores were inaccurate due to failure to consider the absent urine output and potentially [Mr A's] confusion. Aggregate underscoring is likely to have resulted. Consequently a score of 6 or above was not attained at the outset of EWS activation when it might otherwise have triggered a request for Registrar attendance earlier in [Mr A's] deterioration. This policy also advises immediate Consultant contact if the Registrar is unable to attend within 10 minutes. When a score of 6 was however activated at 0100hrs the protocol was not followed to request Registrar review within 10 minutes. Review 2 hours later by the on-call House Officer occurred. Similar circumstances appear to have recurrently occurred over subsequent EWS activations despite scores of 8 on the morning of 23 [Month4] and apparent delays in excess of 10 minutes of attending Registrars. The management of patients in such circumstances should be regarded as a team effort with an expectation that nursing staff feel empowered to seek senior doctor review when the junior medical staff are seen to be struggling. In essence the default safety thresholds inherent in a protocol based EWS system appear to have been circumvented. Had these been followed senior medical notification would have occurred at an early stage in [Mr A's] deterioration. That said, recurrent review by attending junior doctors still occurred within a not entirely unreasonable timeframe over a weekend night shift and Monday morning. Clinical records do not always reflect every brief return for review. Much of the correct diagnosis was in fact identified on review by the on call Surgical House Officer at 2030hrs and 2110hrs 22 [Month4] but this appears to have been lost sight of at subsequent reviews and handovers (if these occurred). There were still many potential opportunities to intervene more appropriately even if the EWS was not followed

to the letter. In my opinion there was a lack of appreciation of [Mr A's] ongoing deterioration which occurred over a period of some 20 hours beginning from 1630hrs 22 [Month4] to approaching critical deterioration by 1200hrs 23 [Month4]. Whilst ultimately a matter of judgement by the attending junior medical staff I consider the failure of [Mr A] to improve despite treatment, the complexity of his case and his recurrent increasing EWS scores should have mandated the seeking of senior advice at a much earlier stage.

3/ The standard of medical team documentation and communication with the orthopaedic and other colleagues.

In my opinion documentation by [Dr I] and [Dr J] met the expected standard of a House Officer.

In my considered opinion the documentation provided by [Dr K] falls below the expected standard. The absence of many important and expected details have been described above in the objective findings relating to [Dr K's] period of involvement. This can be contrasted with the documentation by the attending Medical Registrar at 0940hrs which meets the expected standard. I would regard this as a moderate to severe departure from the expected standard especially given [Dr K] was the first doctor in a role above House Officer to review [Mr A]. Shortcuts in documentation do at times have to be made due to competing clinical demands. Repeating clinical information recently recorded by other attending doctors is not always necessary and statements such as 'history as per [Dr J]' (the referring House Officer) can be a reasonable course of action. Poor documentation relating to complete absence of physical examination findings, investigation interpretation, the lack of explained clinical reasoning and a cursory problem list however creates doubt as to the provision of adequate care and attention to detail.

A limited meaningful outcome to [Mr A's] care resulted following [Dr K's] medical consultation. The IV fluid recommendations were not actioned until 0800hrs, and the ceftriaxone antibiotic had already been given at 0430hrs. No follow-up plans, meaningful further investigation recommendations or guidance to the orthopaedic team were documented.

In [Dr K's] submission to the Commissioner he offers a differing opinion. I would question the appropriateness of his deferred decision making where he states he was of 'the understanding that the morning team would review [Mr A] with the additional information [repeat blood tests] to assist in further decisions'.

The referring orthopaedic doctor's concerns of 'need to rule out bleed' also do not appear to have been addressed. This could raise questions regarding communication and attention to detail. From the documentation provided by [Dr K] it is not certain if any actual clinical interaction with [Mr A] occurred or a chart review only occurred. The timeliness of [Dr K's] review could also be questioned given [Mr A's] EWS scores over this period. His review did not occur until 0625hrs with his earlier phone advice (to stop IV fluids and give frusemide) in my opinion being inappropriate in the circumstances.

Further Medical Registrar review at 0940hrs occurred. In my opinion this meets the expected standard of documentation. The underlying correct diagnosis was ultimately not reached at that stage but with [Mr A's] ongoing deterioration things had become more complex and clouded than earlier assessments when aspects of the correct diagnosis had been entertained. The identification of his acute kidney injury and diagnosis of pneumonia appears to have distracted the attending doctors from further consideration of the underlying pathology.

4/ The nature and appropriateness of the medical team process in place at the time to manage a deteriorating patient.

I am unaware of any formally documented medical team processes that were in place at the public hospital to manage a deteriorating patient at the time of [Mr A's] care. No such documentation has been supplied to me.

[Dr K's] submission to the Commissioner sets out his understanding of the procedures and policy in place governing action to be taken in the event of a deteriorating patient. From his understanding this appears to be limited to a handover process at the change of shift.

There does appear to have been some confusion from junior staff regarding referral processes to the medical team versus the renal team and to the on call anaesthetist. This is not uncommon in complex hospitals with subspecialty services, and is often a process of discussion and negotiation between involved individuals, where guidelines cannot account for every nuance of a patient's circumstances. Delays in review can consequently occur. In my opinion this referral process did not significantly impact on [Mr A's] care and can be separated from any escalation of care issues.

5/ General comment regarding systemic and general oversight concerns and my opinion on the appropriateness of remedial actions taken by the MidCentral District Health Board as a result of this case.

As presented there appears to have been a significant pattern of reluctance to seek senior doctor advice throughout the management of [Mr A's] deterioration. This was a team effort. In my opinion this began with nursing staff not following hospital EWS policy of appropriate activation and notification, through to the different junior medical staff that were involved who did not seek senior input. Given the numbers of staff involved, many of whom practised in a similar manner, systemic root causes need to be considered. Direct clinical oversight particularly over weekends and nightshifts will always be a challenge with senior staff relying on the judgement of junior staff on when it is appropriate to seek guidance. Factors such as organisational culture, perceived approachability of senior staff and junior staff awareness of any delegated authority policy can all be influencing factors. Safety 'check points' such as the EWS which allow for a protocol driven backup outside of individuals' judgement should be well understood by clinical staff using such tools and not circumvented. Factors such as adequate staff orientation to such procedures and policies, specific inservice training and even

simulation training around the deteriorating patient may have the potential to highlight such issues.

From the MidCentral District Health Board Action Plan for Implementation of Recommendations relating to [Mr A], recommendation 2, 3 and 4 appear to be the most relevant to the above question.

Recommendation 2 relating to a deteriorating patient.

It is unclear from this documentation what measures have been taken at this stage to improve the timely assessment of a deteriorating patient. I note consideration to establishing a 'rapid response team' was considered and ultimately dismissed on the basis of 'the evidence for such an approach is not supportive …'.

From the evidence supplied to me I am unclear how this has been addressed by MidCentral Health.

Of concern remains the situation that potentially the most inexperienced medical staff are placed in a position of being asked to see the deteriorating and sickest patients in the hospital. This may often be in isolation, outside regular hours when staffing numbers are reduced, and without the onsite direct clinical supervision of their seniors. This can be a distressing experience with significant long term impacts for the doctors concerned when things go wrong. Inexperienced medical staff often do not know what they do not know. Errors are consequently common. An adequate systemic approach in my opinion needs to be in place to support these developing clinicians and to enhance patient safety.

Recommendation 3 relating to referral mechanisms.

Following review it has been stated by MidCentral Health that referral mechanisms to general medicine have been reviewed and found to be functioning well.

In [Mr A's] case the specific referral from the orthopaedic to the medical team did appear to function adequately and in my opinion was not a significant area of concern.

Recommendation 4 relating to Clinical Records.

I would support [Dr D's] final further comments in his letter to the Commissioner 1/09/2015 where he highlights that current paper based medical records are not easy to peruse for relevant important information and alerts, particularly when many patients' records run into many volumes. Much of the documentation from the doctors involved early on in this case is essentially around them being potentially unaware of such important information.

It is not clear to me from the documentation in recommendation 4 that enough has been done to improve this issue from a practical standpoint, in a busy clinical environment, across all potential areas of patient interaction — not just prior to surgery. This opportunity to improve patient safety should not be missed. In the

absence of an adequate electronic medical record alert system my own institution has implemented a front alert sheet which must always sit at the very front of every patient's current volume of notes. This can include things such as drug allergies, medication intolerances (such as NSAIDs related gastrointestinal haemorrhage), anticoagulant use or caution renal impairment, as examples. I am unaware if something similar is now in place at MidCentral Health.

Yours Sincerely

Dr Richard Shepherd
Consultant Physician General Medicine
Waikato District Health Board
MBChB FRACP"