General Practitioner, Dr C

A Medical Centre

A Report by the

Health and Disability Commissioner

(Case 14HDC00368)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. Mr A, aged 21 years, was fit and healthy. From 17 May 2011, he felt unwell with flu-like symptoms, achy bones, and a headache. He saw general practitioner Dr C at a medical centre on Thursday 26 May 2011. Dr C undertook a physical examination of Mr A and queried whether he had a viral infection. Dr C prescribed Paracode (paracetamol and codeine) for Mr A's pain and referred him for blood tests, which Mr A had taken that day.

2. Dr C reviewed the blood test results at 9.45am on Friday 27 May 2011. The results were abnormal. In particular, C-reactive protein (a non-specific inflammatory marker) was markedly elevated, the blood count was abnormal, and renal function tests were abnormal. Dr C intended to have a practice nurse contact Mr A to advise him of the results and to ascertain his current condition, but he forgot to ask the nurse to do this.

3. Mr A remained unwell. On Sunday 29 May 2011, he tried to get up but could not walk. Mr A's father took him to an accident and medical clinic. Mr A was assessed by a doctor who accessed his recent blood test results, noted the abnormalities, and referred Mr A to the medical registrar at Hospital 1.

4. Mr A was transferred to Hospital 1 by ambulance. He was treated with broad spectrum antibiotics and admitted to the Critical Care Unit (CCU). He was reviewed by a number of specialities and a variety of causes of his illness were considered. At 5.30pm on 30 May 2011, nursing staff noted that Mr A was conscious. At 12.30am on 31 May 2011, Mr A had a lumbar puncture. By that afternoon, Mr A was unconscious and he was intubated to protect his airway. Mr A had a CT scan of the head, chest and abdomen, which confirmed swelling of the liver and spleen, and suggested that he had swelling of the brain. At this stage, Mr A was presumed to have meningitis. On 1 and 2 June 2011, Mr A remained unconscious.

5. On 3 June 2011, there was no known diagnosis despite a number of tests being undertaken. On 5 June 2011, Mr A was reviewed by a visiting neurologist who considered that Mr A's condition was consistent with severe acute demyelinating encephalomyelitis[1] following a systemic viral illness of undetermined nature.

6. Mr A was transferred to Hospital 2 to undergo treatment recommended by the visiting neurologist. He remained there for around three months, then moved to a spinal unit for rehabilitation. He is now tetraplegic and lives at a residential care facility.

Findings

7. Dr C failed to fully inform Mr A of his abnormal blood test results and, accordingly, breached Right 6(1)(f) of the Code of Health and Disability Services Consumers' Rights (the Code).[2]

[1] A post-infectious inflammatory disease that damages the protective myelin layer around the nerve fibres in the brain.

[2] Right 6(1)(f) states: "Every consumer has the right to the information that a reasonable consumer, in that consumer's circumstances, would expect to receive, including — … (f) the results of tests …".

8. Dr C failed to ensure that the abnormal results were followed up with Mr A in a clinically appropriate manner. Accordingly, he breached Right 4(1) of the Code.[3]

9. Adverse comment is made that, at the time of these events, the medical centre did not have in place a formal process for the tracking of urgent results.

10. The care Mr A received at Hospital 1 was appropriate in the circumstances.

Complaint and investigation

11. The Commissioner received a complaint from Mrs B about the services provided by Dr C and Hospital 1 (DHB1) to her son, Mr A. Mr A confirmed that he supports the complaint. The following issues were identified for investigation:

- *Whether Dr C provided Mr A with an appropriate standard of care in May 2011.*
- *Whether the medical centre (owned and operated by Drs C and D) provided Mr A with an appropriate standard of care in May 2011.*

12. An investigation was commenced on 30 April 2015.

13. The parties directly involved in the investigation were:

Mr A	Consumer
Mrs B	Complainant
Dr C[4]	Provider
Medical centre	Provider

Also mentioned in this report:

Dr D	General practitioner
Dr E	Intensive care consultant
Dr F	Intensive care consultant

14. Information was also reviewed from:

ACC
DHB2
DHB1

15. Independent expert advice was obtained from in-house clinical advisor general practitioner Dr David Maplesden (**Appendix A**), and intensive care specialist Dr Shawn Sturland (**Appendix B**).

[3] Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."
[4] Dr C is vocationally registered.

Information gathered during investigation

Background

16. Mr A, aged 21 years at the time of events, was fit and healthy. He had been a registered patient at the medical centre since 1991. He had last been seen there in 2010 with an injury.

17. The medical centre is owned and operated by Drs C and D. Dr D was Mr A's regular general practitioner (GP).

18. On 17 May 2011, Mr A felt unwell with flu-like symptoms, achy bones, and a headache. He remained unwell and, on 23 May 2011, he telephoned the medical centre and booked an appointment to see Dr C on 26 May 2011. Between 23 and 26 May 2011, Mr A continued to work.

19. Around 5 June 2011, Mr A was diagnosed with a severe systemic viral infection (no organism identified) complicated by acute haemorrhagic leukoencephalitis (AHLE),[5] the hyperacute variant of acute demyelinating encephalomyelitis (ADEM).[6] During the course of his illness, Mr A became tetraplegic, and he now lives in a residential care facility owing to his high needs.

20. This report relates to the care provided by Dr C and the medical centre to Mr A. It also addresses the care Mr A received at Hospital 1/DHB1.

Appointment with Dr C on 26 May 2011

21. Dr C told HDC that Mr A presented with a generalised headache and arthralgia (joint pain) for one week, a sore throat for one day, and diarrhoea. Dr C said that he undertook a physical examination, which would have included listening to Mr A's chest, taking his pulse, checking for any stiffness in his neck, and observing his respiratory rate.

22. Dr C recorded in the clinical notes that Mr A's temperature was 36.2°C,[7] his throat was red, and no abnormalities of his joints were found. He also documented "? viral inf[ection]". Dr C prescribed Paracode[8] for Mr A's pain and referred him for blood tests (including a complete blood count, C-reactive protein[9] and ferritin[10]).

23. Dr C told HDC that he asked Mr A to contact the medical centre the next day regarding his blood test results. This instruction is not documented in the clinical notes. Mr A told HDC that he remembers Dr C saying he would contact him (Mr A) the next day with the results, and that Dr C did not tell him to call for the results.

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[5] Characterised by bleeding in the brain in association with an intense inflammatory state.
[6] A post-infectious inflammatory disease that damages the protective myelin layer around the nerve fibres in the brain.
[7] Normal body temperature is around 37°C.
[8] Paracetamol and codeine.
[9] CRP is an acute phase reactant, a protein made by the liver and released into the blood within a few hours after tissue injury, the start of an infection, or other cause of inflammation. CRP is a non-specific inflammatory marker.
[10] Ferritin is tested to measure the amount of iron stored in the body.

24. Dr C told HDC that he also advised Mr A to contact him again if he was not feeling better the next day. While he omitted to record this advice in the clinical record, Dr C is confident that he gave Mr A this safety-netting or follow-up advice. Dr C stated: "It is my standard practice to tell my patients to notify me if their symptoms do not improve or if their condition deteriorates." Mr A told HDC that there was no talk at the appointment about contacting Dr C the next day if he was not feeling any better.

25. In response to the provisional opinion, Dr C said that throughout his career he has endeavoured to keep comprehensive and full clinical records diligently. He has not, however, tended to record safety-net advice given to patients, which was so in this case. He stated: "I have always provided safety net advice to patients as part of my routine practice, and therefore can confidently say I provided such advice to [Mr A]."

26. Dr C said that he handwrites patients' clinical history on laboratory referral forms, as the computer software the medical centre uses does not self-populate this information. Dr C said that this would have been the case with the form he gave to Mr A to give to the laboratory provider when he went to have his blood test done. Dr C provided HDC with a copy of the laboratory request form as printed from the medical centre's system, which did not include the handwritten history. The form requested: "Complete Blood Count, CRP, Ferritin, B12/Folate, Liver Group, Renal — Creatinine, Glucose — Random." Mr A had the blood test done that day at a local medical laboratory.

Blood test results

27. Dr C told HDC that he reviewed Mr A's blood test results the following day (27 May 2011). According to the medical centre practice's management system records, this was at 9.45am. The results were abnormal. In particular:

- C-reactive protein was markedly elevated[11] and ferritin was elevated.[12] The pathologist's comment was: "The elevated ferritin is likely, in part, to be secondary to the inflammatory process."

- Blood count was abnormal: haemoglobin was low[13] and platelets were significantly reduced.[14] Total white cell count was elevated[15] with neutrophilia[16] and lymphopenia.[17] The pathologist's comment was: "Anaemia is present. Neutrophilia is present. Neutrophils show toxic changes. Thrombocytopenia is present. Possible causes include medication, viral infection, hypersplenism[18] and autoimmune destruction."

[11] 321mg/L (normal <5mg/L).
[12] 468µg/L (normal 20–320µg/L).
[13] 109g/L (normal 130–175g/L).
[14] $56x10^9$/L (normal 150–$400x10^9$/L).
[15] $12.8x10^9$/L (normal 4–$11x10^9$/L).
[16] More than the normal number of neutrophils, a type of white blood cell. Result: $11.79x10^9$/L (normal 1.9–$7.5x10^9$/L).
[17] An abnormally low level of lymphocytes, a white blood cell with important functions in the immune system.
[18] Overactive spleen.

- Renal function tests showed elevated serum creatinine[19] and reduced eGFR.[20]

28. Dr C told HDC:

> "In light of the abnormal results [Mr A] needed to be advised and I intended to have a practice nurse contact [Mr A] to advise him of the results and also to ascertain his current condition. Regrettably I forgot to ask the practice nurse to do this and therefore [Mr A] was not advised of the blood test results. I am at a complete loss as to why this omission occurred. It may have slipped my mind as a result of consulting with other patients that morning after I reviewed the results. However, my oversight did not come to my attention until August 2011 when I learnt of [Mr A's] diagnosis."

29. Dr C stated that, at that time, the medical centre did not have in place any formal procedures or practice policy for the handling of test results, abnormal or otherwise. Dr C told HDC:

> "It was my usual practice to say to a patient that I would contact him/her with a significant or abnormal result, but also that it was important for the patient to contact the surgery if they were still concerned about their condition. I can confirm that up until this matter this is the first occasion in over 30 years of practice where I have failed to follow-up with a patient to advise him/her of abnormal test results with good effect."

Deterioration

30. Mr A went to work as usual on Friday 27 May 2011. Mr A's mother, Mrs B, told HDC that he finished work at 4.30pm and drove straight home. At around 6.30pm, Mr A's father found him asleep in his car in the driveway; he had been asleep for almost two hours, he did not want to eat, and was disorientated.

31. Mrs B told HDC that on Saturday 28 May 2011, Mr A had little energy, was confused, and was not eating or drinking much.

Visit to the accident and medical clinic

32. On Sunday 29 May 2011, Mr A was still unwell. In the afternoon he tried to get up but could not walk. Mr A's father was concerned, so took him to an accident and medical clinic.

33. Mr A was triaged by a registered nurse (RN) as category 4.[21] The RN noted that Mr A was shivery, off colour, and had achy joints and general weakness. She noted that he

[19] A chemical waste molecule that is generated from muscle metabolism. Result: 162µmol/L (normal 60–105µmol/L).

[20] Estimated glomerular filtration rate (a test for kidney damage). Result: 47ml/min/1.73m^2 (normal >90ml/min/1.73m^2).

[21] New Zealand emergency departments use the Australasian triage scale, which has five triage categories; triage category 1 patients are very urgent, while triage category 5 patients are less urgent. For each triage category there is a specified maximum clinically appropriate time within which medical assessment and treatment should commence. Category 4 refers to potentially serious or potentially adverse outcomes from a delay in treatment of more than 60 minutes.

had cold hands and poor circulation, and recorded "Recent ?viral illness" in the clinical records. She noted that Mr A had been taking Paracode. She recorded his vital signs as: temperature 37.8°C, blood pressure 98/59mmHg,[22] pulse 125 beats per minute[23] and oxygen saturation 98%. There were multiple abnormalities on urine dipstick analysis.

34. A doctor (a general registrant practising in general practice) then reviewed Mr A.[24] He noted that Mr A was tachycardic and had cool peripheries. He recorded that Mr A was shivering, and had a dry throat and tongue, general tenderness of his neck, and a reduced range of movement.

35. The doctor accessed Mr A's recent blood test results. He noted the abnormalities and referred Mr A to the medical registrar at Hospital 1.

Admission to Hospital 1

36. Mr A was transferred from an accident and medical clinic to the emergency department (ED) at Hospital 1 by ambulance, arriving at around 7.20pm on 29 May 2011. Intensive care consultant Dr E told HDC that the medical team saw Mr A and noted that he had a fever and looked unwell, and he had joint pains, generalised stiffness in the neck, and some abdominal pain. A general surgical registrar reviewed Mr A and considered that his abdomen was not the source of infection.

37. Intensive care consultant Dr F recorded:[25]

> "[Mr A] presented [to Hospital 1] with a history of several days of myalgia,[26] general tiredness, headache, rigors,[27] fevers and bleeding nose. [He] initially presented to his GP on the 26th of May 2011, and was sent for a blood test which showed him to be significantly anaemic for a young man of 21, a raised white count, a CPR of 320 and acute renal impairment with a creatinine of 162. It is unclear as to whether those results were reviewed, because he did not present to hospital for another three days."

38. At 8.00pm, Mr A was commenced on broad spectrum intravenous (IV) antibiotics.[28] He was reviewed medically, and virology/serology testing was recommended and undertaken. Mr A's blood pressure was initially stable but progressively fell over the next two hours. Mr A was reviewed by the Critical Care Unit (CCU) team and admitted to CCU at 10.00pm. Mr A was given fluids and noradrenaline[29] to increase

[22] Generally, normal adult blood pressure should be less than 130/85mmHg.
[23] The normal adult pulse rate is 60–100 beats per minute.
[24] The clinical notes do not state the time of review.
[25] This information is included in the ward round patient summary of 2 June 2011.
[26] Muscle pain.
[27] Exaggerated shivering, which can occur with a high fever.
[28] Ceftriaxone.
[29] A potent medication that is administered intravenously to treat patients with critically low blood pressure.

his blood pressure. At that stage, the working diagnosis was of septic shock[30] with an unclear source.

39. The following day (30 May 2011), Mr A was reviewed by the general medical, haematology, and infectious diseases teams. A variety of causes of Mr A's condition were considered, especially given his occupation, which could expose him to unusual organisms. After an interdisciplinary team discussion, the consensus was that a lumbar puncture[31] was indicated to rule out central nervous system infection. The clinical notes record: "[S]uggest continue [with] advice to do [lumbar puncture]." Dr E advised that Mr A improved over the day of 30 May 2011, with no ongoing blood pressure support and a normal level of consciousness. At 5.30pm, the nursing notes record that Mr A's Glasgow Coma Scale score (GCS) was 15/15.[32] In response to the "information gathered" section of the provisional opinion, Mrs B disputed that Mr A had a normal level of consciousness at that time. She explained that she was with Mr A during the day and recalls that he was not able to hold a conversation, and was drifting in and out of consciousness. Mr A does not recall the time from when he arrived at Hospital 1 until after he came out of the coma (detailed below).

40. At 12.30am on 31 May 2011, the lumbar puncture was performed by a CCU registrar (it could not be performed earlier owing to workload). The opening pressure was elevated.[33] The contents of the spinal fluid were abnormal, with a high white cell count (1100 per mm), elevated protein (1.82g/L) and low glucose (2.1mmol/L). These findings were consistent with bacterial meningitis, and Mr A's antibiotics were adjusted to improve cover for this.

Further deterioration

41. At 6.00am on 31 May 2011, Mr A's GCS was 14/15, and he appeared drowsy and lethargic. His oxygen saturation was decreasing at times, and his temperature spiked to 39°C. He complained of body aches. At 10.40am, a nurse recorded that Mr A's GCS was "fluctuating this morning", and that he had developed a rash over his hands and trunk.

42. By the afternoon, Mr A's consciousness had deteriorated (GCS 3/15) and he was intubated to protect his airway. It is recorded that he was sedated. Mr A had a CT scan of the head, chest and abdomen, which confirmed swelling of the liver and spleen, and ascites.[34] The report also suggested cerebral swelling and queried elevated intracranial pressure.

[30] Sepsis induced hypotension despite adequate fluid resuscitation, along with the presence of perfusion abnormalities.
[31] A lumbar puncture is a medical procedure where a needle is inserted into the lower part of the spine to test for conditions affecting the brain, spinal cord or other parts of the nervous system. During the procedure, pressure is measured and samples of cerebrospinal fluid (CSF) are taken from inside the spine.
[32] A common scoring system used to determine a person's level of consciousness. The GCS is scored between 3 and 15, 3 being the worst and 15 the best (fully conscious and orientated).
[33] At 36cm H_2O. Opening pressure measurements are clinically useful for establishing diagnoses and monitoring therapy.
[34] Ascites is the accumulation of fluid in the peritoneal cavity, causing abdominal swelling.

43. Dr E stated that Mr A continued to be investigated for the underlying cause of his presumed meningitis and hepatosplenomegaly.[35] On 1 and 2 June 2011, sedation was ceased so that Mr A's brain function could be assessed. Dr E told HDC that Mr A remained deeply unconscious with no reaction to stimuli.

44. On 1 June 2011, Mr A had a further CT scan of his head at around 3pm. This revealed diffuse brain swelling and increased signal from the surface of the brain, along with tonsillar herniation.[36] The indication as recorded on the CT scan report was "meningitis/encephalitis with severe cerebral oedema [swelling]".

45. Mr A was reviewed by a haematologist, and underwent a bone marrow examination at 4.05pm to rule out underlying lymphoma or another haematological problem. The changes in Mr A's bone marrow were consistent with severe infection. However, the haematologist noted that further results would be available in one to two days' time to confirm or rule out lymphoma. Mr A underwent an echocardiogram at 6.00pm. The sonographer and Dr F noted that this was normal.

46. On 2 June 2011, Mr A was reviewed by Dr F. Dr F noted that Mr A appeared to have suffered a significant neurological event, the cause of which was uncertain. Dr F noted: "[Mr A's] prognosis remains extremely guarded." On the morning of 2 June 2011, Mr A underwent an MRI scan of his brain. This showed an area of no blood flow in the top of the brainstem and into the cerebellum.[37] There were also changes in the deeper parts of the upper brain, which represented either infection or inflammation.

47. A family meeting was held, and it is recorded that the family were told about the brain swelling and abnormalities shown on the MRI scan, and that staff would be assessing Mr A's neurological condition regularly.

48. On 3 June 2011, Mr A was reviewed by a neurologist, who recorded that Mr A was a "complex and critically ill patient [with] multi-organ dysfunction (blood, renal, neurologic systems)". He suggested multiple possibilities for the cause of Mr A's condition.

49. Mr A was then reviewed by an intensive care consultant, who recorded:

> "[Mr A] has an unusual syndrome of meningitis and coma in the setting of widespread lymphadenopathy and abnormal bone marrow aspirate. Further clarification of his haematological diagnosis is awaited … [Mr A] has been assessed this morning by the Neurologist. He feels that there is significant papillodema[38] and that raised intracranial pressure is a significant part of the cause of his current coma. We will discuss with our colleagues in [DHB2] whether a change in his management is indicated at this stage."

[35] Simultaneous enlargement of the liver and spleen.
[36] A type of brain herniation, where brain tissue, cerebrospinal fluid, and blood vessels are moved or pressed away from their usual position inside the skull.
[37] The part of the brain at the back of the skull that coordinates and regulates movement and balance.
[38] Optic disc swelling caused by increased intracranial pressure.

50. A further family meeting was held on the afternoon of 3 June 2011. Dr E was present (along with other staff members) and explained that there was no known diagnosis despite the number of tests undertaken, but that Mr A was being treated for all suspected causes. Mr A's prognosis was discussed with the family. Mrs B told HDC that that evening she raised suspicion that her son had ADEM,[39] because she had heard of someone else who had that condition.

51. On 4 June 2011, Mr A's GCS remained 3/15 but he was breathing spontaneously. His bone marrow results were negative for lymphoma. Staff noticed swelling in Mr A's left elbow joint, and he had an ultrasound and aspiration.

52. On 5 June 2011, Mr A was reviewed by a visiting neurologist from DHB2. The neurologist noted that the MRI appearances were consistent with severe ADEM following a systemic viral illness of undetermined nature. He thought that the haemorrhagic changes in the medulla could be secondary to ADEM, and recorded that "this picture falls in the spectrum of acute haemorrhagic leukoencephalitis".[40] He recommended treatment with methylprednisolone[41] and plasmapheresis (plasma exchange), but the latter needed to be done through the Critical Care Unit at Hospital 2 (CCU2).

Subsequent events — Mr A

53. On 5 June 2011, Mr A was transferred to CCU2. Soon after arriving he was able to communicate with his eyes (but was otherwise unable to communicate). In CCU2, Mr A had plasmapheresis and methylprednisolone treatment, and a prolonged course of high dose prednisone. In mid-June it was clear that he would remain ventilator dependent, but his ability to communicate improved. Mr A remained in CCU2 until 29 August 2011. He then moved to a spinal unit for rehabilitation.

54. Mr A now resides at a residential facility. He is able to spend 8–10 hours in his wheelchair, and converses with his friends and family without becoming fatigued. He can operate a computer and use the internet and telephone.

ACC treatment injury cover

55. One of the key concerns raised by Mrs B is that the lumbar puncture (at Hospital 1 on 31 May 2011) was performed without a CT or MRI scan being undertaken first to check Mr A's intracranial pressure.

56. In July 2011, an intensivist at Hospital 2 lodged a treatment injury claim with ACC on Mr A's behalf. The claim was that "medullary infarction may be due to lumbar puncture in setting of raised intracranial pressure". This claim was turned down by ACC in January 2012. Following the exchange of expert neurologist reports (for ACC and Mr A), in December 2012, Mr A was granted full ACC cover, which has been beneficial to his ongoing care requirements.

[39] See footnote 6.
[40] See footnote 5.
[41] A steroid that prevents the release of substances in the body that cause inflammation.

Subsequent events — DHB1

57. Dr E told HDC that DHB1 had not considered Mr A's deterioration to be related to a treatment injury at the time, and therefore did not discuss that with the family. Dr E said that this was because Mr A "had a normal level of consciousness prior to the lumbar puncture, and there was a large delay prior to his deterioration".

58. Mr A's case was reviewed internally at Hospital 1, and later with the neurologists at Hospital 2. Dr E stated:

> "In review, the opinion of both meetings was that this was a fulminant disease with haemorrhage and infarction being a feature. The decision to perform the lumbar puncture was considered and appropriate given the presenting clinical problem at the time.
>
> A CT scan is not generally indicated in a patient with a normal level of consciousness prior to lumbar puncture unless there are other localising signs. This is largely due to protecting patients from unnecessary radiation and its associated health risks. Based upon [Mr A's] clinical presentation at the time, a CT scan was not indicated before the lumbar puncture was performed."

Apology — DHB1

59. Dr E stated: "I'd like to say that the whole [CCU] Team remembers [Mr A] vividly and recall his deterioration from a fit well man to being left in a very dependent state. It was a devastating course at the time and it is clear to see from [Mrs B's] letter the ongoing impact it has had on both [Mr A] and his family. We are really sorry that we couldn't prevent this outcome despite our best efforts."

Subsequent events — the medical centre

60. In 2014, the medical centre underwent a Cornerstone Accreditation process with the Royal New Zealand College of General Practitioners (RNZCGP), and a patient notification system for managing patient test results was put in place.

61. During this process, the medical centre implemented the "Test Results and Medical Record Management and Tracking of Urgent Results Policy". This specifies that doctors and nurses inform patients, when a test is required, that they will be contacted should there be an abnormal result that needs clinical follow-up. In that circumstance, the patient will be asked to return for a further consultation or a change in prescription or other services. The turnaround time for test results is up to 72 hours, and patients can be contacted either by telephone or letter. The medical centre is increasingly using "text-to-remind" software to contact patients. Patients are also urged to contact the practice nurse at 72 hours to take better control of their health.

62. In 2016, the medical centre will undergo a Cornerstone reaccreditation process. It advised that during this process, the implementation of a formal tracking system will be considered, and the Test Results and Medical Record Management and Tracking of Urgent Results Policy will be considered again.

63. The medical centre has employed an extra nurse to assist with the increase in data collection and primary health organisation compliance.

64. Dr C has reviewed the RNZCGP document on managing patient test results and minimising error, as well as Chapter 14 of *Cole's Medical Practice in New Zealand*,[42] "The management of clinical investigations". Dr C advised that he has also reduced his workload since the time of these events, when he was working close to full time in general practice, and on a 0.3 basis at a local hospice.

65. Dr C told HDC that he continues to be more diligent with his note-keeping and management of test results.

Apology — Dr C

66. Dr C stated: "I am extremely sorry for what happened to [Mr A] and the significant impact that this has had on his and his family's lives. Since this matter was brought to my attention I have spent a significant amount of time reflecting on my care and management … I very much regret that I failed to notify [Mr A] of his test results on 27 May 2011." Furthermore, he stated:

> "I would like to take this opportunity to express again how very sorry I am for what happened to [Mr A] and the impact his diagnosis has had. I have no hesitation in apologising for the imperfections in the care I provided to [Mr A] … I genuinely believe that the changes I have made to my practice (including changes at the practice) as a direct result of this matter … have adequately addressed the shortfalls identified in the practice processes at the time and have gone a long way to ensuring these systems or processes are more robust and there will be no repeat of this matter."

Responses to provisional opinion

67. Responses to the relevant sections of my provisional opinion were received from Dr C, the medical centre, DHB1, and Mrs B. Where appropriate, the responses have been incorporated into this report. DHB1 had no comments to make in response to the provisional opinion.

68. Dr C told HDC that in October 2015 the Medical Council of New Zealand undertook a preliminary competence inquiry and no concerns were identified regarding his practice.

Opinion: Dr C — Breach

69. Doctors owe patients a duty of care in handling patient test results, including advising patients of, and following up on, results. This opinion highlights the importance of the effective and prompt communication of test results by providers to consumers. The primary responsibility for following up abnormal results rests with the clinician who ordered the tests, in this case, Dr C.

[42] Available at: https://www.mcnz.org.nz/assets/News-and-Publications/Coles/Chapter-14.pdf.

70. After feeling unwell with flu-like symptoms, achy bones and a headache for about ten days, Mr A attended an appointment with Dr C on 26 May 2011. Dr C physically examined Mr A, and queried whether he had a viral infection. He said that he handwrote Mr A's clinical history onto the laboratory referral form, which he gave Mr A to take with him when he went for a blood test. My in-house clinical advisor, Dr David Maplesden, advised me:

> "The physical assessment of [Mr A] undertaken by [Dr C] on 26 May 2011 was probably reasonable given his apparent moderate viral-like symptoms of over a week's duration, normal temperature and absence of respiratory symptoms … The recorded picture is certainly suggestive of a viral illness with such illnesses being self-limiting in a majority of cases when they occur in an apparently healthy subject such as [Mr A]."

71. Dr C told HDC that he asked Mr A to contact the medical centre the next day regarding his blood test results, and that he advised Mr A to contact him again if he was not feeling better the next day. In response to the provisional opinion, Dr C stated: "I have always provided safety net advice to patients as part of my routine practice, and therefore can confidently say I provided such advice to [Mr A]." Dr C did not record either of these instructions in the clinical notes. Dr C told HDC that throughout his career he has endeavoured to keep comprehensive and full clinical records. However, he has not tended to record safety net advice. In my view, it is best practice to record such information.

72. Dr C said that it was his usual practice to say to patients that he would contact them with a significant or abnormal result, but also that it was important for patients to contact the surgery if they were still concerned about their condition. Mr A told HDC that he remembers Dr C saying that he would contact him (Mr A) the next day with the results, and that Dr C did not tell him to call for the results. Mr A also said that there was no talk at the appointment about contacting Dr C the next day if he was not feeling any better.

73. Due to the conflicting accounts provided by Dr C and Mr A, I am unable to make a finding as to whether Dr C told Mr A to contact him or the medical centre regarding his blood test results and if he was not feeling better.

74. The blood test results were sent to the medical centre, and the practice management system shows that Dr C viewed them at 9.45am on 27 May 2011. Dr C recognised that the results were abnormal, and stated that he intended to have a practice nurse contact Mr A to advise him of the results. However, Dr C forgot to do this and, therefore, Mr A was not advised of the blood test results.

75. Dr Maplesden advised me that the failure by Dr C to notify Mr A of his abnormal results and ensure they were followed up in a clinically appropriate manner was at least a moderate departure from expected standards. I accept this advice. To ensure patient safety, general practitioners and practices must remain especially vigilant when managing abnormal test results. While this was a human error, I do not consider it was adequate for Dr C to rely on his memory alone to ensure that the results were actioned. Dr C should have had in place a more robust system.

76. Dr C also said that he intended to have his practice nurse ascertain Mr A's current condition. Dr Maplesden advised me that the blood test results required prompt actioning, including notifying Mr A and discussing his current physical status. Dr Maplesden stated: "[I]t might have been appropriate to review the patient prior to the weekend — particularly if there had been any deterioration in his condition, and to discuss the results and the patient's condition with a secondary care registrar following review." I agree with this advice.

77. Right 6(1) of the Code states: "Every consumer has the right to the information that a reasonable consumer, in that consumer's circumstances, would expect to receive …" This includes information about the consumer's condition, and the results of tests. As Dr C failed to fully inform Mr A of his abnormal blood test results, I find that he breached Right 6(1)(f) of the Code.

78. Right 4(1) of the Code states: "Every consumer has the right to have services provided with reasonable care and skill." As Dr C failed to ensure that the abnormal results were followed up with Mr A in a clinically appropriate manner, I find that he breached Right 4(1) of the Code.

Opinion: The medical centre — Adverse comment

79. As I have commented in a previous case, medical centres have a responsibility to have in place good systems to ensure that patients receive good quality care. In particular, they are responsible for having effective policies for the handling of incoming results and patient follow-up.[43] The RNZCGP document, "Aiming for Excellence",[44] states that practices should have an "effective system for the management of clinical correspondence, test results, and other investigations".

80. At the time of these events, the medical centre did not have in place any formal procedures or practice policy for the handling of test results, abnormal or otherwise. Dr Maplesden advised me that the practice should have in place a process to ensure that abnormal results are reviewed and actioned in a timely manner.

81. The medical centre was not Cornerstone accredited at the time of these events, but it has since been through the accreditation process, during which the "Test Results and Medical Record Management and Tracking of Urgent Results Policy" was developed and implemented. The medical centre told HDC that it is considering implementing a formal tracking system for significant results/referrals in its practice management system. Dr Maplesden's advice is that the medical centre's policy could be improved by incorporating the use of a formal tracking system for significant results or referrals. I consider this to be both necessary and appropriate.

[43] See Opinion 10HDC01419 available at www.hdc.org.nz.
[44] "Aiming for Excellence". RNZCGP Standard for New Zealand General Practice 2011–2014. The Royal New Zealand College of General Practitioners, Wellington, 2011.

82. Dr Maplesden advised me that even with electronic tracking, a result may not be regarded as "overdue" for several days. Furthermore, given that Mr A appeared to be a young and normally healthy individual who had what seemed to be a classic viral illness, the degree of abnormality in Mr A's results was not expected, and thus it might not have been tracked electronically even if a policy had recommended this.

83. While it is concerning that there was no formal process in place at the time for the tracking of urgent results, I am satisfied that the error to follow up the results in this case was Dr C's alone, given that he had read the results and intended to take action on them, but he forgot to.

Opinion: DHB1 — Other comment

84. Mr A was admitted to Hospital 1 from 29 May to 5 June 2011 before being transferred to Hospital 2. He was treated in the CCU by intensive care consultants. At 5.30pm on 30 May 2011, Mr A's GCS was recorded as 15/15. A lumbar puncture was undertaken at 12.30am on 31 May 2011 after an interdisciplinary team discussion.

85. My expert advisor, intensive care consultant Dr Shawn Sturland, advised me that a lumbar puncture was indicated in the circumstances, and the decision to perform the lumbar puncture was "appropriately considered by a multi-disciplinary team".

86. Mrs B raised concern that the lumbar puncture was performed without a CT or MRI scan first being performed to check Mr A's intracranial pressure. Dr Sturland's advice on this point, which I accept, is:

> "CT head is not required prior to lumbar puncture in patients with a normal conscious level. There is a large body of evidence to suggest that in the absence of risk factors, a CT head prior to lumbar puncture is more harmful than beneficial … In severe acute neurological conditions such as this, brain swelling and neurological deterioration are common in the course of the disease process. Evidence shows that coma, seizures and tonsillar herniation occur irrespective of, if or when a lumbar puncture is performed … The prolonged interval between lumbar puncture and onset of coma would also suggest the two events are unrelated … In my opinion, the neurological deterioration in this patient was not a result of the lumbar puncture, but most likely due to the haemorrhagic leukoencephalitis."

87. Dr Sturland further advised me that from the time of Mr A's arrival in Hospital 1's emergency department, he received timely examination, investigation and referral to other specialities (General Medicine, Infectious Diseases, Surgery and Intensive Care). As a result, his time to first antibiotics dose was less than one hour, and an extended range of further investigations had already occurred by the time he was transferred from the ED to CCU. In addition, Mr A's failure to respond to the initial therapy prompted an appropriate range of further, more invasive tests. Based on the

results of the tests, there were several multidisciplinary meetings and clinical reviews by other specialities. Dr Sturland considered that the handover was appropriate and well documented, as were the family meetings. Dr Sturland's concluding remark was: "Overall, it is my opinion that this was a rare and complex case. The care received by [Mr A] at [Hospital 1] was timely and appropriate."

88. I acknowledge that major deterioration in Mr A's condition occurred while he was in Hospital 1, so it is understandable that concerns have been raised about the care Mr A received there. I also acknowledge the permanent impact of the illness on Mr A, and the ongoing effect of this for Mr A and his family. However, I accept Dr Sturland's advice that the care Mr A received in Hospital 1, including the lumbar puncture, was appropriate in the circumstances.

Recommendations

89. I recommend that Dr C provide a written apology to Mr A for his breaches of the Code. This apology should be sent to HDC for forwarding to Mr A within three weeks of the date of this report.

90. I note that in October 2015 the Medical Council of New Zealand undertook a preliminary competence inquiry and no concerns were identified regarding Dr C's practice.

91. I recommend that the medical centre implement a formal tracking system for significant results/referrals. The medical centre told HDC that this will be considered during the Cornerstone reaccreditation process in 2016. I recommend that the medical centre report back to HDC on this matter after the reaccreditation process is complete.

Follow-up actions

92. A copy of this report will be sent to DHB1.

93. A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be sent to the Medical Council of New Zealand and RNZCGP, and they will be advised of Dr C's name.

94. A copy of this report with details identifying the parties removed, except the experts who advised on this case, will be 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 my in-house clinical advisor, general practitioner Dr David Maplesden:

"1. Thank you for the request that I provide clinical advice in relation to the complaint from [Mrs B], about the care provided to her son, [Mr A], by various providers. In preparing the advice on this case to the best of my knowledge I have no personal or professional conflict of interest. I have reviewed the information on file: complaint from [Mrs B]; ACC documentation including various expert advice; [DHB2] and [DHB1] clinical notes and responses; [the medical centre's] GP notes. Additional information was received on 11 August 2014 by way of a response from [Dr C] and a copy of [the medical centre's] 'Urgent Results' policy. **Comments on the additional information received have been added in bold type to the original report.**

2. I have been asked to comment specifically on [Mr A's] management by [Dr C] whom he consulted on Thursday 26 May 2011 at the start of his illness. Blood tests were performed at that time and were significantly abnormal. However, it is not apparent [Mr A] was contacted regarding the results. He became progressively more unwell and was seen at [an accident and medical clinic] on 29 May 2011 where he was noted to be hypotensive and tachycardic. Blood test results were obtained and [Mr A] referred to [Hospital 1] by ambulance. Here he required fluid resuscitation and admission to ICU. He was treated for sepsis of unknown origin and he initially stabilised but then had progressive neurological deterioration from the morning of 31 May 2011 (lumbar puncture had been performed at 0030hrs that day) and required intubation and ventilatory support. [Mr A] was eventually diagnosed with acute demyelinating encephalomyelitis (ADEM) secondary to severe viral infection and he was transferred to [CCU2] on 5 June 2011. Although he eventually recovered from the illness itself, the permanent effects of the illness have been severe with [Mr A] suffering high tetraplegia and numerous complications secondary to this. An ACC claim for treatment injury (related to the possible contribution of the lumbar puncture to the severity of his permanent disabilities) has apparently been accepted by ACC.

3. [Mr A] had been previously well and was working. On Thursday 26 May 2011 he presented to his GP [Dr C] of [the medical centre]. Clinical notes are: *headache, arthralgia — generalised 1/52. Sore throat 1/7. Diarrhoea. T 36.2, Throat red, jnts NAD. ?viral inf.* A form was given for blood tests and analgaesia was prescribed in the form of Paracode. There is no specific follow-up advice recorded. **In his response, [Dr C] states it is was his usual practice to record relevant abnormal physical findings and he recalls checking [Mr A's] pulse on this occasion. He now documents all relevant findings whether positive or negative. [Dr C] states he asked [Mr A] to ring the practice the next day (Friday) regarding his blood test results, and he instructed [Mr A] to seek medical review should his symptoms deteriorate. He now documents when he has given such advice.**

4. [Mr A] proceeded to have the blood tests performed the same day. The laboratory request form does not include any clinical details. I am not sure what time the blood test was undertaken but results would normally be available within a few hours and certainly by the following day (a Friday). In addition, the pathologist will sometimes contact the referring GP directly, or fax results promptly, if the results are particularly concerning. Otherwise results will generally be downloaded in their electronic form by the practice at pre-determined times where they appear in the provider 'inbox' for review and actioning. **[Dr C] confirms he received [Mr A's] blood test results on 27 May 2011 and reviewed them at 0945hrs that day. He states he recognised the results were abnormal and intended to ask the practice nurse to contact [Mr A] to come in for review but he omitted to do this. He is unsure precisely why this action was overlooked and was not aware it had been until he learned of [Mr A's] diagnosis in August 2011.**

5. [Mr A's] results from 26 May 2011 were significantly abnormal:

(i) C-reactive protein (a non-specific inflammatory marker) was markedly elevated at 321 mg/L (normal <5) and ferritin (another acute phase reactant) was elevated at 468 µg/L (normal 20–320)

(ii) Blood count was abnormal: haemoglobin was low at 109g/L (130–175) and platelets were significantly reduced at $56x10^9$/L (150–400). Total white cell count was elevated at $12.8x10^9$/L (4–11) with a neutrophilia ($11.79x10^9$/L (1.9–7.5) and lymphopenia. Pathologist comment was *Anaemia is present. Neutrophilia is present. Neutrophils show toxic changes. Thrombocytopenia is present. Possible causes include medication, viral infection, hypersplenism and autoimmune destruction.*

(iii) Renal function tests showed presumably acute impairment with elevated serum creatinine (162 µmol/L (60–105) and reduced eGFR at 47 ml/min/$1.73m^2$ (>90).

6. The physical assessment of [Mr A] undertaken by [Dr C] on 26 May 2011 was probably reasonable given his apparent moderate viral-like symptoms of over a week's duration, normal temperature and absence of respiratory symptoms. Best practice would be to record pulse, blood pressure and respiratory rate as other indicators of possible significant underlying sepsis. The recorded picture is certainly suggestive of a viral illness with such illnesses being self-limiting in a majority of cases when they occur in an apparently healthy subject such as [Mr A]. Management was appropriate to the diagnosis. 'Safety-netting' and follow-up information (usually to present in the event of deterioration or new symptoms) may have been given but is not recorded. Best practice is to record such information. **See comments above.**

7. The blood test request form gave no clinical details and again best practice is to record relevant clinical details when making such a request although in this case the results were consistent with a viral illness although there were some concerning features, particularly the impaired renal function, extreme elevation of inflammatory markers and thrombocytopenia. **In his response, [Dr C] states it**

was his practice to write clinical details in freehand on the lab request form and this was done for [Mr A's] form. The blood tests required prompt actioning including notification of the patient and discussion with the patient of his current physical status. Assuming the results were received on the Friday **(which they were)**, it might have been appropriate to review the patient prior to the weekend — particularly if there had been any deterioration in his condition, and to discuss the results and the patient's condition with a secondary care registrar following review. These actions may or may not have resulted in earlier hospital admission (depending to some extent on the status of the patient). Had [Mr A's] condition remained stable, advice might have been to repeat the tests with patient review on the Monday, but for the patient to have a low threshold for seeking review should there be any deterioration over the weekend.

8. [Mr A's] condition did deteriorate over the weekend and he attended [the accident and medical clinics] for review on 29 May 2011. Nurse triage notes record *has been unwell since Thur — for last 3/7. Very shivery … very cold hands … visible cyanosis … temp 37.8, BP 98/59, P125, O2 sats 98%.* There were multiple abnormalities on dipstick urinalysis. The examining MO notes the history and findings and accessed the recent blood results noting the multiple abnormalities determined on testing. An IV line was inserted, fluid resuscitation commenced and [Mr A] transported to [Hospital 1] by ambulance.

9. Notes recorded by the ICU specialist [Hospital 1] on 2 June 2011 recount [Mr A's] history to date including *he presented* [to Hospital 1] *with a history of several days of myalgia, general tiredness, headache, rigors, fevers and bleeding nose. [Mr A] initially presented to his GP on the 25th May 2011, and was sent for a blood test which showed him to be significantly anaemic for a young man of 21, a raised white count, a CPR of 320 and acute renal impairment with a creatinine of 162. It is unclear as to whether those results were reviewed, because he did not present to hospital for another three days.*

10. [Dr C] was conscientious in undertaking blood tests on a patient with an apparent moderate viral illness. However, having performed the tests he had a duty to ensure they were reviewed and actioned in a timely manner whether this was done by himself or an assigned deputy. His practice should have a process in place to ensure abnormal results are reviewed and actioned in a timely manner even if the provider is absent. I am assuming [Mr A] was not notified of his results on the 26 or 27 May 2011 **(see comments above)** and there are no notes in the documentation provided that record attempts to contact him. In the context of an unwell patient with the type of abnormalities evident in the test results and the weekend looming, the failure to notify the patient of these results and ensure his wellbeing by way of repeat assessment and/or admission to hospital and/or appropriate 'safety-netting' advice (depending on the clinical situation) would be at least a moderate departure from expected practice. However, I am conscious the clinical records may be incomplete and [Dr C] has yet to provide a response.

11. I recommend a copy of this advice be forwarded to [Dr C] for comment and a response be sought from [Dr C] asking him to detail his assessment and

management of [Mr A] on 26 May 2011. He should provide all documentation relevant to this consultation. He should be asked to comment specifically on the following matters:

> (i) What 'safety-netting' or follow-up advice was given to [Mr A] following the consultation of 26 May 2011?
> (ii) When were [Mr A's] blood results uploaded to the PMS? When were they reviewed by [Dr C]? What actions did [Dr C] take on reviewing the results?
> (iii) Please provide a copy of the practice policy relating to handling of abnormal results.

12. The questions posed above were answered by [Dr C] in his response and have been incorporated into the body of the report. This appears to be a case of human error whereby [Dr C] recognised the results as abnormal and intended to action them appropriately but the results were inadvertently filed without actioning and there was no prompt (such as a call from [Mr A] or an electronic reminder) to draw [Dr C's] attention to the misfiling. It is difficult to determine what actions may reduce the risk of an event such as this occurring — it is not difficult to inadvertently misfile results in Medtech, and there are few practices that electronically track all requested tests because of the impracticality of doing this. Even with electronic tracking, a result may not be regarded as 'overdue' for several days. If [Dr C] had a strong suspicion the results would be significantly abnormal, it is possible to set an electronic recall for a specific time (such as the next day) which might then have served as a reminder the results needed to be reviewed and followed-up. However, in this case [Mr A] appeared to be a young and normally healthy individual who had what seemed to be a classic viral illness. Nevertheless, I remain of the view that the failure by [Dr C] to notify [Mr A] of his abnormal results and ensure they were followed up in a clinically appropriate manner was at least a moderate departure from expected standards, although the fact this was human error during an administrative process, not helped by an imperfect practice management system (and no practice management system is 'perfect'), might be regarded as a mitigating circumstance. The practice policy on handling of urgent results has been reviewed. There is some discussion within the policy on electronic tracking of results and the reasons this process is not used at the practice. I think the robustness of the policy could be improved, and be more in line with RNZCGP recommendations[1] and certainly with opinions expressed by the previous Commissioner[2], by incorporating use of a formal tracking system (such as Task Manager) for 'significant' results or referrals eg suspected cancer referrals, biopsy results, tumour marker tracking etc. However, as discussed above the degree of abnormality in [Mr A's] results was not expected and thus might not have been tracked electronically even if the policy recommendations had been changed."

[1] RNZCGP. Managing Patient Test Results: Minimising Error. Second Edition, July 2005. Available at: http://www.rnzcgp.org.nz/assets/documents/Publications/College-Resources/Managing-Patient-Test-Results-July-2005.pdf
[2] St George IM 2013. The management of clinical investigations. Chapter 14 in: St George IM (ed.). Cole's medical practice in New Zealand, 12th edition. Medical Council of New Zealand, Wellington. https://www.mcnz.org.nz/assets/News-and-Publications/Coles/Chapter-14.pdf

Appendix B — Independent advice to the Commissioner

The following expert advice was received from intensive care consultant Dr Shawn Sturland:

"My name is Dr Shawn Sturland. I am an Intensive Care Specialist and the Clinical Director of Intensive Care Services at Wellington Regional Hospital. I have been employed by Capital and Coast District Health Board in this capacity for eight years.

I have been asked to provide expert advice regarding the case of [Mr A].

I have no personal or professional conflict to declare.

I have been provided with the following information and this forms the basis of my report.

1. [Mrs B's] letter of complaint dated […]
2. [Hospital 1's] response letter from Dr E dated 23/05/2014
3. [Mr A's] clinical records covering his inpatient stay 29/05/11 till 05/06/11
4. Clinical summary letter from Dr Maplesden dated 30/06/2014

Clinical Summary

This is a very complex case. In summary, [Mr A] most likely suffered from acute haemorrhagic leukoencephalitis complicating a severe viral illness.

He has been left tetraplegic as a result.

I have been asked to give my opinion in regard to three specific questions.

Regarding the question 'Was the lumbar puncture indicated'

Given the presentation of this patient was consistent with systemic infection, and initial examination did not readily suggest a focus, then a lumbar puncture WAS indicated. Based on its results, a change in therapy (antibiotics) was initiated. The decision to perform the lumbar puncture was appropriately considered by a multi-disciplinary team (Intensive Care, Internal Medicine, Infectious Diseases Medicine and Haematology) and all contra-indications excluded.

Regarding the question 'Should a CT scan be performed prior to a lumbar puncture in a patient with a normal level of consciousness'

CT head IS NOT required prior to lumbar puncture in patients with a normal conscious level. There is a large body of evidence to suggest that in the absence of risk factors, a CT head prior to lumbar puncture is more harmful than beneficial. Such risk factors would include, but not be limited to:-

Decreased consciousness level
Known intracranial space occupying lesion

Immunosuppressed patient
Age greater than 60
Focal neurological deficit
New onset of seizures
Clinically suspected sub-arachnoid haemorrhage as cause of presentation

Regarding the question 'was the deterioration likely due to the lumbar puncture'

In severe acute neurological conditions such as this, brain swelling and neurological deterioration are common in the course of the disease process. Evidence shows that coma, seizures and tonsilar herniation occur irrespective of, if or when a lumbar puncture is performed.

The prolonged interval between lumbar puncture and onset of coma would also suggest the two events are unrelated.

In my opinion, the neurological deterioration in this patient WAS NOT a result of the lumbar puncture, but most likely due to the haemorrhagic leukoencephalitis."

The following further expert advice was received from Dr Shawn Sturland:

"[…]

I have been asked to

'Review the information provided and advise whether you consider that the overall standard of care provided to [Mr A] at [Hospital 1] was appropriate. Please comment on all matters which you consider to be relevant, including the investigation of [Mr A's] condition and the timeliness of his diagnosis.

For each issue, it would be helpful if you would 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 you consider it is?
c) How would it be viewed by your peers?'

Opinion

With respect to the investigation of [Mr A's] condition.

From the time of his arrival in [Hospital 1's] ED department (19:15), he received timely examination, investigation and referral to other specialities (General Medicine, Infectious Diseases, Surgery and Intensive Care). As a result his 'time to first antibiotics dose' was less than one hour (20:00 given) and an extended range of further investigations had already occurred by the time he was transferred from the ED to ICU (23:00 — within the '4 hour' KPI). By 23:15 further modification to his treatment was instigated as a result of the sub-speciality opinions sought.

[Mr A's] failure to respond to the initial therapy prompted an appropriate range of further, more invasive tests:

1. Further Virology / serology testing (from 21:00 on 29/05/11 onwards)
2. Lumbar puncture (00:30 on 31/05/11)
3. CT head/abdomen/pelvis (on 31/05/11 and 01/06/11)
4. Bone marrow biopsy (16:05 on 01/06/11)
5. Cardiac echo (18:00 on 01/06/11)
6. MRI head (on 02/06/11)
7. Joint aspiration (04/06/11 ? time)

Based on results of the above tests, there were several multi-disciplinary meetings and clinical reviews by other specialities from 31/05/11 until 05/0[6]/11 when Mr [Mr A] transferred to [DHB2] for plasmapheresis.

I also note that the Medical handover process was appropriate and well documented, as were the family meetings that occurred throughout [Mr A's] ICU admission.

Overall, it is my opinion that this was a rare and complex case. The care received by [Mr A] at [Hospital 1] was timely and appropriate. As such it would represent the standard of care expected by specialist peers in all the specialities involved."