A District Health Board

General Surgeon, Dr D

General Surgeon, Dr E

Surgical Registrar, Dr F

A Report by the

Health and Disability Commissioner

(Case 09HDC01146)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. On 20 March 2009, Mr A was referred to DHB1's Emergency Department (ED) with acute pain in his left leg and a cold, blue, left foot. He was diagnosed with impending ischaemia[1] and admitted to hospital.

2. Mr A was under the care of Dr D. Mr A experienced a delay of ten days before he was seen by Dr E, a general surgeon with an interest in vascular surgery at DHB1.

3. A week later Mr A underwent surgery for an aneurysm behind his left knee. Following the surgery, Dr E went on leave but failed to hand over Mr A's care to the on-call consultant.

4. Mr A suffered complications but the significance of his symptoms was not appreciated by the registrar, Dr F, and Mr A was not referred to a vascular surgeon at DHB2 for several days.

5. By this time, Mr A's leg could not be saved and he required an above-knee amputation.

6. This report finds the following breaches:

   - Dr D breached Right 4(1) for failing to seek specialist advice within a reasonable time.
   - Dr F breached Right 4(1) for failing to verify the information he provided to Dr D about the absence of Dr E, keep adequate records, and adequately assess Mr A.
   - Dr E breached Right 4(5) for failing to adequately hand over Mr A's care.

7. DHB1 was found to have adequate systems in place and was not found in breach of the Code.

Complaint and investigation

8. On 27 April 2009 the Commissioner received a complaint from Ms B about the services provided to her father, Mr A, at DHB1. The family believe that a series of failures led to their father having his leg amputated. The complaint is about the poor standard of care their father received.

9. The following issue was identified for investigation:

   Whether Mr A received an appropriate standard of care at DHB1 in March and April 2009.

   An investigation was commenced on 5 June 2009.

[1] "Ischaemia" means a reduction in blood supply to part of the body caused by restriction or blockage of blood vessels. It has an acute, chronic and acute-on-chronic dimension depending on the degree of obstruction.

10. On 17 September 2010 the investigation was extended to cover:

Dr D

- *Whether Dr D provided an appropriate standard of care to Mr A in March 2009.*

Dr E

- *Whether Dr E provided an appropriate standard of care to Mr A in March and April 2009.*

Dr F

- *Whether Dr F provided an appropriate standard of care to Mr A in March and April 2009.*

11. Information was obtained from the parties directly involved in the investigation:

Mr A	Consumer
Mrs A	Consumer's wife
Ms B	Complainant/consumer's daughter
Dr C	General practitioner
Dr D	General surgeon
Dr E	General surgeon
Dr F	Surgical registrar
Mr G	Consumer's son-in-law
DHB1	Provider
DHB2	Provider

Also mentioned in this report:

Dr H	Consultant physician
Dr I	Surgical registrar
Dr J	General surgical house surgeon
Dr K	On-call consultant
Dr L	Vascular surgeon

12. Independent expert advice was obtained from vascular surgeon Professor Justin Roake and is attached as **Appendix one**, and from general surgeon Dr Stephen Kyle and is attached as **Appendix two**.

Information gathered during investigation

Background

13. Mr A, aged 79 years, had been diagnosed with Parkinson's disease around five years before the events complained of. For approximately a year he had been experiencing "seizures" in his left leg when walking.

14. Mr A first complained to his general practitioner, Dr C, about his left leg pain in September 2008. Mr A described attacks of pain, numbness in his lower leg and foot,

and a loss of control of his left lower lateral (side) muscle. Mr A told Dr C that the "seizures" lasted for about an hour, and he had had about four attacks in the previous year.

15. When Dr C examined Mr A's left leg there was good blood flow to the left foot. Dr C was unable to reproduce the pain on a "slump test" (by stretching the sciatic nerve). Dr C said he told Mr A that he could have a problem with his sciatic nerve and, rather than prescribe medication, decided to "observe for now".

16. On 7 October 2008, Mr A had a routine appointment with consultant physician Dr H regarding symptoms related to his Parkinson's disease. Dr H examined Mr A's left leg and foot and advised Dr C that he was unable to give a diagnosis but had arranged lumbosacral[2] spine and left foot X-rays, and screening haematology and biochemistry tests.

17. Dr H advised Dr C that he explained to Mr A that the symptoms were not a complication of Parkinson's disease, and he might need a referral to an orthopaedic surgeon. Otherwise, Mr A remained reasonably mobile with no significant changes.

18. Dr H saw Mr A for a follow-up appointment on 21 October 2008. In his reporting letter to Dr C, Dr H explained that any sinister pathology had been reasonably excluded by the investigations noted above, and that Mr A's symptoms were probably related to degenerative changes in his spine. Dr H advised Dr C that Mr A had told him his pain had completely resolved, and he was reasonably confident it was sciatica. As the symptoms were not particularly limiting, Dr H recommended to Dr C that conservative management be continued. Dr C told HDC that in his view Mr A seemed happy to continue conservative management.

19. Dr C did not see Mr A about his left foot again until Mr A telephoned Dr C's practice nurse on 5 January 2009 to tell her that his leg had given way while he was walking and, once again, he was experiencing excruciating pain.

20. Dr C saw Mr A on 6 January 2009. Dr C examined Mr A's left leg, Achilles tendon,[3] calf and foot, and found that all appeared normal. Dr C was satisfied that there was good blood flow. He decided to observe and monitor Mr A.

21. Mr A had a further episode on 24 February 2009 and, as his Sinemet tablets (for Parkinson's disease) had been recently altered, Dr C changed the Sinemet back to the previous lower dose.

22. Dr C saw Mr A on 2 March 2009 and noted that since the reduction of Sinemet, Mr A's pain had not reoccurred. Mr A's leg showed a good blood flow and no signs of sciatica but, as Dr C still did not have a diagnosis, he decided to refer Mr A to the Parkinson's disease specialist at DHB1.

23. When Dr C next saw Mr A on 20 March 2009, unlike previous occasions, the blood flow to Mr A's lower leg was compromised. Dr C referred Mr A to the DHB1

[2] Lumbosacral refers to the lower part of the backbone or spine.
[3] A tendon that runs down the leg behind the ankle.

emergency department (ED) for further investigation and management. In his referral letter, Dr C stated that Mr A had a "blue pulseless left foot [when] the leg was elevated to >30deg, but with some normal colour returning on resting his leg down". Dr C questioned whether Mr A was "suffering a critically ischaemic foot".

DHB1 — emergency department

24. Mr and Mrs A arrived at the ED at 2.30pm on Friday 20 March 2009. Mr A was triaged as category three and examined by surgical registrar Dr I at 4.10pm. Dr I recorded the absence of pulses in Mr A's left foot, and the colour of his foot when it was down and when it was elevated. Dr I's impression was "Impending [left] foot ischaemia but [not] critical, Admit to surgical, blds [admission blood tests] ?CTA mane [angiogram in the morning] O2 [oxygen]". Dr I recommended that Mr A be admitted to the ward under the surgical team.

25. Mr A was seen by general surgical house surgeon Dr J. Dr J examined Mr A and recorded his treatment plan as: "Admit, analgesia, Clexane 20mg[4] od [one a day] s/c [subcutaneously]" and recorded that observations and an electrocardiograph (ECG) were to be carried out once Mr A was in the ward.

26. Dr J could not feel Mr A's pulses in the front of his foot, and his differential diagnosis was "(?) popliteal [artery] aneurysm[5] of the left leg". Mr A left the ED to go to the ward at 10.10pm.

Hospital admission

27. Mr A's records show that he was admitted to the ward under general surgeon Dr D's team at 10.51pm, and his diagnosis noted "… impending [left] foot ischaemia but not critical". It appears that Mr A spent a comfortable night with no complaints of pain or signs of infection.

28. On Saturday 21 March 2009, Mr A was seen at 11am by Dr D during his routine ward round. Dr D's provisional diagnosis was "left ischaemic limb". The plan was to keep Mr A in hospital over the weekend and to have a CTA (CT angiogram) and refer Mr A for a vascular consultation on Monday.

29. Dr D explained to HDC that when a patient requires a vascular assessment, he or she is always referred to Dr E,[6] and is usually seen within a few hours of that referral.

30. Dr D was advised that Dr E was on leave. Dr E's registrar, Dr F, informed Dr D that Dr E would return to the hospital on Monday 23 March 2009. In Dr D's opinion, Mr A's condition was not critical, and Dr E could see him in two days' time. In the circumstances, Dr D decided to keep Mr A in hospital.

[4] This is a low prophylactic dose intended for DVT prevention.
[5] An aneurysm is a sack formed by dilatation of the wall of an artery or vein which is filled with fluid or clotted blood and may be felt as a pulsating tumour. It can occur in any artery but in this case it was in Mr A's left popliteal artery, which runs behind the knee.
[6] Dr E is a vocationally registered general surgeon with a special interest in vascular surgery. Dr E is appropriately qualified to perform this surgery. DHB1 advised that Dr E is credentialled to perform perivascular surgery at DHB1. He is the only surgeon with those particular interests and experience at DHB1 and performs on average about 20 vascular surgeries a year.

31. Dr D told HDC that he spoke with the family about obtaining a vascular consultation at DHB2 but, as they knew Dr E, they decided to await his return. However, Ms B stated that although her brothers went to school with Dr E, the family are adamant that Dr D never discussed with them the need for a vascular consultation. They were anxious to find out what was wrong with Mr A. The records state that the "patient's attendants explained about his condition" but there is no record of a discussion about whether to refer Mr A to DHB2.

32. Dr E told HDC that he was on leave when Mr A was admitted. Dr E said that when he requests leave, the relevant departments are informed. His leave is clearly documented on the surgical roster, which is circulated to colleagues and available on the hospital intranet. In general, leave must be requested six weeks in advance. In contrast, Dr D advised HDC that "[u]nfortunately our roster is notoriously unreliable" and said that in practice the most effective way to find out information is from the registrar working with the consultant. Dr F told HDC that he "may well have" talked to Dr D about when Dr E was due to return. He said he would get the information off the roster, but sometimes it was outdated for consultants. Normally if he wanted to know when someone was on duty he would talk to the other registrars and use the roster only as a back-up. He said it was possible he got the information from Dr E himself, but he could not remember. Dr D said he "took the registrar's word" about when Dr E would return.

33. Dr D examined Mr A on Sunday 22 March when he noted improved colour of Mr A's foot and stable observations. Dr D recorded: "Plan 1. Vascular surg r/v tmrw [review tomorrow] by [Dr E]."

34. Dr D saw Mr A again on Monday 23 March. Dr D advised HDC that he learned that day that Dr E would not be back "until the end of the week". As this was only another three or four days, he decided to wait because at that time Mr A's condition was stable. Dr D said that if he had known on 21 March that Dr E would be away for ten days in total, he would have transferred Mr A to DHB2 that day.

35. On Tuesday 24 March Mr A was seen by Dr F. Mr A had been reasonably stable, with his primary complaint being pain in his left foot. Dr F recorded: "[Dr E] away this week. Pain improving generally — nocturnal [night] pain in foot." Dr F arranged for an angiogram (CTG) which was performed on 25 March.

36. Dr D saw Mr A on Wednesday 25 March and recorded his foot as "colour — purple–black", indicating changes in blood flow.

37. Dr F examined Mr A on Thursday 26 March. Dr F asked the house officer to chase up the angiogram results and order a physiotherapy assessment. Mr A's physiotherapy assessment was completed later that day. The angiogram revealed a large bilateral popliteal aneurysm on the left leg, one large and a second smaller femoral (artery) aneurysm in the right leg, and a lower abdominal aortic aneurysm.

38. On Friday 27 March Dr D assessed Mr A again and discussed his CTG at the radiology meeting. After the meeting Dr D discussed its conclusions with Mr A and

his family. The record notes "d/w Family + Pt [re] need for vascular surgery". Dr D recorded that Mr A was to be seen by Dr E on Monday 30 March.

39. Mr A went home on leave on 27 March intending to return on Monday 30 March. However, he returned to the hospital at 8am on Sunday 29 March, because his pain was not controlled with paracetamol.

40. Dr D continued to oversee Mr A's care, reviewing him on Monday 30 March, before handing over to Dr E.

Dr E

41. Dr E saw Mr A at 9.10am on Monday 30 March. Dr E diagnosed "left foot ischaemic" and "dusky and cold" on examination. He commenced Mr A on a therapeutic quantity of Clexane (an anticoagulant) and scheduled him for surgery on 7 April. Dr E planned to use the left short saphenous vein to bypass the aneurysm and, on 31 March, Mr A had an ultrasound to examine the patency of the vein.

42. Mr A was allowed leave on Friday 3 April for the weekend, returning each day for Clexane injections, which were stopped on 5 April in preparation for surgery. His records show that he was seen daily by Dr F, or the second surgical registrar, or by Dr E.

Surgery 7 April

43. Mr A had his scheduled bypass graft to the large popliteal aneurysm behind his left knee under general anaesthetic on Tuesday 7 April 2009. Dr E's letter describing the operation notes that the ultrasound taken preoperatively had identified a suitable vein to harvest but unfortunately at surgery it was found to be too short. Dr E had to use a reinforced Gortex (artificial) graft. Dr E explained to HDC that using artificial grafts on joints is far from ideal. Dr E gave the same explanation to Mr A's family.

Postoperative care

44. Mr A's postoperative treatment plan was that he was to avoid flexing his left knee, neurovascular observations of his left foot were to be carried out, and his wound drainage was to be monitored. A urinary catheter had been inserted in theatre, he was having intravenous fluids, and antibiotics were ordered.

45. Mr A's records suggest that the surgery went well. His foot was warm and viable.

46. On Wednesday 8 April Mr A's condition was satisfactory, although he was mentally confused at times. His oxygen saturation was good, and his observations were within the normal range. His pain was controlled with epidural medication supervised by the pain team. The anaesthetic registrar's notes record that Mr A was alert, orientated and pain free. Therapeutic Clexane was recommenced.

47. Dr E saw Mr A daily and considered he was making good progress. By Thursday morning Dr E had no immediate concerns for the viability of Mr A's leg. The nursing staff had been recording Mr A's vascular observations regularly and his circulation appeared to be doing well. The records show that plans were underway to discharge

Mr A the following week, although Dr E told HDC that that would have been overly optimistic.

Handover

48. Dr E was again going on leave over Easter. On Thursday 9 April 2009 Dr E visited Mr A. Ms B said that the family were left with the impression that Mr A was progressing well.

49. Dr E told HDC he did not talk to the on-call consultant over Easter, Dr K, about Mr A.

50. Dr E advised HDC that while he was on leave the policy was that "[c]urrent inpatients are handed over to a designated consultant". However, Dr E advised that his practice was, in general, to only hand over major cases and those with complications.

51. He stated that Mr A's ongoing care was "assumed by the on-call registrar and surgeon". He said he had never previously had any reason to consider that the staff had insufficient knowledge about vascular problems to be able to identify when an assessment by a consultant was necessary. He said: "The relevant DHB staff including Nurses, Junior Doctors, Senior Doctors have all been trained appropriately to their level of function."

52. Dr E advised that Dr F was a training registrar who appeared competent. The training was apprenticeship-style with ad hoc discussion of cases and postoperative complications as they arose. Dr F advised that although he had not had the benefit of being attached to a vascular unit, he felt suitably orientated to the hospital and knew he had the support and back-up of consultants and other departments in the hospital if needed.

53. The DHB root cause analysis stated: "There was a verbal handover between surgeons indicating to the on-call surgeon that the pulses were present and the foot was a good colour." However, in contrast, Dr E told HDC: "I didn't specifically tell [the] on-call surgeon that [Mr A] was on [the] ward when Easter came … When I went on leave the on-call surgeon was responsible, albeit that [Dr F] was [the] first point of contact."

54. Dr F told HDC that Dr E advised him that he was going on leave. With regard to patients under his care, the handover was, if there were any concerns about any patient, he was first to go to the consultant on duty on the day. If the consultant was not available he might need to seek outside help. In the case of Mr A (being a vascular case), Dr F should seek assistance from DHB2 or the other DHB1 hospital. Dr F said that he "did not recall receiving any direct handover from [Dr E] about any particular issues with [Mr A]".

9–12 April

55. During the night of 9/10 April Mr A's left foot was pale and cool and his pulses "faint". Ms B said that on the morning of Friday 10 April, the family arrived at the hospital to find Mr A in considerable discomfort. He was repeatedly trying to get out of bed and becoming increasingly disorientated; his left foot was intermittently

turning purple and white and was cold to touch. They noted that his level of pain varied according to the changes in the temperature and colour of his foot.

56. The nurse could not detect peripheral pulses in Mr A's left foot and the pain in his left leg had increased. The record states: "[Left] foot looking dusky & cold to touch, hard to palpate pulse OCMS informed of [patient] status." Dr J was notified.

57. When Dr J arrived, Mr A was sitting in a chair with his left knee flexed at 30º. Dr J recorded that Mr A's leg was pale and cold, with reduced capillary return and no palpable dorsal (front of foot) pulses. Dr J asked for Mr A to be returned to bed, with his leg elevated in full extension, and he was given pain relief. Dr J informed Dr F of these findings. In the meantime, the nurses applied ice and heat packs, but with no effect.

58. Dr F and Dr J reviewed Mr A's leg later that day. Dr F recorded that he could hear blood flowing in the bypass graft using Doppler ultrasound and recorded that a clot from the aneurysm could be causing the problem.

59. Mr A's son-in-law, Mr G, said that Dr F came in, used the Doppler, and heard a pulse above the left knee. He could not find one in Mr A's foot but told the family that he thought "it should be all right". The family were very worried as they had observed paleness and blueness in the foot and leg on several occasions.

60. Dr F told HDC that he got a good reading directly below the graft and knee joint indicating that there was blood flow through the graft, but he could not find a reading or hear a pulse noise on the dorsal part of the foot. He was not overly concerned and took into account the fact that Mr A had more than one artery running down his leg and there were at least three ways below the graft the blood could flow down. He said that he relied on his clinical observations — the fact that the skin tone and colour was as it had been before, and there was no difference in the noted pain levels. He considered whether there was a clot coming down the leg and decided to continue monitoring Mr A's progress.

61. Dr F was called back later, as Mr A was complaining about pain in his leg and there had been a colour change. Dr F recalled that when he arrived back at Mr A's room, family members were present and Mr A was sitting up on his bed with his legs hanging over the side. Dr F ordered that Mr A be laid flat on the bed with his legs fully extended, ensuring there was no bend of the knee. He said he then examined him again with a Doppler and, as before, got good readings above the knee joint and just below it. On examining the foot he again got no pulse sound, signal or noise. Dr F said he wasn't particularly concerned about the lack of readings in Mr A's foot as he believed the circulation had been compromised by Mr A's sitting position and would start to return to its previous state. Dr F said he "told nursing staff to keep a close eye on it and call him if [Mr A's] condition changed and then he would escalate it up to the consultant, if it required". However, Dr F did not record these instructions.

62. Dr F put Mr A on a therapeutic dose of Clexane plus morphine[7] to control the pain. Later that evening Mr A's foot was noted to be "dusky purple" with reduced sensation and very faint pulses. Drs F and J assessed Mr A several times that day but did not contact Dr K.[8]

63. During the night of 10/11 April Mr A was very unsettled and disorientated, climbing in and out of bed, and resisting all attempts to restrain him. A "special" (someone with him all the time) was arranged for the following day, and a family member agreed to stay with him.

64. DHB1 explained to HDC that having a family member present would help relieve Mr A's anxiety and support the nursing staff. Having family support nursing interventions in partnership is a common occurrence. It was not expected that the family would take over the normal core functions of nursing staff but, on occasions, families do support these functions and it is always appreciated by nursing staff.

65. It was very difficult to keep Mr A's leg straight, and his wound began oozing profusely. It was difficult to record his observations because he struggled with the staff trying to take them.

66. Mr A was complaining of burning pain down his left leg. His leg was cold and nursing staff could find no pulse in his foot.

67. Mr A's family told HDC that their impression was that over Saturday and Sunday 11–12 April, staff simply looked at Mr A's foot, which went from purple to white to purple, but did nothing about it.

68. DHB1 advised HDC that Dr F came in on his day off to examine Mr A's leg over Easter but he did not document his findings. Mr A's notes indicate that he was also examined by the general surgical registrar on call (signature illegible) on 10 and 11 April (Friday and Saturday).

Assessment by Dr K

69. On Sunday 12 April Mr A was assessed by Dr K, who found that Mr A was calm and his observations normal. However, Dr K recorded: "I could not convince myself that there was any substantial signal over the graft — there may have been a faint nomophasic signal at best. Overall, the impression is that the graft was blocked." Dr K discussed his impressions with Dr E by telephone, and Dr E recommended that Dr K consult the DHB2 vascular surgeons.

Transfer to DHB2

70. Dr K spoke to DHB2 vascular surgeon Dr L, who agreed that Mr A should be transferred immediately. Mr A was transferred to DHB2 for surgery that day. Mr A

[7] Mr A had been on epidural analgesia postoperatively but this had been discontinued on 9 April 2009.

[8] The DHB1 information booklet *The Introduction to the Department of Surgery for New Registrars* notes that the on-call consultant should be telephoned between 9pm and 10pm with a list of all new patients and any patient causing concern. ED patients require prompt assessment (that is, referrals from the GP or ED department). After going home, the surgical registrar should be quick to return if there are any patients with whom the house officer is having problems.

presented at DHB2 with acute left leg ischaemia of over 24–48 hours' duration following an acute thrombosis of the graft. Unfortunately, removing the clot did not improve the condition of his foot. Dr L discussed amputation with Mr A and his family, and Mr A underwent an above-knee amputation of his left leg on 16 April 2009.

Transfer back to DHB1

71. On 24 April 2009, Mr A was transferred back to Dr E's care for rehabilitation and monitoring of his right popliteal and abdominal aortic aneurysms with follow-up appointments for vascular assessments at DHB2.

DHB1 response

Initial delay

72. DHB1 advised HDC that Mr A waited too long for the appropriate treatment, and suffered pain and, at times, confusion. DHB1 said it appeared that some members of Dr E's team did not know he was on three weeks' leave. This left Mr A waiting ten days to be seen by the appropriate clinician. There were two options available for patients needing a consultation with a vascular specialist — either refer them to DHB1's general surgeon (if available) or seek advice from the vascular team at DHB2. DHB2 vascular surgeons were very prompt at providing expert opinion and treatment advice.

Staff rostering

73. DHB1 explained its rostering systems for on-call staff and leave of senior surgical staff. Dr K completes the on-call roster for one month, and the master copy is on-line. Senior staff verify the roster to ensure that no leave has been missed. The on-call roster is then emailed to the Booking Clerks Surgical Group, General Surgeons group, Dr D's private rooms, and the surgical registrars. Printed copies are put in baskets for Dr E, another general surgeon, and other surgeons, a printed copy is pinned on the notice board above Dr E's desk, and a printed copy is pinned on the general surgical team's notice board.

74. The leave roster (current month and next month) is emailed out each Monday morning to the Booking Clerks Surgical Group and cc'd to surgical typists. It is also on the senior medical officers' website under "SMOLEAVE 'year'".

Registrar orientation

75. DHB1 is a training centre for registrars in the Royal Australasian College of Surgeons programme. DHB1 provided HDC with copies of its manuals *Resident Medical Officer's Handbook* and *An Introduction to the Department of Surgery for New Registrars (December 2008)*, the latter being the most relevant in this case. As well as being a consultant general surgeon, Dr K is the supervisor of training in general surgery at DHB1. Dr K prepared the manuals.

76. The manual informs registrars in the first and second parts of the programme how the surgical department works, including placement of patients on elective and acute surgical lists, referral for investigations, and some acute situations where discussions with the consultant is obligatory. Registrars are expected to attend various training sessions, such as grand rounds and radiology conferences. They have various

administrative duties, such as applying for leave, on-call cover, record-keeping, and patients' referrals and discharges. DHB1 and its senior surgical staff expect registrars to be senior members of the resident staff, with a role in leadership of junior doctors. Senior registrars are encouraged to see themselves as "running the show", which includes keeping consultants informed "at all stages" and making executive decisions.

Registrars' supervision

77. DHB1's surgical personnel comprises five consultant surgeons, four registrars, five house officers and two trainee interns from the medical school. Registrars in training gain experience working in each team within the year. This means that each team is assigned two registrars in training.

Root cause analysis

78. DHB1 carried out a root cause analysis of these events and found the following failures:

- Mr A was admitted to hospital with a vascular problem but was not seen by a surgeon with an interest in vascular surgery for ten days.
- The surgeon with special interest was on leave and his registrar knew he would be away for three weeks.
- The surgeon was on leave over Easter and the relevant registrar came in on his day off because different registrars were rostered on call. He did not document his assessment of Mr A's leg, or that the colour of the foot had changed but pulses were present.
- The registrar on call noticed the deterioration in Mr A's leg but did not advise the on-call consultant general surgeon.
- The nursing staff did not record Mr A's vascular observations consistently over 10 and 11 April.
- There was no integrated pathway for popliteal grafts in the surgical unit and no clear postoperative care plan.

79. DHB1 advised that the case was discussed at the surgical Mortality Morbidity Review and there was a clear understanding that much can be learned by junior doctors about recognising when to seek help from consultant staff. This requirement is now in *An Introduction to the Surgical Department for New Registrars* and every opportunity is taken to reinforce the message in a number of other hospital forums.

80. DHB1 stated that, as a result of this case, when any patient presents with peripheral ischaemia where there is an indication that surgery may be required, their surgeons have agreed to consult a vascular surgeon at DHB2 or a general surgeon with a special interest in vascular surgery within 24 hours.

81. In addition, Dr E and the nurses in the surgical unit will design a clinical pathway to ensure that the services will be provided by a nursing team with the right skill mix. The surgical team also plans to have the complete services credentialled by colleagues at DHB2, once the pathway and appropriate education is completed.

Responses to provisional opinion

Dr F

82. Dr F did not respond to my provisional opinion.

Dr D

83. Dr D provided an apology for Mr A and his family.

Dr E

84. Dr E advised that the practice in the department was to hand over patients to the Registrar if the patient's recovery was following the expected pathway. The Registrar on call reviewed the surgical patients and notified the on-call surgeon if there was a deviation from the expected pathway. As such, he considered he had taken reasonable steps in the circumstances.

DHB1

85. DHB1 responded accepting the findings of this report and expressing its regret about the opinions and actions taken which meant their service did not meet Mr A's needs in a timely and efficient manner.

Opinion: Breach — Dr D

86. This case is about the care provided to a 79-year-old man with vascular problems whose referral for a vascular consultation was delayed. Dr D first examined Mr A on Saturday 21 March. In his opinion Mr A had subacute ischaemia of his left foot and needed a vascular consultation. However, because Dr E was on leave, Mr A was not seen by Dr E for ten days. In the interim Mr A had limited treatment, although Dr D prescribed prophylactic doses of Clexane.

Cause of delay

87. When Dr D saw Mr A on 21 March Dr D understood from Dr F that Dr E would be back on Monday 23 March. Dr D said he had no reason to question this information. Dr F has confirmed that he may have talked to Dr D about when Dr E would return. It is clear that neither Dr F nor Dr D consulted the roster. Dr E acknowledged that there was a "general understanding" within the surgical team of when surgeons would be on leave, but it would not be unusual if his registrar did not know the exact date of his return.

88. In my view, at this stage it was reasonable for Dr D to rely on the information provided by Dr F.

89. On Monday morning, when Dr D was preparing to hand over Mr A's care to Dr E, Dr D was told that Dr E would not be back until the end of the week. In the event, Dr E did not return until Monday 30 March.

90. At this stage it was no longer acceptable for Dr D to rely on the information provided to him by Dr F. Dr D had the roster available to him, which clearly showed Dr E's

leave. Although both Dr D and Dr F have indicated that, at times, the roster was unreliable as there were frequent changes, Dr E's leave was shown on each version of the roster.

91. Although I accept that, at that stage, Mr A's condition was not acute, Dr D's failure to verify the information himself after Dr F's information had been shown to be unreliable was, in my view, unacceptable. My expert advisor, Dr Stephen Kyle, advised me that:

> "Standard practice for the management of an acutely ischaemic limb would be for reasonably prompt assessment, investigation and initiation of management. Ideally it would have been appreciated that thrombotic emboli from a popliteal aneurysm was likely to be responsible for [Mr A's] symptoms at an earlier stage and prompt initiation of therapeutic anti-coagulation and angiography performed with a plan for surgery.
>
> The potential severity of [Mr A's] problem was not appreciated; he was misdiagnosed as having chronic ischaemia. His ischaemia was judged as being non-critical. In the setting of chronic non-critical ischaemia it may be reasonable to undertake a less urgent course of investigation and management, as was undertaken.
>
> An early telephone vascular consultation would have been appropriate.
>
> …
>
> The delay was largely due to misdiagnosis and the departure from standard care is minor."

92. My expert advisor, Professor Roake, explained that "[Mr A] clearly had signs and symptoms of acute ischaemia … and by the morning of Saturday 21/03/09 [when Dr D assessed him] was suspected of having popliteal aneurysms". Professor Roake further explained that "[t]he management of acute limb ischaemia especially in the presence of popliteal aneurysms is notoriously difficult. It is of great concern that it took ten days for [Mr A] to be reviewed by a surgeon with an interest in vascular surgery. This occurred despite there being a specialist service available (at [DHB2]) for consultation by phone at any time." Professor Roake considers that this was a serious departure from standard care.

93. I accept the advice of Dr Kyle and Professor Roake. Both thought the delay was unacceptable, albeit their views as to the seriousness vary. Clearly it was unacceptable for Mr A to wait ten days to see a vascular surgeon. He was in significant pain and he and his family were anxious and distressed. He was misdiagnosed as having chronic ischaemia and did not receive therapeutic dosages of anticoagulant.

94. In my view, it is equally unacceptable that an opportunity to seek advice and provide appropriate treatment to Mr A was missed. It is my opinion that, rather than wait and observe, there needs to be a low threshold for seeking specialist advice in complex cases such as that of Mr A, Accordingly, I consider that the standard of care provided

to Mr A was inadequate. I find that Dr D breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[9]

Opinion: Breach — Dr F

95. The involvement of Dr F in Mr A's care, as outlined in the "Information gathered" section, is of concern with regard to the information he provided to Dr D about the absence of Dr E, his inadequate record-keeping, his assessment and management of Mr A over the Easter period, and his failure to recognise that he needed to seek advice from the on-call consultant.

96. However, I am also concerned about the lack of co-operation of Dr F during this investigation. DHB1 advised HDC that they had left messages on Dr F's cell phone, sent emails to Dr F, and wrote to Dr F, in an attempt to obtain his response to the complaint made by the family. Each of these attempts was met with no response.

97. Similarly, HDC wrote to Dr F on 13 April 2010 and emailed him on 4 May 2010. He failed to respond to either of these communications. A message was left on 19 October 2010 for him to call HDC and, when he spoke to my investigator on 20 October, Dr F claimed that he did not know about the complaint. He was invited to respond to HDC's correspondence. However, no response was received and further messages were left on 16 November and 18 November, but he did not respond to the messages.

98. Finally, on 29 November 2010, Dr F was contacted by way of his pager through the hospital switchboard at his present place of employment. At that stage he was prepared to undergo a telephone interview. In my view, this is a lamentable history and suggests that Dr F lacks appreciation of his obligations to respond to HDC. I find that this is of particular concern because by 29 November 2010 Dr F indicated that, in many respects, he could not recall the events in question.

Provision of information to Dr D

99. Dr F advised that he "may well have talked to [Dr D] at some stage about when [Dr E] was due to return, but couldn't say exactly when it was". He advised HDC that he would have obtained the information off the roster. He stated that normally if he wanted to know when someone was on duty he would talk to the other registrars and that he would use the roster only as a back-up. It is apparent that Dr F told Dr D on 21 March that Dr E would return on 23 March. Then on 23 March he told Dr D that Dr E would return on Friday 27 March. In the event, Dr E did not return until Monday 30 March.

100. I have already indicated in paragraph 90 that I consider it was inappropriate for Dr D to continue to rely on Dr F once his information had been proved to be unreliable. However, in my view Dr F displayed a casual attitude by failing to provide accurate

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

information, which was a contributory cause to the delay in Mr A obtaining appropriate assessment and treatment.

Assessment and treatment of Mr A

101. Dr E went on leave on Friday 9 April 2009. He advised HDC that Mr A's ongoing care was "assumed by the on-call registrar and surgeon". Dr F was the first point of contact and he was aware that if there were any concerns about any patient, he was to go to the consultant on duty on the day.

102. When Dr F assessed Mr A on the morning of Friday 10 April he noted a pulse over the graft on Doppler, and good capillary refill and warm feet. This is in contrast with the nursing record of 10 April, which recorded that there was increasing pain, the foot was looking dusky and was cold to the touch, and it was hard to palpate the pulse.

103. Dr F told HDC he had the impression that Mr A had an embolism from the aneurysm. Professor Roake advised that the signal obtained above the graft is likely to have been from the common femoral artery, or its branches. The signals from below the graft and knee are likely to have come from the popliteal artery fed either by the graft or by collateral vessels around the knee, or directly from the collateral vessels. In his view the findings described by Dr F are "entirely consistent with the graft having thrombosed. [Dr F's] inference that the findings indicated the graft was functioning suggests inexperience and may have contributed to his failure to appreciate the significance of the change in the condition of the left foot …".

104. In Professor Roake's opinion the explanation provided by Dr F (that the lack of pulse was not of concern because there were at least three ways the blood could flow down) is totally incorrect, as Mr A's preoperative CT angiogram had already demonstrated that the posterior tibial and peroneal arteries were occluded close to their origins and the anterior tibial was occluded in mid-calf.

105. On 10 April when Dr F found Mr A sitting in a chair with his leg flexed, he asked the nursing staff to elevate Mr A's leg in extension. He told HDC he believed the sitting position had compromised the circulation. Professor Roake advised that he considered that sitting with the knee flexed may have improved the circulation and eased the pain. It should not have compromised the graft. In his opinion, Dr F should have checked for improvement soon after advising bed rest with the leg extended, not just asked the nurse to report any change.

106. Dr F did not believe that Mr A's situation was deteriorating. Professor Roake advised that this indicates Dr F failed to recognise that Mr A's condition had already deteriorated, that the limb was severely ischaemic, and that the graft was thrombosed.

107. In Professor Roake's opinion:

> "The assessment and management by the junior doctors on duty indicates poor understanding of the pathophysiology of vascular disease. For example elevation of an ischaemic limb is generally inappropriate and the suggestion that the deterioration was due to embolism from the aneurysm was impossible given that it had been excluded by surgery."

108. My advisors, Professor Roake and Dr Kyle, and the vascular surgeons at DHB2 have concluded that the first signs of Mr A's failing circulation to his lower limb were apparent by Friday 10 April 2009.

109. In Dr Kyle's opinion, "[v]ascular consultation should have been obtained as soon as it was clinically apparent that the leg was ischaemic and the graft likely to have been thrombosed. This would have been sometime over the day or night of the 9.4.09." Professor Roake advised that "[t]here is clear evidence of a substantial change in the condition of [Mr A's] limb by Friday 10/04/09. In my opinion it is highly likely that this is when the graft thrombosed." Dr L, DHB2's vascular surgeon, estimated that the thrombosis was 24 to 48 hours old when he first saw Mr A.

110. Mr A's family were aware that he was in trouble when they arrived at the hospital on the Friday morning. Mr A's pain had escalated considerably and he was disorientated and confused. They saw the circulation to his foot fail. Mr A and his family waited anxiously as staff came in, took observations and left without anything being done.

111. Dr F appeared unconcerned about the condition of Mr A's leg on the morning of 10 April despite the nursing staff doubting that the limb was adequately perfused and being aware of Mr A's increased pain levels. They recorded that Mr A's foot was dusky and cold to the touch and it was hard to palpate the pulse. Later in the day the change in his circulation was also evident to the house surgeon, Dr J.

112. In my opinion, if Dr F was not convinced by the observations of the nursing staff and Dr J, he should have discussed the observations and Mr A's increasing pain levels with Dr E (who was available by telephone) or the on-call consultant.

113. There were some mitigating factors. I accept that DHB1's guidelines for new registrars provided relatively brief written instructions as to when consultants should be called. In addition, Dr E had not clearly instructed Dr F and Dr J about Mr A's treatment plan and what Dr E expected from them in terms of out-of-hours consultations. Despite these factors, Dr F was aware of the availability of assistance, but he failed to recognise that he needed to avail himself of it. His clinical decision-making was deficient.

114. I am also concerned that Dr F did not document all his examinations and findings. DHB1 advised HDC that Dr F came into the hospital when he was off duty to examine Mr A, but there is no record of this. It is through the medical record that health care providers have the power to produce definitive proof of a particular matter. Health professionals whose evidence is based solely on their subsequent recollections (in the absence of written records offering definitive proof) may find

their evidence discounted. As in this case, memories can become unreliable and, if the notes are inadequate, it is difficult to provide an accurate account.

115. As this Office has previously stated:[10] "Junior doctors who accept responsibility for the care of patients … should expect to have their actions scrutinised when their patient's care is compromised. Being held accountable for one's actions is the flipside of the privilege of registration as a health professional and of accepting responsibility for the care of patients. Accountability goes with the territory."

116. I conclude that Dr F failed Mr A. He had appropriate support available to him but he did not use it. In my opinion, Dr F's poor documentation and inadequate assessment and treatment of Mr A were not of an adequate standard and were a breach of Right 4(1) of the Code.

Opinion: Breach — Dr E

Handover

117. Good handover is essential when different doctors and nurses take over responsibility for a patient's care. In a previous case,[11] the Commissioner's expert advisor stated: "It is the responsibility of the handing over doctor to ensure that all relevant clinical information is passed on to the clinician assuming a duty of care for the patient and that this should include all outstanding results and a clinical plan." I agree.

118. Dr E was going on leave for Easter on 9 April. He told HDC that he did not specifically tell the on-call surgeon that Mr A was on the ward. He said that "when I went on leave the on-call surgeon was responsible, albeit that [Dr F] was [the] first point of contact".

119. Dr E told HDC that "current in-patients are handed over to a designated consultant". However, in response to my provisional opinion he said the practice of the surgical team was to hand over to the Registrar if the patient was following the expected recovery pathway.

120. He told HDC, "There is a clear understanding that in my absence there is no vascular surgery provided at [DHB1]. As such any acute vascular surgical consult is directed to the vascular service at [DHB2]." Dr E advised that his experience is that nursing staff have the skill and knowledge to recognise when a problem may be developing. However, he acknowledged that there may be difficulties postoperatively with synthetic or native grafts and both of these need to be observed. He advised that difficulties with synthetic grafts occur on a more unpredictable basis.

121. In my view, although Dr E believed that Mr A was making a good recovery at the time Dr E went on leave, there were significant risk factors. Mr A was 79 years old, had Parkinson's disease, and the surgery involved a Gortex graft on a joint.

[10] Opinion 08HDC04311 (31 March 2009).
[11] Opinion 07HDC10767 (25 September 2008).

122. As stated in Cole's *Medical Practice in New Zealand*, "You must be satisfied, when you are off duty, that suitable arrangements are made for your patients' medical care. These arrangements should include effective handover procedures and clear communication between relevant doctors."[12]

123. Expert advice provided to this Office in another investigation[13] was that, in general, the effects of ineffective handover are multiple and include a 3.5-fold increase in preventable adverse events, delays in diagnosis, decreased patient satisfaction, increased length of hospital stay, increased investigations performed, and delays in ordering tests. The HDC expert in that case noted that there is a burgeoning literature outlining the importance of handover meetings.

124. I consider that in light of Mr A's risk factors his care should have been formally handed over to the on-call consultant, Dr K. I agree with the assessment of Professor Roake: "Overall it is clear that [Mr A] did not receive the benefits of timely assessment by appropriately experienced staff and this was a serious departure from the expected standard of care."

125. I am particularly concerned that no specific instructions were left in the clinical records to cover Dr E's absence and, in particular, there were no instructions as to the actions to be taken if there was clinical deterioration. As a result, Mr A's management depended upon the training and experience of the nursing and medical staff covering the Easter period. Accordingly, as Dr E did not adequately hand over Mr A's care, I find that Dr E breached Right 4(5) of the Code.[14]

Opinion: Adverse comment — DHB1

126. This case reflects the difficulties of a regional hospital maintaining a single-handed vascular service with sufficient structures in place to ensure adequate care in the absence of the sole qualified surgeon. I have carefully considered whether DHB1 put in place sufficient processes to prevent a failure of care during such absences. As a health care provider, DHB1 is subject to the Code and had a duty to provide Mr A with services of an appropriate standard. In addition, as the employer of Drs D, F and E, DHB1 was responsible for the actions and omissions of its employees.

127. The medical record demonstrates that the nurses and the medical officer were concerned about Mr A's deterioration. However, there was a lack of action at the stage when Dr F's management should have been questioned and when concerns about the care being provided should have been escalated to the on-call consultant. DHBs and senior practitioners need to encourage a culture where it is acceptable and even commonplace for questions to be asked, to and from any point in the hierarchy, at any time.

[12] Cole's *Medical Practice in New Zealand* (2009) at p105.
[13] Opinion 07HDC08819.
[14] Right 4(5): "Every consumer has the right to co-operation among providers to ensure quality and continuity of services."

Direct liability

Referral

128. DHB1 had a system in place for referral of vascular patients to DHB2 in the absence of Dr E. Dr D's response of 25 February 2010 to this Office makes it clear that he was aware of the need for such a referral and that it should occur promptly. The policy at the time of these events did not state a time limit for the referral and subsequently the root cause analysis has recommended a 24-hour limit.

Leave roster

129. DHB1 had a system for notifying leave. A roster showing the dates the doctors were on leave was available on DHB1's intranet. Copies are available from the receptionist and from the RMO office. The information is shared at monthly meetings and is available every weekday from the surgical clerical support person. In my view, the systems enabling the roster to be available to staff were appropriate.

Pathway for popliteal grafts

130. DHB1 had no documented pathway for popliteal grafts. As a result the nurses may not have been aware of the required postoperative care, the need for accurate pedal pulses and the care of the grafts. However, I note that DHB1 advised HDC that Dr E and the nurses are working to design a pathway for these patients and to ensure that the service has the right skills mix in the nursing team to provide the expected care.

Handover

131. DHBs should have clear policies and procedures in place for medical and other clinical handover, including appropriate information systems support where necessary. The expectation was that a consultant would hand over to the on-call consultant. In my view, it was Dr E's responsibility to adequately hand over Mr A's care.

132. Overall, although they could have been more detailed and specific, I consider that DHB1 had adequate policies and procedures in place and so did not directly breach the Code.

Vicarious liability

133. In addition to any direct liability for a breach of the Code, employers are vicariously liable under Section 72(2) of the Health and Disability Commissioner Act 1994 for any breach of the Code by an employee. Under Section 72(5) of the Act it is a defence for an employing authority to prove that it took such steps as were reasonably practical to prevent the act or omission of employees that breached the Code.

134. DHB1 commented that had it had the services of more than one vascular surgeon, the issues would not have arisen. However, in my view, the availability of surgeons at DHB2 was known to the relevant staff and was appropriate.

135. Over the Easter period there was full staffing and on-call consultant Dr K was available.

136. After examining all the evidence I am satisfied that DHB1 took reasonable steps to enable Dr D, Dr F and Dr E to provide safe services. Accordingly, DHB1 is not

vicariously liable for Drs D, F, and E's breaches of the Code. That said, it is of concern that three doctors employed by DHB1 failed to comply with the standards expected in the Code in this case.

Recommendations

Dr F

137. I recommend that Dr F:

- apologise to Mr A and his family for his breaches of the Code. The apology is to be sent to this Office by **18 May 2011**.

Dr E

138. I recommend that Dr E:

- apologise to Mr A and his family for his breaches of the Code. The apology is to be sent to this Office by **18 May 2011**.

DHB1

139. I recommend that DHB1:

- include in its training and induction for all staff information that the practice in this DHB is that the asking of questions and reporting of concerns is expected and accepted from all members of the multidisciplinary team; and
- supply a copy of the training and induction material, and report to this Office by **30 June** 2011 on the steps taken to ensure there is a culture that encourages these actions.

Follow-up actions

- A copy of the final report will be sent to the Medical Council of New Zealand.
- A copy of the final report with details identifying the parties removed, except the name of my experts, will be sent to the Royal Australasian College of Surgeons.
- A copy of the final report with details identifying the parties removed, but naming the experts who advised on this case, will be sent to all district health boards, the New Zealand Resident Doctors' Association, and the Association of Salaried Medical Specialists and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix One: Expert advice from Professor Justin Roake

The following report was obtained from vascular surgeon Professor Justin Roake:

"Complaint: [Mr A] Ref: 09/01146

Preamble
Thank you for asking me to provide advice on the above complaint made by [Mr A's] family relating to [Mr A's] admission to [DHB1], in March and April 2009.

I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

My qualifications are MBChB (Otago), DPhil (Oxon), FRACS(Vasc), FRCS, and I have training and experience in the theory and practice of peripheral vascular surgery.

I was consultant vascular surgeon at the John Radcliffe Hospital, Oxford, UK, from 1992 to 1997. In September 1997 I was appointed to the Chair of Surgery, Christchurch, NZ, and have practised as a consultant vascular surgeon at Christchurch Hospital continuously since my appointment. My medical registration number is 12088 and I am vocationally registered in general and vascular surgery in New Zealand.

I have no conflict of interest with respect to this complaint.

Complaint
Whether [Mr A] received an appropriate standard of care at [DHB1], between 20 March and 12 April 2009.

Expert Advice Requested

1. The appropriateness of [Mr A] waiting over eight hours for admission to the surgical ward at [DHB1].
2. The appropriateness of [Mr A] waiting ten days in [DHB1] with an acute vascular condition before seeing a vascular surgeon.
3. Should a vascular surgeon have been consulted about [Mr A's] by-pass graft over the Easter period and, if so, when?
4. Given the information available, did [DHB1] provide appropriately experienced staff to cover [Dr E's] absences in March and over Easter?
5. Should [Mr A] have had popliteal by-pass surgery at [DHB1] and, if not, please explain your concerns?
6. Any other aspects of the care provided by [DHB1] that you consider warrant additional comment.

Material referred to in making this report
I have read and considered the material provided which includes:

1. [Mr A's] family's complaint (pages 1–7).
2. Notification letter to [DHB1] (pages 8–10).
3. Information supplied by [DHB1] including a root cause analysis and a statement from [Dr E] (pages 11–16).
4. [Mr A's] medical records from [DHB1] (pages 17–118).
5. [Mr A's] medical records from [DHB2] (pages 119–173).
6. [DHB1] Handbook: 'Introduction to the Department of Surgery for new registrars' (pages 174–181).

Summary of facts
The relevant background to this complaint regarding the care received by [Mr A] is summarised as follows:

1) [Mr A], aged 79 years, was referred to the emergency department at [DHB1] on Friday 20 March 2009 by his general practitioner [Dr C]. The referral letter noted that previously [Mr A] had several episodes of acute left leg pain that had been assessed by [Dr H] (neurologist) in October 2008. No specific diagnosis was reached but [Dr H] considered that sinister pathology had been excluded. [Dr C] noted that on this occasion (unlike the previous episodes) the left foot was blue (when elevated) and pulseless (unlike GP consultations on 02/03/2009). [Dr C's] concern was that [Mr A] may be 'suffering a critically ischaemic foot'.

2) [Mr A] arrived at the Emergency Department and was triaged at 14:27; 'painful left leg — ?ischaemic left foot — 70 mins — pain a little better now'.

3) He was seen by the surgical registrar ([Dr I]) at 16:10 who noted that the left foot was cold and blue when dependent but white when elevated. Pedal pulses were absent. There were no comments on sensory or motor loss. His assessment was 'impending left foot ischaemia but not critical. Admit surgical. ?CTA mane'.

4) [Mr A] was seen and assessed by a house officer ([Dr J]) in the emergency department (the entry in the records is dated 20/03/09 but not timed). He/she noted there may be a left popliteal aneurysm and prescribed analgesia and Clexane 20mg od s/c (this is a low prophylactic dose for DVT prevention).

5) A nursing note dated 20/03/09 and timed 22:51 states 'Admission via ED ...' Further nursing notes overnight indicate that pain was not a problem and that paracetamol was given.

6) On Saturday 21/03/09 [Mr A] was seen at 08:45 by [a doctor] (registrar?) who noted there was pain and numbness in the medial aspect of the left leg and calf and considered there may be bilateral popliteal aneurysms. At 11:00 [Mr A] was seen by [Dr D] (consultant General Surgeon) who considered that the left lower limb was ischaemic. He asked for an opinion

from a vascular surgeon, that [Mr A] stay in hospital for the weekend and that a CT angiogram (CTA) be performed on Monday.

7) On Sunday 22/03/09 [Mr A] was reviewed by [Dr D] and was noted to have ongoing pain in the toes but with full movement. The plan was for vascular surgical review by [Dr E] on Monday. There was significant pain in the foot overnight.

8) On Monday 23/03/09 [Mr A] was awaiting review by [Dr E] and on Tuesday 24/03/09 the hospital notes record that [Dr E] was away for the week. [Mr A's] pain was improving overall but there was nocturnal pain in the foot.

9) On Wednesday 25/03/09 [Mr A] was reviewed again by [Dr D] and the foot noted to be purple/black but sensation and movement were normal. A CTA was performed.

10) On Thursday 26/03/09 the attending medical staff were awaiting a report of the CTA and review by [Dr E].

11) On Friday 27/03/09 the CTA was discussed with [Dr D] and his team at the regular radiology meeting. The presence of bilateral popliteal aneurysms was confirmed and a small (43mm) abdominal aortic aneurysm was also noted. In relation to the left limb the report stated 'there is a fusiform aneurysm of the upper half of the popliteal artery measuring 120mm in length with axial dimensions of 52 x 48 mm with extensive mural thrombus. Run-off is reduced with occlusion of the posterior tibial and peroneal arteries. The anterior tibial appears to reach the lower calf.' The plan was for [Dr E] to review [Mr A] on Monday and for home leave for the weekend.

12) On Sunday 29/03/09 [Mr A] returned to the ward at 08:00 because of uncontrolled pain.

13) On Monday 30/03/09 [Mr A] was reviewed by [Dr D] at 08:20 and [Dr E] at 09:10. The left foot was dusky, cold and ischaemic. Full dose Clexane was prescribed and a bypass operation was planned. An ultrasound examination of the veins as a possible conduit (graft) was arranged and obtained on 01/04/09.

14) On Wednesday 02/04/09 the attending medical staff were awaiting the result of the ultrasound. The left foot was noted to be better. Surgery was planned for Tuesday 07/04/09.

15) On Monday 06/04/09 [Mr A] reported that the left foot was improving. He was reviewed by [Dr E] who requested that the saphenous vein be marked using ultrasound.

16) On Tuesday 07/04/09 [Mr A] underwent left femoro-popliteal bypass (exclusion of popliteal aneurysm) via the posterior approach using PTFE. The operation was performed by [Dr E]. PTFE [artificial graft] was used because the available short saphenous vein was too small.

17) On Wednesday 08/04/09 [Mr A] was reviewed by [Dr E]. The left foot was warm with a pulse felt over the graft. No concerns were noted. Clexane was prescribed at prophylactic dose.

18) On Thursday 09/04/09 [Mr A] was reviewed again by [Dr E] — no concerns were noted. A weekend plan was recorded in the notes. The nursing observation record (page 60 and duplicated as page 61) shows a clear deterioration in the condition of the left foot from 10:40am and which was well established by 10:00am on the following day.

19) On Friday 10/04/09 (Good Friday) [Mr A] was reviewed by the General Surgical registrar who noted the presence of a pulse over the graft and good capillary refill with warm feet. These observations were inconsistent with the nursing record noted above. Later the house surgeon was called because of increasing pain in the left foot. [Mr A] was sitting in a chair with the leg flexed. The foot was pale and cold with reduced capillary refill. The treatment plan was elevation of the leg in extension, analgesia and review by the registrar. The time of review by the registrar was not noted. However, the registrar noted 'flow on doppler in graft bypass' and considered the problem may be embolic from the aneurysm. Therapeutic dose Clexane and Morphine were prescribed.

20) On Saturday 11/04/09 [Mr A] very unsettled with severe pain in the left leg which was notably cold and pulseless. [Mr A] became confused and agitated. He was reviewed by the General Surgical registrar who noted 'patient has been found sitting on the edge of the bed with the left leg bent'. The registrar also noted change in colour with elevation of the limb and recorded 'Doppler + signal'. He advised avoidance of positions that may cause compression of the graft.

21) On Sunday 12/04/09 [Mr A] was seen by [Dr K] (the consultant on call) — the possibility of re-exploration of the graft was raised and he planned to discuss this with [Dr E]. The General Surgical registrar could not find a Doppler signal from the graft. [Dr E] was contacted by phone — he suggested referral to [DHB2] as he was on leave. [Dr L] ([DHB2] vascular surgeon) accepted transfer of [Mr A].

22) [Mr A] was transferred to [DHB2] and underwent popliteal thrombectomy on 12/04/09. However, the foot [was] not viable and an above knee amputation was performed on 16/04/09.

Opinion

1. *The appropriateness of [Mr A] waiting over eight hours for admission to the surgical ward at [DHB1].*

This was unfortunate but probably unavoidable. It is always preferable for patients to be moved from the emergency department to the ward expeditiously but limitations on beds and other resources mean this is not always achievable.

2. *The appropriateness of [Mr A] waiting ten days in [DHB1] with an acute vascular condition before seeing a vascular surgeon.*

In my opinion the appropriate course of action was early referral to a specialist vascular service:

a. It is of concern to me that [Mr A] waited over an hour and a half in the emergency department for a first assessment by a doctor for a potentially critically ischaemic limb. Luckily the ischaemia was sub-critical and immediate action to preserve the limb was not required. Nevertheless the early management was deficient and anticoagulation to prevent extension of thrombosis was not even considered. This deficiency may have been corrected by an early phone call to a vascular service. This was a relatively minor departure from the expected standard of care.

b. [Mr A] clearly had signs and symptoms of acute ischaemia (Rutherford category lIa or possibly lIb) and by the morning of Saturday 21/03/09 was suspected of having popliteal aneurysms. Furthermore [Mr A] experienced significant on-going pain resulting from ischaemia. The management of acute limb ischaemia especially in presence of popliteal aneurysms is notoriously difficult. It is of great concern that it took ten days for [Mr A] to be reviewed by a surgeon with an interest in vascular surgery. This occurred despite there being a specialist service available (at [DHB2]) for consultation by phone at any time. It is notable that following review by [Dr E] full dose anticoagulation was prescribed immediately. While it is commendable that throughout the period before [Mr A] was reviewed by [Dr E] he was seen regularly by a surgical consultant and the standard of record keeping was generally good, [Mr A] should have had the opportunity of early assessment by a vascular specialist, early vascular imaging, and consideration of thrombolysis to re-establish flow through acutely thrombosed crural arteries. This was a serious departure from the expected standard of care.

3. *Should a vascular surgeon have been consulted about [Mr A's] by-pass graft over the Easter period and, if so, when?*

Yes. There was clear evidence of a substantial change in the condition of [Mr A's] limb by Friday 10/04/09. In my opinion it is highly likely that this is when the graft thrombosed. On the morning of 10/04/09 the registrar was not concerned about the condition of the limb although nursing notes suggest that the perfusion of the limb was poor. However, by later in the day the change in condition of the limb was obvious to the attending house surgeon and registrar. The change in condition should have been discussed immediately with [Dr E] or, failing that, with the vascular service at [DHB2]. Unfortunately the significance of the change was not appreciated and appropriate management was not implemented. This was a serious departure from the expected standard of care.

4. *Given the information available, did [DHB1] provide appropriately experienced staff to cover [Dr E's] absences in March and over Easter?*

The deficiencies in [Mr A's] management reflect a systems failure relating to the difficulty of sustaining a single handed vascular service including the infrastructure required. Overall it is clear that [Mr A] did not receive the

benefits of timely assessment by appropriately experienced staff and this was a serious departure from the expected standard of care.

a. It is apparent that the staff managing [Mr A] in March were unaware of [Dr E's] absence and lack of local cover by a vascular surgeon.

b. After the bypass operation no specific instructions were left in the clinical records to cover [Dr E's] absence. In particular there were no instructions in relation to actions to be taken if there was clinical deterioration. Appropriate management was therefore critically dependent upon the training and experience of the nursing and medical staff covering the Easter period. It is notable that as [DHB1] does not have a specialist vascular service the presence of staff experienced in vascular surgery could not be assured.

c. The assessment and management by the junior doctors on duty indicates poor understanding of the pathophysiology of vascular disease. For example, elevation of an ischaemic limb is generally inappropriate and the suggestion that the deterioration was due to embolism from the aneurysm was impossible given that it had been excluded by surgery.

d. It is unclear whether there was continuity of care or multiple registrars involved in [Mr A's] assessment during the Easter holiday period. Lack of continuity may have contributed to the failure to recognise and act on the clinical deterioration.

e. The deficiencies in management were only recognised when [Mr A] was seen and assessed by [Dr K] (a consultant surgeon). Unfortunately by this time the situation was not salvageable.

5. Should [Mr A] have had popliteal by-pass surgery at [DHB1] and, if not, please explain your concerns?

Although [Mr A's] limb was improving surgery was required to prevent further complications of the popliteal aneurysm. Arterial run-off was compromised most likely as a consequence of embolism from the aneurysm at some time between early March (when peripheral pulses were noted to be present) and presentation to the GP on 20 March. In my opinion run-off via a single vessel (the anterior tibial) that may not have extended beyond the calf (CTA report) was unlikely to have sustained a synthetic (PTFE) graft. If [Mr A] had been assessed by a specialist vascular service soon after presentation thrombolysis may have been employed to establish better run-off and improve the chances of successful bypass grafting. It is not clear whether thrombolysis was available as an option [at DHB1] and in any case it is debatable whether there would have been any benefit by the time [Mr A] was assessed by [Dr E]. I consider that [Dr E] acted appropriately in operating upon [Mr A] at [DHB1].

6. Any other aspects of the care provided by [DHB1] that you consider warrant additional comment.

Overall this case illustrates some of the difficulty in maintaining a vascular service in a small centre with suboptimal staffing levels. Some of the deficiencies in care highlighted above are amenable to improvement through

development of clear management pathways. I note that this has already been identified by [DHB1] and some corrective action has been undertaken.

Summary

This case raises some concerns. There were substantial delays in getting [Mr A] assessed by a vascular specialist which was a serious departure from the expected standard of care. Secondly, there was failure to recognise and act upon significant deterioration in the state of [Mr A's] limb following surgery. In my opinion this was largely a system problem related to inexperience of staff and was also a serious departure from the expected standard of care.

Professor Justin Roake
Professor of Surgery and Consultant Vascular Surgeon"

Further expert advice was obtained from Professor Justin Roake:

"Complaint: [Mr A]

Ref: 09/01146

Thank you for asking me to provide further expert advice on the above complaint made by [Mr A's] family relating to [Mr A's] admission to [DHB1], in March and April 2009.

I have read the transcript of the telephone conversation with [Dr F] dated 29/11/2010 and have been asked to give an opinion on the following:

1. Is it likely that there would have been a good reading above the knee and below the graft and knee joint but no pulse noise on the foot?

2. In light of [Mr A's] having had the graft because of pain in his foot and his foot being dusky and cold before the surgery, is it reasonable to state that the lack of pulse was not of concern because there were 'at least three ways the blood could flow down'?

3. At what stage would it have been appropriate for the registrar to have referred [Mr A] to the on-call consultant?

I note that there is at least one inconsistency in the transcript. Easter Saturday was on 11 April 2009. At least some of the events described by [Dr F] occurred on Good Friday (10 April) judging by my records that were taken directly from the clinical records. In particular his reference to 'a clot coming down the leg' referred to events on the Friday.

Opinion

1. *Is it likely that there would have been a good reading above the knee and below the graft and knee joint but no pulse noise on the foot?* Yes. The readings referred to are from a hand-held Doppler machine that is a sensitive

means of detecting blood flow; it gives little information about adequacy of flow to support tissue viability. The absence of any detectable flow, however, is generally an indication of ischaemia and is consistent with occlusion of the graft. The signal obtained above the graft is likely to have been from the common femoral artery, or profunda femoris or its branches. The signals from below the graft and knee are likely to have come from the popliteal artery, fed either by the graft or by collateral vessels around the knee, or directly from collateral vessels. The findings described by [Dr F] are entirely consistent with the graft having thrombosed. [Dr F's] inference that the findings indicated the graft was functioning suggests inexperience and may have contributed to his failure to appreciate the significance of the change in the condition of the left foot documented by the nursing staff during Thursday and Friday morning. It is unclear whether [Dr F] had had any instruction in the use and interpretation of hand-held Doppler and its limitations.

2. *In light of [Mr A's] having had the graft because of pain in his foot and his foot being dusky and cold before the surgery, is it reasonable to state that the lack of pulse was not of concern because there were 'at least three ways the blood could flow down'?* No this is totally incorrect. The appearance of the foot alone, regardless of the presence or absence of pulses, should have been of concern especially as it was a substantial change from the appearance soon after the operation. It is also incorrect that there were 'at least three ways the blood could flow down'. I assume [Dr F] was referring to the crural arteries (anterior tibial, posterior tibial and peroneal) but [Mr A's] preoperative CT angiogram had already demonstrated that the posterior tibial and peroneal arteries were occluded close to their origins and the anterior tibial was occluded in mid calf. There are three other aspects to [Dr F's] comments and management that merit comment:

   a. The sitting position adopted by [Mr A] with the limb dependent is typical of a patient suffering ischaemic pain — one of the consequences of graft thrombosis. Having the limb dependent improves the circulation because of the assistance of gravity and often helps alleviate the pain. Having the knee flexed in a sitting position should not have compromised the graft. [Dr F's] advice was an indication of inexperience.

   b. It is clear that on his second visit to [Mr A] on 10 April [Dr F] did recognise that there was compromise to the circulation but his interpretation that it was as a result of [Mr A] adopting a sitting position was almost certainly incorrect. Furthermore, having made this diagnosis he should have checked for improvement soon after advising bed rest with the limb fully extended. Asking the nursing staff to report a change was insufficient.

   c. [Dr F] said he had 'ordered continued monitoring of [Mr A] and did not believe his situation was deteriorating'. Unfortunately I believe this indicates that he had failed to recognise that [Mr A's] condition had

already deteriorated, that the limb was severely ischaemic, and that the graft was thrombosed.

3. *At what stage would it have been appropriate for the registrar to have referred [Mr A] to the on-call consultant?* This should have occurred as soon as it was recognised that there was a significant change in the perfusion of the foot. Ideally this should have occurred on Friday morning but at the latest by Friday afternoon when the change was clear to all including [Dr F].

Summary
[Dr F] failed to recognise and act upon significant deterioration in the state of [Mr A's] limb following surgery. In my opinion his actions were a severe departure from an appropriate standard of care and were largely related to his inexperience.

Professor Justin Roake
Professor of Surgery and Consultant Vascular Surgeon"

Appendix Two: Expert advice from Dr Stephen Kyle

The following advice was obtained from independent general surgeon Dr Stephen Kyle.

"Case 09/01146 [Mr A]

Purpose of report:

To provide independent advice about whether [DHB1] had appropriate cover when [Mr A's] key surgeon, [Dr E], was on leave.

Introduction:

I have been requested to provide advice in the full knowledge that I am a Consultant Provincial General Surgeon who does not perform major elective vascular surgery. I work in a similar environment to general surgeons working for the [DHB1] who do not perform vascular surgery.

For the purpose of providing advice, I have reviewed:

1. The Guidelines for Independent Advisers (Appendix H)
2. [Mr A's] Family's complaint (marked A — Pages 1–7)
3. The Notification to [DHB1] (marked B — Pages 8–9)
4. Information supplied by [DHB1] (marked C — Pages 10–16)
5. [Mr A's] medical records from [DHB1] (marked D — Pages 17–118)
6. [Mr A's] medical records from [DHB2] (marked E — Pages 119–173)
7. Information from [DHB2] (marked F — Pages 174–181)

Background provided by Commissioner's Office:

[Mr A], aged 80 years, was referred to the A&E department at [DHB1] on 20 March 2009 by his general practitioner, [Dr C]. [Mr A] had been consulting [Dr C] with leg cramps for about a year. In A&E [Mr A] was examined and told he had an acute vascular problem and would be admitted.

On 1 March 2009 [Mr A] was examined by the on-call consultant [Dr D], who advised [the family] that his doctor, [Dr E] (a general surgeon with a special interest in vascular surgery), was on leave until 30 March. In the meantime [Mr A] had CT scans which revealed small aneurysms behind each knee and one abdominal aneurysm.

[Dr E] saw [Mr A] on 30 March, and scheduled him for surgery on 7 April 2009. [Dr E] placed a by-pass graft to the aneurysm behind the left knee. On 9 April [Dr E] examined [Mr A] before taking leave over Easter. He assured [Mr A's] family that he was progressing well.

On 10 April [Mr A] seemed to deteriorate. He was experiencing increased pain and the colour of his foot was changing from purple to white and it felt cold. The on-call consultant, [Dr J], was called and the treatment plan was discussed with surgical registrar [Dr F].

[Dr F] closely monitored [Mr A's] circulation over the following two days but by Sunday 12 April the on-call consultant, [Dr K], was called and arrangements made for [Mr A's] transfer to [DHB2]. At [DHB2] attempts to save [Mr A's] leg failed and he had an above knee amputation on 16 April 2009.

Complaint:

[Mr A's] family have documented their concerns about how [Mr A] was treated at [DHB1]. The Commissioner has obtained advice about [Mr A's] vascular care and now wants to gain a sense of the systems pertaining to the provision of specialist surgical services in provincial centres. He is seeking advice on the following:

- What would be expected from a general surgical team presented with a situation such as this in a similar environment as [DHB1].

Questions raised by the Commissioner:

1. The appropriateness of [Mr A] waiting ten days in [DHB1] with an acute vascular condition before seeing a vascular surgeon.

Background

[Mr A] was admitted into [DHB1] on 20.3.09 with an acutely ischaemic left foot. His ischaemia was judged as not being critical. [Mr A] had a CT arteriogram performed on 25.3.09. The result was not available that day or the next morning. It is commented in the notes that the result was available on 27.3.09 where it was apparent that [Mr A] had a popliteal aneurysm which would have been responsible for his symptoms. The aneurysm would have been producing thrombotic emboli. Therapeutic anti-coagulation was not commenced until 30.3.09 after review by [Dr E] who took over [Mr A's] care at that stage.

Comment

With the obligation of emergency call it is important that non-vascular surgeons working in centres that don't have continuous 'in house' vascular cover have knowledge of assessment and likely appropriate management of acute vascular conditions.

Standard practice for the management of an acutely ischaemic limb would be for reasonably prompt assessment, investigation and initiation of management. Ideally it would have been appreciated that thrombotic emboli from a popliteal aneurysm was likely to be responsible for [Mr A's] symptoms at an earlier stage and prompt initiation of therapeutic anti-coagulation and angiography performed with a plan for surgery.

The potential severity of [Mr A's] problem was not appreciated; he was misdiagnosed as having chronic ischaemia. His ischaemia was judged as being non-critical. In the setting of chronic non-critical ischaemia it may be reasonable to undertake a less urgent course of investigation and management, as was undertaken.

An early telephone vascular consultation would have been appropriate.

While [Mr A's] investigation and introduction of therapeutic anti-coagulation were delayed, his leg remained viable and he was still able to proceed to surgery on [Dr E's] return from leave.

The delay was largely due to misdiagnosis and the departure from standard care is minor.

2. Should a vascular surgeon have been consulted about [Mr A's] bypass graft over the Easter period and, if so, when?

Background
[Dr E] performed ligation of the left popliteal aneurysm with a popliteal bypass using a PTFE graft on 7.4.09. [Mr A's] last assessment by [Dr E] was on 9.4.09 at which time the left lower leg was reported as being well perfused. It appears from the records that the graft became thrombosed in the 24-hour period after [Dr E's] assessment on the morning of 9.4.09.

Comment:
With a surgeon's absence such as holidays, patients need to be formally 'handed over' to another consultant. Usually this would be the on-call Consultant and Registrar. It appears in [Mr A's] case that daily review was largely delegated to junior medical staff. Assessment was inadequate as clearly [Mr A] had a severely ischaemic leg consequent upon a thrombosed graft. This was finally diagnosed by [Dr K] on the morning of 12.4.09 and appropriate vascular consultation was made and transfer undertaken at that time.

Vascular consultation should have been obtained as soon as it was clinically apparent that the leg was ischaemic and the graft likely to have been thrombosed. This would have been sometime over the day or night of the 9.4.09. While there is a good chance that early vascular consultation and intervention may still have not resulted in successful revascularisation, [Mr A] did spend an unpleasant time with his severely ischaemic leg and any possibility of revascularisation was lost.

I would regard this delay with moderate disapproval.

3. What guidelines/instructions should be given to junior doctors in this situation?

Junior doctors should be involved in regular examination of patients following major surgery as well as being available should there be any nursing concern. It would be reasonable to perform a twice daily surgical review in a case such as [Mr A's] by the junior staff. They should also know that if they have any concern, that they have ready access to at least discuss problems with a consultant. It should be clearly known which consultant is responsible for a patient at any particular time.

4. What should be the thresholds and/or arrangements for consultations with larger health boards?

As skills and experience are so variable between surgeons in dealing with so many surgical conditions that can present, it is impossible to give an answer that covers all contingencies. It is, however, in an era of cell phones, email and electronic transmission of radiological investigations, generally easy to obtain a specialised consultation.

If it is felt that further advice or management is required, then it should be a simple matter to seek appropriate help from more specialised services within larger health boards.

It also requires that specialised consultants who work for those larger health boards be sympathetic, co-operative and receptive to consultation.

5. Is there any other aspect of the care given by [DHB1] that you consider requires additional comment?

[Mr A's] relatives criticised the seemingly lack of nursing staff to adequately care for [Mr A] during his stay at [DHB1]. [The] Quality and Risk Manager of [DHB1], commented in her report dated 26.8.09 that the ward had a full complement of staff.

It is my observation that with the advent of day case surgery, short stay surgery and minimally invasive surgery, the residue of patients on general surgical wards are often complex patients such as [Mr A] who require a large amount of nursing care and time. Clearly, I cannot specifically comment on staffing arrangements at [DHB1], though in my own hospital, adequate rostering is considered if a nurse is looking after up to six patients. Several could require the attention that [Mr A] needed, hence while administratively it may appear that nursing numbers were satisfactory, the fact is, on the ward, this may not be enough to provide adequate individual care.

To the general surgeons at [DHB1's] credit, as a result of [Mr A's] case, and review thereof, changes have been made. I understand that the surgeons have agreed that any patient presenting with peripheral vascular ischaemia where surgery may be required, a discussion with a vascular surgeon will be held within 24 hours of that clinical decision.

Mr Stephen Kyle"