Counties Manukau District Health Board

A Report by the
Health and Disability Commissioner

(Case 17HDC00893)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. Mr A (aged 78 years) was admitted to a public hospital in 2017 having sustained a laceration to his right lower leg and other wounds and abrasions following a fall. Mr A's regular medications included dabigatran (an anticoagulant).

2. Mr A had surgery to clean and close his wounds under the Orthopaedics team on Day 2[1]. He was discharged from hospital on Day 4 and seen by district nurses at home.

3. On Day 13, Mr A was readmitted to the public hospital under the Orthopaedics team, with cellulitis[2] and a haematoma[3] in his calf. His dabigatran was withheld from Days 14 to 17 pending anticipated further surgery, and he then received Clexane (anticoagulant) injections on Day 18 and Day 19. Mr A did not have a clearly documented VTE[4] risk assessment during his admission.

4. Mr A was identified as requiring debridement[5] and skin grafting early in his admission, but there was no clearly documented plan setting out whether the Orthopaedics team or the Plastic Surgery team would be undertaking these procedures. Accordingly, there was a delay in undertaking Mr A's surgery until Day 20.

5. Sadly, Mr A became non-responsive during surgery, and he died. He was found to have had a large right middle cerebral artery infarction.[6]

Findings

6. Mr A did not receive quality and continuity of services because of the failures in communication and a lack of clear planning between the Orthopaedics and Plastic Surgery teams. Accordingly, the Commissioner found that Counties Manukau DHB breached Right 4(5) of the Code of Health and Disability Services Consumers' Rights (the Code).[7] These communication and planning failures led to a delay in undertaking Mr A's surgery. In these circumstances, the Commissioner also found that Counties Manukau DHB breached Right 4(1) of the Code[8] for failing to provide Mr A's services with reasonable care and skill.

7. The Commissioner was critical that the Orthopaedics team did not initiate Clexane treatment earlier, and considered that it would have been useful for the documentation of the decision-making in relation to Mr A's anticoagulation to have been more explicit.

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[1] Relevant dates are referred to as Days 1-26 to protect privacy.
[2] Diffuse and especially subcutaneous inflammation of connective tissue.
[3] A collection of blood, usually clotted, outside a blood vessel.
[4] Venous thromboembolism (VTE) refers to the blocking of a blood vessel by a particle that has broken away from a blood clot at its site of formation.
[5] Removal of lacerated, devitalised, or contaminated tissue (usually surgical removal).
[6] A stroke.
[7] Right 4(5) of the Code states that every consumer has the right to co-operation among providers to ensure quality and continuity of services.
[8] Right 4(1) of the Code states that every consumer has the right to have services provided with reasonable care and skill.

Recommendations

8. The Commissioner recommended that Counties Manukau DHB (a) update its policy on clinical documentation; (b) consider implementing policies outlining when a patient should become a Plastic Surgery patient and when to undertake patient transfers between teams via the teams' consultants; (c) reiterate to its Plastic Surgery and Orthopaedics staff the need to document communication pathways accurately; (d) provide an update to HDC on the efficacy of its venous thromboembolism (VTE) prevention pathway; and (e) provide a written apology to Mr A's family.

Complaint and investigation

9. The Health and Disability Commissioner (HDC) received a complaint from Mrs B about the services provided to her late father, Mr A, at the public hospital (Counties Manukau District Health Board). The following issue was identified for investigation:

- *Whether Counties Manukau District Health Board provided Mr A with an appropriate standard of care in 2017.*

10. The parties directly involved in the investigation were:

Mrs B	Complainant
Counties Manukau District Health Board (DHB)	Provider

11. Further information was received from:

Dr C	Orthopaedic consultant
Dr D	Plastic surgery consultant
Dr E	Plastic surgery consultant
Dr F	Orthopaedic consultant
Dr G	Plastic surgery registrar
Dr H	Haematology consultant
Dr I	Orthopaedic registrar
RN K	Charge nurse manager

Also mentioned in this report:

Ms L	Quality Liaison Officer
Dr M	Orthopaedic registrar
Dr N	Plastic surgery registrar
Dr O	Plastic Surgery registrar
Dr P	Orthopaedic consultant
Dr Q	Orthopaedic consultant
Dr R	Plastic surgeon
Dr S	Orthopaedic house surgeon

12. Independent expert advice was obtained from an orthopaedic surgeon, Dr John Dunbar (Appendix A), and a plastic surgeon, Dr Sally Langley (Appendix B).

Information gathered during investigation

First admission to the public hospital

13. Mr A (aged 78 years) was admitted acutely to the public hospital on Day 1. He had sustained a laceration to his right lower leg following a fall the previous day. He had multiple wounds and abrasions, the most significant being wounds to the right shin region, and a rupture of his quadriceps tendon, thus preventing normal extension of his right knee.

14. Mr A had a past history of hypertension,[9] atrial fibrillation,[10] hyperlipidaemia,[11] and benign prostatic hyperplasia.[12] His regular medications included dabigatran (an anticoagulant) 150mg twice a day, Losec,[13] Accupril,[14] terazosin,[15] and a statin.[16]

15. After review and treatment in the Emergency Department, Mr A was admitted to the orthopaedic ward, initially under an orthopaedic consultant. Mr A was booked for theatre as priority four — acute not urgent (acute to be operated on within 24 hours). Mr A's dabigatran was withheld on Days 1 and 2, ahead of the surgery.

16. Mr A was operated on at 5.20pm on Day 2 by orthopaedic registrars Dr I and Dr M. A tourniquet was used on his right thigh for 58 minutes, and he underwent a repair of his quadriceps tendon, washout and closure of the shin wound, and debridement and dressing of the posterior calf wound. During the procedure, a plastic surgery opinion was sought for advice on the wound management.

17. Postoperatively, Mr A was transferred to the care of orthopaedic consultant Dr C. Mr A's knee was immobilised in a range of movement (ROM) brace locked in extension. The notes record that Mr A had been seen and assessed by an orthogeriatrician on Day 2.

18. On Day 3, Mr A was seen on Dr C's ward round, and at that stage no obvious concerns were noted. Mr A was recommenced on his normal dose of dabigatran.

[9] High blood pressure.
[10] An irregular, often rapid heart rate that commonly causes poor blood flow.
[11] High level of cholesterol or triglycerides in blood.
[12] An enlarged prostate.
[13] Medication to treat stomach ulcers and gastric reflux.
[14] Medication used to treat high blood pressure.
[15] Medication used to treat high blood pressure and an enlarged prostate.
[16] Medication used to help lower cholesterol levels in the blood.

19. Mr A was seen on the registrar ward round on Day 4 and cleared for discharge, subject to appropriate arrangements being made by physiotherapy and occupational therapy. A normal dose of dabigatran was given that day.

20. The physiotherapy entry in the clinical record on Day 4 includes an assessment of Mr A prior to discharge. The record states:

> "Patient feeling good. Pain is minimal when mobilising. ROM brace had arrived and felt comfortable. Patient is keen to go home. Wife will be able to help with [activities of daily living] at home … Patient tolerated session well, safe mobilising with crutches (4-point walk) and safe ascend/descend stairs inside, need supervision with outside steps with crutches."

21. The occupational therapy notes for Day 4 state: "[Mr A] feels confident to access his upstairs bedroom and en suite." The occupational therapist recognised that a shower stool with arms would be beneficial to increase Mr A's safety and independence.

22. The hospital discharge summary instructed that Mr A was to stay in the ROM brace in extension for four weeks, but that he could weight bear as tolerated. Mr A was discharged with a one-week course of antibiotics, two weeks of paracetamol for pain relief, and instructions to continue with his normal dose of dabigatran and his other regular medications.

23. Counties Manukau DHB stated that initially the occupational therapist noted that Mr A might need supports at home via ACC, but that on discharge, his function had improved to being regarded as independent and safe. Counties Manukau DHB said that the occupational therapist, on reflection, recognises that documentation of the reason why ACC supports were not put in place on discharge was not clear, and that ACC contact details should have been provided to Mr A and his family, in case supports were needed later on.

District nursing

24. Mr A's discharge summary does not state that a referral to the district nursing service had been made. The charge nurse of the orthopaedic ward, registered nurse (RN) RN K, received a telephone call from a family member of Mr A on Day 5 querying whether a referral had been made. RN K checked the ward district nursing referral book, and on finding that the referral had not been made, arranged for one to be sent immediately. The referral requested that the first district nursing visit be made on Day 6, and noted that Mr A's aids (eg, a shower stool) would be arriving that afternoon.

25. Mr A was visited by a district nurse on Day 6, with twice-weekly visits planned. Subsequently he was seen by a district nurse on Day 11, Day 12 and Day 13. On Day 13, the district nurse had concerns that the wound on the back of Mr A's right leg had become infected. Accordingly, she contacted the on-call Orthopaedics registrar at the public hospital, who advised her to send Mr A to hospital for review.

26. In response to the information gathered during the investigation, Mr A's family reiterated their concern that Mr A was not provided with information about minimising the risk of infection, pressure ulcers, or deep vein thrombosis (DVT),[17] and that there was a five-day gap between nursing visits on Day 6 and Day 11.

Second admission to the public hospital

27. Mr A was taken to the public hospital by ambulance and admitted under Dr C's Orthopaedic team (12 days after his first operation) with cellulitis and a haematoma in his calf, with an area of necrotic[18] skin measuring approximately 8 x 5cm. Dr I reviewed Mr A and withheld his dabigatran for that day, pending anticipated further surgery.

28. The following morning, on Day 15, Mr A was seen on Dr C's ward round. The plan, as indicated in the notes, was to continue intravenous antibiotics; ask the Plastic Surgery team to review Mr A as it was likely that his calf wound would require debridement and skin grafting; and withhold dabigatran for one more day and review this the following day. Mr A was then booked for acute surgery as priority four.

29. Dr C told HDC:

> "[I asked the Plastic Surgery team to review [Mr A] with an intention that they [would] take over his care as I thought this wound was best managed by their service due to the complexity of the wound and that it [would] be needing skin grafting in a compromised situation."

30. Dr I told HDC that he tried to contact Dr N (the Plastic Surgery registrar who had seen Mr A during his first admission), but reached her voicemail. Dr I said that he then contacted the acute Plastic Surgery registrar, Dr O, who initially referred him to Dr N's team. Dr I stated:

> "I contacted the team registrar, who was not on-site at the hospital, and had no knowledge of this patient. I returned back to the on-call acute plastic registrar, [Dr O]. He advised over-the-phone that orthopaedics could do the debridement and then contact plastics for coverage."

31. These conversations are not documented in the clinical record.

32. On Day 16, Mr A was seen by Dr C and Dr I on the consultant ward round. It is documented that Mr A had had some palpitations, and the plan was to discuss his electrocardiogram[19] and palpitations with the medical team. It was again documented that the Plastic Surgery team should review Mr A, and that dabigatran should be withheld until he was reviewed by the Plastic Surgery team. Intravenous antibiotics were continued.

[17] DVT is a clot in a deep vein, usually in the leg.
[18] Dead.
[19] A medical test that detects heart problems by measuring the electrical activity generated by the heart as it contracts.

33. At 10.40am, Mr A was seen by Plastic Surgery registrar Dr G, who noted the cellulitis and necrotic area on the posterior right calf. The recommendation was that Mr A undergo debridement and vacuum dressing to allow the cellulitis to settle further, and then to proceed with a skin graft later. The notes do not indicate who should provide that care (ie, the Plastic Surgery or Orthopaedics team). Counties Manukau DHB told HDC that the Plastic Surgery team "were under the impression that orthopaedics would debride the wound and let them know when it was ready for grafting, which is the normal process".

34. After her review of Mr A, Dr G telephoned Dr I. Dr G remembers advising him that she would recommend debridement under Orthopaedics, then skin graft under Plastics once the wound was not infected, and that Dr I accepted this recommendation. Dr G did not document this conversation.[20]

35. Dr G told HDC that she also recalls verbally informing an on-call Plastic Surgery registrar about her plan, but cannot recall which registrar she told. However, Plastic Surgery consultant [Dr E] stated that he recalls being told by one of the Plastic Surgery registrars about a patient under the Orthopaedics team who had a flap laceration that needed grafting, which the registrar thought the Orthopaedics team should be able to do. [Dr E] stated that he agreed with this plan.

36. Later that day, Mr A's palpitations were discussed with the medical team, and an ECG was requested and completed, then discussed with the Orthopaedics team. At 1.20pm, a nurse also notified the Orthopaedics team that Mr A's dabigatran continued to be withheld.

37. On Day 17, Mr A was seen by Dr C and orthopaedic consultants Dr P and Dr Q, on the combined Orthopaedics consultant ward round. The notes state that it was explained that Mr A's wound needed debridement and Plastic Surgery involvement, and that the team was still awaiting Plastic Surgery involvement.

38. A dictated electronic note made by Dr Q states:

> "[T]he posterior calf laceration has now declared itself being necrotic and will require debridement and skin grafting. We would like our plastic surgical colleagues to deal with this."

39. Dr C told HDC: "Our understanding and intention was that [Mr A's] care was to be taken over by a Plastic Surgical team and they would want to operate on [Mr A.]" Dr C explained that dabigatran was again withheld so that the anaesthetist could have the option of using spinal or epidural anaesthesia if required.

40. At 9.10pm, Mr A complained that his intravenous site was sore. The on-call house officer documented that an attempt was made to replace the luer,[21] but that it was difficult and a

[20] Dr G was then on leave on Day 17 and Day 18.
[21] A device used to connect intravenous catheters or syringes to deliver intravenous therapy.

new one was unable to be inserted. The impression was thrombophlebitis[22] of the left arm provoked secondary to the luer. The documented plan was to administer oral antibiotics, have a team review in the morning, query a VTE team review by haematology, and consider ultrasound of the left arm. In response to the information gathered during the investigation, Mr A's family raised concern that the ultrasound was not undertaken.

41. Dr I saw Mr A on the morning of Day 18, and the notes include the comment: "Plastics to see (!)." Mr A's intravenous luer was reinserted on his other hand, and it was noted that the luer site on his left arm seemed to be improving.

42. At 12.50pm, a nurse documented that she asked the house officer to review Mr A's dabigatran, as it had not been given for the past five days. Clexane[23] 40mg was charted for DVT prophylaxis, and was given that night. Dr C explained that this was due to the delay in surgery. In response to the information gathered, Mr A's family expressed concern that Mr A was given a prophylactic dose of Clexane, rather than a higher treatment dose.

43. The notes record the following comment from the Orthopaedics house surgeon at 2pm: "[Orthopaedics registrar] has tried multiple times to contact plastics registrar [Dr N] and leaves messages for plastics team to review patient for plastics management." Counties Manukau DHB told HDC that Dr N was on leave from Day 16 to Day 19.

44. On Day 19, Mr A was seen by Dr M on the registrar ward round. The notes state: "[Patient] frustrated about Plastics. Otherwise well." The documented plan was: "Will try to get Plastics to see, if Plastics do not respond today, then we will debride in [operating theatre] under [Orthopaedics]." Mr A was also seen by the orthogeriatrician. It was noted that he was feeling "great, comfortable", and that he had had a migraine the previous night but that it had resolved.

45. Later that day, Mr A was seen by the acute Plastic Surgery registrar, Dr O. The documented recommendation was debridement of the right calf and vacuum dressing under Orthopaedics, and then, once the infection had settled, consideration of a split skin graft. The notes state that Dr O discussed the case with the senior Orthopaedics registrar, Dr M, and that the Plastic Surgery registrar would discuss the case with the on-call consultant, write the plan after this discussion, and "? take over" care. Counties Manukau DHB stated that the new plan of care was that the Plastic Surgery team would take over Mr A's care the following day. However, this is not clearly recorded in the notes. Mr A received 40mg of Clexane that afternoon.

46. On Day 20, Mr A was seen on the Orthopaedics ward round by Dr P. It was acknowledged that the Plastic Surgery team would be taking over Mr A's care.

47. Later that morning, Mr A went to the operating theatre for debridement of his calf wound under the Plastic Surgery team (headed by Plastic Surgery consultant Dr D). Towards the

[22] Inflammation of a vein with formation of a thrombus (a clot of blood formed within a blood vessel and remaining attached to its place of origin).
[23] An anticoagulant given by injection.

end of the surgery, Mr A's blood pressure dropped suddenly and he became non-responsive. The anaesthetist thought that Mr A was experiencing significant pulmonary emboli (PE),[24] so he was treated for this and given cardiopulmonary resuscitation. Mr A developed complications secondary to the cardiopulmonary resuscitation efforts and his loss of cardiac output.

48. Mr A was transferred from the operating theatre to the intensive care unit. Unfortunately, despite the efforts of the intensive care specialists, Mr A deteriorated. By Day 25, Mr A was in established multi-organ failure and he had a large right middle cerebral artery infarction. The following day, medical intervention was withdrawn, and subsequently he died.

Further information from Counties Manukau DHB

DVT and VTE risk assessment and management

49. Counties Manukau DHB stated that the issue of whether Mr A should be re-started on dabigatran or receive Clexane was discussed daily by his Orthopaedics team. Counties Manukau DHB noted that the decision on whether or not to anticoagulate a patient is a balance between the risk of the patient bleeding further and the risk of stroke or VTE. Counties Manukau DHB stated:

> "On readmission to the orthopaedic ward … the nursing notes show that [Mr A] was routinely assessed for the falls risk assessment and pressure injury risk. There is no documentation of a VTE risk assessment completed on admission. However, [Mr A] was taking dabigatran, which is an anticoagulant, for his atrial fibrillation. [Mr A] was a low risk of DVT on admission.
>
> It is [Dr C's] view that orthopaedic patients have a high risk of VTE and thromboprophylaxis is usually used unless it is contraindicated such as in [Mr A] case with his impending surgery; excessive wound ooze (pre-starting infection); haematoma formation; and exacerbating wound necrosis. [Mr A] was mobilising independently to the toilet and in the ward. He had injuries to both his legs, which meant that anti-embolism stockings were not an option for use. [Dr C] explained that foot pumps are routinely used on patients in the orthopaedic wards for sedentary patients. He acknowledges that [Mr A] could have had one foot pump, however as he was mobile this would have needed to be removed regularly.
>
> [Mr A] was on dabigatran for his atrial fibrillation … dabigatran is a longer acting medication than Clexane, and the reversal process is more extensive. Dabigatran was withheld at admission as it needs to be stopped 24 hours prior to surgery, and in addition [Mr A] had a haematoma and the Dabigatran may have caused extra bleeding. It was the expectation that [Mr A] would be going to surgery at short notice."

[24] PE occurs when a DVT breaks free from a vein wall, travels to the lungs, and blocks an artery in a lung.

50. Dr C acknowledged that the documentation of DVT prophylaxis was not done well in Mr A's case. Dr C stated that DVT prophylaxis is always deliberated upon with every patient. He said that due to ongoing unexpected delays, Mr A was started on Clexane on Day 18, and that this is proof that DVT prophylaxis was indeed being considered. Dr C also stated that Mr A was verbally prescribed a foot pump and mobilisation on admission; however, these instructions are not documented.

51. Counties Manukau DHB advised that it is normal procedure for clinicians to explain to a patient at ward rounds and during other visits why a decision has been made to withhold, or change, one of the patient's medications, and what the implications of that may be. In respect of Mr A's dabigatran, Counties Manukau DHB stated: "[W]hile there is no documented note saying this discussion took place, there is no evident reason why the discussion would not have taken place."

52. Counties Manukau DHB haematology consultant Dr H stated that it is impossible to say with certainty that the omission of anticoagulation was sufficient to make a meaningful difference between Mr A sustaining and not sustaining an intra-operative PE.

Coordination between Orthopaedics and Plastic Surgery teams

53. With regard to the coordination between the Orthopaedics and Plastic Surgery teams, Counties Manukau DHB stated:

> "We acknowledge that there was a temporary miscommunication between the orthopaedic team and the plastic surgery team. The orthopaedic registrar had difficulty contacting the plastic surgery team, as the plastic surgery registrar, along with another plastic surgery registrar were off sick. Once the plastic surgery team were appropriately contacted and [asked] to review and take over [Mr A's] care this was done promptly. There was never any dispute between the two services."

54. Counties Manukau DHB accepts that the co-ordination of care and communication between the Orthopaedic and Plastic Surgery services was not ideal, and that staff conversations about which service was to manage Mr A's care were not documented clearly in the clinical notes. Counties Manukau DHB stated: "[The notes] did not clearly reflect the discussion and intention of the plans that had been discussed or which team was to take over the care of [Mr A]."

55. Counties Manukau DHB acknowledges that there was a lack of clarity over which service was to care for Mr A, but stated:

> "[Mr A] did continue to receive the appropriate assessments and antibiotic treatment and his wound continued to improve so that he was able to go to theatre for a one step procedure, split skin graft, rather than having to undergo serial operations."

56. Counties Manukau DHB also noted that the Orthopaedics team routinely waits for cellulitis to settle before debriding necrotic wounds, sometimes for days or weeks.

57. Dr C acknowledged that although he had overall supervision of Mr A's care, he was unaware of the exact nature of the delays in contacting the Plastic Surgery team. He said that if he had been aware of the difficulty, he would have insisted that his registrars deal with the on-call Plastic Surgery team, and that if that had proved to be ineffective, he would have contacted the Plastic Surgery consultant himself.

58. Dr D stated:

> "Given that either service could have performed the initial debridement, clarity around the request and subsequent advice given was crucial, and unfortunately lacking in written documentation so that others could clearly understand what had transpired."

59. Dr D also said that it was his team's understanding that Plastic Surgery would be contacted in the future if required following debridement of the wound by Orthopaedics.

Delay in surgery

60. Counties Manukau DHB stated:

> "It is acknowledged that there was a delay in [Mr A] receiving surgery. However … there was no urgency for surgery as [Mr A] was mobile, his cellulitis was resolving, the swelling was going down and he was stable. It was important for the cellulitis to be treated first before surgery. A clear plan was documented for [Mr A] every day."

61. Counties Manukau DHB acknowledged that the delay was not ideal. However, it stated that Mr A was admitted on the Friday of a very busy weekend, and the acute workload over this period was high. Counties Manukau DHB said that on admission Mr A was prioritised together with the other acute cases that were also scheduled for the acute operating theatres.

Changes to service

62. Counties Manukau DHB advised that a number of changes have been made to its service following Mr A's case. These are outlined in the paragraphs that follow.

63. Dr D discussed this case at the Plastic Surgery Morbidity and Mortality meeting. As a result of that meeting, the following was reiterated and disseminated to all Plastic Surgery teams:

a) All consultations by the on-call Plastic Surgery registrar need to be documented accurately in the patient's notes, recording the registrar and the consultant the registrar is representing. The consultant also needs to be informed of decisions, and any advice involving a surgical plan must include which team is to perform the plan.

b) Clear pathways of communication need to be established following a consultation, and these communication pathways should be documented accurately within the patient's notes. Inability to reach a particular registrar should default to the acute team to ensure minimal delay in patients receiving treatment.

c) If on-call registrars are called by another service for a review, they should see the patient, document the review, and discuss it with the Plastic Surgery consultant they are representing.

64. Dr C and Dr D discussed Mr A's case and decided that if there is a delay in a registrar being able to make contact with another service, the registrar should escalate the communication so that a consultant of the team can contact the consultant of the other service.

65. Counties Manukau DHB advised that the VTE audit in Care Compass (an organisational audit tool for a range of clinical indicators) has been reviewed for use in Orthopaedics, and routine use will commence shortly.

66. Posters detailing how and when to escalate issues of being unable to contact medical staff in another service, and what doctors should do if they have a pager or phone and are off sick, have been placed in areas frequented by RMOs and medical staff. The process around escalating issues to senior medical staff when a doctor is unable to contact a colleague from a different service, and what to do with the pager when a doctor is off sick, will be included in the updated RMO handbook that is distributed at orientation.

67. The Orthopaedics service raised the issue of VTE prophylaxis at its business meetings, which are held one to two monthly with consultants and the service manager, and there is evidence of discussion regarding acute referral guidelines and escalation for registrars and other services. Further, VTE has been minuted as a regular discussion point at the multidisciplinary Orthopaedics departmental complication meetings.

68. In July 2016, Counties Manukau DHB developed a VTE prevention pathway for Orthopaedics to embed key processes into routine practice, including VTE risk assessment of all patients at Orthopaedics preadmission clinics; VTE risk assessment of all patients as part of "time out" in operating theatres; decision-making at the end of each surgical procedure regarding the appropriate thromboprophylaxis and charting thereof; and close monitoring of potential complications associated with VTE prophylaxis.

69. The pathway means that each patient has a specific VTE prevention plan based on the patient's individual VTE and bleeding risk. The associated bundle of care includes an orthopaedic VTE risk assessment tool (discussed further in the following paragraph); a template for dictation of the VTE prevention plan in Orthopaedics preadmission clinics; patient and staff VTE prevention pamphlets; a range of resources regarding the use of anti-embolic stockings; and an eLearning resource for staff.

70. Counties Manukau DHB advised that the VTE prevention pathway has been embedded for use in elective orthopaedics with a new focus and use for acute patients. The Counties Manukau DHB "Orthopaedic VTE and Bleeding Risk Assessment" document has been tested and has had several modifications to improve its effectiveness in the assessment and planning for patient VTE prophylaxis and treatment. Updates include a medication

dosing table and a process table, and integration of a formerly trialled VTE daily plan sticker.

Responses to provisional opinion

71. Counties Manukau DHB was given an opportunity to respond to the provisional opinion. It stated that it accepts the provisional opinion and will comply with the provisional recommendations. Counties Manukau DHB made some minor suggestions for changes to the recommendations, which are reflected in the recommendations section below.

72. Mr A's family responded to the "information gathered" section of the provisional opinion. Where appropriate, their comments have been incorporated into the report above. Mr A's family stated that they are concerned about "a significant lack of patient-centred care evident at the public hospital during [2017]".

73. Mr A's family said that Mr A's mobility was limited at best. They are concerned that the clinical records do not indicate that Mr A was assisted to mobilise other than to get up to go to the toilet. They are concerned at a lack of deliberation or consideration of DVT prophylaxis/VTE prevention planning during Mr A's second admission, and a lack of involvement of Mr A or his family in such planning.

Opinion: Counties Manukau District Health Board

Coordination between the Plastic Surgery and Orthopaedics teams — breach

Lack of clear planning

74. On Day 13, Mr A was admitted to the public hospital for the second time under the Orthopaedics team. Mr A was seen by the Plastic Surgery team registrar on Day 16. The documented recommendation for Mr A was wound debridement, and then a skin graft of his posterior calf wound. However, the notes do not specify which team was to undertake each procedure.

75. The Plastic Surgery team's understanding was that the Orthopaedics team would undertake the debridement and let the Plastic Surgery team know when the wound was ready for grafting. However, over the following days, the Orthopaedics team continued to document that it was awaiting Plastic Surgery input, and that unsuccessful attempts to contact the Plastic Surgery registrar had been made.

76. The statements provided by staff of both the Plastic Surgery and Orthopaedics teams indicate that Mr A's care was discussed within the teams on more occasions than were documented in the clinical record. However, no clear plan about which team would be undertaking the debridement and skin grafting of Mr A's calf wound was recorded until he was seen by the acute Plastic Surgery registrar on Day 19.

77. My plastic surgery expert advisor, Dr Sally Langley, advised that the level of coordination of Mr A's care between the two teams was not acceptable. She commented that a clear discussion regarding the responsibility for Mr A's care should have occurred on Day 16. Dr Langley considers that the Orthopaedics team's attempts at contacting the Plastic Surgery registrar were inadequate, and that when they were unable to contact the Plastic Surgery registrar, they should have contacted the acute Plastic Surgery team or the Plastic Surgery consultant. Dr Langley also commented that this case has emphasised the need to document interactions between medical staff, particularly ad hoc and corridor conversations. She noted the importance of specifying the names of the staff involved in the interactions, and the name of the consultant.

78. My orthopaedics expert advisor, Dr John Dunbar, acknowledges that during some of Mr A's second admission, two Plastic Surgery registrars were on leave. However, Dr Dunbar considers that the failure of the Orthopaedics team to make contact with the Plastic Surgery team and provide clarity about who should care for Mr A represents a moderately serious departure from the normal standard of care. Dr Dunbar stated:

> "I believe my peers would see this as very frustrating and would be concerned about the delays in treatment with the potential for subsequent morbidity.
>
> The two … points that stand out for me in this situation are that when another department has been asked to review a patient, it should be made clear whether the review is specifically for advice or whether the requesting team is asking that the team consulted take over the care. Secondarily, where it is obvious that there was difficulty making contact between departments at a registrar level, there should be a rapid escalation to alternative means of contact at a registrar to consultant level or consultant to consultant level."

79. Dr Dunbar advised that although the standard of orthopaedic care Mr A received during his admissions was reasonable, the problem lay in the communication between the Orthopaedics and Plastic Surgery teams. Dr Dunbar commented that this is more of a systems failure than a particular failure of orthopaedic care.

80. I accept the advice of Drs Langley and Dunbar. I am very concerned that despite Mr A having been identified as needing debridement and skin grafting, there was no clearly documented plan setting out which team would be undertaking these procedures. In my view, this was contributed to in two ways. First, the Plastic Surgery team failed to document its discussions regarding its understanding that the debridement would be done under the Orthopaedics team, and secondly, the Orthopaedics team did not make sufficient attempts to contact the Plastic Surgery team or escalate its concerns to the acute team or consultant level for several days.

Delay in undertaking surgery

81. On Day 15, Mr A was identified by the Orthopaedics team as likely requiring debridement and skin grafting, and he was booked for acute surgery as priority four. The requirement

for debridement and skin grafting was confirmed by the Plastic Surgery team on Day 16. However, this surgery was not undertaken until Day 20 — six days after admission.

82. Dr Dunbar advised that most of his orthopaedic peers would believe it important to debride necrotic and infected tissue as soon as reasonably possible, which in Mr A's case would probably have been about two to three days post admission. Dr Dunbar stated:

> "[T]his would allow time for some intravenous antibiotics to get on top of some of the infection and also allow for his dabigatran levels to diminish to a level where excessive bleeding was not likely to pose a major problem."

83. Dr Dunbar noted that the wait time was longer than would be desirable, in light of the morbidity of more elderly people being immobile and waiting in bed. Dr Dunbar stated:

> "I consider the wait [Mr A] experienced to be a moderately serious departure from an accepted standard of care, being directly attributable to the deficiencies in communication between the Orthopaedic and Plastic Surgical Teams."

84. Dr Langley advised that the delay in undertaking the surgery was not reasonable. However, she acknowledges that delays do occur in public hospitals owing to the urgency of other acute patients. Dr Langley commented that the surgical removal of dead skin and haematoma was a sensible procedure for Mr A's presentation, but advised: "It would have been acceptable for Mr A to wait several days for this surgery but the wait of six days is indeed too long." Dr Langley noted that Mr A's mobility was limited, as he was in a ROM brace and using crutches, and that the effects of relative immobility increase the longer it occurs.

85. I accept the advice of my advisors, and am critical that Mr A's necessary surgery was delayed until six days after his admission. Although I acknowledge that in public hospitals delays in performing surgery do occur based on the acuity of other patients, in my view the delays in Mr A's case were a result of poor communication between the Orthopaedics and Plastic Surgery teams.

Conclusion

86. Right 4(5) of the Code states that every consumer has the right to co-operation among providers to ensure quality and continuity of services. Mr A did not receive quality and continuity of services because of the failures in communication and a lack of clear planning between the Orthopaedics and Plastic Surgery teams. Accordingly, I find that Counties Manukau DHB breached Right 4(5) of the Code. These communication and planning failures led to a delay in undertaking Mr A's surgery. In these circumstances I also find that Counties Manukau DHB breached Right 4(1) of the Code for failing to provide Mr A services with reasonable care and skill.

DVT and VTE risk assessment and management — adverse comment

87. When Mr A was readmitted to the public hospital, his dabigatran was withheld on Days 14-17, pending surgery. He then received Clexane injections on Day 18 and Day 19, owing to

the ongoing delays to his surgery being undertaken. Although Counties Manukau DHB advised that the issue of whether Mr A should be re-started on dabigatran or receive Clexane was discussed daily by his Orthopaedics team, Mr A did not have a clearly documented VTE risk assessment.

88. Dr Dunbar stated that the management of VTE prophylaxis in the acute setting is a complex scenario that must be individualised by the treating physicians, and therefore it is very difficult to provide absolute guidelines for the acute scenario. He commented that Counties Manukau DHB had in place good guidelines for VTE prophylaxis and management, but that there did not appear to be guidelines promoting and facilitating documentation of the complex decision-making process.

89. Dr Dunbar advised that it is common practice to withhold dabigatran from patients whilst they await surgery. He noted that there is a reversal agent available, but that normally it would be used only where there is a need for urgent surgery. Dr Dunbar said that in Mr A's case, it would have been appropriate to treat him for a day or two with intravenous antibiotics, withhold dabigatran to let the levels fall, and operate about two days after readmission. However, Dr Dunbar acknowledged the Orthopaedics team's daily expectation of surgery. He stated:

> "This expectation tends to prompt the withholding of dabigatran in case surgery is going to proceed and it is relatively easy to lose sight of the fact that where surgery is delayed, some alternative thromboprophylaxis may be required."

90. Dr Dunbar also noted that had surgery for debridement occurred after two days, Mr A may have had to return to theatre several days later for skin grafting, which would have posed a very difficult clinical situation in managing appropriate thromboprophylaxis.

91. Dr Dunbar considers that at the time of Mr A's second admission, Mr A was a relatively high risk for VTE for reasons of his age, his atrial fibrillation, and that he was just under two weeks' post lower-limb trauma, following which he had been immobilised with his knee in extension. Dr Dunbar commented that Mr A's dabigatran levels would have been adequate for reasonable VTE protection for two days following his readmission, but that there was then a further two days where he was relatively unprotected. Dr Dunbar stated: "[G]iven his risk factors for VTE it might have been reasonable to start him on Clexane two days earlier than the day on which he was started." Dr Dunbar also advised:

> "It is difficult to make a comment on the extent to which the treating doctors assessed his risk of DVT as it is something that normally would be thought about and acted upon rather than necessarily recorded in the notes. It might be assumed that given there was a period of relative unprotection from his VTE that this matter had escaped the attention of the treating doctors. Under the circumstances I believe my peers would consider that a mild to moderate departure from accepted practice."

92. Dr Dunbar clarified that "the issue in relation to the thromboembolic prophylaxis is not so much what was done but a lack of documentation of what was considered and the thought processes behind the decisions made".

93. Dr Langley commented that although Mr A did not have a documented VTE risk assessment, the Orthopaedics team did address his atrial fibrillation, his palpitations, and his dabigatran and the withholding of it, every day. She stated that this is the equivalent of a VTE assessment. However, she noted that appropriate attention was not paid to some of his risk factors for VTE, including his recent trauma, recent surgery, and relative immobility. Dr Langley considered that although not directly relevant, Mr A's left arm thrombophlebitis should have triggered a haematology or orthogeriatric review.

94. I accept the advice of Dr Dunbar and Dr Langley. I acknowledge that Mr A's anticoagulation was considered regularly by the Orthopaedics team, and I consider it to have been a reasonable course of action to withhold Mr A's dabigatran on admission, pending surgery. However, Mr A had a two-day period (on Day 16 and Day 17) where he was relatively unprotected from VTE risk, as his dabigatran levels had reduced, and Clexane had not yet been started. I am critical that the Orthopaedics team did not initiate Clexane treatment earlier, and I consider that it would have been useful for the documentation of the decision-making in relation to Mr A's anticoagulation to have been more explicit. In my view, it would have been beneficial for Counties Manukau DHB to have had in place guidelines promoting and facilitating documentation of the complex decision-making process around anticoagulation.

Recommendations

95. I recommend that Counties Manukau DHB:

a) Introduce the following changes to its policy on clinical documentation, and report back to HDC within three months of the date of this opinion, with a copy of the updated policy:

   i. The circumstances under which interactions between medical staff (eg, ad hoc and corridor discussions) should be documented in the clinical record.

   ii. That requests for another team's input should specify clearly in the clinical record whether the request is for a review or for complete transfer of care.

b) Consider implementing the following recommendations, as outlined by Dr Langley in her advice, and report back to HDC within six months of the date of this opinion, outlining any action taken as a result of these recommendations:

   i. Develop a policy outlining when a patient should become a Plastic Surgery patient (noting Dr Langley's comment that in a tertiary hospital with Plastic Surgery and

Orthopaedics surgery services, this should be when the patient has significant soft tissue trauma to the lower limb without bone or joint trauma, or following stabilisation of bone or joint trauma). The definition of "significant soft tissue trauma" should be included in the policy.

ii. Where there is uncertainty or disagreement about a patient transfer, undertake patient transfers from team to team via the teams' consultants.

c) Reiterate to all Plastic Surgery and Orthopaedics medical staff that clear pathways of communication need to be established following a consultation, and that these communication pathways should be documented accurately within the patient's notes, and the inability to reach a particular registrar should default to the acute team. Confirmation that this has been done should be provided to HDC within three months of the date of this opinion.

d) Provide a further update to HDC on the efficacy of the VTE prevention pathway, particularly regarding its use for acute Orthopaedics patients. This update should be provided to HDC within three months of the date of this opinion.

e) Provide a written apology to Mr A's family for the failings identified in this report. The apology should be sent to HDC within three weeks of the date of this opinion, for forwarding to the family.

Follow-up actions

96. A copy of this report with details identifying the parties removed, except the experts who advised on this case and Counties Manukau District Health Board, will be sent to the Health Quality & Safety Commission and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent advice to the Commissioner

The following expert advice was obtained from Dr John Dunbar:

"Prior to compiling this report I have read and agreed to follow the Commissioner's guidelines for independent advisors in writing reports.

My qualifications include:

B.Ag.Sc. (Hons), F.R.A.C.S

MBCHB gained in 1983

FRACS Orthopaedic Surgery in 1991

I am currently practising as a Consultant Orthopaedic Surgeon in Dunedin as a General Orthopaedic Surgeon but with a special interest in Paediatric Orthopaedic Surgery. My work includes caring for acute admissions of patients having suffered trauma.

The instructions I was given in the request for advice are below:

Expert advice requested

Please review the enclosed documentation and advise whether you consider the care provided to [Mr A] by Counties Manukau was reasonable in the circumstances, and why.

In particular, please comment on:

1. The coordination of care and communication between the Orthopaedic and Plastic Surgery Teams
2. The adequacy of the communication within the Orthopaedic Team
3. Whether the initial decision to discharge [Mr A] on [Day 4] was appropriate and the discharge was managed appropriately
4. The reasonableness of [Mr A's] surgery taking place six (6) days after his admission on [Day 13]
5. Whether [Mr A] was appropriately assessed and managed for risk of Deep Vein Thrombosis (DVT) and Venous thromboembolism (VTE) during his second admission
6. Whether it was reasonable for Dabigatran to be withheld from [Mr A] while awaiting surgery and whether the withholding of Dabigatran was managed appropriately
7. The standard of documentation regarding [Mr A's] care and treatment plan
8. The overall standard of care provided by the Orthopaedic Team
9. Any other matters in this case that you consider warrant comment.

For each question, please advise:

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

b. If there has been a departure from the standard of care or accepted practice, how significant a departure do you consider this to be?

c. How would it be viewed by your peers?

d. Recommendations for improvement that may help to prevent a similar occurrence in future.

If you note that there are different versions of events in the information provided, please provide your advice in the alternative. For example, whether the care was appropriate based on scenario (a), and whether it was appropriate based on scenario (b).

INFORMATION AND DOCUMENTS REVIEWED

I was provided with the following documents which I have reviewed:

Complaint documentation dated […]

Counties Manukau DHB's response dated […]

Complainant's response dated […]

Counties Manukau DHB's further response dated […]

Clinical records from Counties Manukau DHB for [Mr A] covering the period [Days 1–4] and [Days 14–26]

SUMMARY OF EVENTS

The initial response from Counties Manukau DHB to the complainant provides a detailed summary of events but I will mention in particular some areas which I consider of importance.

[Mr A] was a seventy-eight (78) year old man admitted acutely to the public hospital on [Day 1]. He had sustained a laceration to his right lower limb following a fall from […] the previous day. He had multiple wounds and abrasions, the most significant wounds being to the right shin region. He had no laceration above the knee, I believe, but clinically he had a rupture of his quadriceps as he was unable to extend his right knee normally.

He had a past history of hypertension, atrial fibrillation, hyperlipidaemia and benign prostatic hypertrophy for which he was treated with Dabigatran 150 mg twice a day, Losec, Accupril, Terazosin and a Statin.

His Dabigatran was withheld on [Day 1] and [Day 2]. A normal dose of Dabigatran was given again on [Day 3] and then on [Day 4]. On [Day 2] he went to the operating theatre. A tourniquet was used for fifty-eight (58) minutes and he underwent repair of

his quadriceps tendon and a washout and closure of a pre-tibial wound and a debridement and dressing of a posterior calf wound. The surgery was performed by [Dr I] and [Dr M], whom I believe are Orthopaedic Registrars. Post-operatively he was transferred to the care of [Dr C]. Post-operatively his wounds were dressed and his knee immobilised in a range of movement brace locked in extension. The notes record that he had been seen and assessed by an Ortho Geriatrician on [Day 2]. On [Day 3] he was seen on [Dr C's] ward round and there were no obvious concerns at that stage. On [Day 4] he was seen on the Registrar Ward Round and cleared for discharge, subject to appropriate arrangements being made by Physiotherapy and Occupational Therapy Departments. There was a physiotherapy entry in the clinical record on [Day 4]. This included an assessment of [Mr A] prior to discharge. Extracts are as follows:

> 'Patient feeling good. Pain is minimal when mobilising. ROM brace had arrived and felt comfortable. Patient is keen to go home. Wife will be able to help with ADLs at home'. 'Patient tolerated session well, safe mobilising with crutches, 4-point walk and safe ascending and descending stairs inside, needs supervision with outside steps with crutches'.

An occupational therapy note from the same day prior to discharge included the comment '[Mr A] feels confident to access his upstairs bedroom and en suite'. The occupational therapist recognised that a shower stool with arms would be beneficial for discharge to increase safety and independence.

The notes that were available to me, as far as I could find, did not indicate that a referral to District Nursing had been done but the Counties Manukau DHB response indicated that a District Nursing referral was made on [Day 5] and he was visited by a District Nurse on [Day 6] with planned twice weekly visits. I understand he was subsequently seen on [Days 11-13] by the District Nurse.

The hospital notes record the discharge instructions in several places. These were that [Mr A] stay in the range of movement brace locked in extension for four (4) weeks. He was to be reviewed in the Orthopaedic Outpatient Clinic in two (2) weeks and he was allowed to be weightbearing as tolerated. He was also discharged on a one (1) week course of Augmentin orally, having been on intravenous Augmentin in the early post-operative period. He was to continue with his normal dose of Dabigatran and his other regular medication.

[Mr A] was then readmitted to the public hospital on [Day 14], i.e. thirteen (13) days following his initial admission, with cellulitis and a haematoma in his calf with an area of necrotic skin measuring approximately 8 x 5 cm. He was readmitted under the Orthopaedic Team. On initial admission he was seen by the Orthopaedic Registrar [Dr I] and his Dabigatran was withheld for that day pending anticipated further surgery. The following morning, [Day 15], he was seen on [Dr C's] ward round. The plan as indicated in the notes following that ward round was to continue the intravenous antibiotics, ask the Plastic Surgery Team to review [Mr A] as it was likely his calf wound would require debridement and skin grafting and to withhold the Dabigatran

for one (1) more day with review the following day. The following day, [Day 16], [Mr A] was again seen on the Consultant ward round with [Dr C] and with the Registrar [Dr I]. It was noted that [Mr A] had had some palpitations and the plan was to discuss his ECG and palpitations with the Medical Team. It was again indicated that the Plastic Surgery Team should review [Mr A] and that Dabigatran should be withheld until reviewed by Plastic Surgery. He was to continue his intravenous antibiotics. Later that same morning [Mr A] was seen by the Plastic Surgery Registrar who noted the cellulitis and necrotic area on the posterior right calf. The suggestion was that [Mr A] undergo debridement and vacuum dressing to allow the cellulitis to settle further and then proceed with later skin graft. The notes do not indicate who should provide that care, whether that be under the Plastic Surgery Department or Orthopaedics.

On the following day, [Day 17], [Mr A] was seen again on the combined Orthopaedic ward round by [Dr C], [Dr P] and [Dr Q]. The notes state that it was explained that his wound needed debriding and Plastic Surgery involvement and that the team was still awaiting Plastic Surgery involvement. On [Day 18] [Mr A] was seen early in the morning by the On Call House Surgeon as he had developed thrombophlebitis in his left arm secondary to his intravenous line. The House Surgeon considered the possibility of a thromboembolism arising secondary to the thrombophlebitis in his arm and suggested review by the clinical team responsible for his care in relation to his venous thromboembolism management.

It was noted on that same day that the Dabigatran had been withheld since [Day 13] and therefore [Mr A] was started on 40 mg of Clexane daily.

He was seen on [Day 18] by [Dr I] and the notes include the comment 'Plastics to see (!)'. The notes also record a note from the Orthopaedic House Surgeon indicating 'Ortho Reg has tried multiple times to contact Plastics Registrar [Dr N] (leaves messages for Plastics Team to review patient for plastics management)'. On [Day 19] [Mr A] was seen by [Dr M] on the registrar ward round. The notes indicate 'PT frustrated about Plastics' and the plan from the notes was that 'we will try to get Plastics to see, if Plastics do not respond today, then we will debride in OT under Ortho'. [Mr A] was also seen by the Ortho Geriatrician Team on that day. It was noted that he was feeling great. He'd had a migraine the previous night but that had resolved and there were no other specific suggestions.

Later that day he was seen by the acute Plastic Surgical Registrar where the notes indicate that a formal agreement for the Plastic Surgery Department to take over [Mr A's] care was agreed upon.

He again received 40 mg of Clexane that evening.

The following day i.e. [Day 20] [Mr A] was again seen on the consultant ward round by [Dr P]. It was acknowledged that the Plastic Surgery Department was going to take over his care.

Later in the day [Mr A] went to the operating theatre for debridement of his calf wound but it was during this surgery that his blood pressure dropped and he became non-responsive. It was thought that he probably suffered a pulmonary embolus with subsequent cardiac arrest with loss of cardiac output. He also developed a pneumothorax secondary to fractured ribs as a result of cardiopulmonary resuscitation efforts. His loss of cardiac output also resulted in his developing an acute kidney injury.

He was transferred to the ICU from the operating theatre.

The notes include excellent summaries from ICU consultants on day 3, 5 and 6 of his time in ICU. Unfortunately despite the efforts of the Intensive Care Specialists, [Mr A's] condition deteriorated and on [Day 26] medical intervention was withdrawn and he died.

OPINION

I will comment on each of the points listed in the request for expert advice.

1. The coordination of care and communication between the Orthopaedic and Plastic Surgery Teams.

The record suggests that the coordination of care between the Orthopaedic and Plastic Surgery Teams and the communication between those teams was poor. [Mr A] was seen promptly by the on call Plastic Surgical Registrar as requested by the Orthopaedic Team following his readmission with cellulitis and necrosis of his wound. However, the on call Registrar, despite making some recommendations, did not make it clear who should be responsible for undertaking those recommendations and there was no indication in the notes that the Plastic Surgical Consultant had been informed. It appears then that the Orthopaedic Team assumed that the further surgery for [Mr A] would be undertaken by Plastic Surgery, but it also appears that the Plastic Surgery Department had made no plans to provide that care. It was also apparent that the Orthopaedic Registrar was having difficulty recontacting the Plastic Surgical Registrar and that situation continued from [Day 16] to [Day 19]. Multiple attempts were made to contact the Plastic Surgical Registrar but only messages were left on a phone I believe, and there was no indication that the attempts to communicate between Orthopaedic and Plastic Surgical Teams had escalated to consultant level. Once the request for [Mr A's] care to be continued under the Plastic Surgical Team had reached Consultant level on [Day 19], he went to the operating theatre promptly on [Day 20]. It was clear from the notes that the Orthopaedic Team and the patient were both becoming frustrated with their inabilities to make contact with the Plastic Surgical Team.

I understand that two (2) of the Plastic Surgical Registrars were on leave during this time but the failure for the Orthopaedic Team to make contact with the Plastic Surgical Team and also to provide clarity about who should care for [Mr A] represents a moderately serious departure from a normal standard of care. I believe my peers

would see this as very frustrating and would be concerned about the delays in treatment with the potential for subsequent morbidity.

The two (2) points that stand out for me in this situation are that when another Department has been asked to review a patient, it should be made clear whether the review is specifically for advice or whether the requesting team is asking that the team consulted take over the care. Secondarily, where it is obvious that there was difficulty making contact between departments at a registrar level, there should be a rapid escalation to alternative means of contact at a registrar to consultant level or consultant to consultant level.

2. The adequacy of the communication within the Orthopaedic Team

[Mr A] was visited frequently by consultants during his time in the Orthopaedic Ward. For each ward round a clear plan was recorded in the notes and this will have been arrived at after discussion between the Consultant and the Orthopaedic Registrar. It appears therefore that the communication within the Orthopaedic Team was adequate but it is difficult to tell from information available to me whether the Consultant Orthopaedic Surgeon was aware of the difficulties the Registrar was having in contacting the Plastic Surgical Team. If that had been the case, it might have been expected that the Consultant Orthopaedic Surgeon or registrar contact the Consultant Plastic Surgeon. I do not consider I have sufficient information about the level of communication within the Orthopaedic Department to make a comment whether there was any departure from an accepted level. I would like to point out that it is common practice for Consultants to do ward rounds with Registrars and House Surgeons, for the Consultants to make recommendations and for the junior staff to action those. However, it does remain the responsibility of the consultant to ensure that his/her recommendations are actioned to his/her satisfaction.

3. Whether the initial decision to discharge [Mr A] on [Day 4] was appropriate and the discharge was managed appropriately

The notes indicate that the decision to discharge [Mr A] on [Day 4] was entirely appropriate and it does appear that all the necessary assessments and arrangements were made for [Mr A]. This included an assessment of his fitness to return home from the Medical Team, the Physiotherapy Team and the Occupational Therapy Team. Arrangements were also made for him to be visited at home by a District Nurse and there did appear to be a clear follow up plan.

It is my understanding that [Mr A's] family had a number of concerns about the initial discharge, including there being no appropriate detailed care plan, no assessment for home help and showering and wound management being undertaken, no district health nursing plan and no obvious consultant overview. Their letter of complaint indicated that the district nursing input was initiated by a neighbour.

The notes as available to me suggest that those concerns were all addressed in the hospital by the hospital staff. There is quite a discrepancy in this area between the account by the family and that as recorded in the hospital notes.

Where such discrepancies exist the reason is usually as a result of a lack of communication between the parties indicating what has actually been arranged. The hospital notes do not contain any records during the first admission of discussions between hospital staff and [Mr A's] family in relation to post-discharge care and it is therefore difficult for me to comment on the adequacy of communication given that such discussions are often not recorded in the notes. However, the discrepancy in accounts suggests that there was probably room for more communication.

4. The reasonableness of [Mr A's] surgery taking place six (6) days after his admission on [Day 13]

On [Mr A's] readmission on [Day 13], it seems clear that he required further debridement of his calf wound and skin grafting of the defect. At the time of his admission the complicating factors were that he had surrounding cellulitis indicating infection in the wound and he was also on Dabigatran. The fact that there was cellulitis and infection would have prevented acute skin grafting. The fact he was on Dabigatran raises the problem of further excessive bleeding and haematoma formation. I believe most of my orthopaedic peers would believe it important to debride necrotic and infected tissue as soon as was reasonably able, which in [Mr A's] case, would probably be about two to three (2–3) days after admission. This would allow time for some intravenous antibiotics to get on top of some of the infection and also allow for his Dabigatran levels to diminish to a level where excessive bleeding was not likely to pose a major problem. If, for example, debridement was undertaken a day after admission, there would be likely to be significant bleeding post-operatively and also, in the presence of cellulitis, it is sometimes difficult to know which tissue requires excision and which remains still viable.

[Mr A] waited five (5) days prior to his surgery which I believe most of my peers would consider a longer period than desirable. The reasons relate to morbidity of more elderly people waiting in bed and being immobile. He also had had his Dabigatran stopped and his level of protection from venous thromboembolism was diminishing every day. This was recognised on [Day 18] when he was started on Clexane.

I consider the wait he experienced to be a moderately serious departure from an accepted standard of care, being directly attributable to the deficiencies in communication between the Orthopaedic and Plastic Surgical Teams previously commented on.

5. Whether [Mr A] was appropriately assessed and managed for risk of Deep Vein Thrombosis (DVT) and Venous Thromboembolism (VTE) during his second admission

[Mr A] was at relatively high risk for venous thromboembolism at the time of his second admission for reasons of his age, his atrial fibrillation, the fact that at the time

of his admission he was just under two (2) weeks following a lower limb trauma after which he had been immobilised with his knee in extension. This is often around the time when we see problems with venous thromboembolism following injury in the instances where significant events occur.

The notes available to me do not specifically mention his risk for venous thromboembolism being formally assessed other than the note from the on call House Surgeon who was asked to see [Mr A] when he developed thrombophlebitis from his IV site. It would be unlikely in my opinion, that his subsequent pulmonary emboli arose from his arm as they more likely arose from deep veins in his leg or pelvis. It was later on the same day as the House Surgeon raised concerns that [Mr A] was started on Clexane, his Dabigatran at that stage having been withheld for four (4) days.

On the assumption that [Mr A's] Dabigatran levels would have been adequate for reasonable VTE protection for two (2) days following his readmission on [Day 13], there was an interval of a further two (2) days where he was relatively unprotected. Given his risk factors for VTE it might have been reasonable to start him on Clexane two (2) days earlier than the day on which he was started.

It is difficult to make a comment on the extent to which the treating doctors assessed his risk of DVT as it is something that normally would be thought about and acted upon rather than necessarily recorded in the notes. It might be assumed that given there was a period of relative unprotection from his VTE that this matter had escaped the attention of the treating doctors. Under the circumstances I believe my peers would consider that a mild to moderate departure from accepted practice.

6. Whether it was reasonable for Dabigatran to be withheld from [Mr A] while awaiting surgery and whether the withholding of Dabigatran was managed appropriately

It is common practice to withhold Dabigatran from patients whilst awaiting surgery. There is a reversal agent available but that would normally only be used where there is a need for urgent surgery. In [Mr A's] case, he had cellulitis in addition to wound necrosis and it does seem appropriate that he be treated for a day or two (2) with intravenous antibiotics prior to proceeding with surgery. In that situation it would seem appropriate to withhold the Dabigatran, let the levels fall, and then operate about two (2) days after his readmission. The Dabigatran would be restarted immediately following the surgery.

The problem arose here in the delay in getting to surgery and it seems likely to me that the focus of the Orthopaedic Team seemed to be more in trying to make contact with the Plastic Surgical Team with an expectation every day that [Mr A] might be going to surgery. This expectation tends to prompt the withholding of Dabigatran in case surgery is going to proceed and it is relatively easy to lose sight of the fact that where surgery is delayed, some alternative thromboprophylaxis may be required.

The standard of documentation regarding [Mr A's] care and treatment plan

Overall I believe the standard of documentation in the notes is good. It was relatively easy for me to follow the train of thought and understand the treatment plan and it was also relatively easy to follow the sequence of events in his hospital stay. As previously mentioned the summaries provided by the ICU Consultants were excellent. They included comments in relation to discussions held with the family. There were no such comments in orthopaedic notes documenting any discussions with the family about [Mr A's] care and the risks associated with his problem and there was nothing specifically documented about his VTE risk. However, I would not necessarily expect to find such documentation in the notes as often discussions with family members are undertaken in an informal way and not necessarily recorded. Similarly, discussions about the relative risks of venous thromboembolism would normally be held on a ward round and the end result of that discussion recorded but not necessarily the detail of the discussion. It is not clear to what extent those discussions were held and therefore difficult to comment any further, but the family's comments in the letter of complaint suggest that such discussion was lacking.

The overall standard of care provided by the Orthopaedic Team

I believe the standard of care provided by the Orthopaedic Team at the first admission was well within the standard of acceptable practice. His surgery was appropriate and all other aspects of his treatment were appropriate at the first admission. On the second admission [Mr A] didn't really receive much orthopaedic care other than be started on intravenous antibiotics and then have his dressings changed. The Orthopaedic Team was under the expectation that the appropriate surgical care would be provided by the Plastic Surgical Team. The decision to ask Plastic Surgery to care for [Mr A] was a perfectly reasonable one given that he had a large area of necrotic skin which would have required skin grafting and the type of expertise offered by the Plastic Surgery Department. The standard of orthopaedic care was acceptable but the problem lay in the communication between the Orthopaedic Department and Plastic Surgery Department and that is more of a systems failure than a particular failure of orthopaedic care. As a result of this failure there was a delay in [Mr A] going to the operating theatre which was a major contributing factor to a prolonged time of withholding of his Dabigatran.

There is a tendency, when a patient is being transferred to another service, for considerations in the patient's management to be considered 'their' problem, but until that transfer has been effected, the team under which the patient has been admitted still needs to take responsibility for the full care of the patient. On the face of it, it appears that the mentality of it being someone else's problem may have been a factor in [Mr A's] case.

9. Any other matters in this case that you consider warrant comment

The striking feature of [Mr A's] case was the communication problem between the Orthopaedic and Plastic Surgery Departments. This appears to be predominantly a

systems failure more so than a failure on the part of any individual. The decision making by the members of the Orthopaedic Team seemed appropriate other than perhaps the lack of a decision to escalate the request from Orthopaedic Surgery to Plastic Surgery further up the ladder of superiority. It was this communication problem which created a snowball effect with the delay in surgery and hence the prolonged withholding of the Dabigatran and possibly also in the overlooking of the need to institute alternative thromboprophylaxis as the Dabigatran levels fell.

It should perhaps also be considered that the events of the second admission occurred at a most inopportune time following the initial injury. The ideal situation might have been that on [Mr A's] readmission, he would be started on intravenous antibiotics and his Dabigatran withheld, as was done, for about two (2) days and then go to the operating theatre for debridement of his wound. He may then have had to return to theatre several days later for skin grafting. This poses a very difficult clinical situation in managing appropriate thromboprophylaxis at a time of relatively high risk of venous thromboembolism whilst at the same time trying to avoid further haematoma and wound problems. It remains possible that the same outcome may have occurred even if everything had run more smoothly. It seems unlikely to me that the communication problems and issues with VTE prophylaxis were the sole cause of [Mr A's] very unfortunate demise but nevertheless the problems encountered in these areas were significant and should be addressed."

The following further advice was received from Dr Dunbar:

"I have read the documents you sent which are listed on your instructions to me of […]. I have re-looked at my original report and a summary of my thoughts from that time are below.

Firstly, the main concern was in relation to the poor communication between the orthopaedic and plastic surgical departments resulting in confusion over who was going to be providing the necessary surgical care after [Mr A's] second admission. Furthermore, what communication there was, was not well documented.

Secondly the wait for surgery was longer than ideal although that seemed to arise largely from the first point relating to confusion over who was going to provide the actual surgical care.

Thirdly, the issues of thromboprophylaxis arose. There were two (2) days during which [Mr A] did not receive prophylaxis for venous thromboembolism but I did comment that this may have not altered his final outcome. Provision of prophylaxis for thromboembolism in the acute setting has so many variables that it is very difficult to make firm recommendations and I believe that the issue in relation to the thromboembolic prophylaxis is not so much what was done but a lack of documentation of what was considered and the thought processes behind the decisions made.

The other factor I thought important was the perceived lack of communication directly between medical staff and [Mr A's] family.

My review of the documentation provided recently seems quite consistent with my original thoughts. It has been recognised by the public hospital that communication was a main issue both between and within departments, and that there were some documentation deficiencies. The general consensus in relation to venous thromboembolism prophylaxis is that it's a very complex business and that there are often no right answers. I accept that as being correct.

I was asked to consider a number of questions:

1. The appropriateness of the changes implemented by CMDHB.

The main changes that I could determine have been instituted following this case include a new VTE assessment sheet being trialled and audited on the orthopaedic ward. This assessment sheet is clearly designed to make more transparent the decision-making process in relation to provision of prophylaxis for VTE. There are also VTE risk assessment stickers available and I understand that whilst the hospital has relatively clear guidelines for VTE prophylaxis following elective admissions, the guidelines are not so clear for acute admissions but efforts are being made to develop those.

The issue of venous thromboembolism is one which is repeatedly discussed in morbidity and mortality meetings in all hospitals and that does appear to be the case at the public hospital as well and [Mr A's] case has placed further emphasis on the importance of these discussions.

Overall, I believe the response of the hospital in terms of assessment for VTE risk and recording of decisions for mitigating that risk has been well addressed.

The issue of communication between and within departments and the recording of discussions has also been addressed. There have been meetings within the orthopaedic and plastic surgical departments and recommendations made in terms of improved documentation. The staff involved with [Mr A's] case will no doubt change their practices, but over time there is a risk of communication perhaps falling back to the state of that which occurred at the time of [Mr A's] admission to hospital. The poster created to indicate to junior staff how and when to escalate requests and also a poster indicating what should be done at times of leave or sickness are appropriate.

It seems to me that there should perhaps be a little more in such a publication as a handbook to junior medical staff specifying the expectations around documentation and response to consultation requests. For example, whilst there is a policy document entitled 'documentation in the clinical record' — this document is mainly concerned with how to make records in the document and not so much when to make such records. It may be helpful to write guidelines relating to the types of discussions which should be documented; i.e. discussions regarding ongoing care — especially where it

may involve another department. There could perhaps also be a statement indicating the necessity for junior staff to make it abundantly clear whether any request to another department is for advice or for taking over care of the patient.

I am not familiar with any handbook that the junior medical staff receive at the public hospital but it would seem appropriate that any such handbook should provide advice and fairly strict guidelines on matters of documentation.

2. The adequacy of the policies and procedures that were in place at the time of these events.

The information provided to me indicates there were guidelines and policies for many factors relating to patient care. These include a policy regarding documentation and clinical records as previously mentioned, a VTE prophylaxis guideline, guideline for oral Dabigatran usage, guideline for peri-operative management of Warfarin patients, guideline for thrombolysis for pulmonary embolism and a guideline for peri-operative management of patients on Dabigatran. These guidelines are all good and helpful but the management of VTE prophylaxis in the acute setting is a complex scenario and has to be individualised by the treating physicians. It is therefore very difficult to provide absolute guidelines for the acute scenario.

I believe overall that the guidelines for VTE prophylaxis and management were good, but as mentioned previously the problem in [Mr A's] case was more in the lack of documentation of the decision making. There did not appear to be guidelines promoting and facilitating documentation of this complex decision-making process. The institution of the VTE assessment sheet which is currently being trialled addresses that problem.

3. Any comments regarding the standard of care provided by any individual staff members that you consider warrant comment.

I do not believe there were major deficiencies in the standard of care provided by any of the individual staff but rather some 'sloppiness', mainly amongst the junior staff in establishing and maintaining clear lines of communication between departments and within departments and also clarifying which department was going to be responsible for [Mr A's] care.

4. Any other matters in this case that you consider warrant comment.

The issue that hasn't really been addressed by any of the correspondence from the hospital, but which I consider important, relates to communication between medical staff and families of patients. This was brought out in the letter from [RN K] — the Charge Nurse/Manager. Her letter documents matters relating to concerns from [Mr A's] daughter, [Mrs B]. She discussed with the nurse looking after her father at that time some concerns about knowing what the plan was for him. It was suggested by the nursing staff that perhaps a doctor should come to explain what was going on but it was ultimately agreed on the occasion mentioned that this was probably not necessary.

However, this discussion does raise the very important issue of direct communication between medical staff and the family of patients. It is relatively difficult for family members to have a chance to talk with the treating medical staff in any hospital and this does lead to potential misunderstandings in relation to decision making processes and what the main issues are in relation to the care of the family member. It seems in [Mr A's] case in particular, that if one of the treating medical staff had sat down with the family for some period of time and discussed the complexities of VTE prophylaxis and the issues in relation to timing of surgical treatment in the presence of necrotic tissue, cellulitis and anti-coagulation being present, such a discussion may have provided helpful understanding to [Mr A's] family. It might therefore be appropriate to formalise a mechanism for family members to provide clarification of aspects of care from medical staff. My impression is from my own experience that such discussions with family members are always very valuable but tend to be somewhat opportunistic and haphazard and are often not documented when they do occur.

5. Any further recommendation for improvement that may help prevent a similar occurrence in the future.

I believe the main points have been well made and the greatest improvement can be made in improving communication channels and documentation. There is less improvement possible in terms of decision making in applying VTE prophylaxis, but the documentation of the decision-making process and a transparent way of risk assessment are important factors."

Appendix B: Independent advice to the Commissioner

The following expert advice was obtained from Dr Sally Langley:

"My name is Sally Jane Langley.

I qualified in medicine, University of Otago, MBChB, 1980.

I gained my fellowship in plastic and reconstructive surgery, FRACS, in 1988.

I have worked in Christchurch as a plastic and reconstructive surgeon since 1990. I am in full active practice. My work is general plastic surgery in public and private practice. My work includes the full range of plastic and reconstructive surgery.

I have been asked by [HDC] to provide a report on [Mr A] (dec) who had treatment at the public hospital, as outlined below.

I know the plastic surgeons involved but I do not consider that is a conflict of interest.

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

I have been sent the documents as listed:

- Letter of complaint written by Mrs B […]
- Response from Counties Manukau District Health Board (CMDHB) […]
- Complainant's comments […]
- CMDHB further response […]
- Clinical records CMDHB

I have summarized the documents sent.

Letter of Complaint written by [Mrs B] […]:

[Mrs B], on behalf of her family, has written a detailed letter about her complaint. She points out that a series of completely avoidable issues occurred which ultimately led to an intra-operative pulmonary embolus (PE) and after 7 days in intensive care unit (ICU) Mr A's death on [Day 26].

[Mr A] was admitted to the public hospital (the public hospital) on 2 occasions [Days 1-4] and [Days 14-26].

The admission, [Day 1–Day 4], was via [a medical centre], after a fall […]. [Mr A] required surgery to reattach his right quadriceps muscle and repair a deep laceration right anterior leg. He was discharged on [Day 4] with a range of movement (ROM) brace.

The second admission was [Day 14]–[Day 20] because of necrotizing tissue right posterior leg requiring surgical debridement and application of a VAC dressing. He was assigned Acute grade 4 admission. After significant delay, the surgery finally took place in the early afternoon of [Day 20], 7 days after the second admission.

During the operation on [Day 20] [Mr A] became hypotensive and nonresponsive to vasopressor. He received intermittent cardiopulmonary resuscitation (CPR), with adrenaline. A massive PE was diagnosed and he was thrombolysed. He was intubated, transferred to ICU, with significant cardiac damage, and potential brain damage, in a critical condition requiring life support and high levels of medication. [Mr A] died on [Day 26].

The family are grateful for the remarkable and highly skilled nursing and medical staff in the public hospital ICU and Emergency Room.

However, the family has significant and serious concerns about the care [Mr A] received at the public hospital, especially in the orthopaedic ward, prior to the sentinel event.

[Mrs B] and the family have concerns about:

- [Mr A's] discharge from the orthopaedic ward on [Day 4] to his home with no appropriate detailed care plan
- No assessment of home help in showering and wound management being undertaken
- No district health nursing plan
- No obvious Consultant overview

[Mrs B] says that, as a result of a friend and neighbour intervening, and because [Mr A's] home care by [his wife] was not adequate for the level of injuries, he did receive district nursing support some days after discharge, put in place by the neighbour.

During that time [Mr A] felt aggrieved about the inadequate level of discharge information and non-existent care plan from the orthopaedic ward [the public hospital]. [Mr A] spent considerable time on the phone with ACC senior staff and case managers discussing his concerns.

On [Day 14] the district nurses observed a necrotising wound with cellulitis on his lower leg leading to his readmission to [the public hospital] for surgical debridement and dressing.

[Mrs B] outlines that during [Mr A's] second admission to the orthopaedic ward, [the public hospital] he had

1. No risk assessment for deep vein thrombosis (DVT). [Mrs B] lists reasons why [Mr A] should have had this assessment: age; previous haematoma, and injury

at multiple sites; previous 90 minutes of high thigh tourniquet; immobile for 7 days in the orthopaedic ward, and limited mobility for 2 weeks before that; in atrial fibrillation when admitted and suffered periods of palpitations; 0n [Day 18] swelling and suspected venous thromboembolism (VTE) from intravenous (IV) luer (left arm).

2. Appeared not to have a structured VTE prevention program based on his individual VTE and bleeding risk.
3. On admission his usual dabigatran was stopped for 5 days from [Day 14] to [Day 18]. This was done while awaiting anticipated surgery.
4. No other anti-coagulant medication was dispensed in the 5 day period [Day 14]-[Day 18].
5. Suffered significant delays in receiving surgery despite being graded as acute priority 4 (should receive surgery within 24 hours) upon admission on [Day 14].
6. No charted review of [Mr A's] case or care plan by a consultant.
7. [Mr A] was the subject of an ongoing dispute between Orthopaedic Surgery team and Plastic Surgery team as to which department would undertake his Grade 4 acute surgery.
8. [Mr A] suffered several days nil by mouth while waiting for surgery.
9. [Mr A] had not been given clear information about the risks of stopping dabigatran for an extended period.

[Mrs B] and her family believe that the above listed points were avoidable and the combination of these events contributed to the untimely death of [Mr A]. [Mrs B] was not able to identify who was the consultant he was admitted under and who was ultimately responsible for his care.

2. Response to HDC Request for Information by [Ms L], Quality Liaison Officer, Surgery Anaesthesia and Perioperative Care, Counties Manukau DHB, […]

[Ms L] has done an extensive review of [Mr A's] case and has written a detailed commentary addressing the points raised.

[Ms L] outlines that [Mr A] had a previous medical history of hypertension, atrial fibrillation, hyperlipidaemia and benign prostatic hyperplasia. His medications were Pradaxa (dabigatran), Losec, statin, Accupril and Terazosin.

[Ms L] has summarized [Mr A's] admission through the emergency department on [Day 1].

[Mr A] was admitted to the orthopaedic service. His injuries were: grazes to both forearms, upper thighs; a deep laceration to his right shin. The plan was to commence antibiotics, withhold dabigatran, take blood including coagulation screen, and x-ray both lower limbs. His wounds were redressed and a splint applied. He was booked for

operating theatre as Priority 4 — ACUTE NOT URGENT (to be done within 24 hours). He was to be nil by mouth from 2am.

On [Day 2] [Mr A] had an ECG and was assessed by the orthogeriatrician. His surgery was completed at 5:20pm that afternoon. He was to continue his dabigatran from the next day [Day 3], have a leg brace and be transferred to orthopaedic surgeon, [Dr C's] care.

[Mr A] was seen by [Dr C] the next day on his post-acute ward round. He was reviewed by occupational therapist (OT) and physiotherapist (PT) and he was for discharge the next day. There was a delay getting the leg brace from orthotics but this did not impact on his discharge.

On the morning of [Day 4] [Mr A] was seen by the registrar and his wounds were reviewed. [Mr A] was fitted with the leg brace and was cleared as safe for discharge by OT and PT. His discharge summary stated that he was for analgesia and he could weight bear as tolerated with knee locked in extension with ROM brace for 4 weeks. He was to be seen in clinic for removal of clips in 2 weeks.

A referral to district nurse was made the day after [Mr A] was discharged, on [Day 5]. [Mr A] was visited by the district nurse on [Day 6] and planned twice weekly visits. He was subsequently seen on [Days 11, 12 and 14] when he was referred back to [the public hospital] with possible cellulitis. [Ms L] says there was no delay in [Mr A] receiving treatment due to the district nurse referral arriving the day after discharge.

On [Day 14] [Mr A] was re-admitted by ambulance to the emergency department on referral from the district nurse who was concerned about an infected haematoma of his right lower limb. He had fever for 3–4 days. He had a large necrotic area with reddened cellulitis border on the back of his right leg. His observations were stable. His white cell count was in the normal range and his C reactive protein was 28.

The plan was for IV antibiotics (flucloxacillin), remain nil by mouth and have IV fluids. He was discussed with orthopaedics and he was to have a possible referral to plastic surgery team. The orthopaedic review was completed at 3:25pm and it was planned that he could eat and drink and that one stitch would be removed from the lower end of the anterior tibial wound. Dabigatran was to be withheld that night. He was admitted to the orthopaedic ward [the public hospital] and booked for theatre as Priority 4 and he was to be nil by mouth from 2am.

On [Day 18] [Mr A] was seen on the orthopaedic consultant's ward round and he was for an acute plastic surgery review and that dabigatran was to be withheld until after the plastic review. The on-call plastic surgery registrar reviewed [Mr A] at 10:40am and suggested that the wound be debrided of necrotic skin and a VAC dressing be applied to allow the cellulitis to settle further and that [Mr A] might need a tissue biopsy for culture to make sure the wound was clean prior to a split skin graft (SSG).

Plastic surgery were under the impression that the wound would be debrided by orthopaedics and then let them know when ready for skin grafting.

On that day a discussion was had re [Mr A's] atrial fibrillation and an ECG was requested, completed and reviewed. Dabigatran was still to be withheld.

On [Day 17] at the 9:30am orthopaedic consultant's ward round it was explained that the infected calf needed surgical debridement and plastic surgery involvement. At 9:10pm [Mr A] complained that his IV site was sore. Nursing staff put in a request for a new luer and old luer to be removed. The on-call house officer has documented that they tried to replace the luer but it was difficult and unable to insert a new one. There was a tender hard lump under the skin. The house officer's impression was thrombophlebitis of the left arm secondary to the luer or thromboembolism provoked by the luer. The plan was to administer antibiotics and the team was to review in the morning; query a VTE (haematology) team review; consider an ultrasound of the left arm for possible thromboembolism.

At 12:50pm on [Day 18] a nurse documented that she asked the house officer to review [Mr A's] dabigatran as it had not been given for 5 days. Clexane was charted for the evening of [Day 18].

On [Day 19] at the 7:35am registrar's ward round [Mr A] expressed his frustration about the plastic surgery team. The plan was that if the plastic surgery team does not see [Mr A] today, orthopaedics will go ahead and debride the wound. The orthopaedic registrar documented that they had attempted multiple times to contact the plastic surgery registrar, who had seen [Mr A] previously, and left messages for the plastic surgery team to review [Mr A].

An acute plastic surgery registrar review was undertaken at 11:45am. The plastic surgery comment was that orthopaedics had discussed [Mr A] on [Day 18] and recommended debridement under orthopaedics and to await infection to settle. On examination [Mr A] had right calf necrotic area/wounds and that the wounds were not ready for skin grafting. The recommendation was for debridement under orthopaedic and a negative pressure (VAC) dressing. When the infection settled he would be considered for SSG under orthopaedics. IV antibiotics were to continue; staged grafting could be considered once the infection settled; repeat bloods for inflammatory markers. The senior orthopaedic registrar agreed to contact plastic surgery consultant and write up a plan after the discussion if a handover of care was made to plastics.

Images of [Mr A's] wounds were reviewed by the acute plastic surgery consultant. The plan was to repeat bloods and clarify the plan with regards to quadriceps repair; NBM from 2am for debridement under plastic surgery. [Mr A's] care plan was to be transferred to plastic surgery consultant once surgery completed. [Mr A] was booked for surgery, Priority 4 under plastic surgery. An ECG was requested, house surgeon

informed of the plan and orthopaedics indicated when the staples from the initial surgery could be removed.

At 2:50pm the nurse documented that [Mr A] received his Clexane late, as surgery was cancelled just after lunch. At 4pm orthopaedic house surgeon documented that bloods had been taken but the sample had clotted; very difficult IV access; plastic surgery to repeat blood count if concerned. It is documented that his care was taken over by plastic surgery.

On [Day 20] [Mr A] had his surgery for evacuation of haematoma and debridement back of his right leg under the plastic surgery service. Towards the end of the case, as the dressings were being applied, [Mr A's] blood pressure dropped suddenly and there was difficulty ventilating him. An emergency was called. The anaesthetist felt that he was experiencing significant PE and he was thrombolised for that.

[Mr A] required prolonged CPR and he was transferred to the ICU.

On [Day 25] it was documented that [Mr A] was in established multi-organ failure.

A CTPA was completed at 1:15pm and confirmed significant bilateral segmental pulmonary emboli with corresponding changes and atelectasis. A head CT scan was done at 1:30pm and showed extensive right middle cerebral artery stroke which appeared to be ischaemic in nature and at least 48 hours old.

Following ICU discussions with family [Mr A] passed away on [Day 26].

[Ms L] has addressed the family concerns re admission [Day 1–Day 4].

The family was concerned there was no obvious consultant overview, no detailed care plan, no assessment for home help in showering and wound management and no district nursing plan.

[Ms L] explains the team structure of orthopaedic consultants at CMDHB. The team consists of 2–3 consultants, senior registrars and junior doctors. This allows flexibility for the consultants who also have other obligations for surgery (acute and elective), clinic appointments and ward rounds. [Mr A] was initially admitted under [an orthopaedic consultant] and then transferred to [Dr C's] team on [Day 2]. [Dr C's] team includes 3 consultants: [Dr C], [Dr P] and [Dr Q]. The family were not documented to be present for the consultant ward rounds which are held first thing in the morning. The names of the consultants who attended the consultant ward round are documented in the notes.

The senior registrars and house officers are usually more available to attend to the daily ward rounds, care and treatment of the patients in the ward. They document and discuss the progress and symptoms of patients with their consultants. [Dr C] was the overseeing consultant and his name is listed on all patient labels. [Ms L] apologized to the family if that was not explained adequately.

[Dr C] advises that there were multiple entries in the clinical notes which document care plans and referrals for other specialists to be contacted. The discharge plan and discharge summary is documented with instructions.

The OT who assessed [Mr A] as an inpatient on the orthopaedic ward, documented her assessment in the clinical notes. She documented his functional status prior to discharge was independent with mobility on crutches and he was able to ascend and descend stairs. However, he needed one person assist when accessing the external front and back door steps for safety. He was independent with his personal cares. The OT assessed his home environment and potential equipment and supports that may have benefited [him] on discharge. It was documented that he may need supports at home via ACC. However, on discharge his function had improved to being independent and safe, with documentation by the PT that his wife was happy to help with personal cares/activity of daily living (ADLs) at home if needed. It was the OT's opinion that ACC supports were not needed at that time.

OT did identify that [Mr A] needed equipment at home. A shower stool with arms and over toilet frame were delivered to the home to increase safety and independence with personal cares. There was a recommendation to purchase a long handled shower brush.

The OT has reflected that she did not clearly document why ACC supports were not put in place on discharge. She apologizes for this oversight and acknowledges that she should have provided [Mr A] and his family ACC details should supports be needed later on.

It is acknowledged that a referral to district nurse was not listed on the discharge summary on [Day 4]. However, [Mr A] was referred to the district nurse by the orthopaedic ward the day after he was discharged, [Day 5], and he was first seen on [Day 6].

The family had concerns about [Mr A's] admission [Day 14]–[Day 26]. There was no assessment for DVT risk and no structured VTE prevention plan based on [Mr A's] high risk. The family's complaint is:

On [Day 18] it is documented that the house officer suspected thrombophlebitis or DVT of hand/arm related to an IV luer. [Mr A] was not given any clear information about the risks of stopping dabigatran. There were significant delays in receiving surgery despite being graded as an acute priority. There was not a charted review of [Mr A's] case or care plan by a consultant. There was an alleged dispute between orthopaedics and plastic surgery as to who should undertake [Mr A's] surgery.

[Ms L] responds by saying: On readmission to [the ward] the nursing notes show that [Mr A] was routinely assessed for the falls risk assessment and pressure injury risk. There was no documentation of VTE risk assessment on admission. However, [Mr A]

was taking dabigatran for atrial fibrillation. On admission [Mr A] was a low risk for a DVT.

[Ms L] has commented that the orthopaedic consultant's view was that orthopaedic patients have a high risk of VTE and thromboprophylaxis is usually used unless it is contraindicated such as in [Mr A's] case with his impending surgery, excessive wound ooze, haematoma and wound necrosis. [Mr A] was mobilizing independently to the toilet in the ward. He had injuries to both legs which meant that anti-embolism stockings were not an option. The orthopaedic consultant explained that foot pumps are often used in orthopaedic wards for sedentary patients. [Mr A] could have had one foot pump but as he was mobile it would need to be removed frequently.

[Ms L] explains that [Mr A] was on dabigatran for atrial fibrillation. Dabigatran was withheld at admission as it needs to be stopped 24 hours before surgery and in addition [Mr A] had a haematoma and the dabigatran might have caused extra bleeding. It was the expectation that [Mr A] would be going to surgery at short notice. There is no documentation whether the risks of withholding the dabigatran were discussed with [Mr A].

[Ms L] has found in the nursing notes that the orthopaedic team was notified on [Day 18] that [Mr A's] dabigatran was withheld. The nursing notes on [Day 18] note that the house officer was asked to review [Mr A] as his dabigatran was being withheld. The house officer charted Clexane for the evening of [Day 18] and he had it again on [Day 19].

With respect to the palpable lump from the IV luer, the house officer thought [Mr A] might have thrombophlebitis or a thromboembolism. The consultant explained that thromboembolism was unlikely from tissued IV luer.

Left arm was improving next day. There is no further documentation re IV luer site.

[Ms L] says that it is acknowledged that there was a delay in [Mr A] getting surgery. The consultant advises that there was no urgency since [Mr A] was mobile, his cellulitis was improving, swelling was going down and he was stable. It was important for the cellulitis to be treated first. A clear plan was documented.

[Ms L] also says that it is clearly documented in the notes that the orthopaedic team had been trying to contact the plastic surgery team after it had completed the initial review on [Day 18]. The initial plastic surgery review was by a registrar for [Dr E]. The opinion was for a skin graft to the wound. There was no indication from the orthopaedic registrar that the plastic surgery service was being asked to take over the care of [Mr A]. [Dr E] has said that if that was the request he would have seen [Mr A] personally. The orthopaedic team's view was that [Mr A] was going to be managed by the plastic surgery team. There is documentation on [Days 17-18] that they needed to be involved and they were awaiting review. The orthopaedic registrar had made several attempts to contact the plastic surgery registrar. It is normal practice to

contact the initial team for continuity of care. The plastic surgery service has confirmed that the plastic surgery registrar who initially saw [Mr A] was on sick leave [Days 16-18]. When the orthopaedic registrar could not contact the plastic surgery registrar he contacted the acute plastic surgery team. Once that was done the plastic surgery team saw [Mr A] on the same day.

[Ms L] says that there was never any dispute about which team would care for [Mr A] or do the surgery. However, there was a breakdown in communication which meant there was a delay. Once the plastic surgery team was aware they were being asked to take over the care of [Mr A], they responded promptly. [Mr A] was reviewed by Dr R on [Day 19] and her colleague, consultant, [Dr D] on [Day 20]. [Dr D] felt that the cellulitis had been treated adequately and that a one stage debridement and skin grafting could be attempted.

[Dr D] and his senior registrar took [Mr A] to theatre on [Day 20]. Then the major complication occurred. [Dr D] held a family meeting immediately after [Mr A] had been stabilized. He then advised [Dr C].

[Ms L] comments on [Mr A] being kept 'nil by mouth'. Patients who are for potential surgery are kept nil by mouth from 2am on the morning of planned operation. If it becomes evident that the surgery is unlikely to occur that day the ward is informed that the patient can eat and drink. This is usually by early afternoon. Also patients are often on IV fluids. [Ms L] apologized that the family was not aware of this process.

[Ms L] has documented that [Dr D] has acknowledged that there were a number of areas during [Mr A's] care when communication and documentation could be improved. His case was discussed at the Morbidity and Mortality meeting. Following that meeting the following advice was disseminated to all plastic surgery teams:

1. All consultations by plastic surgery team must be documented in the patient's notes, recording the names of registrar and the consultant represented. The consultant needs to be informed of the decision in case a different outcome is required. Any advice about a surgical plan must include which team is to perform such plan.

2. Clear pathways of communication need to be established following a consultation and these pathways must be documented within the patient's notes. Inability to contact a registrar should default to the 'acute team'.

3. If the 'on call' registrar is called by another service for a review they should see the patient, document the review and discuss with the plastic surgery consultant they are representing.

The two plastic surgery registrars who had reviewed [Mr A] had been on sick leave between [Days 16-20]. The acute plastic surgery team remains available 24 hours a day.

[Ms L] documents that [Dr C] acknowledges that [Mr A] had risk factors for a DVT. It was his clinical opinion that there were also indications for not using prophylactic treatment, which included the fact that [Mr A] was mobile, was booked for impending surgery, had ongoing wound ooze, infection and haematoma concerns. [Dr C] accepts that documentation of DVT prophylaxis had not been done well in [Mr A's] case. [Mr A's] surgery was not urgent since his cellulitis had to settle which it did and then he could proceed to surgery for the skin graft. [Ms L] apologises for the delay in the surgery.

[Ms L] says that [Mr A's] care was overseen by a team of consultants from different services during his admissions. A treatment and care plan was documented daily. He was appropriately assessed by medical, OT and physiotherapy and discharged with a care and treatment plan after his first admission.

[Ms L] acknowledges that there was a temporary miscommunication between orthopaedic and plastic surgery team. There was never any dispute between the two services.

The extended family of [Mr A] ([Mr A's wife], [Mrs B] and others) responded to [Ms L's] report from [the public hospital] Counties Manukau District Health Board (CMDHB) on […].

They were very disappointed with the explanation of the circumstances leading to the unexpected and avoidable death of [Mr A]. They found the response was as inadequate as the care [Mr A] received. The response has not answered their concerns about [the public hospital] staff's disregard for their own policies and processes, the dysfunctional coordination between the departments as well as the ineffective communication processes. They believe that the small number of process improvements should already be commonly accepted behaviours and that the senior management of [the public hospital] do not seem to be holding responsible parties to account for their actions.

They believe the issues relate to:

1. Inadequate and ineffective communication and cooperation within departments and between departments — between orthopaedics and plastic surgery particularly between [Days 14-19]. The delay in surgery led to a 5.5 day delay in getting surgery and withholding anticoagulation [and] was a significant contributor to [Mr A's] death. The family say this contravenes [Mr A's] right to services of an appropriate standard, with quality of care and continuity of services, provided in a manner that minimizes potential harm.

2. Lack of consultant overview, ownership and management of [Mr A's] care plan. The family say this contravenes [Mr A's] right to have services provided with reasonable care and skill, in a manner that minimizes the potential to harm and optimizes the quality of life. They feel that the outcome might have been

different if [Dr C] had fulfilled his obligations and followed up on his care recommendations.

3. VTE assessment not made, high risk VTE ignored and protocols not followed. The family say that CMDHB thromboprophylaxis chart clearly requires all adult medical and surgical patients to be risk assessed within 6 hours of admission, reassessed within 24–48 hours and whenever clinical situations change significantly. They say that all staff should have been aware of this, and the risk of VTE especially for those who have had recent surgery and enforced immobility. The family says that there are no VTE assessment documents or nursing notes to show VTE status within 6 hours of admission, nor at 24–48 hours or at any time during stay in ward 10.

   There was no objective confirmation or otherwise by investigation. [the public hospital] VTE protocols were not followed. [Dr C] and his registrars failed to recognize or address this.

   They cannot understand why a formal review of VTE risk for [Mr A] was not done, as [Mr A's] risk was high.

   The family say that the haematoma was not a contradiction to continuing anticoagulation and having surgery.

   The family say that [Mr A] was on bedrest and not mobilizing, and that the ROM brace stopped him.

   The family say that the surgery for debridement was not a contradiction to anticoagulation.

4. Lack of drug management planning, particularly withholding anticoagulant medication. The family quote [the public hospital's] dabigatran use guideline A24096. They say that [Mr A] was on dabigatran for atrial fibrillation for some years. Also he was recovering from quadriceps surgery. When [Mr A's] surgery was repeatedly delayed he was not given dabigatran from admission or another anticoagulant until the evening of [Day 18]. The guidelines say that if dabigatran needs to be stopped you should plan ahead; renal excretion; consider bridging anticoagulation if risk of thrombosus; involve haematologist of need urgent surgery. Reversal with idarucizumab can be done. The family believe that [Mr A's] right to services of an appropriate standard of care gave potential harm. The family say that [Mr A] was not informed of the risks of being abruptly withdrawn from anticoagulation and the VTE risks that he had. The family have also noted that the acute surgery booking form said 'NO' to anaesthetic review request. The family feel that if [Mr A] had an anaesthetic review they would have picked up on his VTE risk and lack of anticoagulation. The family points out that they did not see evidence of CMDHB senior management involvement or head of department ownership in understanding

the communication and care delay. The family believe there is significant risk to other patients unless thorough process and communication improvements are made.

The family says that the orthopaedic department had still not held a discussion in their department about [Mr A] at 3 months from the incident.

The family have commented that the actions the plastic surgery department have made should already have been standard practice.

VTE Assessment:

- NZ VTE prevention policy frameworks
- Reliable risk assessment
- Reliable care delivery
- Education and awareness
- Culture of safety and quality improvement
- Patient and family centred

CMDHB: 'Aiming for Zero Patient Harm' work, reference

The orthopaedic wards have committed to a structure VTE prevention pathway.

Orthopaedic VTE risk assessment tool

VTE alert sticker in patients' notes.

Thromboprophylaxis decision

Further Response from CMDHB […]

This second response is also written by [Ms L].

Seven questions are addressed:

1. Why was Clexane not given each day after dabigatran stopped? Initially the dabigatran was withheld because of the infected haematoma right calf and that surgery might be needed next day. The orthopaedic consultant opinion was that [Mr A] was at a low risk of developing thromboembolic disease as he was mobile and had been on dabigatran for atrial fibrillation rather than to prevent DVT or PE. [Mr A] was considered at high risk of enlargement if he continued dabigatrin.
2. This question is about the withholding of dabigatran on [Day 18]. There is no documentation of the response by the orthopaedic team after being notified by the nurse. The orthopaedic team did review [Mr A's] medication including dabigatran each day.

3. What is the usual process around management of withholding regular medication from a patient? CMDHB has 'green bag' policy. It is usual for clinicians who make a decision to withhold or change medication to explain to the patient the reason.

4. This question is about [Mr A's] theatre priority booking, Priority 4 — ACUTE NOT URGENT, on admission but surgery not done until [Day 20]. [Ms L] explains the booking process re 'keeping the patient on the radar'. Every patient with this priority is reassessed each day with respect to healing and also other acute patients requiring surgery. The discussion about the need for surgery occurs at the bedside with consultants and patients each morning. The patient would have been warned about other acutes needing to be done ahead and starvation status clarified by early afternoon so as he could eat and drink as happened for [Mr A]. There is documentation that the family visited but no documentation that a family meeting was requested. [Mr A] was competent and able to understand his care plan.

5. What are the processes around VTE risk assessment at [the public hospital]? There is a standard form to be completed for VTE risk for elective surgery patients. Acute patients are assessed at the time of their surgery. The comment here is the same one as previously re [Mr A] already being on dabigatran for atrial fibrillation and that he was at low risk of DVT on admission. The orthopaedic surgeon says that orthopaedic patients have a high risk of VTE and thromboprophylaxis is usually used unless contraindicated as here.

6. Why was [Mr A's] surgery on [Day 15] not undertaken? The answer here states that [Mr A] was reviewed by orthopaedic consultant and trauma specialist on morning of [Day 15] and plastic surgery review was requested because of the skin necrosis. Plastic surgery reviewed [Mr A] on [Day 18]. (not requested urgently).

7. Communication between departments when registrar not available. Process outlined.

CMDHB Clinical Record

I have been through the clinical record in detail and I have made notes as follows so as I can be sure of what happened and the sequence of events. Please note that I have had to do my best to interpret abbreviations written by medical staff. There are some which I do not know.

[Days 1-4] admission to CMDHB under [Dr C]. Right lower limb lacerations including quads tendon laceration. AF on dabigatran.

[Day 1] OT assessment: Noted that he had problems with internal stairs, showering, toileting. Lives with [his wife]. Bed is upstairs. Nil issues with transfers. Issue: standing to shower. Possible provision of equipment closer to discharge. Possibly short term ACC supports of personal cares.

[Day 4] OT: mobilized upstairs with physio and feels confident to access upstairs bedroom and ensuite. OT provided written list of showering aids such as long handled brush. Shower stool with arms and OTF (?) identified as beneficial for dc today to increase safety and independence with STS transfers and PC tasks. Plan: OT order OTF and shower stool with arms.

1250 Physiotherapy assessment: Wife will be able to help with ADLs at home. Transfers checked. Mobility independent with crutches. Stairs with crutches independent. Education re ascend descend stairs technique; get in and out of car. Safe mobilizing with crutches and safe with stairs. Needs supervision with outside steps.

Home

[Day 5] ACC progress note: ROM brace 4 weeks. Unable to weight bear.

Wound described. Care required described. Follow-up frequency of visits twice a week. The first visit is detailed. He was resting on bed. He had been advised he could weight bear as tolerated. He was able to mobilise to the toilet. No home care assistance in place yet. Toilet chair and shower stool had been delivered. Unable to shower himself and [wife] unable to assist. [Wife] contacted ACC while DN present and requested equipment (bed lever shower chair with back, urinal). And personal care assistance. Hopefully by Monday.

[Day 6] Home Health Care Referral. For daily wound care right lower limb lacerations including quads tendon laceration. The referral was received by […] Home Health Care. The acknowledgement of referral is dated [around 2 months later]but the next page of the process is dated [Day 6]. This detailed assessment documents that shower stool and toilet seat are arriving that afternoon. He is mobilizing with crutches. He may require help with showering if wife not managing.

[Day 11] ACC progress note: Leg wound checked and dressed. Necrotic patch back of leg. Patient very fragile. He is not taking pain relief but is in obvious pain. Advised he was to be up and mobile.

[Day 12] ACC progress note: [Mr A's wife] rang concerned that there were red marks where the splint rubs on leg. Three red areas back of thigh, popliteal fossa and around patella. Redressed and reassured.

[Day 14] ACC progress note: Posterior calf red and warm and surrounding necrotic area. Cellulitis marked. Hard necrotic tissue. On call orthopaedic registrar contacted and sent to ED by ambulance.

[Day 14]–[Day 26] admission to [the public hospital]

ED acute assessment form documents injury and that he had afib and was on dabigatran.

Seen by [Dr I], orthopaedic registrar at 1525. For readmission with infected right lower leg calf haematoma. dabigatrin noted. Plan to withhold dabigatran. Review tomorrow.

[Day 14] 1820 Handover form filled out by nurse does mention that he had AF and was on dabigatran.

Daily Care Plan for 4 days, [Day 14]–[Day 17]. Mentions re problem 'right posterior leg cellulitis, right quads repair' on [Day 17]/ 'a/w plastics r/v' which I interpret as meaning 'awaiting plastics review'. Under chronic problems 'AF on dabigatrin' each days says 'regular meds'. Under 'procedures/referrals' each day has 'NBM from 0200' and on [Day 17] 'a/w plastics r/v'.

[Day 18] 'a/w plastics'

[Day 19] NBM for OT 'await plastics'

[Day 20] NBM 0200 for OT

[Day 14] Falls assessment

[Day 14] Pressure Injury Risk Assessment

[Day 14] Skin Integrity Assessment

[Day 14] Patient Smokefree Assessment

[Day 14] Acute Surgery Booking Form for left infected haematoma. Proposed surgeon: Ortho. Proposed date: [Day 15]

Proposed surgery: Right washout + debridement + proceed.

Anaesthetic Review: No

Case booked by and Filled out by [Dr I]

[Day 15] 0920 PAWR — [Dr C], notes written by [Dr S]: Right leg cellulitis (recent repair of right quadriceps). Explained needs plastic input for right calf laceration. Cellulitis improved. Plan 1. Continue IV flucloxacillin 2. Plastics team review — ? need debridement/skin graft 3. W/H dabigatran for one more day. R/V tomorrow 4. Monitor inflammatory markers.

1535 reviewed by team. Not for OT today. Mobilizing with crutches. For NBM 0200 Monday for review plastics team.

[Day 18] CWR — [Dr C] / RWR — [Dr I]

Right calf cellulitis and eschar improving. ECG afib with frequent ectopics. Plan 1. Plastics team R/V — discussed with acute team ?needs debridement

2. Will discuss with medics re ECG/palpitations 3. ETD today, NBM 0200 4. Continue IV abx 5. W/H dabigatran until plastics R/V 6. Keep dressings down until plastics

1040 Reg Review Plastics: [Dr G] for [Dr E] on call. Necrotic tissue 4 x 4cm right posterior calf + secondary cellulitis. Suggests debridement + VAC of necrotic skin to allow cellulitis to settle further. May need tissue bx for culture to ensure clean prior to SSG.

1120 HO note: Plastics R/V noted. R/V for palpitations — occasional episodes only lasting 1–2 minutes. No chest pain or SOB.

1320 Nurse: dabigatran has been withheld

[Day 17] PAWR — [Dr P]/[Dr C]/[Dr Q]. [Dr S]. Infected posterior calf blister. Explained needs debridement and plastics involvement. Plan: Needs plastics ??. Continue abx.

1340 Patient voiced no concerns to nurse. 'a/w plastics review'

2110 a/w plastics r/v. No concerns expressed by patient.

[Day 18] Nurse: A/W plastics R/V

0800 OCHO — [Name]: ATSP replace IV luer because tissued L acf reviewed left arm: erythema, hard under skin in distribution of vein, swelling hand and wrist. IV line removed. Difficult access right arm/hand, unable to place new IV luer. Impression: 1. Thrombophlebitis left arm secondary to luer. 2. ?thromboembolism provoked secondary to ?? Plan: 1. Oral abx stat as IV luer abx now due. 2. Team r/v mane ?VTE team review/notification consider USS left arm ?VTE.

0745 RWR — [Dr I], [House surgeon]. Comfortable. Obs stable. Plan: plastics to see (!). IVL reinsert. Continue IV Abx. Can E+D.

1245 No concerns. a/w plastics r/v. IV luer site left arm improving.

E+D today a/w plastics r/v.

1250 Had H/O r/v dabigatran as not been given for past 5 days. Clexane charted for tonight. ([RN]) Drug chart seen for Clexane.

1405 [Dr S]: Ortho reg has tried multiple times to contact plastics registrar [Dr N] 'illegible words'. Plastics team to review patient for plastics management. Plan: 1. A/W plastics R/V 2. Continue as per prev.

1830 Pt 'I' with mobilization (I think that I in a circle might mean 'Independent') No concerns expressed. A/W plastics R/V.

[Day 19] RN: for plastics input.

0725 RWR — [Dr M]: Pt frustrated about Plastics. Otherwise well. NBM. Plan: Will try to get plastics to see. If plastics do not respond today then we will debride in OT under ortho.

1005 SMO Orthogeris — [Name]: Feels great, comfortable. Examined. For OT today.

1145 Acute Plastics Review — [Dr O] (reg). Noted AF on dabigatran. History reviewed. Had been D/W plastics on [Day 18] and recommended for debridement under ortho and for infx to settle. Multiple necrotic lesions right calf and surrounding erythema. Impression right calf necrotic areas/wounds. Not ready for grafting. Recommend: 1. Debridement of right calf under ortho and VAC 2. Once infection settled then for consideration of SSG under ortho 3. Continue IV Abx 4. Could consider staged grafting once infection settled 5. Repeat bloods for inflammatory markers Plastics reg gas discussed with ortho snr reg ([Dr M]). Will discuss with oncall consultant and write/document plan after discussion ?take over.

1230 Plastic Reg [Dr O] (for [Dr R]) Images taken. Necrotic skin/haematoma right calf needs debridement. Usually on dabigatran for AF — W/H for 5 days. Reviewed images with [Dr R] Plan: 1. Repeat bloods 2. Ortho to clarify f/u for this patient with regards quads repair 3. NBM from 0200 for ??? under plastic for debridement 4. Patient's care can be transferred to [Dr R's] team once above complete. 5. ECG please. [Ortho HS] informed of above.

1450 RN: Plan changed. Plastics came and reviewed patient. Patient could eat and drink. For theatre tomorrow under plastics. Clexane given early as per plastics reg. Pt cancelled just before lunch so had lunch.

1600 Ortho HS note [name]: Very difficult IV access. FBC sample clotted. Has been booked for debridement. For OT Friday, NBM 0200. T/O by plastics under [Dr R]. Ortho will clarify re ROM brace. Clarified with ortho reg: stay in ROM brace.

Drug chart shows Clexane 40mg given at 1405.

[Day 19] Request for Treatment form: Signed by Dr […].

[Day 19] Acute Surgery Booking Form for right calf infected haematoma. Proposed surgeon: Plastic. Proposed date of surgery: [Day 20]

Proposed Procedure: Debridement of right calf haematoma/necrotic skin and application VAC.

Anaesthetic Review: No

Case booked by and filled out by Dr O.

[Day 19] Photographs (small black and white photos) clearly show a calf with large area of necrotic skin.

[Day 20] Plastics acute [Dr D]. Ongoing problem [Day 1]. Pt NBM OT.

CWR — Dr P ortho. Plastics T/O

1105 Nurse: Monitor phlebitis left arm. NBM for OT.

[Day 20] Request for treatment, anaesthesia

[Day 20] Operation, [Dr D]: Evacuation haematoma and debridement of devitalized skin + application of split skin graft. Surgeon: [name] and [Dr D]. The comment was that there was a very large haematoma.

Towards the end of this procedure as the dressings were being applied [Mr A] dropped his blood pressure, CPR, suspected significant PE.

Anaesthetic record seen.

Expert Advice Sally Langley, plastic and reconstructive surgeon:

I have studied [Mr A's] case in detail. I will comment on each of the six areas:

The coordination of care and communication between Orthopaedic and Plastic Surgery Team

The level of coordination of [Mr A's] care between these two teams was not acceptable. [Mr A's] second admission was on [Day 14], a Saturday. The orthopaedic consultant, [Dr C], saw [Mr A] on [Day 15] and advised that plastics review was needed so orthopaedic theatre booking was cancelled. On [Day 16] [Dr C] and [Dr I] advised that [Mr A] needed plastics review and to continue to withhold dabigatran but that review did not happen until [Day 17] by Dr G, registrar for plastics consultant Dr E. Dr G advised appropriately that debridement was needed with tissue cultures prior to skin graft. It is not known whether Dr G discussed this with her consultant and whether she made it clear that the debridement could be done under the orthopaedic team with subsequent re-referral to plastic surgery for skin graft. Dr E should have been aware and commented about the plan. However all correspondence is not documented in the clinical notes. We do not know how much more discussion there was between Dr G and Dr E, or between plastic surgery and orthopaedic surgery. If there was nothing more than documented then this is a moderate departure from accepted behaviours. If there was discussion between these groups then there was no departure.

The plan by Dr G re orthopaedic team doing the debridement is not documented as having been discussed and confirmed as acceptable by the orthopaedic team. At this stage, on [Day 16], [Mr A's] course might have been better if there was appropriate coordination between the two teams. A clear discussion re responsibility for care of [Mr A] should have occurred on that day.

The necrotic skin and haematoma debridement is a procedure routinely done by plastic surgery. However, it is also a procedure that orthopaedic surgeons should be competent at since a plastic surgery service is not always available. This patient was under the care of the orthopaedic team until such time as his care was accepted for transfer to plastic surgery or shared with plastic surgery. Both of these services are very busy with their acute workloads and demands for theatre time, and this does vary.

The orthopaedic team (and nurses) have repeatedly, from day to day, awaited further plastic surgery review, with starvation from 2am each day and cancellation of surgery around lunch time each day. This was until nurses and patient had had enough on the Thursday and Friday when contact was made with the plastic surgery team who came and reviewed [Mr A] and then made appropriate surgical plans. The orthopaedic team's attempts at contacting the plastic surgery registrar during that week were inadequate and inappropriate. It is obvious that if a registrar cannot be contacted, there would be a reason for that such as being on leave or working at another site. After the orthopaedic registrar failed to get hold of the plastic surgery registrar who had previously visited [Mr A], Dr G, the orthopaedic registrar or consultant should have contacted the acute plastic registrar, or the consultant. I am sure that the plastic surgical involvement would have occurred promptly if that communication had occurred. This is a moderate departure from accepted practice and had a significant effect on [Mr A's] care.

This poor quality coordination is not acceptable standard of care. [Mr A] would have benefited from surgical debridement early in that week of his admission. Once it was evident that the acute procedure was recommended it should have occurred in less than 24 hours, unless there was a contraindication, or lack of theatre availability. [Mr A's] condition was safe to be booked and cancelled each day but this was not ideal.

This is partly related to economical use of his bed stay. [Mr A] occupied the bed several days longer than he needed to, prior to debridement surgery. If further contact (plastic surgery review) was sought for an acute patient, though not urgent (degrees of urgency), this should occur promptly. For [Mr A], the further plastic surgery review should have occurred on the first day attempts were made to re-contact plastics, which was [Day 18]. This would have got [Mr A] reviewed a couple of days earlier and he might have got to the operating theatre by Thursday. Also his VTE prophylaxis might have been reviewed more appropriately prior to surgery.

However the major incident at surgery might still have occurred.

The adequacy of communication pathways within the Plastic Surgery Team

The communication pathway within the plastic surgery team was mildly inadequate since we do not know the extent of their involvement. Not everything will have been documented. Many communications are verbal. [Mr A] should have been 'under the plastic surgery radar' after the first visit by Dr G. I know that the recommendation was for orthopaedic surgery to do the debridement and call plastic surgery when ready for

skin grafting but the reality is that this soft tissue work at a tertiary hospital in New Zealand should be done by plastic surgery. The same plastic surgery team, or the acute team of the day should have 'touched base' with [Mr A] and his surgeons each day. The plastic surgery service should make it clear that if the original registrar and team are not available, that contact with the acute team of the day is the next step. [Dr D], plastic surgeon, has issued guidelines that reinforce the appropriate consultation behaviour.

The reasonableness of [Mr A's] surgery taking place 6 days after his admission on [Day 13]

This is not reasonable but this does occur in our public hospitals in New Zealand due to the hierarchy or urgency of acute patients and the acute workload at the time. Each day the most urgent cases will be done ahead of those that are less urgent. Also it is kinder to the patient to cancel earlier in the day each day (around lunch time) rather than later in the day so as the patient can eat and this did occur.

[Mr A] had an infected haematoma with necrotic overlying skin evident at admission. Certainly intravenous antibiotics and wound management are helpful in treating this but surgical removal of dead skin and haematoma if it is present will allow more definitive clearing of the infection and steps towards healing. Surgical excision of dead tissue is a sensible procedure to be done for this indication. It is fortunate that [Mr A's] leg improved during his stay but it might not have. It would have been acceptable for [Mr A] to wait for several days for this surgery but the wait of 6 days is indeed too long.

[Mr A] was allegedly mobile with the ROM brace on crutches but this is still limited mobility and the effects of this relative immobility (VTE risk and pressure area risk etc) increase the longer it occurs.

The standard of documentation from the Plastic Surgery team regarding [Mr A's] care and treatment plan

The documentation is normal and acceptable. The registrar has been named as well as the consultant on both occasions. The plan has been documented for each plastic surgery assessment and discussed at least documented for the Thursday/Friday involvement.

The overall standard of care provided by the Plastic Surgery team

Once the plastic surgery team became more formally involved later in the week, the standard of care was normal and acceptable. The standard of care earlier in the week was probably adequate but I think they should have offered plastic surgical debridement (debatable) and kept in touch with [Mr A] and the orthopaedic team. This lack of continuity is mildly unacceptable. I would like to see daily interaction with the orthopaedic team to clarify that the plan suits the needs of the patient, the orthopaedic team, the plastic surgery team, and the hospital.

Any other matters in this case that you consider warrant comment

The problem with the VTE prophylaxis needs to be addressed. VTE assessment for elective surgery is widely assessed but not so well assessed for acute patients. [Mr A] had 4 other important standard assessments but not a documented VTE one. However the team did address his atrial fibrillation, palpitations, dabigatran and withholding of, every day. This is equivalent of VTE assessment. Appropriate attention was not paid to some of his risk factors for VTE such as recent trauma, recent surgery, relative immobility. The team seem to have reviewed his dabigatran each day. The issue of left arm thrombophlebitis is not directly relevant but should have triggered a VTE team or orthogeriatric review specifically of that. It is a difficult situation when there is the need for anticoagulation and also the risk of bleeding and presence of haematoma even though the haematoma would have occurred at the time of injury.

[Mr A] was seen by an orthopaedic consultant, registrar and an orthogeriatrician each day and that is good practice.

[Mr A] was comfortable and happy for his stay. The nurses have clearly documented that. His aberrations from feeling well were well documented ie palpitations and migraine headache.

[Mr A] was informed of plans as documented in the clinical notes. It was up to [Mr A] to communicate with his family under the circumstances prior to the surgery on [Day 20].

The nurses and house officers have made appropriate documentation."

The following further advice was received from Dr Langley:

"I have been asked by [HDC] to provide further expert advice on [Mr A] (dec) who had treatment at [the public hospital], as outlined in my previous report dated […].

I know the plastic surgeons involved but I do not consider that is a conflict of interest. I have read and agree to the HDC's Guidelines for Independent Advisors.

I have read the following documents:

1. Letter from [Acting Chief Medical Officer, Counties Manukau Health (CMH)] to [HDC].
2. Letter from Acting Chief Medical Officer to [Mrs B] and family.
3. What to do — Can't get hold of a doctor in another specialty
4. What to do — Off work sick and unsure what to do with your phone or pager
5. Letter from Acting Chief Medical Officer to [Mrs B] and family
6. Summary of actions from the VTE Prevention meetings
7. [Day 17] Orthopaedic ward round note, Dr Q

8. [Day 1] to [Day 4] Transfer of Care to GP, Orthopaedic Surgery.
9. Letter from [Dr D], plastic surgeon, to [HDC].
10. Document Venous Thromboembolism (VTE) Prevention at Counties Manukau, undated.
11. Minutes extract from adverse events meeting
12. Letter from [Dr C], orthopaedic surgeon, to [Ms L], [the public hospital]
13. Letter from Dr E, plastic surgeon, to [HDC]
14. Report from Dr F, orthopaedic surgeon, Clinical Director Orthopaedic Surgery.
15. Letter from Dr G, plastic surgery registrar, to [HDC].
16. Illegible page, possibly log of phone calls
17. Letter from Dr H, haematologist, to [HDC].
18. Letter from [Dr I], orthopaedic registrar, to [HDC]
19. Letter from RN K, Charge Nurse Manager, orthopaedic ward 10, to [HDC].
20. Policy: Documentation in Clinical Record, CMH
21. Guideline Dabigatran (Pradaxa) Usage (Adult), CMH
22. Perioperative Management of Warfarin Patients
23. Bridging anticoagulation
24. Guideline: Venous Thromboembolism (VTE) Prophylaxis, CMH
25. Guideline: Thrombolysis for Pulmonary Embolism
26. VTE Investigation Algorithm
27. 04/05/2018 VTE Prevention in Orthopaedics
28. 07/05/2018 VTE/Bleeding Risk Assessment
29. Protocol: Perioperative Management of Patients on Dabigatran
30. Sally Langley report

I understand that Mr John Dunbar, orthopaedic surgeon, has also provided expert advice. The expert advice I have been asked to comment on is as follows:

1. The appropriateness of the changes implemented by CMDHB
2. The adequacy of policies and procedures that were in place at the time of these events
3. Any comments regarding the standard of care provided by any individual staff members that you consider warrant comment
4. Any other matters in this case you consider warrant comment

5. Any further recommendations for improvement that may help to prevent a similar occurrence in future

1. The appropriateness of the changes implemented by CMDHB

I have looked through all of the reports and associated documents and policies and I can see the following:

a. VTE prevention pathway for orthopaedics. Orthopaedic VTE risk assessment tool. Trialed VTE risk assessment and alert sticker for documenting and highlighting of VTE risk in clinical notes. Template for dictation of VTE prevention plan in Orthopaedic preadmission clinics. Patient and staff VTE prevention information pamphlets. A range of resources for staff and patients on application of anti-embolic stockings. VTE prevention eLearning resource. New VTE assessment sheet.

These policies all seem appropriate.

b. VTE risk assessment of all patients as part of 'Time Out'.

Throughout New Zealand this has been an evolving change in the last few years as part of the 'Check List' of a number of areas re patient identification, consent, surgery, equipment and post-operative care. Discussion of VTE risk and prophylaxis is part of this and should help to establish appropriate VTE prophylaxis planning for every patient.

c. Decision making at the end of each surgical procedure regarding the appropriate thromboprophylaxis and charting thereof, prior to 'Check Out/Sign Out'.

As above in b.

d. Close monitoring of potential complications associated with VTE prophylaxis

This is a hard one for which to clarify changes. I am not aware of changes.

In general patients are monitored and the EWS (Early Warning Score) now used throughout New Zealand would alert medical staff to assess patients and investigate and manage appropriately.

e. Plastic surgery: [Dr D] has instigated the following policies and behaviours within the plastic surgery department. The following advice was disseminated to all plastic surgery teams:

1. All consultations by plastic surgery team must be documented in the patient's notes, recording the names of registrar and the consultant represented. The consultant needs to be informed of the decision in case a different outcome is required. Any advice about a surgical plan must include which team is to perform such plan.

2. Clear pathways of communication need to be established following a consultation and these pathways must be documented within the patient's notes. Inability to contact a registrar should default to the 'acute team'.

3. If the 'on call' registrar is called by another service for a review they should see the patient, document the review and discuss with the plastic surgery consultant they are representing. These are all important behaviours and better standards of care. The emphasis on formal documentation, consistently done, is extremely important as demonstrated by this case. Corridor discussions are widespread but the important actions need to be documented. This is part of a medical management change whereby patients are looked after by a primary team but also the acute or available team members. It is really important to be clear about who to contact if the initial registrar/team cannot be contacted. I do not think that there should be any expectation of being able to contact a registrar or consultant, previously involved, out of normal working hours ie overnight and at weekends and in particular public holidays. The 'on call' team has to be available and prepared to manage patients with ongoing problems.

f. Posters about when to escalate issues of being unable to contact staff in another service. The posters included should be helpful to remind doctors to make contact and who to contact.

g. Posters about what to do with phone/pager when off sick.

The posters included should be helpful to remind doctors who to contact if off sick etc.

h. Orthopaedic complications meetings continue.

Such regular meetings are extremely important to present the complications including DVT and PE experienced by patients, both elective and acute, during a period of time, and comparing over time periods.

i. VTE and communication discussed at acute handover meeting (daily SMO, RMO, senior nurse meeting). Not minuted.

This is an extension of the operative 'time out' and 'sign out'; ongoing supervision of the VTE risk and prophylaxis. These are verbal, non-minuted, informative communications, related to ongoing patient care. They are appropriate.

2. The adequacy of policies and procedures that were in place at the time of these events

Some policies were available at the time of this incident but not extensive enough eg elective VTE prophylaxis was covered well but not acute. Some of the medical staff interactions have been 'ad hoc' 'corridor' consultations, advice and plans, phone calls and text messages. These were often not formally documented and may have been inconsistent. With the increased staff numbers these days, communications have to be reliable and documented. A lot of behaviours with respect to patient care have been via non-documented conversations or communications. This case has

emphasized the need for the interactions to be documented and also document the names of those involved and who their consultant is.

3. Any comments regarding the standard of care provided by any individual staff members that you consider warrant comment

I think some excellent standards of care have been demonstrated here eg the patient was visited daily by consultant surgeon and older person's health physician.

The nursing care and documentation has been excellent. It has been very helpful to read the documentation per nursing shift of the status of the patient.

4. Any other matters in this case you consider warrant comment

Public hospitals are very busy places and the medical staff have a lot of demands on their time.

Surgical registrars in particular have to see patients, communicate to their seniors, document by writing and electronically, fill out requisitions, review, make phone calls, and go to the emergency department, clinic or operating theatre. There has been a significant change in staffing over the last few years such that for many surgical specialties there is a registrar/team dedicated to managing the acute service. This is a better standard for patient care. I suspect this was already the case in orthopaedic surgery and plastic surgery when [Mr A] was at [the public hospital]. However, despite this better staffing, the job is still very busy and there are always other sick patients to be managed.

With respect to managing anticoagulants, VTE prophylaxis, haemorrhage or potential haemorrhage with trauma and surgery, despite better understanding of physiology, it is still difficult to work out the best regimen for each patient.

5. Any further recommendations for improvement that may help to prevent a similar occurrence in future

I am not sure whether this is relevant to this case, but computers need to be readily available and quick to access.

Specifically for orthopaedic to plastic surgery lower limb trauma referrals, there should be a policy developed with respect to when the patient should become a plastic surgery patient. I advise that in a tertiary hospital, where plastic surgery and orthopaedic services are both available, significant soft tissue trauma to the lower limb, without bone or joint trauma, or following stabilization of bone or joint trauma, the patient should be transferred to plastic surgery.

Significant soft tissue trauma to the lower limb needs to be defined.

Orthopaedic registrars and surgeons need to learn and practise the skills of wound debridement and split skin grafting since plastic surgery services are not always available. The trainee orthopaedic registrar should either do a plastic surgery

attachment or attend the operating theatre to learn surgical debridement and split skin grafting technique, including indications and timing.

Patient transfers from one team to another should be consultant to consultant. The receiving consultant needs to be aware of receiving the patient under his or her care and the referring consultant has to agree to the transfer."