Capital and Coast District Health Board

A Report by the

Health and Disability Commissioner

(Case 11HDC00532)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

Background

1. On a Thursday in 2010, Mrs A presented to the Emergency Department (ED) at a public hospital with pain in her hip. She was initially diagnosed with musculoskeletal pain. It was noted that Mrs A had been taking roxithromycin in the community, but this medication was not reconciled and she missed two doses.

2. There was a delay of 11 hours before Mrs A was reviewed by the medical team. At 1.15pm on Friday the medical consultant reviewed Mrs A and agreed with the diagnosis of soft tissue injury.

3. Mrs A's temperature and respiratory rate increased. At 2.20pm a medical house officer, Dr H, identified the possibility of septic arthritis. Dr H contacted the orthopaedic team, who were too busy to review Mrs A and recommended an ultrasound and an ultrasound-guided aspiration.

4. Dr H contacted a radiology registrar, who recommended other sources of infection be excluded before radiological investigations were undertaken, which Dr H did. At 5pm, the radiology registrar performed the ultrasound, but did not perform the aspiration. Dr H then contacted orthopaedics, who were still too busy to review Mrs A.

5. During handover for the weekend, inadequate information about Mrs A was passed between outgoing and incoming doctors.

6. At 10.10pm on Friday, the medical team again contacted the orthopaedic team, who were still too busy to review Mrs A. The orthopaedic registrar, Dr L, recommended that the medical team contact radiology to request an ultrasound-guided aspiration or an MRI.[1] Dr L advised delaying administration of intravenous (IV) antibiotics until further radiological investigations had been undertaken.

7. Due to a series of delays and miscommunications between the orthopaedic and medical teams, an aspiration was never performed, and IV antibiotics were not commenced until 5pm on Saturday. Orthopaedic review did not occur until 8am on Sunday, after which time a decision was made to provide Mrs A with palliative care only. Mrs A passed away around a week later.

Commissioner's findings

8. There were a number of failures that led to Mrs A receiving suboptimal care and treatment at the hospital. While individual health professionals must take some responsibility for the failures that occurred, the failures were largely a result of broader, systems issues at the hospital.

[1] Magnetic resonance imaging (a diagnostic technique used to visualise internal structures of the body).

9. Capital and Coast District Health Board (the DHB) breached Right 4(1)[2] of the Code of Health and Disability Services Consumers' Rights (the Code) for failing to undertake a timely orthopaedic review of Mrs A, failing to undertake an ultrasound-guided aspiration, and failing to provide Mrs A with appropriate antibiotic treatment in a timely manner.

10. The DHB also breached Right 4(5)[3] of the Code, for failures within the medical team to communicate Mrs A's condition to one another, failures between the medical and orthopaedic teams to communicate Mrs A's condition to each other, and the lack of clarity regarding the process for requesting an ultrasound-guided aspiration.

Complaint and investigation

11. The Commissioner received a complaint from Ms B about the services provided by Capital and Coast District Health Board to her mother, Mrs A. The following issue was identified for investigation:

- *Whether Capital and Coast DHB provided Mrs A with an appropriate standard of care in 2010.*

12. Relevant information was received from:

Ms B	Mrs A's daughter, complainant
Mr C	Mrs A's son
Mr D	Mrs A's son
A medical centre	provider
Dr E	General practitioner
The ambulance service	Provider
Capital and Coast DHB	Provider
Dr F	ED senior house officer
Dr G	Medical consultant
Dr H	Medical house officer
Dr I	Orthopaedic senior house officer
Dr J	Radiology registrar
Dr K	Consultant radiologist
Dr L	Orthopaedic registrar
Dr M	Medical house surgeon
Dr N	Medical registrar
Dr O	Medical consultant
Dr P	Medical consultant
Dr Q	Orthopaedic registrar

[2] Right 4(1) of the Code states that "[e]very consumer has the right to have services provided with reasonable care and skill".
[3] Right 4(5) of the Code states that "[e]very consumer has the right to co-operation among providers to ensure quality and continuity of services".

Dr R	Medical house officer
Dr S	Orthopaedic consultant
Dr T	Medical house officer
Dr U	Sub-specialties registrar
Dr V	Orthopaedic registrar
Dr W	Medical registrar
Dr W	Medical registrar
Dr Y	Executive director (clinical)

13. Also mentioned in this report:

Dr Z	General practitioner
Dr AA	General practitioner
Dr BB	Dermatologist
Dr CC	Medical registrar
Dr DD	Sub-specialties registrar
Ms EE	Pharmacist
Dr FF	Medical registrar
Dr GG	Microbiologist

14. Independent expert advice was obtained from an orthopaedic consultant, Dr Garnet Tregonning (Appendix A), and a general physician and geriatrician, Dr David Spriggs (Appendix B).

Information gathered during investigation

Introduction

15. This report is about the care provided to Mrs A (aged 88 years) at a public hospital in 2010. Mrs A was admitted with hip pain, and a diagnosis of septic arthritis was considered. After a series of delays in appropriate reviews and investigations, Mrs A died of multi-organ failure secondary to staphylococcal septicaemia.

16. The following symptoms of sepsis[4] and septic arthritis[5] are relevant in assessing the facts gathered during the investigation:

Sepsis:[6]

- Chills

[4] Sepsis is the systemic inflammatory response to infection caused by any class of microorganisms, with the invasion of these microorganisms or their toxins in the bloodstream causing illness. Sepsis may be graded as mild, moderate or severe according to the associated damage or failure of organ(s). When sepsis causes shock, this situation is defined as septic shock.
[5] Septic arthritis is the inflammation of a joint due to a bacterial or fungal infection. It is also referred to in this report as "joint sepsis".
[6] http://www.nlm.nih.gov/medlineplus/ency/article/000666.htm.

- Confusion or delirium
- Fever or low body temperature (hypothermia)
- Light-headedness owing to low blood pressure
- Rapid heartbeat
- Shaking
- Skin rash
- Warm skin

Septic arthritis:[7]

- Inability to move the limb with the infected joint (pseudoparalysis)
- Intense joint pain
- Joint swelling
- Joint redness
- Low fever

17. A diagnosis of septic arthritis is normally confirmed by aspiration of the infected joint for microscopy and culture.

Relevant medical history

18. Mrs A's relevant medical history included recent persistent left lower lobe pneumonia, atrial fibrillation,[8] chronic heart failure, osteoporosis, gout,[9] hypothyroidism, acute on chronic renal failure, and cellulitis on both legs. In February 2010 Mrs A had broken her right hip, which was repaired with a screw and plate. Later in 2010, Mrs A had fractured her right arm, which was placed in a cast.

Use of antibiotics prior to hospital admission

19. The same month that Mrs A fractured her right arm, she was seen by a GP, as she was experiencing fevers and rigours. She was prescribed a 14-day course of antibiotics (roxithromycin and amoxicillin clavulanate), and the prescription was dispensed at her local community pharmacy that day. The day after she saw the GP, Mrs A was admitted to the hospital with pneumonia, but was discharged the next day.

20. A month later, GP Dr E, had a phone conversation with Mrs A's son, Mr C, as Mrs A had a night cough. Dr E prescribed Mrs A a 14-day course of antibiotics (roxithromycin) over the phone, with instructions for her to take them if her cough worsened.

21. Three days later, a dermatologist, Dr BB, removed skin lesions from Mrs A's left cheek and scalp at the hospital.

22. Two days later Mrs A saw GP Dr Z at the medical centre, as her cheek lesion appeared to be infected. Dr Z prescribed antibiotics (flucloxacillin and Foban ointment). At 8.30pm GP Dr AA (also from the medical centre) visited Mrs A at

[7] http://www.nlm.nih.gov/medlineplus/ency/article/000430.htm.
[8] Irregular heartbeat.
[9] Acute inflammatory arthritis, which presents as red, tender, hot, swollen joints.

home. Dr AA noted that Mrs A had vomited that afternoon after taking flucloxacillin, and had previously vomited after taking flucloxacillin and erythromycin (another antibiotic). Mrs A had a raised temperature of 38.8°C[10] and some redness below her left eye and on her legs, where she had previously had cellulitis.[11] Dr AA advised Mrs A to stop taking flucloxacillin and start taking the roxithromycin she had been prescribed earlier.

23. The next day a medical centre practice nurse telephoned Mrs A's home and was told by Mrs A's son that she was tolerating roxithromycin, there had been no further vomiting, the cheek lesion showed slight improvement, and her leg was not worsening.

24. The following evening (a Tuesday), Mrs A was trying to stand up from an armchair when she twisted and felt pain in her right pelvis and groin. She was unable to weight bear and the pain became increasingly worse.

Thursday

Ambulance

25. Two days later, at 2.41pm on Thursday, Mrs A's family called an ambulance. The ambulance officers' patient report form included "[nil] nausea/vomiting". Mrs A's skin was noted to be warm but no temperature was recorded.[12] Mrs A was given pain relief (morphine and ketamine) and anti-nausea medication (metoclopramide) to counteract the effects of the pain relief.[13] The ambulance crew documented her current medications, including roxithromycin. By 3.42pm Mrs A was on her way to the Emergency Department (ED) at the hospital.

Emergency Department

26. At 3.50pm the ambulance arrived at ED. At 3.58pm Mrs A was triaged as Code 4 (to be seen by a doctor within one hour). At 4.23pm Mrs A had a hip X-ray, which showed no new fractures. At 4.53pm her temperature was 38°C, but this went down over the next few hours.

Initial assessment — senior emergency house officer Dr F

27. At 5.04pm Mrs A was seen by senior house officer Dr F.[14] Dr F has little recollection of this initial assessment but advised HDC that he believes he would have read the ambulance officers' patient report form.

28. Mrs A's daughter, Ms B, recalls that she told the ED doctor that her mother had an infection on her face following surgery to remove skin lesions, and she was being

[10] A normal temperature is around 37°C.
[11] A bacterial infection of the skin/tissues beneath the skin. Ms B told HDC that her mother was prone to developing this on her legs but does not recall her having any on the day she was admitted to hospital.
[12] An ambulance officer advised HDC that had Mrs A's skin been hot to touch, she would have taken her temperature.
[13] The DHB advised HDC that morphine and ketamine can mask the signs and symptoms of sepsis, including decreased heart and respiratory rates.
[14] Dr F had two years' experience at the time of these events.

treated with roxithromycin. Dr F recorded in the ED clinical record that Mrs A had been prescribed roxithromycin, but queried whether this was in relation to a recent upper or lower respiratory tract infection. Dr F advised HDC that his documentation indicates that he had not been clear about the prescribed purpose of the roxithromycin and did not take any steps to clarify the issue.

29. Dr F recorded a list of Mrs A's medications in the ED clinical record (Ms B advised that those medications were brought to the ED), but did not include roxithromycin. Dr F advised HDC that he assumed the admitting medical doctor would note his reference to roxithromycin in the notes and include roxithromycin on the medication chart.

30. Ms B and her brother, Mr C, recall Ms B telling the ED doctor about their mother's spiking temperatures and vomiting. Dr F did not document a history of spiking temperatures but did note in the ED clinical records, under "drug allergy", vomiting in relation to flucloxacillin. Dr F advised HDC that the 4.53pm temperature of 38°C was taken around the time that he first saw Mrs A, and it may not have been on the system. He acknowledged that he should have reviewed Mrs A's temperature at this time.

31. Ms B said that the ED doctor kept insisting that her mother had fallen. However, Dr F advised HDC that he did not simply assume Mrs A's symptoms to be musculoskeletal pain[15] and had documented in the ED clinical record, "Twisting last night — felt twinge in upper right leg" and "Nil [history] of fall, other trauma", indicating his consideration of differential diagnoses.

32. Dr F advised HDC that, at that time, Mrs A had no palpable tenderness in her groin and had a full range of movement, albeit with pain. Overall, Dr F's impression (as recorded in the ED clinical record) was "[m]usculoskeletal pain requiring large amounts of analgesia and unable to mobilize". Dr F requested Mrs A be transferred to the medical ward, and requested blood tests (including full blood count and C-reactive protein[16]) and pain relief as required.

33. At some point between 5.04pm and 5.36pm Dr F left Mrs A to attend a handover meeting.

34. At 6.09pm Dr F copied the clinical record, clinical history, and medications from Mrs A's previous admission to hospital into the ED clinical record. This included her previous diagnoses of pneumonia and "new" atrial fibrillation, as well as medication that had since been stopped. Dr F advised HDC that it was his normal practice to copy and paste that information where a patient had been recently discharged, with careful review and correction of it to ensure accuracy of the information. He accepted that he

[15] Pain that can result from trauma, "wear and tear", postural strain, repetitive movements, overuse, and prolonged immobilisation.

[16] C-reactive protein is a non-specific test for inflammation (eg, from tissue injury or infection). The normal range is below 10mg/L but increases with age. The result of the test was 25mg/L, which is consistent with mild inflammation (10–40mg/L).

did not undertake a careful review on this occasion, and apologised for this oversight.[17]

35. At 6.14pm a nurse took the blood tests requested by Dr F and requested a hospital bed. The hospital bed was provided at 9.50pm; however, Mrs A remained in ED.

Review by medical registrar delayed

36. At 6.14pm, 7.35pm, 9.50pm and 11.23pm that night, ED nurses documented in the ED clinical record that Mrs A was still awaiting medical review. At 11.33pm an ED nurse informed an ED registrar that Mrs A had not been reviewed by a medical registrar.

Friday

Medical registrar assessment — Dr CC

37. At 12.11am on Friday, medical registrar Dr CC reviewed Mrs A in ED. In the ED clinical record Dr CC recorded Mrs A's previous medical history, her current medications (except roxithromycin), and that she was afebrile. Dr CC also noted, "Hip pain following twisting injury in frail elderly lady — no evidence of new fracture", and her plan to admit Mrs A to the medical ward, to continue with her current medications and analgesia, and to obtain multidisciplinary team input and further imaging if Mrs A's pain and mobility did not improve.

Medical ward

38. At 3.30am Mrs A was transferred from ED to the medical ward.[18]

Medication reconciliation — Ms EE

39. At 11am pharmacist Ms EE visited Mrs A and conducted a medication reconciliation,[19] by requesting information from Mrs A and her community pharmacy. Roxithromycin was written down on the medication reconciliation form and then crossed out. The DHB was unable to advise HDC why this occurred. Ms B was with her mother when the hospital pharmacist visited, but does not recall a discussion about roxithromycin.

Roxithromycin charted — medical house officer Dr H

40. At around 12pm Ms B told a nurse that her mother was taking an antibiotic for "infection of her lesions on face [and] leg". Medical house officer Dr H[20] subsequently charted roxithromycin for 8am and 6pm each day, but did not document the time he made this entry. No roxithromycin was administered to Mrs A at that time.

[17] Dr F has since reviewed and made changes to his practice in this regard.
[18] Mrs A was in the ED for over 11 hours. The national target is that 95 percent of patients will be admitted, discharged, or transferred from an ED within six hours. In this quarter, Capital and Coast DHB was the lowest performing DHB, achieving only 76% for this target.
[19] A process to collect, compare, and communicate the most accurate list of medicines a patient is taking, together with details of any allergies and/or adverse drug reactions, with the goal of providing correct medicines for a given time period at all transition points (eg, admission and discharge).
[20] Dr H had two years' experience at the time of these events.

41. Dr H advised HDC that he was extremely busy at that time because there had been a large number of acute patients admitted the night before, and a number of those patients were particularly complicated or quite unwell.[21] Dr H said that he was the only house officer for Team B[22] that day. The DHB was unable to confirm whether this was correct, but advised HDC that the remainder of the team members were all present that day, so there would have been reasonable cover.

Medical consultant assessment — Dr G

42. At 1.15pm consultant physician Dr G reviewed Mrs A on the ward round. Dr H was present and documented the progress notes. Dr G advised HDC that there were 13 new patients that morning, which was why she did not review Mrs A until 1.15pm. Dr G said that, due to the time that has elapsed, she has limited recall of this initial assessment of Mrs A.

43. Dr G does recall seeing Mrs A's facial lesions, but does not recall any discussion about infection or antibiotics. Dr G does not recall Mrs A or her son telling her about vomiting and fevers (despite her practice always to ask family whether there is anything else they would like addressed), and noted that those symptoms had not been documented as part of Mrs A's history on presentation by any of the other practitioners who had assessed Mrs A up until this point.[23]

44. After discussing the onset of Mrs A's pain and noting that there was no evidence of a fracture, Dr G recalls being reassured by the results of Mrs A's blood tests, which she said showed a normal white blood count[24] and C-reactive protein. Dr G also recalls reading that Mrs A had had a temperature spike in ED the preceding day, but that her temperature had been normal since then. Dr G does not recall reading that Mrs A had a temperature of 37.8°C at 11.50am that morning, and advised HDC that "sometimes morning recordings are not added to the chart by nursing staff until sometime after they are taken".

45. Dr G's impression was that Mrs A had a soft tissue injury of her right hip. The plan was to keep her in hospital over the weekend and cautiously mobilise her with physiotherapist input. If she continued to have "++ pain" then further imaging could be required. Mrs A's pain was to be reviewed the next day.

[21] The DHB provided daily bed occupancy and discharge data across the medical wards for the relevant month in both 2009 and 2010. The numbers were similar across the second week of the month for both years. The DHB explained that the patient lists utilised at handover to organise tasks and priorities are disposed of after the weekend, so it is unable to state how many patients were assigned to each individual doctor.

[22] There are four medical teams, A to D, comprised of registrars and house officers.

[23] The ED clinical records dated [Thursday] did identify Mrs A vomiting in relation to flucloxacillin.

[24] The full blood count showed a normal white cell count of 9.57x109cells/L (normal range 4x109cells/L to 11x109cells/L) but raised monocytes of 1.56x109cells/L (normal range 0.2x109cells/L to 1x109cells/L). Monocytes play multiple roles in the immune system and can indicate infection or inflammation.

Dr H's initial contact with orthopaedics — Dr I

46. At 2.20pm Mrs A's temperature was 38.2°C, her heart rate was 76 beats per minute,[25] her respiratory rate was 21 breaths per minute,[26] and she was alert. A nurse paged Dr H. Dr H confirmed receiving this call, and advised HDC that he considered the possibility of septic arthritis at that point. He said that he therefore contacted the on-call orthopaedic senior house officer, Dr I.

47. No conversation between Drs H and I was documented. According to Dr H, Dr I said that he was busy reviewing patients in ED and would not be able to attend immediately,[27] and recommended that Dr H ask a radiology registrar to perform an ultrasound of the hip joint and possibly take an aspiration at the same time. Dr H recalls that Dr I said he would try to review Mrs A later that afternoon and, if he could not, he would ask the evening on-call orthopaedic registrar to review her.

48. Dr I advised HDC that he does not recall Mrs A's case.

Dr H's initial contact with radiology

49. Dr H advised HDC that, following the above discussion with Dr I, he called a radiology registrar. Again, no such conversation was documented. According to Dr H, the radiology registrar was reluctant to perform the ultrasound and aspiration because Mrs A had not been seen by an orthopaedic registrar, and asked Dr H to exclude other causes of fever by way of a urine dipstick and chest X-ray before the ultrasound and aspiration were performed.

50. At 2.45pm Dr H called a nurse and requested a urine dipstick and chest X-ray. The urine test showed no significantly abnormal results but the chest X-ray showed a possible infection of the left lower lobe of Mrs A's lung. Dr H said that he was unable to take a full blood count and blood cultures as he was the only house officer on duty for his team and was extremely busy.

Pre-weekend handover meeting — medical team

51. At around 3.30pm there was a pre-weekend handover meeting for the medical team.

52. Dr G advised HDC that there is generally not a separate consultant-to-consultant handover, as this is covered in the 3.30pm meeting. She also advised that, due to significantly reduced staffing levels at weekends, only newly admitted patients since the ward round that morning, those patients identified for review at the pre-weekend handover, or those patients about whom nursing staff were concerned, would be seen during weekend consultant-led ward rounds. At the time of the pre-weekend handover meeting, Mrs A did not meet the criteria.

Patient at Risk (PAR) Protocol

53. The hospital uses a Patient at Risk (PAR) protocol, which scores a patient's respiratory rate, heart rate, systolic blood pressure, level of consciousness, and urine

[25] The normal range is 51–100 beats per minute.
[26] The normal range is 9–14 breaths per minute.
[27] The DHB explained that Dr I was rostered to work in an outpatient clinic, but would also have been expected to attend to other duties concurrently.

output. A high score can trigger more frequent observations, interventions, referral to the PAR nursing team, or emergency intervention. Each observation is scored as 0 when it is within the normal range, and up to 3 when it is outside the normal range (see **Appendix C** for a chart showing how each parameter is scored). Temperature is not included in the score, although it is recorded on the same observation chart. When a patient's total PAR score reaches the threshold of 3 or above, the charge nurse must be notified and the PAR nurse paged (between 9.30pm and 8am the house surgeon can alternatively be paged). When a patient's PAR score is 5 or above (irrespective of the time of day) the house surgeon must be paged and should respond within 15 minutes.

54. At 4pm Mrs A's temperature was 38.5–39.0°C, her respiratory rate was 20 breaths per minute (PAR score 2), and her heart rate was 105 beats per minute (PAR score 1). A nurse calculated Mrs A's PAR score as 3 but documented "N" in relation to referral to the PAR team. It is not clear whether the charge nurse and PAR team were contacted because no records were made in the progress notes at this time.

Radiology (ultrasound) — Dr J

55. At 4.57pm, having received Mrs A's urine dipstick and chest X-ray results, radiology registrar Dr J performed an ultrasound (under the supervision of consultant radiologist Dr K). The results were recorded in Mrs A's progress notes as follows:

> "Probably small amount of fluid adjacent to the proximal right femur
> 7mm x 16mm x 7mm.
> No fluid within the hip joint.
> The cause for this is uncertain and include[s] fluid secondary to her osteoarthritis, an occult fracture or septic arthritis."

56. No aspiration was taken. Dr J recommended an orthopaedic review prior to further imaging/radiology intervention. She advised HDC:

> "It is usual practice for patients with a possible septic arthritis to be reviewed by orthopaedics prior to radiology performing diagnostic aspiration of a joint in order to ensure this is the correct investigation in the overall clinical context. In most cases a diagnostic aspiration is done under fluoroscopic rather than ultrasound guidance. Aspiration, when done, is to aid diagnosis and is not a treatment. Joint aspiration is an invasive (all be it [sic] only moderately so) procedure that is not without risk, in particular there is a risk of infecting a sterile joint. It is for these reasons that orthopaedic assessment prior to a decision on aspiration is appropriate."

Dr H's medical assessment and contact with orthopaedics

57. At 5.25pm Dr H again reviewed and examined Mrs A. He documented in the progress notes that her temperature was 38.5°C, respiratory rate was 20 breaths per minute, and heart rate was 100 beats per minute (the upper limit of normal). Dr H also noted that Mrs A/her family reported cellulitis on her legs and under her left eye, and that she denied symptoms of other sources of infection, such as a cough and urinary symptoms. On examination, "nil cellulitis" was recorded in respect of Mrs A's legs. It

remained Dr H's impression that Mrs A had septic arthritis. He therefore left written instructions in the progress notes for Mrs A to have daily blood tests over the weekend and to continue with the oral roxithromycin for the cellulitis on her face. He also noted that blood cultures had been taken (it seems that this was occurring at the time of Dr H's assessment, by another house officer).

58. Dr H advised HDC that he called Dr I again, this time with the results from Mrs A's ultrasound. Again, no conversation between Dr H and Dr I was documented. According to Dr H, Dr I said that he did not have time to see Mrs A before leaving, but said he would hand the request to review her to the evening on-call orthopaedic registrar, Dr L. At that time, Dr L was performing an urgent operation in theatre and recalls someone holding the telephone to his ear and him receiving a "minimal" handover with words to the effect of:

> "I know you're busy, I'll sort out all the ward and ED patients, would you be able to go to fracture clinic and see patients who are waiting once you're done."

59. Dr L advised HDC that, "as important as detailed handovers are, we both understood that the surgery I was in the middle of at the time was more urgent."

Dr H's other actions

60. Dr H advised HDC that, on at least one occasion that afternoon, he also discussed Mrs A's care with medical registrar Dr N. No such conversation was documented. Dr H said that Dr N agreed with Dr H's plan. Dr N and the two other medical registrars working at the time cannot recall any specific details regarding Mrs A.

Dr G's other involvement

61. Dr G remembers being called by a registrar in the afternoon regarding Mrs A's spiking temperatures, and recalls being told that blood cultures had been taken. Dr G explained that her usual practice would have been to commence antibiotics after the blood culture was taken, but cannot recall whether she discussed antibiotics with the registrar. Dr G recalls being reassured by the fact that an orthopaedic review of Mrs A would take place that evening.

Verbal communication between medical house officers at handover

62. At around 5.30pm, the on-call medical house officer coming on duty, Dr M, recalls having a handover with Dr H. Dr H advised HDC that he explained to Dr M and the subspecialties registrar coming on duty, Dr DD,[28] that he thought Mrs A had septic arthritis (supported by the progress notes). Dr H recalls asking Dr M to obtain a blood culture specimen from Mrs A, and that he may also have asked Dr M to request other blood tests. Dr M can only recall being asked to follow up the orthopaedic review.

Evening medical consultant — Dr O

63. Dr O was the medical consultant on call that Friday evening. Dr O does not recall being contacted regarding Mrs A.

[28] Dr DD subsequently left his employment with the DHB, and the DHB was unable to contact him.

Rising temperature and first dose of roxithromycin

64. At 6pm Mrs A was given the first dose of roxithromycin since her admission.

65. At 6.15pm Mrs A's temperature was 38.7°C, her respiratory rate was 20 breaths per minute (PAR score 2), her heart rate was 120 beats per minute (PAR score 2), and her blood pressure was 115/50mmHg (PAR score 0). A total PAR score of 4 was documented, along with "N" in relation to referral to the PAR team.[29] The nurses performed an ECG, which showed atrial fibrillation and a heart rate of 132 beats per minute.

66. At 7.30pm Dr M was asked to review Mrs A because her heart rate was high. Dr M prescribed metoprolol[30] to bring down Mrs A's heart rate. Mrs A had a temperature of 38.5°C, so Dr M instructed the nursing staff to take further observations in two hours' time, and then four-hourly. Dr M suggested changing the antibiotic to intravenous (IV) cefazolin the next day if Mrs A was still spiking fevers.

67. At 8.30pm Mrs A's temperature was 38.9°C and at 9.40pm it was 38.8°C. Her respiratory rate remained at 20 breaths per minute but her heart rate decreased to 88 and 98 respectively (both PAR score 0). Her blood pressure was 120/60mmHg (PAR score 0).

Further request for orthopaedic review

68. At 10.10pm Mrs A still had not been reviewed by the orthopaedic team. Dr M called orthopaedic registrar Dr L,[31] who was too busy to review Mrs A personally. According to Dr L, Dr M told him that Mrs A had hip pain, was spiking intermittent temperatures, and had a mildly raised C-reactive protein. Dr M advised Dr L that she was unsure of the cause, but queried a hip infection. In response to my provisional opinion, the DHB advised that Mrs A was not significantly unwell or haemodynamically unstable at this time.

69. Dr L recommended that Dr M arrange an ultrasound-guided aspiration as soon as possible or, if radiology were reluctant to do an aspiration, an MRI scan. Dr L suggested withholding IV antibiotics until either the aspiration had been done (which he explained was to help identify a causative organism), unless antibiotics were considered necessary by the medical team.[32] Both Dr L and Dr M documented this conversation.[33] Dr L advised HDC:

> "I was not told about any other sources of infection such as face or legs. I was not told that the patient was septic or haemodynamically unstable.[34] This was most

[29] The observation chart does not have a space for identifying who has recorded the observations.
[30] A beta blocker.
[31] Dr L was rostered to work until 10.30pm that night with handover from 10.30 to 11pm.
[32] The DHB explained that this recommendation not to start IV antibiotics until after an aspirate had been obtained was with the aim of improving the yield from microbiological cultures (letter dated 9 March 2012).
[33] Dr M's progress note records the time of the call at 10.10pm, whereas Dr L's personal notes state that Dr M's call was at 10.25pm.
[34] Mrs A was not haemodynamically unstable at that time.

> unfortunate because it would have added an element of urgency and resulted in different advice.
>
> In any case based on what I was told, I informed Dr M that given the fact that there was a traumatic event, the patient suffered from gout, and had been spiking temperatures, my differential diagnoses were 1. Right hip infection (septic arthritis, metal ware infection or osteomyelitis),[35] 2. Arthropathy[36] secondary to gout, 3. A fracture (as fractures are not always obvious on plain film X-ray in elderly patients), 4. Soft tissue injury/infection."

70. Dr L said that this was the first time he was made aware of Mrs A, and that it was busy that night[37] and he was unable to take a break. The DHB explained that the orthopaedic registrar is often busy in the evenings in the operating theatre or ED. The DHB recommends that orthopaedic registrars attend all ward referrals but, if they are unable to do so in a timely fashion, they should provide advice over the phone or, if urgent, recommend that the referring doctor contact another registrar or the on-call orthopaedic consultant. The DHB said that it does not have specific policies regarding requests for orthopaedic review.

Orthopaedic handover

71. Dr L advised HDC that, after he spoke to Dr M, he discussed Mrs A's case with the night orthopaedic registrar and asked her to liaise with the medical team looking after Mrs A. Dr L said that he specifically asked the night orthopaedic registrar to proceed with a management plan if warranted, once the aspirate result was back, and recalls his colleague writing down Mrs A's details. Dr L recorded in his personal notes (ie, not Mrs A's progress notes) that he "H[anded] O[ver] to N[ight] R[egistrar]".

72. The orthopaedic registrar on duty that night was Dr Q. Dr Q does not recall any handover regarding Mrs A and advised HDC that, if she had been asked to review Mrs A, she would have.

73. Dr L advised HDC that he did not contact the orthopaedic consultant on duty, Dr S, as he had handed over Mrs A's care, and considered it would be more prudent to contact the consultant once Mrs A's investigations were completed and she had been reviewed by a member of the orthopaedic team. Dr L said that he expected the review to take place a couple of hours after Dr M's telephone call (at around 10.10pm, recorded above), once the results of the aspirate microscopy came back. Dr L did not anticipate that the aspiration would be done the following morning, as the hospital provides a 24-hour radiology service. Dr L advised HDC:

> "I was not informed by [Dr M] that the aspirate or MRI would have been done the following morning. If that were the case, I would have wanted it to be done that same night and if that was still not feasible (due to logistics) then I would have

[35] Osteomyelitis is a bone infection.
[36] Arthropathy is a disease of the joint.
[37] Dr L said that, at the time of Dr M's call, he was "attending to an ill patient who had recent surgery and was haemodynamically unstable, loosing [sic] blood from their wound and suffering from confusion, hypotension, severe agitation and pain".

made sure the patient was seen earlier and facilitated an aspiration in theatre and recommended that antibiotics be started immediately. If the hip joint aspirate was negative for pus or bacteria, I would have asked for an MRI scan [to] be done that night."

74. In response to my provisional opinion, the DHB advised HDC that it considers Dr L failed to:

- discuss Mrs A with the on-call consultant, as required by the Registrar Handbook. In response to that allegation, Dr L acknowledged to HDC this requirement in respect of all ward referrals, but set out his understanding that "… the telephone discussion [he] had with [Dr M] fell well short of the ordinary meaning of 'referral' …" and that, had he called the consultant, "… the consultant would have told me in no uncertain terms that it would have been more prudent and efficient if he were contacted after the investigations were performed …";

- update the handover sheet to include the request to review Mrs A, as required by the formal handover system in place at the time. However, in response to that allegation, Dr L advised HDC that "the handover sheet was only for patients who had already been seen, admitted patients, and patients who need[ed] operations. It was not a 'to do list' for the person you were handing over to. It was viewed as being quite pointless updating the handover sheet until you'd actually seen the patient"; and

- hand over the request to review Mrs A to the night registrar. However, in response to that allegation, Dr L advised HDC that he did hand over the request, with reference to his personal notes (referred to above).

Ultrasound-guided aspiration — DHB process

75. The DHB advised HDC that urgent requests for imaging, such as ultrasound scanning and MRI, both after-hours and during weekends, are discussed with the radiologist on call, who triages his or her service's workload. To expedite any such request, it should come from a senior member of the clinical team, preferably a consultant or registrar. Advice, findings, and direct requests from other clinical specialties may also help prioritise urgent imaging requests.

76. Dr M advised HDC that she did not order the ultrasound-guided joint aspiration or MRI urgently as Mrs A was stable at that time, apart from spiking temperatures. Dr M could not recall whether Dr L had said that these investigations should be done urgently or the next day, but documented in the progress notes that the investigation should be done "ASAP". Dr M understood that an aspiration or MRI would be done urgently only if the patient was more unwell or septic, otherwise she thought it could reasonably be done the next day. Dr M said that she could order an aspiration but a consultant would need to order an MRI. Dr M does not recall contacting a consultant about any patients that evening or discussing Mrs A's care with the registrar on call.

77. Dr M said that radiology requests are not normally looked at until the morning unless the radiology registrar is called. Dr M could not recall whether she entered the request

for Mrs A's ultrasound-guided aspiration into the radiology system or handed over this task for the morning staff to do. The DHB confirmed that no request was entered into its radiology system for Mrs A that night or the following morning.

Verbal communication between medical house officers at handover

78. At the night shift handover, medical house officer Dr R recalls Dr M telling her that Mrs A was to have an ultrasound-guided aspiration in the morning. Dr R said that she was not told to review Mrs A, but rather to hand over to the morning house officer the information regarding the ultrasound and the orthopaedic team's instruction to withhold antibiotics until after the aspiration.

Saturday

Weekend medical consultant — Dr P

79. Dr P was the medical consultant on call over the weekend. Dr P was not involved in Mrs A's care until Sunday afternoon.

Condition overnight

80. At 12.00am Mrs A had a temperature of 38.0°C, her respiratory rate was 19 breaths per minute (PAR score 1), her heart rate was irregular, between 87–104 beats per minute (PAR score 1), and her blood pressure was 90/60mmHg (PAR score 1). The total PAR score was 3 and Dr R was contacted.

Medical house officer assessment — Dr R

81. At 1.35am Dr R assessed Mrs A. Mrs A's temperature was 37.8°C and her heart rate was 86 beats per minute. Dr R's impression of Mrs A's condition was possible sepsis secondary to a right hip collection. Dr R started Mrs A on IV fluids.

82. Dr R documented the need for an aspiration to be organised in the morning, and the orthopaedic registrar's advice to avoid IV antibiotics until this was done. Dr R recalls contacting the night orthopaedic registrar, Dr Q, to discuss Mrs A, but did not document this conversation. Dr Q does not recall being contacted by Dr R.

83. At 1.50am Mrs A's temperature was 37.8°C, her blood pressure was 94/54mmHg (PAR score 1), and her respiratory rate was 15 breaths per minute (PAR score 1). Her urinary output was noted as low but, at that time, did not meet the PAR threshold of less than 120ml over four hours. The total PAR score was 2.

84. At 4.10am Mrs A's temperature was 37.5°C and she was noted as drowsy after taking OxyNorm.[38] No other observations were taken, and a PAR score was not documented, as Mrs A was on four-hourly observations at this time.

85. At 6am Dr R reviewed Mrs A and requested further IV fluids, as Mrs A had not had any urinary output since 1am. The IV fluid rate was increased to 250ml/hour.

[38] OxyNorm (oxycodone hydrochloride) is an opioid painkiller, and side effects can include fatigue and dizziness.

86. At 7.20am Mrs A's temperature was 37.8°C, and her respiratory rate, heart rate, and blood pressure were within the normal range. Mrs A's level of consciousness was given a PAR score of 1, as she was responsive to voice. Mrs A had still had no urinary output since 1am (PAR score 3) but no total PAR score was documented.

Verbal communication between medical house officers at handover

87. Around 8am Dr R handed over to medical house officer Dr T. Dr R recalls telling Dr T:

> "(1) that I felt [Mrs A] was developing signs of sepsis, (2) that she was to have an ultrasound guided aspiration that morning and (3) would require IV antibiotics following from this, and (4) that she would require a fluid review at 10.00 when her 0.9% saline would run out. I don't recall if I told [Dr T] to contact the orthopaedics team regarding [Mrs A]."

88. Dr T does not recall the handover but recalls that, at some point, there was discussion concerning the orthopaedics team's advice not to commence IV antibiotics.

89. Dr R recalls that the medical registrars were present at handover, but she cannot recall whether she discussed Mrs A with any of them. Sub-specialties registrar Dr U cannot recall Mrs A's case, and said that if he had reviewed Mrs A he would have written in her notes.

90. At 11am Mrs A had a range of blood tests taken including CRP and a full blood count. The CRP results were elevated, consistent with infection.[39]

Medical house officer assessment — Dr T

91. At 12.30pm Dr T assessed Mrs A. Dr T documented in the progress notes receiving a call from the laboratory regarding Mrs A's blood culture results (presumably those taken the night before) — one bottle had grown a gram positive cocci resembling staphylocci. This could either be a skin contaminant or a pathogenic species, such as *Staphyloccus aureus*, and further blood culture testing was required to identify the organism. In the progress notes Dr T recorded his impression as "becoming septic", and his plan to speak to microbiologist Dr GG and the sub-specialties registrar Dr U about the commencement of cefazolin (an antibiotic). Dr T advised HDC that he also recalls speaking to Mrs A's family at this time.

92. At 3.45pm Dr T recorded in the progress notes that Dr U had approved the use of cefazolin, but had suggested that Dr T "recontact" the medical registrar about this. Dr T advised HDC that he had tried to call/page both the medical and orthopaedic registrars multiple times as he needed their authorisation (or a consultant's) to commence the cefazolin. However, Dr T said that "the responsibility for the decision kept getting pushed to someone else".

[39] The CRP was 188mg/L, which is consistent with a bacterial infection (40–200mg/L). The white blood cell count was 20.95×10^9 cells/L and the monocytes were 2.05×10^9 cells/L.

93. Also at 3.45pm Dr T documented in the progress notes and medication chart that Mrs A was to be started on 1G cefazolin; however, Dr T advised HDC that this was not administered until authorisation had been granted. Mrs A's first dose was administered at 5pm, and a further dose was given at 8.40pm.

94. At 9pm Dr T noted that an infectious diseases consultant[40] had suggested the antibiotic vancomycin, but advised to continue with cefazolin since it had been started. The DHB explained that the on-call microbiologist will sometimes not immediately notify the clinical team if further blood culture results are pending for gram positive organisms resembling staphylococci, as the organisms may be contaminants. Dr GG called Dr T once the test was positive, indicating that the blood culture isolate was significant.

Orthopaedic registrar assessment — Dr V

95. Between 10pm and 11pm orthopaedic registrar Dr V was in theatre and recalls being contacted by a male medical house officer to review Mrs A (the DHB advised that this was Dr T, who advised of Mrs A's blood test results). Dr V said that this was the first time he was contacted regarding Mrs A. This phone conversation was not documented.

96. At 11.05pm Dr V assessed Mrs A and recorded in the progress notes her recent clinical history and that he had contacted the orthopaedic consultant, Dr S, to discuss Mrs A's care. Dr S decided to review Mrs A the next morning. In the interim, Dr V requested:

- the IV antibiotic be changed from cefazolin to flucloxacillin (the first dose was given at 11pm) with ondansetron (an antiemetic);
- IV fluids;
- close monitoring of urinary output;
- an ECG that night (if not already done);
- staff to call the orthopaedic registrar if any deterioration in observations or symptoms overnight;
- an indwelling urinary catheter; and
- nothing by mouth until the clinical ward round in the morning.

Sunday

Medical registrar assessment — Dr W

97. At 1.15am nursing staff asked night medical registrar Dr W to review Mrs A, because of her low blood pressure, which was 80/56mmHg at 12.05am, 70/unrecordable at 1.00pm and 76/32mmHg at 1.15am. Dr W reviewed Mrs A and was of the impression that the effect of the benzodiazepine and opiate medication may have been responsible for the drop in blood pressure, and ordered them to be withheld. Nursing staff were asked to repeat the blood pressure recording every hour and to monitor Mrs A's urinary output.

[40] It is unclear who this consultant was; the DHB has advised HDC that Dr GG is not an infectious diseases consultant, but advised that it was Dr GG who called Dr T at this time.

98. At 3.45am Dr W reviewed Mrs A again. Her blood pressure remained low (80/30–40mmHg). Dr W diagnosed septic shock and requested that Mrs A be transferred to a high dependency bed and her blood pressure and urinary output be monitored every 30 minutes.

Transfer to high dependency bed

99. Around 4.30am Mrs A was transferred to a high dependency bed. She continued to have low blood pressure and low urinary output. At 5.25am a PAR nurse reviewed Mrs A again and noted that Mrs A's urinary output remained low but she was not in pain. The PAR nurse planned a further review later in the morning.

100. Dr R reviewed Mrs A and contacted Dr W because Mrs A's blood pressure had remained low (90/49mmHg) and her urinary output was 10mls in two hours.[41]

101. At 7.20am Dr R reviewed Mrs A again. Her blood pressure had improved slightly but her urinary output remained low. Dr R contacted Dr W, who suggested IV frusemide (a diuretic), which was given at 8.20am.

102. Dr W recalls requesting an urgent medical consultant review of Mrs A at the morning medical team handover.

Orthopaedic consultant assessment — Dr S

103. At 8am orthopaedic consultant Dr S assessed Mrs A. Dr S requested a repeat ultrasound scan, close monitoring of urinary output, continuation of IV fluids and IV antibiotics, nil by mouth, and medical team assessment.

Palliative care

104. At around 9.00am a medical registrar proposed performing an MRI but, following discussion with Mrs A's family, it was decided that it would be of no benefit because of the high mortality related to any subsequent surgery.[42] An intensive care registrar reviewed Mrs A, following which Mrs A and her family decided to proceed with palliative treatment and comfort care. Mrs A's IV fluids and antibiotics, including roxithromycin, were stopped. Mrs A died in hospital around a week later.

Actions taken by the DHB

105. Initially Ms B complained directly to the DHB about the care and treatment her mother had received.

106. On 18 March 2011 the DHB met with Ms B to discuss her concerns, particularly that her mother's roxithromycin was not continued when she was admitted to hospital.

107. On 19 April 2011 the DHB wrote to Ms B and "unreservedly apologised" in relation to her concerns about the care her mother had received in ED at the hospital, and particularly that ED medical staff had not appeared to have listened to Mrs A's

[41] Dr R made an entry in Mrs A's progress notes but did not document the time of her entry. The prior and subsequent entries were at 5.25am and 6.45am respectively.

[42] The DHB told HDC that Mrs A had a right-sided metal screw and plate in her hip that would have yielded an artifact on the MRI scan, which would not have aided her investigation.

concerns. The letter stated that Ms B's concerns would be brought to the attention of ED staff, with many of them having already had additional training on communication.

108. On 28 April 2011 the DHB again wrote to Ms B to apologise for the delay in commencing her mother's roxithromycin, confirming that the first dose had been administered during Friday evening (meaning that two doses had been missed). However, the letter stated that, in hindsight, the infection in Mrs A's hip appeared to have developed prior to her admission (despite the roxithromycin), and the DHB was "not certain" that the delay in administering that antibiotic had affected her outcome.

Response to notification of investigation

109. On 9 March 2012 the DHB provided HDC with a comprehensive response to its notification of investigation. The DHB acknowledged that there had been "missed opportunities" to diagnose and respond to Mrs A's infection,[43] and apologised for this. However, the DHB noted that Mrs A's co-morbidities and the pain medication she had received around the time of presentation (ie, in the ambulance and in ED) may have masked the symptoms of her condition, particularly in light of initial blood test results.

110. The DHB acknowledged that an earlier diagnosis of sepsis "would have prompted discussions with Mrs A and her family about the option of IV antibiotic therapy", but advised HDC that:

> "[e]ven if [Mrs A] ha[d] been given aggressive antibiotic therapy at an earlier stage, it is very likely her life expectancy would have been very limited. Septicaemia due to Staphylococcus aureus in an elderly person, even with aggressive antibiotic therapy, has a 10–60% twelve week mortality."

111. On the issue of roxithromycin, the DHB stated that, while the antibiotic would be adequate for treating mild skin infections, it "would not be recommended for treating bacteraemia or complicated skin infections".

112. The DHB advised HDC that it had commenced a "Reportable Event" and "Preliminary Event Review" into the care that Mrs A had received. The latter recommended investigations into the medical and orthopaedic services that attended Mrs A.

113. The DHB identified the following areas for improvement in light of Ms B's complaint:

a) Sepsis recognition — "enhanced teaching of recognising sepsis in the elderly and not relying on 'normal ranges' set in young fit people …".
b) Sepsis pathway/protocol — "further development of guidelines and processes to improve management of sepsis …" (this had commenced).

[43] The DHB believed there to be bacteraemia due to *Staphylococcus aureus*, probably arising secondary to one of her sites of previously treated cellulitis, in turn leading to a subacute sepsis syndrome.

c) Empiric use of antibiotics — discussions regarding commencing IV antibiotics immediately after collection of blood cultures.
d) Rapid rounds — brief multidisciplinary meetings on the ward in the afternoon (this had commenced).
e) Internal medicine weekend handover meeting — meeting at 3.30pm each Friday to identify unstable patients and plan for their review (this had commenced).
f) Early warning score — interpretation of this existing system was to be considered in the sepsis recognition education (set out above).
g) Shared information system — introduction of system allowing access to GP clinical documents.

114. The enclosures to the DHB's response to the notification of investigation included:

a) a response to the complaint from Dr F, a summary of the changes he has made to his practice relating to documentation, and a letter to Mrs A's family, apologising for his role in her care and informing them of those changes (this was forwarded to Ms B);
b) relevant DHB policies and guidelines; and
c) the Preliminary Event Review.

Response to provisional opinion

115. Ms B, the DHB, and several staff members responded to relevant sections of my provisional opinion. Their responses have been incorporated into the report where relevant.

116. Overall, the DHB strongly opposed my provisional opinion. The DHB submitted that it had appropriate systems in place to ensure adequate communication within the orthopaedic and medical teams. In support of this submission, the DHB stated that:

a) communication, documentation, seeking assistance, and keeping consultants informed, is emphasised to junior staff at surgical house officer orientation, and at Orthopaedic Department weekly meetings;

b) there was a formal handover system in place in the Orthopaedic Department;

c) the Orthopaedic Registrar Handbook requires all referrals from other services to be discussed with the orthopaedic consultant; and

d) the DHB's Clinical Handover Policy required all staff to "provide comprehensive clinical information about patients, including tasks requiring completion, at any handover".

Opinion: Capital and Coast DHB

Overview

117. Following Mrs A's admission to the hospital there were a number of failures that led to her receiving suboptimal care and treatment. The individual health professionals who provided care to Mrs A do bear some responsibility for the failures that occurred. However, I am of the view that those failures were largely a result of broader, systems issues at the hospital.

118. My main concern is the significant delay that occurred in Mrs A undergoing orthopaedic review. This appears to have been caused by poor communication within the medical team and between the medical and orthopaedic teams, and a lack of clarity regarding the process for requesting an ultrasound-guided joint aspiration. Those failures ultimately led to Mrs A not receiving appropriate antibiotic treatment in a timely manner. I am reminded of my decision in Opinion 10HDC00703,[44] where I stated that:

> "… this is a case of different services within a district health board each considering a patient from their own specialist viewpoint, without having regard to the bigger picture of the patient's presentation and seeking to cooperate with one another to provide continuity of care to the patient".

119. I find that the DHB breached Right 4(1) of the Code, for failing to ensure that a timely orthopaedic review of Mrs A and an ultrasound-guided joint aspiration were undertaken, and failing to ensure that Mrs A was provided with appropriate antibiotic treatment in a timely manner.

120. I also find that the DHB breached Right 4(5) of the Code, for the medical and orthopaedic teams' failures to communicate Mrs A's condition to each other, and the lack of clarity regarding the process for requesting an ultrasound-guided joint aspiration.

121. The above breaches, as well as the other relevant aspects of the care provided to Mrs A, are addressed in further detail below.

Timing of initial ED review — no breach

122. Upon arrival in ED, Mrs A was triaged to see a doctor within one hour. Mrs A was seen by ED house officer Dr F after one hour and six minutes. I accept that ED was busy at the time and am of the view that Mrs A was seen within a reasonable timeframe.

Initial diagnosis of musculoskeletal pain — no breach

123. Dr F diagnosed Mrs A with musculoskeletal pain. That diagnosis was confirmed early the next morning by medical registrar Dr CC, and the next day by medical consultant Dr G.

[44] 11 September 2012, p 14.

124. My independent expert orthopaedic surgeon, Dr Garnet Treggoning, advised me that there was no significant indication that sepsis or septic arthritis were the causes of Mrs A's pain upon arrival in ED, as she had a normal white blood cell count (which would have "reassure[d]" the medical staff) and a full range of movement in her right hip. Similarly, my independent expert physician, Dr David Spriggs, advised that, at this stage, it was "reasonable [for the health professionals] to put [Mrs A's] pain down to musculoskeletal injury following the twisting". I note that Dr Spriggs confirmed that Dr G's assessment of Mrs A was appropriate at the time, despite Mrs A's raised monocytes and CRP of 25.

125. Whether Ms B informed Dr F about her mother's spiking temperatures and vomiting prior to her admission is unclear. This information is not recorded in the ED clinical records or the ambulance officers' patient report, but Ms B is adamant that she told Dr F. In any event, I am satisfied that, in diagnosing Mrs A with musculoskeletal pain, Dr F considered differential diagnoses, as his notes acknowledge that Mrs A had not had a fall.

Dr F's documentation — adverse comment

126. In respect of Dr F copying and pasting clinical information from one of Mrs A's previous admissions into the ED clinical notes (and failing to update the content), this was clearly unsatisfactory. I accept, however, that Dr F has learned from this error, and I am satisfied with the steps he has taken to modify his practice in this regard.

Charting of roxithromycin — adverse comment

127. I am concerned that Dr F was made aware, and pharmacist Ms EE appears to have been made aware, that Mrs A had been taking roxithromycin, but that both failed to establish why the antibiotic had been prescribed, and failed to chart it adequately in her notes. Mrs A therefore missed two doses of the antibiotic before it was administered to her at 6pm on Friday (more than 24 hours after her admission).

128. I accept that Dr F did not have electronic access to Mrs A's primary care records. However, Dr F should have taken the time to verify with Mrs A and her family the reason that she had been prescribed roxithromycin, and should not have assumed that the admitting medical doctor would note his reference to the antibiotic in the ED clinical notes and include it on Mrs A's medication chart.

129. While it is unsatisfactory that Mrs A missed two doses of the antibiotic, I acknowledge my experts' comments that the delay in administering Mrs A's roxithromycin was not significant in terms of Mrs A's overall care and treatment at the hospital.

Delay in transfer to medical department/initial medical team review — adverse comment

130. At around 6.14pm on Thursday, Dr F requested that Mrs A be transferred to the medical ward. Mrs A was transferred to a hospital bed at 9.50pm, was not reviewed by Dr CC until after midnight, and was not transferred to the medical ward until 3.30am on Friday.

131. Mrs A was therefore in ED for over 11 hours. The national target is that 95% of patients will be admitted, discharged, or transferred from ED within six hours.

132. I accept that ED was busy at the time of Mrs A's admission. However, I do not consider it acceptable that an 88-year-old woman waited over 11 hours to be transferred to a ward. I note that ED nursing staff were aware that Mrs A was waiting for a medical review, but did not alert an ED registrar until 11.33pm. In my opinion, this delay reflects inefficiencies in the DHB's processes for reviewing and admitting patients from ED.

Delay in orthopaedic review — breach

133. By 2.20pm on Friday, Mrs A's symptoms became indicative of a possible diagnosis of septic arthritis. Dr H recognised this, and advised me that he contacted the on-call orthopaedic registrar, Dr I, at that time. Dr Spriggs described Dr H's actions at this point as very appropriate. Dr H said that, at that stage, Dr I was too busy to review Mrs A, and so requested an ultrasound and an aspiration from radiology in the interim (at Dr I's recommendation).

134. Dr H recounted that, at around 5.25pm, having received the ultrasound results, he again contacted Dr I. Dr H said that Dr I remained too busy to review Mrs A, and said he would hand over the request to orthopaedic registrar Dr L. Dr L recalls receiving a limited handover from Dr I, but does not recall being asked to review Mrs A. At around 5.30pm, Dr H advised medical house officer Dr M and subspecialties registrar Dr DD that Mrs A was to have an orthopaedic review that evening. Dr H also documented his impression of Mrs A's condition in the progress notes.

135. At 10.10pm Dr M contacted Dr L. Dr L was also too busy to review Mrs A, and so recommended that Dr M make a further request for an aspiration or an MRI to be done as soon as possible. Dr L advised me that he was not fully informed of Mrs A's condition at that time, or that an aspiration would not be done until the following morning, which would have altered his advice. Dr L did not advise the orthopaedic consultant on duty, as he did not consider it was necessary to do so, and it appears likely that Dr L handed over the request to review Mrs A to the night orthopaedic registrar who came on duty at the end of his shift.

136. Between 10 and 11pm Dr T contacted orthopaedic registrar Dr V in light of Mrs A's blood test results (with IV antibiotic treatment having commenced). At 11.05pm Dr V reviewed Mrs A. Orthopaedic consultant Dr S was contacted, and he reviewed Mrs A at 8am the next day.

137. Overall it took five requests and 32 hours before someone from the orthopaedic team reviewed Mrs A. The following day, palliative care was deemed appropriate.

138. I consider that the delay in Mrs A receiving orthopaedic review was due to the following factors within both the medical and orthopaedic teams (addressed in further detail below):

a) Poor communication within the medical team (including insufficient documentation).

b) Poor communication between the medical and orthopaedic teams regarding Mrs A, including her need to be assessed by orthopaedics.

c) Lack of clarity regarding when and how radiological investigations should be requested (regarding the ultrasound-guided aspiration, which never occurred).

139. Overall, I consider that the delay in Mrs A receiving orthopaedic review significantly compromised the level of care that she received. Dr Spriggs described the delay as "unacceptable" in light of Mrs A having become "desperately sick with joint sepsis". Dr Treggoning viewed the delay with moderate disapproval. I consider the delay a breach of Right 4(1) of the Code.

Poor communication within the medical team — breach

140. Once a possible diagnosis of septic arthritis was considered, some of the members of the medical team did not adequately communicate that diagnosis to one another, and did not make adequate records where communication appears to have occurred. Those house officers that did attempt to contact senior staff to discuss Mrs A's care had difficulty contacting them.

141. Despite Mrs A's possible diagnosis of septic arthritis and her identified need for orthopaedic review, there was a lack of input from senior medical staff. As Dr Spriggs commented:

> "There is a striking lack of input into [Mrs A's] care from the Medical Registrars. It is not clear why they were not consulted more and why they did not support the house officers who were clearly struggling to manage [Mrs A's] condition. A more experienced doctor such as a medical registrar is likely to have appreciated the severity of the disease and may have insisted on early orthopaedic review."

142. I acknowledge Dr H's statement that, on at least one occasion on Friday afternoon, he discussed Mrs A's care with registrar Dr N, although no such conversation is documented. It also appears that a registrar (possibly Dr N) discussed some of Mrs A's symptoms with consultant Dr G that afternoon, but again this was not documented. In any event, due to the absence of documentation, it is not clear that the possibility of septic arthritis was specifically discussed.

143. I accept that Dr H adequately communicated the possibility of septic arthritis to the oncoming medical house officer, Dr M, and documented his impression of Mrs A's condition in the progress notes. However, Mrs A's condition was not discussed at the pre-weekend medical team handover meeting. In response to my provisional opinion, the DHB advised that Mrs A was not discussed at the handover because her condition at that time did not warrant it. However, irrespective of whether Mrs A's condition was stable at that time, she had been recognised as possibly having septic arthritis which, as my experts advised, warranted timely intervention. Given Mrs A's

symptoms at that time, and the need for timely intervention, I consider that the omission to discuss her condition at handover was inappropriate.

144. It is unclear whether, at the end of Dr M's shift, the possibility of Mrs A suffering from septic arthritis was passed on to the medical house officer coming on shift, Dr R. Additionally, Dr M did not discuss Mrs A's possible diagnosis of septic arthritis and need for orthopaedic review with anyone more senior in the medical team. While Dr R did recognise that Mrs A appeared to be suffering from septic arthritis and communicated that to house officer Dr T at handover on Saturday, she did not discuss Mrs A with anyone more senior in the medical team (such as the registrars). Dr T had difficulty in contacting the medical registrar about Mrs A's condition and the need to commence antibiotics.

145. The evening medical consultant on Friday, Dr O, was not made aware of Mrs A's condition. The weekend medical consultant, Dr P, was not made aware of Mrs A's condition until Sunday afternoon, and it was not until 1.15am that day that Mrs A was personally reviewed by a medical registrar, Dr W, at a nurse's request.[45]

146. The DHB's PAR score protocol was evidently not adhered to by nurses in the medical team — there were several instances when Mrs A's PAR score was not calculated, or was calculated and necessary actions were not taken. In my opinion, the nurses' actions and documentation were less than satisfactory in this regard.

147. In response to my provisional opinion, the DHB referred to its policy requiring all staff to provide comprehensive information about patients at handover. Despite this policy, it is clear that there was a breakdown in communication between medical team staff in respect of Mrs A, including between some house officers at handover and between house officers and more senior staff. Good handover is essential when different doctors and nurses take over responsibility for a patient's care.

148. In addition, the quality of the documentation in respect of Mrs A's condition and possible diagnosis was inadequate. Good documentation is a key part of communication and helps ensure continuity of care where there are multiple clinicians involved in a patient's care. Dr Spriggs advised me that:

> "[a]lthough the house officers sought advice from various colleagues at various times there is a marked lack of documentation of such advice, this may reflect the [busy-ness] of the doctors concerned. There is no documentation of the handovers."

149. Overall, I am of the view that the communication that occurred within the medical team was substandard and was in breach of Right 4(5) of the Code.

[45] Although consultant Dr G had seen Mrs A on Friday, this was before a diagnosis of septic arthritis had been considered.

Poor communication between the medical and orthopaedic teams — breach

150. The medical team did not adequately communicate Mrs A's condition, including a possible diagnosis of septic arthritis, to the orthopaedic team, or make adequate records of communication when it did occur. In particular:

- Dr H did not document his apparent conversations with orthopaedic registrar Dr I (I note that, in response to my provisional opinion, Dr H acknowledged that this should have occurred).
- Dr M does not appear to have made Dr L aware of Mrs A's full clinical picture, and did not clarify when an ultrasound-guided aspiration would occur.
- Dr R did not document her apparent conversations with orthopaedic registrar Dr Q.
- No conversation between Dr T and orthopaedic registrar Dr V was documented.

151. I do acknowledge that it is unclear whether all members of the medical team had all relevant information when communicating with the orthopaedic team. In this regard, Dr Spriggs noted:

> "It is expected clinical practice that all relevant information is given when requesting a consult particularly out of hours in urgent situations."

152. However, the relevant members of the medical team were aware that Mrs A had a possible diagnosis of septic arthritis and was awaiting orthopaedic review.

153. In terms of the orthopaedic team's communication with the medical team, I accept that, because they were busy, they provided advice over the phone based on the information made available to them. However, members of the orthopaedic team should have informed the medical team of the likely delays in Mrs A obtaining orthopaedic review and, in light of those delays, should have sought further information regarding Mrs A's condition (which may have revealed the need for her to be more urgently assessed). I acknowledge that the DHB has identified that the handover of referrals from other services needed to be more explicitly stated in the orthopaedic registrar handbook.

154. Overall, I am of the view that the communication that occurred between the medical and orthopaedic teams was substandard and was in breach of Right 4(5) of the Code.

Lack of clarity regarding requests for ultrasound-guided joint aspiration and failure to undertake an aspirate — breach

155. Drs I and L recommended that Drs H and M arrange an aspiration of Mrs A's hip prior to them undertaking an orthopaedic review. Drs H and M subsequently requested that Mrs A undergo an ultrasound-guided joint aspiration. However, despite those requests, no such investigation took place.

156. It appears that there was general confusion amongst staff at the hospital, including radiology staff, regarding the process for requesting an ultrasound-guided joint

aspiration, and at what point this would be undertaken (ie, before or after orthopaedic review). This confusion is likely to have been compounded by the ineffective communication within and between the medical and orthopaedic teams, already addressed, including the lack of senior input. The lack of clarity regarding the aspiration, and the fact that it did not occur, contributed to the delay that occurred in Mrs A receiving orthopaedic review and appropriate treatment.

157. Dr Spriggs advised me that "timely aspiration of the fluid around the joint would have led to an earlier diagnosis and presumably more definitive treatment".

158. Dr Tregonning viewed the failure to carry out an ultrasound-guided aspiration by Saturday morning as a "significant failing", and one that he viewed with severe disapproval. While Dr Tregonning questioned the diagnostic significance of a hip aspiration in the circumstances (like Dr Spriggs, he identified that the sepsis may have been in soft tissue or the femur, rather than the hip joint itself), the fact that it did not occur caused delays in the commencement of Mrs A on IV antibiotics.

159. I am of the view that the failure to ensure that Mrs A underwent a hip joint aspiration was in breach of both Right 4(1) and Right 4(5) of the Code.

Delay in commencing IV antibiotics — breach

160. In Dr L requesting that IV antibiotics be withheld until Mrs A had undergone an aspiration, I accept that he may not have been provided with all relevant information regarding Mrs A's condition. He understood that an aspiration was to occur that evening, and qualified his request with regard to the medical team and whether they considered it necessary to administer IV antibiotics to Mrs A before an aspiration could take place. I also accept that the medical house officers felt that they were constrained by Dr L's request.

161. Dr T eventually revisited Dr L's request to withhold antibiotics after he received Mrs A's blood culture results at 12.30pm on Saturday. However, given Mrs A's condition (including a possible diagnosis of septic arthritis and need for orthopaedic review), I am of the view that Dr L's request should have been revisited earlier, and a medical registrar or consultant contacted for advice.

162. Dr T advised me that, at 3.45pm on Saturday, he tried to contact both medical and orthopaedic registrars to discuss the decision to commence cefazolin, but was unsuccessful in contacting an orthopaedic registrar, and had difficulty contacting a medical registrar. Antibiotics were not commenced until around 5pm.

163. Overall, I consider it unacceptable that IV antibiotics were commenced over 24 hours after a diagnosis of septic arthritis was initially considered by Dr H, and four and a half hours after Mrs A's blood culture results came back indicating staphylococci. It is particularly concerning that, following those results, medical house surgeon Dr T felt that the decision to commence IV antibiotics "kept getting pushed to someone else".

164. Dr Tregonning advised me that the delay in commencing IV antibiotics was "significant" and "most unfortunate". Dr Spriggs advised:

> "While I understand that antibiotic 'stewardship' is important in controlling the inappropriate use of antibiotics, it is essential that DHBs have in place a system whereby authorisation of appropriate antibiotics is able to be obtained quickly."

165. Overall, I am of the view that Mrs A received IV antibiotics after they were clinically indicated, resulting in a breach of Right 4(1) of the Code.

Summary

166. The responsibility to prioritise and manage patients extends beyond individuals to the DHB.[46] DHBs should provide clear direction to staff about their options for monitoring and managing patients who have been identified as requiring timely intervention out of hours within the services available.

167. While I accept that there were errors made by individual staff in respect of Mrs A's care and treatment, I am satisfied that those errors largely occurred as a result of service-level failures at the hospital. Accordingly, the DHB did not provide services to Mrs A with reasonable care and skill and breached Right 4(1) of the Code. The DHB also had inadequate systems for co-operation among its staff to ensure quality and continuity of its service, and breached Right 4(5) of the Code.

Recommendations

168. I recommend that the DHB, in light of this report and my expert's comments:

- provide evidence that the recommendations set out in the DHB's Preliminary Event Review have been implemented, and report on any further changes that occurred following the implementation of those recommendations;
- provide evidence of changes that have occurred in each of the areas identified as requiring improvement by the DHB (see paragraph 113 of this opinion);
- review the guidance provided to junior staff regarding managing deteriorating patients and escalating their management to more senior staff where appropriate;
- review its processes to improve the responsiveness of departments to requests to review patients in other departments;
- review the processes for requesting radiological investigations after hours; and
- undertake training on PAR scoring and protocol.

The DHB is to report to HDC by **31 March 2014** on the outcome of these reviews.

[46] Opinion 09HDC00836 (3 February 2010), pp 6–7 and Opinion 09HDC02089 (4 July 2012), p 24.

169. I also recommend that the DHB apologise to Mrs A's family for its breaches of the Code. The apology should be provided to HDC by **31 January 2014** for forwarding to Mrs A's family.

Follow-up actions

170. • A copy of the final report with details identifying the parties removed, except the experts who advised on this case and the DHB, will be sent to DHB Shared Services and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A — Independent orthopaedic advice to the Commissioner

On 26 October 2011 the following expert advice was obtained from Dr Garnet Tregonning, an orthopaedic consultant:

"Herewith the report as requested on 19th September 2011.

In compiling the report I have read your submissions as well as the copies of extensive amount of information that you have provided including:

1. [Ms B's] complaint (pages 1 to 21)

2. [Mrs A's] GP records (pages 22 to 26)

3. Capital and Coast DHB's response to the complaint (pages 27 to 31). This also included letters from [the] Associate Director of Nursing on the 19th April 2011 and from [Dr Y], Executive Director dated 28th April 2011, the 27th June 2011 and the 6th October 2011.

I have also read [Mrs A's] radiology and laboratory results from the hospital and a recent receipt of records indicating antibiotic sensitivities and copies of the lab request forms for the blood culture specimens.

Analysis of Records: [*deleted for brevity*]

Reply to specific questions.

1. Should the possibility of sepsis as a cause for her pain have been considered on admission?
Answer: In my view there was no evidence to suggest [Mrs A] was suffering from an infection in the hip region when she was first seen by the ambulance or in the Emergency Department. I note that the House Surgeon has recorded that the patient had 'pain with movement but FROM'. I presume this to mean full range of movement which one would not expect in a patient with a septic arthritis of the hip. It was noted at that time that the patient was afebrile but as mentioned previously on another occasion she did have a mildly elevated temperature. In addition the patient's white blood count was normal as was the Neutrophil count and she did not have a significantly raised CRP.

I am not able to explain the discrepancy between the statement by [Mrs A's] daughter that both she and her mother, [Mrs A] had informed the medical staff that she had been spiking temperatures and had been vomiting previously. I note there is no mention of this in the ambulance people's records and certainly there is no mention of it by the nursing staff or medical staff in the Emergency Department. I am unable to account for this discrepancy.

So in summary, I do not believe that sepsis would have been very high on the list of possibilities at that stage.

Clearly, initial management would have been altered had this diagnosis been considered at this stage but this can only be considered in hindsight.

As to the question of the normal white blood count, it certainly is unusual for the white count not to be elevated but it is known that occasionally in older people it may not be elevated in the early stage. I believe that the normal white count did reassure the medical staff that there was nothing serious at that stage.

2. **Were further investigations for joint sepsis undertaken in a timely manner?**
Answer: I believe there was a delay in performing further investigations particularly the proposed aspiration of the hip under ultrasound.

However, I am not convinced that [Mrs A] had a Septic Arthritis, that is, infection in the hip joint itself. I think it is entirely possible that she had an infection somewhere in the soft tissues adjacent to the femur or possibly in the femur itself. The fact that she had previously had surgery meant that she had a scar and it is known that occasionally infections can develop in these areas. Therefore, an ultrasound aspiration of the hip may not have given the answer.

I think it is also disappointing that an MRI scan was not considered in the early stages particularly at the time when she was clearly becoming unwell with spiking fevers. This would probably have revealed where the infection was most localised.

3. Was Orthopaedic Review undertaken in a timely manner?
Answer: It appears that Orthopaedic Review was first requested [on Friday evening] but it is recorded that no one from the Orthopaedic Team came to see her that evening. The House Surgeon did discuss her situation with the Orthopaedic Registrar who recommended aspiration under ultrasound as soon as possible and also recommended that if this was not available that an MRI should be performed. It was also advised that the patient not be started on intravenous antibiotics until an aspirate had been performed. The records indicate that the first time [Mrs A] was seen by the Orthopaedic Service was at 23:05 on [Saturday] over 24 hours after review had been requested and was not seen by the Consultant until the following morning. As mentioned above verbal advice however had been given.

I conclude that there was a delay in Orthopaedic Review which was unfortunate. I view this with moderate disapproval.

4. Were there delays in undertaking aspiration of the hip?

Answer: As indicated previously there were delays in undertaking aspiration of the hip and indeed it was never actually performed. This may well have been facilitated if she had been seen earlier by the Orthopaedic Team.

5. Was intravenous antibiotic therapy commenced in a timely fashion?
Answer: The records indicate that the first time intravenous Kefzol was considered was at 19:30 on [Friday] but this was not given as the House Surgeon had been

advised by Orthopaedics to delay the starting of intravenous antibiotics until aspiration had been obtained.

As is known, the antibiotics were not started until 15:45 on [Saturday] and that was when Cephazolin was started and Flucloxacillin was commenced at 23:05 on [Saturday].

I believe that there was a significant delay in starting intravenous antibiotics and this is most unfortunate.

On the topic of antibiotics, I note that [Ms B] was very concerned that the patient had not been continued on Roxithromycin from the time of admission to hospital. As mentioned earlier the patient had been on Roxithromycin for initially some cellulitis in the lower legs and then the infected face from [two days after her skin lesions were removed until the day of her admission]. It has also been stated by [Dr Y] that, whilst it was unfortunate the antibiotics were not continued, this would probably have had no influence on the treatment of the Septicaemia. Roxithromycin has a bacteriostatic effect, that is, it does not actually kill bacteria but tends to prevent bacteria from increasing in numbers.

I agree with [Dr Y] that missing the doses of Roxithromycin in this situation almost certainly had no bearing on the subsequent infective processes. In passing there is some confusion as to whether the Roxithromycin was ever given, according to [Dr Y's] latest letter of the 6th October 2011.

Summary and opinion.

In my view I agree that there was no significant indication that sepsis was the cause of [Mrs A's] pain when she was first seen in the Emergency Department.

As mentioned above I believe there were delays in the further investigations for infection, and this included delays in undertaking aspiration of the hip (which eventually was not performed) and there were delays in Orthopaedic Review of the patient. I believe this did have a bearing on the subsequent progress of the patient. By that I mean the advice to withhold antibiotics until the hip had been aspirated was certainly a factor in the delay in starting intravenous antibiotics.

In making this criticism of the standard of care I would view the conduct with moderate disapproval.

Yours sincerely

Garnet D Tregonning F.R.A.C.S., F.R.C.S. (C) Orth.

ORTHOPAEDIC CONSULTANT"

The following further advice was received from Dr Tregonning on 31 October 2011:

> "With respect to the delay in Orthopaedic review, from the information available to me I am not able to identify any particular individual. In most large Public Hospitals in this country Departments are run in a Team structure with consultant[s], Registrar[s], and House Surgeons in each Team. I presume this to be the arrangement at [this] Hospital. Certainly the Registrar and Consultant should have been involved in this case.
>
> With respect to the delay in further investigations for infection, again I am not able to identify any one individual. In [Mrs A's] case she had been under the care of a number of Departments — specifically Emergency and Medicine with significant involvement and input from Orthopaedics and Radiology. I think this was probably a significant factor in the delays — that is a Systems failure."

The following further advice was received from Dr Tregonning on 6 May 2013:

> "Herewith my second report subsequent to the first report of the 26 October 2011 directed to [the HDC], Investigator.
>
> In preparing it I have read the Guidelines from Independent Advisors, Appendix H, made available to me.
>
> I have also read the very extensive number of documents which you have enclosed for me including the list of relevant documents starting No. 1, 9th January 2012 Response from Ambulance Staff, through to No. 17, 21st September 2012 Response to Complaint from Orthopaedic Registrar [Dr V].
>
> I have also read a summary of what HDC considers to be the relevant facts.
>
> I appreciate that you have asked me to focus on the care provided by the Orthopaedic Team at C&C DHB and am aware that you have received advice from an expert in Internal Medicine.
>
> At the outset I state that reading the additional material has not caused me to change my original report but there are some further comments I could make.
>
> 1. Given the circumstances of [Mrs A's] presentation to E.D. during the first 24 hours, I still believe that infection would not have been high on the list of differential diagnoses. There is nothing in the additional material that would cause me to change my opinion on this as outlined in my original report.
>
> 2. Failure to carry out the ultrasound-guided aspiration as advised by the Orthopaedic Department on [Saturday morning] was a significant failing. I note that this has been acknowledged by [Dr Y] in his report dated 13 July 2012 on page four. I would view this conduct with severe disapproval.

3. I also agree with [Dr Y] in his report on 13 July 2012, page four, that the Orthopaedic advice to withhold antibiotics at 2210 hours on [Friday] was probably appropriate given the further delay in ultrasound guided aspiration.

4. The failure of the Orthopaedic Department to arrange an assessment of [Mrs A] on [Saturday morning] when the Orthopaedic Registrar had not been able to see her the preceding evening. I note that [Dr Y] had commented on this on page four of the previously noted report. Whilst it would appear it was the Orthopaedic Registrar who was responsible for not arranging this review I believe that some responsibility should also be borne by Senior Members of the Department who would normally set standards and make the Junior Staff aware of what these standards should be. I agree with [Dr Y] that this was an opportunity missed to either elevate [Mrs A's] condition to a more senior level, and/or for antibiotics to have been initiated at that time. I view this failing with moderately severe disapproval.

Finally, although I have mentioned above that there were significant deficiencies in the management of this case, I believe that, had she been reviewed earlier, unfortunately it may not have been possible to successfully treat this very severe septicaemia in an elderly patient and achieve a successful result.

Yours sincerely

Garnet D Tregonning F.R.A.C.S., F.R.C.S. (C) Ortho

ORTHOPAEDIC CONSULTANT"

Appendix B — Independent medical advice to the Commissioner

The following advice was received from Dr Spriggs on 3 May 2013:

"I have been asked by the Commissioner to provide expert advice on the care of [Mrs A] when she was admitted under the care of Capital Coast District Health Board from [Thursday until her death]. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors. I practice as a General Physician and Geriatrician at Auckland District Health Board and I am vocationally registered in Internal Medicine. I have been a Fellow of the Royal Australasian College of Physicians since 1993.

[Information provided and summary of events deleted for brevity.]

Opinion:

1. On admission to hospital [Mrs A] was feverish (38.0°C) she had what had been considered by her GP to be an infected lesion on her cheek and cellulitis. However her neutrophil count was normal and the CRP was in the indeterminate range. These blood tests would not be typical of infection in the joint. It should be noted that the typical signs and symptoms of sepsis are often masked in the elderly. She did have significant pain. The possibility of sepsis at that stage should have been considered however it was reasonable to put her pain down to musculoskeletal injury following the twisting.

2. Once the possibility of septic arthritis was considered at about 2.20pm on [Friday] [Dr H] very appropriately sought advice from orthopaedics and radiology and an ultrasound was performed at 4.57pm. This did not show fluid within the joint making septic arthritis very unlikely. There was however some fluid adjacent to the proximal femur which I assume is the likely focus of infection. No other investigations were undertaken specifically for joint sepsis until they were suggested at 8.00am on [Sunday], by which time [Mrs A] was in septic shock and dying. Timely aspiration of the fluid around the joint would have led to an earlier diagnosis and presumably more definitive treatment.

3. Initial contact with the orthopaedic registrar was at about 2.20pm on [Friday] despite various phone messages giving advice, the first formal clinical assessment by orthopaedics was at 11.05pm on [Saturday]. This is a delay of 32 hours at least. No significant intervention was proposed at that time and it was not until 8.00 am on [Sunday] that an orthopaedic intervention was planned — a delay of 40 hours. This is an unacceptable delay for a lady desperately sick with possible joint sepsis. It is however fair to say that [Dr L] who was the orthopaedic registrar was consulted at 10.10pm on [Friday] and although he was not able to review [Mrs A] he did suggest a plan. He says that he wasn't told about other sources of sepsis nor that the patient was septic and haemodynamically unstable. Had this information been handed over he says that he would have behaved with greater urgency. If he was made aware of the

relevant clinical information, the delay is even less acceptable. It is expected clinical practice that all relevant information is given when requesting a consult particularly out of hours in urgent situations.

4. It is clear that there was a mix up with medicines reconciliation such that the Roxithromycin which [Mrs A] was taking on admission was not administered until 1800 hrs on [Friday]. This mix up is compounded by two different versions of the prescription of Roxithromycin by [Dr Y] in his letters of 28th April and 6th October. However Roxithromycin is very unlikely to have been helpful in this situation and I do not believe this oversight was in any way clinically significant. Of greater concern is the delay in giving appropriate anti-Staphyloccoccal drugs. The first dose of Cefazolin was given at 1700 hrs on [Saturday] more than 24 hours after septic arthritis was considered and 5 hours after blood cultures were positive. While I understand that antibiotic 'stewardship' is important in controlling the inappropriate use of antibiotics, it is essential that DHBs have in place a system whereby authorisation of appropriate antibiotics is able to be obtained quickly. It seems that there was a significant delay in gaining this authorisation to the frustration of the house officer who felt that the decision 'kept getting pushed to someone else'.

5. Although the house officers sought advice from various colleagues at various times there is marked lack of documentation of such advice, this may reflect the business of the doctors concerned. There is no documentation of the handovers.

6. I do not think that the raised monocytes in the blood count of [Thursday] was, in itself, significant.

7. CRP of 25 in this context is unhelpful and I think [Dr G's] assessment was appropriate at the time.

Additional comments:

The management of [Mrs A's] sepsis and the failure to recognise the severity of such is sadly common in hospitals. In about 2009 the 'Surviving Sepsis Campaign' was launched in the USA and subsequently has been taken up in Britain. While this initiative was certainly not recognised by the end of 2010 in New Zealand and therefore the clinical staff could not be criticised for their lack of knowledge, this campaign has emphasized the importance of early sepsis recognition and early management in a generic sense even before bacteriological confirmation. I acknowledge that the DHB has introduced teaching on sepsis recognition and a pathway for sepsis. I think it is important that such initiatives are replicated throughout New Zealand.

I note from the report from [Dr J] that there was a post mortem examination of the hip joint which was shown not to be infected. This would be in keeping with her original ultrasound which showed no fluid within the joint. It remains very likely however that although there was no true septic arthritis the fever, high white cell

count and high inflammatory markers, positive blood cultures and pain around the hip would be in keeping with infection in the soft tissues, bursa or around the metalware. I note that [Mrs A] had a lot of pain in her shoulder subsequently and it may be that there was spread of the infection to that site as well. It is likely that this infection has seeded through the blood stream and entered the body through either the cellulitis in the legs or the facial wound.

It is important that observations are recorded on the appropriate charts immediately they are taken. I would hope that the DHB has changed its processes to ensure this is the case.

There is a striking lack of input into [Mrs A's] care from the Medical Registrars. It is not clear why they were not consulted more and why they did not support the house officers who were clearly struggling to manage [Mrs A's] condition. A more experienced doctor such as a medical registrar is likely to have appreciated the severity of the disease and may have insisted on early orthopaedic review.

While the changes made at C&CDHB since this complaint are beneficial, I note that there has been no attempt to improve a) clinical documentation b) communication and responsiveness between departments c) documentation and SMO supervision of Handover d) failure by House Officers to seek senior assistance. The use of empiric antibiotics is controversial, however the requirement for a responsive, easily accessed, reliable and consistent antibiotic stewardship system is not. The failure of that system in the case of [Mrs A] has not been addressed.

I commend the response of Capital Coast District Health Board to these complaints. They met with [Ms B] promptly and communicated with her by letter. They have also addressed some of the systematic problems unmasked by this case.

Summary of Opinion:

[Mrs A] was admitted to the hospital with pain in the hip, she was subsequently shown to have staphylococcal septicaemia. The recognition of sepsis was timely, however the severity of [Mrs A's] condition was not recognised and there were significant delays in accessing the orthopaedic opinion and commencing appropriate antibiotics. These delays may have contributed to the adverse outcome.

The documentation of communication between the house officers and orthopaedics, and the handovers within General Medicine is inadequate.

I believe the house officers, [Drs H, M, R and T] all provided clinical care to the best of their abilities and of a high standard. They experienced significant problems accessing support from the orthopaedic registrar, the Infectious disease team and probably from the medical registrars on call. These difficulties almost certainly reflect a very high clinical work load of these doctors.

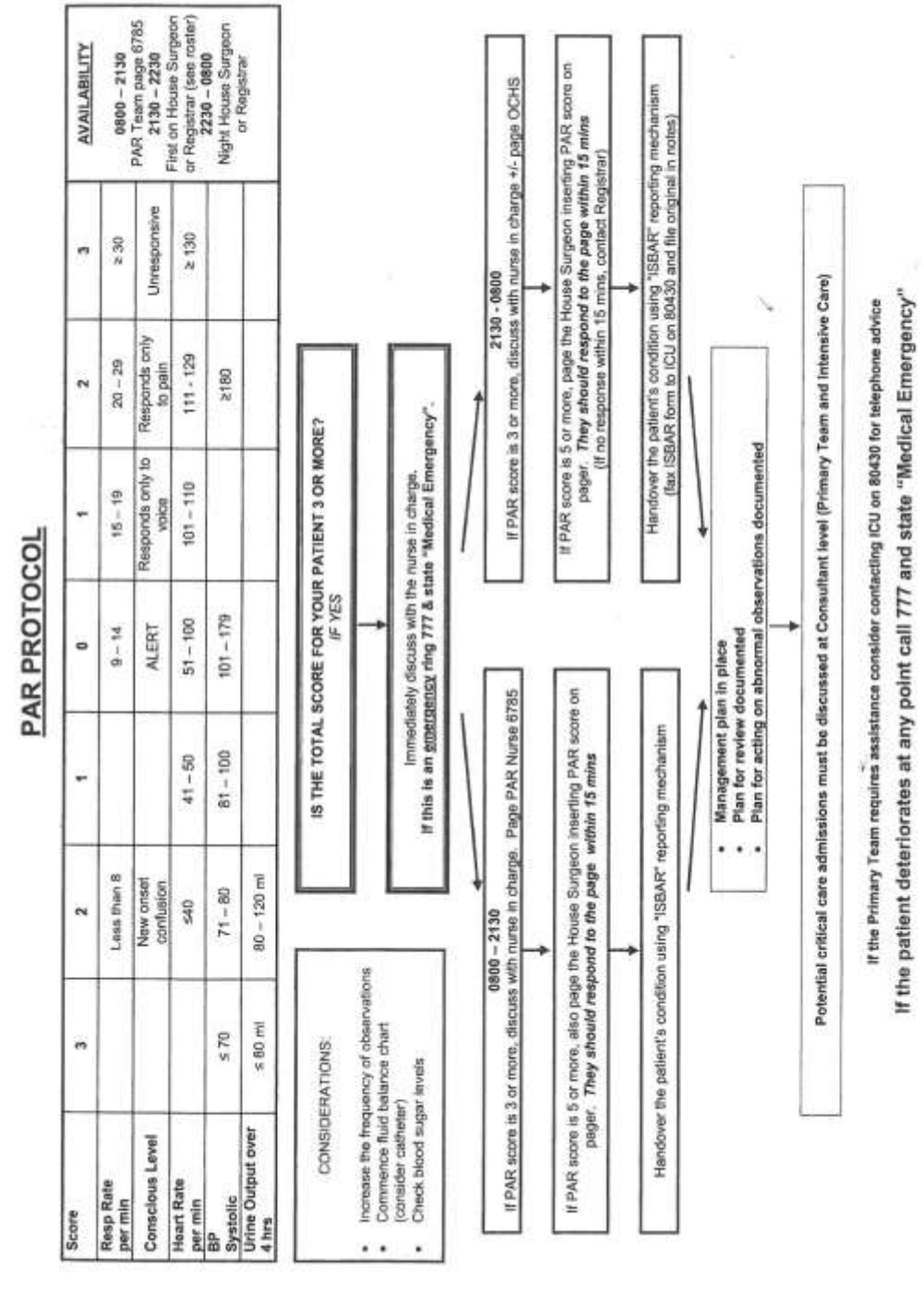
There is a surprising lack of consultation with consultant staff. I have previously commented on issues to do with excessive workload and reluctance to contact consultants in Capital and Coast District Health Board in my Report on Case 05/11908. Such systemic short comings are not the responsibility of individual clinical staff but remain the responsibility of the DHB.

I feel that their peers would not find fault with the individual clinicians from general medicine in this case, however the Capital Coast District Health Board has fallen short of expected standards and I believe this failure to be of mild severity.

I have not made any recommendation with regard to the service offered by Orthopaedics or the Emergency Department.

Should you require any further information, please do not hesitate to get back to me."

Appendix C — PAR Protocol



Names have been removed (except Capital and Coast DHB and the experts who advised on this case) to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's actual name.