Capital & Coast District Health Board
Oral and Maxillofacial Surgeon, Dr B

A Report by the
Deputy Health and Disability Commissioner

(Case 19HDC00256)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided to a woman when she presented to a public hospital eight times in a five-week period for both scheduled and unscheduled reviews of an ongoing dental infection. The woman eventually sought assistance from her doctor to obtain a CT scan privately, and then she approached a different hospital where she had surgery and was diagnosed with osteomyelitis.

2. The woman's experience highlights the importance of critically assessing the reasons behind a consumer's repeated presentations to hospital with a non-resolving infection, and providing appropriate care in that context.

Findings

3. The Deputy Commissioner found that Capital and Coast District Health Board (CCDHB) did not provide quality and continuity of services to the woman, and breached Right 4(5) of the Code. Despite repeated presentations with an active infection, no coordinated plan of care was directed by a senior staff member, and each presentation appeared to be managed in isolation rather than with overall consideration of the woman's non-resolving issues.

4. The Deputy Commissioner also found that CCDHB breached Right 4(1) of the Code in not providing services with reasonable care and skill because it appears that osteomyelitis was not considered as a cause of the woman's ongoing symptoms. Further, once CCDHB staff had results to confirm this, treatment was not initiated in a timely manner. In addition, CCDHB should have arranged a CT scan for the woman, taken a pus swab at her second presentation, and considered a different antibiotic earlier in her treatment.

5. The Deputy Commissioner was concerned that a referral for specialist input made by CCDHB for the woman during this period of care was not accepted by the second DHB. However, he did not find the CCDHB oral and maxillofacial specialist who was involved in the woman's care in breach of the Code.

Recommendations

6. The Deputy Commissioner recommended that CCDHB apologise to the woman, and made a number of recommendations to CCDHB to strengthen the Dental Department's response to patients who present with non-resolving dental infections, including further training, and improving clinical guidance and review processes. He also recommended that the Regional Oral and Maxillofacial Service, which is based at the second DHB, consider whether any changes to service are needed in light of this case.

Complaint and investigation

7. The Health and Disability Commissioner (HDC) received a complaint from Ms A about the services provided to her by Capital & Coast District Health Board. The following issues were identified for investigation:

- *Whether Capital & Coast District Health Board provided Ms A with an appropriate standard of care during October to December 2018.*
- *Whether Dr B provided Ms A with an appropriate standard of care during October to December 2018.*

8. This report is the opinion of Deputy Health and Disability Commissioner Kevin Allan, and is made in accordance with the power delegated to him by the Commissioner.

9. The parties directly involved in the investigation were:

Ms A	Consumer/complainant
CCDHB	Provider
Dr B	Oral and maxillofacial surgeon (OMFS)

10. Further information was received from:

DHB2	Provider
Dr C	Dental surgeon
Dr D	Dental house officer
Dr E	Dental house officer
Medical centre	Provider

Also mentioned in this report:

Dr F	OMFS
Dr G	OMFS

11. Independent advice was obtained from a general dentist, Dr Andrea Cayford (Appendix A), and OMFS Dr Brian Whitley (Appendix B).

Information gathered during investigation

Background

12. On 25 October 2018, Ms A attended her private dentist for root canal treatment on tooth 21.[1] The treatment was unsuccessful, so the dentist dressed the tooth and referred Ms A to an endodontist to have the root canal completed in two days' time.

[1] The upper left central incisor.

13. Ms A's medical history included chronic pelvic pain, for which she took regular pain relief.[2]

First review at CCDHB

14. Before the root canal could be completed, Ms A presented to the CCDHB Emergency Department (ED) on 27 October 2018 with facial swelling and worsening pain. She was seen in the Dental Department by a first-year dental house officer and a periapical radiograph[3] was taken, which showed bone loss. Tooth 21 was extracted under local anaesthetic, and Ms A was admitted to the ED observation unit overnight and given intravenous (IV) antibiotics before being discharged on 28 October 2018. She was given a prescription for a five-day course of antibiotics (amoxicillin), and a follow-up appointment was arranged at CCDHB's Dental Department in three days' time.

Second review at CCDHB

15. Ms A returned to the ED around 3am on 29 October 2018 owing to increased left-sided facial pain and swelling, which had become periorbital.[4] Ms A described waiting all day in ED on a trolley while she was feverish and in pain. During the day, Ms A was seen by medical and nursing staff. At 4.45pm, Ms A was reviewed by a first-year dental house officer, Dr D, and a consultant OMFS, Dr B. Dr D explained that they were unable to review Ms A in the Dental Department until after hours, because of patient workload. Dr B told HDC: "The clinical presentation was that of a canine space/periorbital infection as a result of the non-vital[5] upper left canine tooth (23)." It is recorded in the notes that Ms A had a negative cold response[6] in teeth 22, 23, 24, and 25, that a small amount of pus was removed from the tooth 21 socket, and that an ophthalmology review of Ms A had been requested.

16. Dr D stated:

> "Due to the size of the swelling and orbital involvement, the on-call OMFS at [DHB2], [Dr F], was contacted for treatment and further management of [Ms A] at [DHB2].[7] However, they did not accept the patient due to high work load and we were advised to carry out the treatment in the department after hours under [local anaesthetic]."

17. Dr B told HDC that he made the call to DHB2, and that his request for transfer/admission of Ms A was declined directly. He said: "I did not, and do not, have the authority to have altered the decision." He noted that CCDHB does not have admission rights to DHB2. DHB2 confirmed that the referral process requires consultant-to-consultant discussion about patient management. DHB2 stated: "There is an expectation that if a patient's operation/treatment can be safely undertaken by an [OMFS] in their home DHB, that this is the first choice of treatment modality." DHB2 told HDC that Dr B and Dr F's discussion

[2] OxyNorm (an opioid medication).
[3] Periapical radiographs are X-rays that show the whole tooth from crown to beyond the roots.
[4] Around the eye.
[5] Without access to blood flow.
[6] No sensation in the tooth when a cold stimulus is applied.
[7] The regional oral and maxillofacial service is based at DHB2.

concluded with a decision that the management of Ms A's care was within the scope of the OMFS at CCDHB.

18. Dr D then performed a pulpectomy[8] on tooth 23, which confirmed the tooth to be non-vital, and Dr B incised and drained the abscess and put in place a drain.

19. Ms A remained in hospital on intravenous antibiotics until 31 October 2018, when she was discharged with a plan to remain on oral antibiotics and have an outpatient review appointment.

20. Dr D documented that the swelling around Ms A's eye had resolved completely, but the swelling over her left cheek was still evident, and she was still experiencing pain. However, Dr D noted that she had discussed Ms A's treatment with Dr B and the General Medicine and Ophthalmology teams, and all were happy with the decision to discharge Ms A given her improvement. The discharge summary noted that periapical radiographs were taken and showed no radiographic pathologies associated with the teeth on the upper left-hand side. Dr D documented: "[Patient] is reluctant but agrees to go home today." Ms A was advised to return to her private dentist to complete the root canal treatment on tooth 23, and was scheduled for an appointment the following day (subsequently rescheduled to 2 November 2018). Ms A explained to HDC that she remained concerned about her ongoing symptoms.

Third review at CCDHB

21. Ms A returned to the Dental Department for her scheduled review on 2 November 2018. She saw Dr D, who removed the sutures and drain. Dr D documented that the swelling over Ms A's cheek had reduced a lot, but there was still some swelling over the upper lip and nose, and this could take some time to resolve completely. Dr D reiterated to Ms A that she needed to see her private dentist as soon as possible to complete the root canal on tooth 23.

22. Ms A said that she queried her ongoing facial distortion and requested referral to a maxillo-facial specialist, but Dr D insisted that her symptoms were normal. Dr D told HDC that given the timing (four days after receiving treatment) and size of the original swelling, it was reasonable to expect the swelling to still be present. She said:

> "It is important to note that the swelling was continuing to decrease in size since treatment was carried out and it was not expected that the swelling of that size would have completely resolved in such a short time."

6–22 November 2018

23. On 6 November 2018, Ms A's private dental surgeon commenced the root canal procedure on tooth 23. This was completed on 22 November 2018.

24. The dental surgeon noted that Ms A complained of a tender infra-orbital[9] area, that tooth 22[10] was non-vital, and that there was pus leaking from the site of the tooth 21 socket. The

[8] Complete removal of pulp from the crown and roots.
[9] Below/beneath the eye socket.

dental surgeon prescribed Ms A further antibiotics and told her to return to ED. He wrote a referral letter and provided X-ray images for her to take with her. Ms A recalled that she telephoned the ED, and was referred to the Dental Department, to be told that no one was available until the following day.

Fourth review at CCDHB

25. Ms A presented to the ED the following day, on 23 November 2018. She was seen by a senior dentist, Dr C. On examination, Dr C found slight infra-orbital swelling, seemingly associated with infection around tooth 22, and X-rays were taken. He recommended removal of this tooth, to which Ms A agreed, and this was carried out under local anaesthetic, with pus being drained from the socket during and after the procedure.

26. Dr C recommended that Ms A continue taking oral antibiotics and return for a review in three days' time, but return to ED if she had any problems over the weekend.

Fifth review at CCDHB

27. On 25 November 2018, Ms A attended ED as she felt shaky and unwell. She said that she had a persistent fever, heavy night sweats, an increase in oral pus, and an increase in left facial distortion and paresthesia,[11] along with a sense of pressure and swelling in her jaw.

28. Ms A was seen again by Dr D, who examined her in the ED waiting room. Dr D noted that Ms A had mild facial swelling, which was tender to palpation, and that the areas where her teeth had been extracted were healing well. Dr D suggested performing an incision to drain pus/relieve pressure, but Ms A declined this, electing to wait until her planned appointment in the Dental Department the following day.

29. Dr D acknowledged that the assessment in the ED waiting room was not an ideal setting. She stated:

> "ED was busy and the examination rooms were full so a decision was made to examine [Ms A] in the waiting room rather than transporting her to the back of the building and up 10 floors to the dental department for an examination. Given her history of chronic pain and inability to sit comfortably, this seemed like a more reasonable option at the time, but I apologise that she felt uncomfortable in this situation."

Sixth review at CCDHB

30. On 26 November 2018, Ms A returned to the Dental Department, where she saw a first-year dental house officer, Dr E. Dr E told HDC that she had observed Ms A's facial swelling previously on 23 November 2018 (on the day Ms A was treated by Dr C).

31. Dr E recorded that there had been a significant improvement in swelling compared to three days previously, and that this had completely cleared around the eye, although there was still slight swelling adjacent to the nose. She documented that intra-orally there was

[10] Upper left lateral incisor.
[11] Abnormal sensation of the skin (tingling or prickling, etc).

less inflammation, and that there was pus draining from the tooth 21 buccal sinus[12] and from the socket of tooth 22. Dr E told HDC that she asked Dr B for a second opinion, as she was unsure why there was still pus draining from the sockets, and Ms A was requesting a CT scan.

32. Dr B saw Ms A and prescribed her the antibiotic metronidazole 400mg twice daily for five days. He said that this was in line with hospital protocol. Dr B stated that he advised Ms A and her husband that at that stage, a CT scan would not alter or add to the clinical management or diagnosis, "as clinically the infection was localised to the anterior maxilla". Dr B arranged a follow-up appointment in two days' time.[13]

33. Ms A said that Dr B told her, "You are not going to die," and abruptly left the room. Dr B said that Ms A was "very anxious", and he recalls reassuring her that the infection was very unlikely to progress to the point where it would threaten her life. He said that as it was a busy outpatient clinic, he may have seemed rushed, and he apologised if this was the case.

26–28 November 2018

34. On the afternoon of 26 November 2018, Ms A saw her GP who referred her to have a CT scan performed privately. This was carried out on 27 November 2018, and the report concluded: "There is however evidence of bony destruction centred on the alveolar ridge[14] of the maxillary antrum[15] to the left of midline suggesting chronic infection at this site."

35. Ms A told HDC that she sought assistance from her dentist and made further enquiries about whether she could be seen at the DHB2 Dental Department, but there was a wait of six weeks for an appointment there.

Seventh review at CCDHB

36. On 29 November 2018, Ms A returned to the Dental Department at CCDHB and saw Dr C. Dr C recorded that he discussed with Ms A and her husband their concerns regarding antibiotics and their dosage, and Ms A's swelling and infection. Dr C said that he read the CT report, but "it did not tell [him] anything that [they] did not know before — that there was evidence of severe infection in the upper left anterior maxilla".

37. Dr C prescribed a further five-day course of metronidazole 400mg (three times daily) for Ms A, and planned to review her in a week's time. He noted that she requested the metronidazole thrice daily, and he was happy to prescribe this amount, but informed her that the recently changed CCDHB recommended dose was twice, rather than thrice, daily.

38. Dr C told HDC that re-referral to the Oral Maxillo-Facial Service at DHB2 was not indicated at that point, based on the previous decline to accept Ms A into its service, and her reduced facial swelling and improved clinical picture. Dr C also said that as the service is for acute care, it seemed that further referral as it became a more chronic condition also would have been declined.

[12] An abnormal channel that drains from a longstanding dental abscess.
[13] For reasons that are unclear, this did not occur until three days later.
[14] The alveolar ridge is a bony ridge that holds the sockets of the teeth.
[15] The maxillary antrum forms the inferior aspect of the lateral wall of the nose.

29 November 2018

39. Ms A, worried by her systemic symptoms, returned to the medical centre on 29 November 2018. She saw a GP who recorded: "[Ms A] looks very unwell, pus draining freely [from] upper jaw/2nd tooth extraction area — swab taken." The swab results confirmed "light growth of candida".[16]

Eighth review at CCDHB

40. The following day, on 30 November 2018, Ms A contacted the Dental Department again, as she was concerned about the ongoing infection. She was given an appointment that afternoon and saw Dr C, who recorded: "[E]xtra-oral infection resolving, intra-orally still some swelling." Dr C said that some further blood and pus was drained from the tooth 21/22 buccal region intra-orally with pressure. He stated that at that point Ms A was reluctant to undergo more invasive incision/drainage or curettage[17] of the affected area under local anaesthetic. He arranged to review her again the following week, and advised her to continue antibiotics for the time being.

41. Dr C told HDC that he recommended that Ms A see OMFS Dr B again, but Ms A declined this. This is not recorded in the clinical notes, and Dr C said: "I would not have put this in our clinical notes as she could well have seen him again at some point in the future." Dr C said that in hindsight he should have been more insistent, and would be in any similar situation, but at the time he did not wish to push Ms A against her wishes. He also said that he would record this in any future similar situation.

3–5 December 2018

42. On 4 December 2018, Ms A saw her GP who wrote a referral to DHB2, and Ms A self-presented to the DHB2 ED on 5 December 2018. She was seen in the DHB2 Dental Department by OMFS Dr F, who on examination noted that tooth 21 and 22 were missing, with the associated gums swollen and draining pus, and that an X-ray showed "moth eaten appearance with sequestrum[18]".

43. Shortly after the X-ray Dr F undertook surgery to debride[19] the area, and found a "large bony defect with multiple sequestra and granulation tissue[20]". Dr F also removed tooth 23. Ms A was diagnosed with maxillary osteomyelitis.[21]

Further information

Ms A

44. Ms A told HDC:

> "The outcome of this negligence — a sustained failure by the [CCDHB Dental Department] to recognize and appropriately treat a dental infection finally diagnosed

[16] Oral thrush.
[17] Removal of soft tissue using a curette (a surgical tool).
[18] A fragment of dead bone detached from the adjoining sound bone.
[19] Remove dead tissue.
[20] Tissue made up of granulations that temporarily replace lost tissue in a wound.
[21] Inflammation of the jaw bone, caused by infection.

> at the [DHB2 Dental Department] as maxillary osteomyelitis — has included: permanent loss of left facial and maxillary bone; loss of three upper front teeth (with a fourth extraction still possible); emergency surgery on 5 December 2018 at the [DHB2 Dental Department] to halt the infection's widespread and potentially fatal effects."

45. Ms A's motivation in making a complaint was to seek a review of the practices and procedures at CCDHB Dental Department, in particular around communication with patients and listening to their point of view, and making referrals in a timely manner (eg, to DHB2 Dental Department). She stated: "I would like an assurance, as far as one is possible, that the appalling situation in which I found myself … is unlikely to be repeated."

46. Ms A stated:

> "There is no doubt that the sustained absence of overview and senior expertise in an acute department primarily staffed by inexperienced juniors, with oral and maxillofacial expertise part-time or 'on call', was the cause of the potentially dangerous situation from which I finally extricated myself with the assistance of my GP."

47. Ms A said that she was not told of any decision, and there was no desire on her part, to preserve her teeth and thereby compromise the management of the infection.

Dr B

48. Dr B stated:

> "I apologise that [Ms A's] experience was traumatic, but I believe she was treated appropriately at each stage, although I acknowledge that we were unable to meet her expectations."

49. He commented that the attempt to retain teeth, and Ms A's clinical presentation, resulted in the protracted course of treatment.

50. Dr B provided HDC with an advice report from OMFS Dr G. Dr G was asked to give his view on the care Dr B provided to Ms A. Dr G advised that Dr B's care on 29 October 2018 was reasonable and appropriate, and he provided appropriate advice to Dr D. However, Dr G was concerned that DHB2 refused to accept Ms A as a patient that day. He commented that a CT scan and collection of pus at that stage would have been useful in the management of Ms A's infection, and considered that this would have been done had DHB2 not refused to admit Ms A.

51. Dr G advised that on 26 November 2018, a CT scan was not necessary to make a diagnosis of osteomyelitis (as there was sufficient evidence clinically and radiographically to make the diagnosis). Therefore, he was not critical of Dr B for not referring Ms A for a CT scan at that time. Dr G commented that Dr B's plan for follow-up in two days' time to review the efficacy of antibiotics was reasonable.

52. Dr G stated that unfortunately, it is likely that successful control of Ms A's infection would have resulted in removal of teeth 21, 22, and 23, and that a desire to conserve teeth in the

presence of ongoing infection was likely to have influenced decisions about the most appropriate treatment.

53. Dr G said that there need to be clear guidelines for patient management so that patients are not moved from one dentist to another, and he advised that there should be an overall view from senior staff of the progress of patients through the department. Dr G noted that Ms A's treatment consisted largely of periodic responses to crises rather than a carefully instituted treatment plan.

Dr C

54. Dr C stated:

> "At the CCDHB we deal regularly with facial swellings caused by dental abscesses, which almost always resolve once the cause is removed i.e. tooth extracted. Occasionally there are cases of delayed healing and/or chronic infection, which can only be picked up as they run their course. Regarding [Ms A's] final diagnosis, I do not know if she was diagnosed with osteomyelitis, or delayed healing/necrotic bone/sequestrum, but these cases are rare and unusual, and difficult to diagnose, usually after more common causes are eliminated, which does take time. I understand these are treated with antibiotics and/or surgery, which is what we at CCDHB started, and it appears the [DHB2] dental department/regional on-call maxillofacial service finished."

Responses to provisional opinion

55. Ms A, CCDHB, Dr B, and DHB2 were given an opportunity comment on relevant sections of the provisional opinion.

56. CCDHB, Dr B, and DHB2 did not have any comments to make on my provisional findings. CCDHB provided comments on my provisional recommendations. These are reflected in the recommendations section at the end of this opinion.

57. In her response, Ms A reiterated her grave concerns about her experience with the CCDHB Dental Department. She described the ongoing discomfort, nerve damage, and difficulty eating she experiences as a result of the removal of her three teeth and bone loss from the infection.

58. Ms A asked that I reflect her comments in this report that she has nothing but praise for the DHB2 Dental Department's empathy, skill, and professionalism.

Opinion: Capital & Coast District Health Board — breach

Introduction

59. Ms A presented to CCDHB eight times in a five-week period for both scheduled and unscheduled reviews of her ongoing dental infection. Ms A eventually sought assistance

from her GP to obtain a CT scan, and then she self-presented to DHB2 on 5 December 2018, where she underwent debridement surgery and was diagnosed with osteomyelitis.

60. Ms A's experience at CCDHB highlights the importance of critically assessing the reasons behind a consumer's repeated presentations to hospital with a non-resolving infection, and providing appropriate care in that context. I have concerns about how Ms A's care was coordinated, and about the overall standard of care she received from CCDHB.

Coordination of care

61. Ms A was reviewed eight times in relation to her ongoing infection. Four of her presentations to ED were unscheduled, and four were follow-up or scheduled appointments in the Dental Department. On most occasions she was seen by first-year dental house officers. OMFS Dr B was involved in her care twice, and a senior dentist, Dr C, reviewed her on three occasions. It is apparent that no senior person in the Dental Department had clear oversight of Ms A's case and her repeated presentations.

62. My independent OMFS expert advisor, Dr Brian Whitley, commented:

> "Continuity of care in such situations is very important for consistency and for monitoring any improvement or deterioration in the patient's condition. This is often difficult to achieve when senior staff are part-time, as in [Dr B's] case. Over the four weeks of treatment, [Ms A] was essentially seen and managed at Dental House Surgeon level."

63. Similarly, my independent dental expert advisor, Dr Andrea Cayford, recognised that no one was taking overall charge of Ms A's care, and that a lack of appropriate resources was evident. Dr Cayford stated:

> "There seems to be a lack of cohesion of care. There is a hierarchy of abilities but it is very reactive care rather than looking at the big picture and having one person who is overall responsible for the patient. [Ms A] was seen by several clinicians over the duration of care. They did communicate but no one seemed concerned that [Ms A] still had active infection with blood and pus still draining after the loss of two teeth and several courses of antibiotics. Radiographically the lesion was almost non-existent initially, a month later it was very large. [Ms A] was not responding to the treatment. She needed to be treated by a specialist clinician earlier than she was."

64. Dr B's advisor, Dr G, also noted that Ms A's treatment consisted largely of periodic responses to crises rather than a carefully instituted treatment plan.

65. I agree with these assessments. I am concerned that despite repeated presentations with an active infection, Ms A's reviews were generally conducted by junior staff. There was no coordinated plan of care directed by a senior staff member, and each presentation appeared to be managed in isolation, rather than with overall consideration of Ms A's non-resolving issues. Ms A had four unplanned presentations to ED, and four scheduled appointments in the Dental Department for the same ongoing issue. I would expect CCDHB's system to operate in such a way that a patient who has attended numerous times

with the same issue would be afforded continuity of services (for example, by having one person assigned to oversee, monitor, and plan the patient's care). I am not satisfied that this occurred in Ms A's case. In my view, this meant that CCDHB did not provide quality and continuity of services to Ms A, and accordingly I find that CCDHB breached Right 4(5) of the Code of Health and Disability Services Consumers' Rights (the Code).[22]

Standard of care

66. There were multiple instances during Ms A's engagement with the dental services at CCDHB where she was not provided with care of an appropriate standard. These are discussed below.

Treatment for bone loss

67. Dr Whitley explained that periapical radiographs that had been taken on 27 and 29 October 2018 showed an "abnormal, lytic appearance[23] of the bone over an extensive area in relation to teeth 21, 22 and 23". He also noted that Ms A had a negative cold response in teeth 22, 23, 24 and 25, which would indicate the potential for a more wide-spread infection. He commented: "[I]t does not appear the significance of this finding has been recognised." Dr Whitley was concerned that it was not until the CT scan was taken (in private, on 27 November 2018) that the presence of osteomyelitis involving necrotic destruction of bone was recognised by any staff in the Dental Department. He was also critical that there was an eight-day delay between when the CT scan results were available, and the eventual debridement of the area.

68. Dr Cayford also commented that on 29 November 2018, when Ms A presented with pus still draining, Dr C needed to reassess the treatment that had been given. Dr Cayford stated: "The apparent cause of the infection had been removed (two teeth by now and a root filling) but the infection remained and needed to be drained." Dr Cayford considered that giving a further course of oral metronidazole was "possibly insufficient" given the amount of bone loss indicated on CT scan. In Dr Cayford's opinion, Dr C needed to be insistent that Ms A seek more advanced care than he could provide. Dr Cayford said that this would be seen as a mild to moderate departure from accepted practice, taking into account the duration of time Ms A was being cared for under CCDHB, the number of appointments where she had pus visibly draining, and the amount of bone lost in a short space of time.

69. I note that Dr C explained that he advised Ms A that she should see Dr B again, but she declined this. This recommendation is not recorded in the notes, and I acknowledge that Dr C said that in hindsight, he should have been more insistent. I am therefore unable to conclude with certainty what Dr C recommended to Ms A. In my view, this would be important and useful information to include in the clinical record, and I note Dr Cayford's opinion that if a patient refused treatment or referral to a more senior clinician, this needed to be recorded.

[22] Right 4(5) states that "[e]very consumer has the right to co-operation among providers to ensure quality and continuity of services".
[23] Softened section of bone.

70. I accept the advice of my advisors. It is concerning that despite there being information available showing the involvement of bone loss as early as 27 October 2018, osteomyelitis does not appear to have been considered as the cause of Ms A's ongoing symptoms. I am critical that once CCDHB staff had the CT scan results, debridement to treat osteomyelitis was not initiated in a timely manner, and Ms A had to approach another hospital, where this was carried out.

Failure to arrange CT scan

71. Ms A approached her GP on 26 November 2018, and was referred for a private CT scan, which was carried out the following day. She was not referred for a CT scan by any CCDHB clinicians.

72. Regarding the timing of arranging a CT scan, Dr Whitley advised:

> "Given the protracted course of this infection, with multiple presentations to various clinicians over several weeks, a CT scan should have been arranged weeks earlier through the Radiology Department at CCDHB or, preferably, upon [Ms A's] acute admission for treatment on 29 October 2018 at [DHB2], had her transfer been accepted. This is especially the case given the abnormal, lytic appearance of the bone over an extensive area in relation to teeth 21, 22 and 23 on the peri-apical radiographs taken on 27-10-19 and 29-10-19."

73. Dr Whitley stated:

> "It is not acceptable or appropriate, in my opinion, for the patient to have to arrange her own CT scan in the private sector, almost a month following her initial presentation with a significant odontogenic infection."

74. In Dr Cayford's view, Ms A's initial presentation did not indicate that a scan should be carried out, and she noted that most oral swellings are resolved quickly and completely with the removal of a tooth and use of antibiotics. Dr Cayford commented:

> "It is difficult to say if a scan should have been done earlier. Each time the patient presented a logical treatment was provided. However the continuing nature of the infection and number of teeth involved would mean your level of caution needs to be high and a scan would be an obvious next step. I would suggest a scan should have been considered by the appropriate person (even if that meant a referral) within a day/s of having tooth 22 removed. Sometime after 24/11/18."

75. Dr G considered that a CT scan would have been useful on 29 October 2018, but that by 26 November 2018, a CT scan was not necessary to make a diagnosis of osteomyelitis (as there was sufficient evidence clinically and radiographically to do this).

76. I acknowledge that Drs Whitley and Dr G have a different view to Dr Cayford on exactly when a CT scan should have been carried out. What is clear is that a CT scan should have been arranged for Ms A at some point while she was under CCDHB's care, and she should not have had to arrange this for herself in the private sector after six reviews at CCDHB and grave concern about her ongoing symptoms. I agree with Dr Cayford's comment about

the CT scan: "Maybe it didn't show what they didn't already know but after a month of unresolved infection it is important to get as much information as possible."

Testing and choice of antibiotics

77. Initially, Ms A was prescribed courses of amoxicillin to treat her infection, and on 26 November 2018, at her sixth review, Dr C prescribed a different antibiotic, metronidazole, for the first time. Dr Cayford advised that it would have been appropriate to change to this antibiotic earlier, and noted that one must always consider altering the drug being used if the patient is slow to respond or is becoming worse. She stated:

> "Metronidazole is a very appropriate drug of choice for this type of infection. It could have been used concurrently with what she was already on. One of the clinicians should have considered this earlier ... In private practice if a course of Amoxicillin or Augmentin was not resolving the infection a course of metronidazole would be considered early."

78. Dr Whitley noted that a pus swab was not taken at the time of incision and drainage on 29 October 2018, in line with standard practice. He advised:

> "A gram stain[24] would have identified the likely micro-organisms involved in this infection and therefore the most appropriate antibiotics to target them. The antibiotics may have then required alteration depending upon the results of the microbiological culture and sensitivity."

79. In Dr Whitley's view, an opinion from a microbiologist would have been valuable in terms of identifying and targeting with antibiotics the specific micro-organisms involved, and it would have assisted in establishing the correct diagnosis of osteomyelitis, based on the microorganisms cultured.

80. Dr G also noted that a pus swab had not been taken, and considered that this would have been useful in Ms A's management.

81. I agree. In my view, a pus swab should have been taken during Ms A's 29 October 2018 presentation, to assist in identifying the appropriate antibiotics to target her infection. I also accept Dr Cayford's advice that metronidazole should have been considered at an earlier stage.

Conclusion — standard of care

82. Ms A had the right to have services provided to her with reasonable care and skill by CCDHB. She was seen on eight occasions over the course of her treatment at CCDHB, by Dental Department staff who had widely varying levels of skill and experience. I consider that, at an organisational level, CCDHB had overall responsibility for the actions of the multiple Dental Department staff who were involved in Ms A's care. While I acknowledge Dr C's comment that cases such as Ms A's are rare and difficult to diagnose, and that usually diagnosis occurs after more common causes have been eliminated, I am not

[24] A method of distinguishing bacterial species.

satisfied that CCDHB provided services to Ms A with reasonable care and skill for the following reasons:

a) Despite there being information available showing the involvement of bone loss as early as 27 October 2018, osteomyelitis does not appear to have been considered as the cause of Ms A's ongoing symptoms by any of the staff involved in her care. Once CCDHB staff had the CT scan results, debridement to treat osteomyelitis was not initiated in a timely manner, and Ms A had to approach another hospital, where this was carried out.

b) A CT scan should have been arranged for Ms A at some point while she was under CCDHB's care, and she should not have had to arrange this for herself in the private sector.

c) A pus swab was not taken on 29 October 2018, and metronidazole should have been considered earlier in Ms A's treatment.

83. Accordingly, I find that CCDHB breached Right 4(1) of the Code.[25]

Other comments

Referral to DHB2 on 29 October 2018

84. In my view, it was appropriate for Dr B to attempt to refer Ms A to the Regional Oral and Maxillofacial Service at DHB2 on 29 October 2018. It is concerning that this referral was declined on the basis of workload at DHB2. I am not critical of CCDHB that the referral was declined. I have made recommendations to the service, which are set out at the end of this report.

Care provided by Dr D

85. Dr D saw Ms A during her second, third, and fifth reviews at CCDHB. Dr Cayford commented that Dr D arranged follow-up care for Ms A either at the Dental Department or privately as appropriate. Dr Cayford said that "[Dr D] attempted to get good care for the patient and asked advice frequently".

86. On 25 November 2018, Dr D assessed Ms A while she was in the ED waiting room because there was no available space in the ED, and this was preferable to taking Ms A to the Dental Department ten floors away. Dr Cayford commented that Dr D's examination and consultation in the ED waiting room would be seen as inappropriate by her peers, and a mild departure from the acceptable standard of care. She stated:

> "[T]he exam/consult was done in the waiting room due to a lack of suitable venue. As a [first] year house officer [Dr D] would probably have little control over the environment she works under. In the described circumstances she appeared to do her best."

[25] Right 4(1) states that "[e]very consumer has the right to have services provided with reasonable care and skill".

87. Dr D has reflected on this incident, provided an explanation for why she conducted the review in the ED, and apologised that Ms A found this uncomfortable. I consider this is appropriate in the circumstances.

Other matters

88. Dr Cayford noted that it may have been useful for chlorhexidine mouthwash to be initiated by CCDHB, in order to keep Ms A's mouth as free of bacteria as possible. Dr Cayford noted that this was not commenced until Ms A was seen at DHB2.

89. Dr Cayford also commented that photographs may have been useful and easy to record the various stages of Ms A's intra- and extra-oral swelling. She noted that these could have been sent to the Regional Oral and Maxillofacial Service in an attempt to get an earlier appointment.

90. I agree that both of these things would have been beneficial in Ms A's case.

Opinion: Dr B — no breach

91. Dr B saw Ms A for the first time in the Dental Department after hours on 29 October 2018, along with Dr D. At that time, Dr B attempted to refer Ms A to the Regional Oral and Maxillofacial Service at DHB2, but the referral was declined on the basis of workload, and they were advised to carry out treatment under local anaesthetic at CCDHB. Accordingly, Dr B incised and drained the abscess and placed a drain in situ. Ms A remained in hospital on IV antibiotics until 31 October 2018, and Dr B agreed for Ms A to be discharged that day with a plan to remain on amoxicillin and to attend an outpatient review appointment, which occurred on 2 November 2018.

92. My independent expert advisor, OMFS Dr Brian Whitley, commented that Dr B's assessment of Ms A on 29 October 2018 was adequate, and that the decision to discharge Ms A with a scheduled outpatient appointment was appropriate, as there was no evidence of deterioration in her condition.

93. Regarding Dr B's treatment of Ms A on 29 October 2018, Dr Whitley commented:

> "I believe that it was appropriate. Through no fault of his own, however, the incision and drainage under Local Anaesthetic alone was probably inadequate. Dr B was placed in a position where he had little option but to undertake urgent surgical drainage of the left maxillary space infection under local anaesthetic alone. The on-call Oral and Maxillofacial Surgery Service at [DHB2] had refused to accept [Ms A] as an acute admission from [CCDHB], on the basis of work-load. More aggressive exploration with bone biopsy and debridement, preceded by a CBCT[26] scan, to guide the surgery, would have been preferable."

[26] Cone beam computed tomography scan.

94. I accept Dr Whitley's advice, and I consider that the assessment and treatment of Ms A by Dr B during his first period of involvement in her care was appropriate, particularly in the circumstance of his referral to the Regional Oral and Maxillofacial Service being declined.

95. Dr B was next involved in Ms A's care on 26 November 2018, when dental house officer Dr E requested a second opinion from him. By then it was Ms A's sixth presentation to CCDHB. Dr E had found a significant improvement in Ms A's swelling compared to three days prior, but there was still pus draining from the sockets, and Ms A was requesting a CT scan. Dr B prescribed metronidazole and advised Ms A and her husband that at that stage, a CT scan would not alter or add to the clinical management or diagnosis. He arranged a follow-up appointment in the Dental Department in two days' time.

96. Initially, Dr Whitley was critical that Dr B did not arrange a CT scan for Ms A on 26 November 2018, because there was clearly clinical evidence of a persistent ongoing infection, with swelling and discharge. However, after reviewing Dr B's response to his initial advice and Dr G's report (in which Dr G disagreed that a CT scan was necessary for the diagnosis of osteomyelitis), Dr Whitley accepted that the decision to request a CT scan and its timing is a judgement call. He noted that inevitably there will be differences in opinion on how an individual patient should be managed.

97. I accept that there are differing views on whether a CT scan on 26 November 2018 would have been beneficial by that time. Overall, I consider that Dr B's approach of prescribing a different antibiotic (metronidazole) and arranging a follow-up appointment in two days' time was not unreasonable. I have outlined my views on the failure to seek a CT scan in the earlier phase of Ms A's infection, in the opinion section of this report relating to CCDHB.

98. I note Dr Whitley's concluding comments about Dr B's care:

> "[I]n my opinion, [Ms A's] care was compromised due to a systems failure and not due to any decisions made or treatment offered by [Dr B]. He was acting in an advisory capacity, offering the appropriate advice and treatment when required. He was not [Ms A's] admitting Surgeon, with ultimate responsibility on a day-to-day basis. At all times, [Dr B] behaved in a professional manner and his treatment was appropriate. He met the accepted standard of care, for an Oral and maxillofacial Surgeon, on each occasion he was involved in [Ms A's] management."

99. Overall, I find that Dr B did not breach the Code in respect of the care he provided to Ms A.

Opinion: DHB2 — adverse comment

100. On 29 October 2018, Ms A attended CCDHB for the second time, with increased left-sided facial pain and swelling that had become periorbital. She had had tooth 21 extracted under local anaesthetic two days previously, had received IV antibiotics, and was part-way through a five-day course of amoxicillin.

101. Ms A was seen on the evening of 29 October 2018 by first-year dental house officer Dr D and consultant OMFS Dr B. Dr D stated:

> "Due to the size of the swelling and orbital involvement, the on-call OMFS at [DHB2], [Dr F], was contacted for treatment and further management of [Ms A] at [DHB2]. However, they did not accept the patient due to high work load and we were advised to carry out the treatment in the department afterhours under [local anaesthetic]."

102. Dr B told HDC that he made the call to DHB2, and his request for transfer/admission of Ms A was declined directly. He said, "I did not, and do not, have the authority to have altered the decision," and noted that CCDHB does not have admission rights to DHB2. DHB2 confirmed that the referral process requires consultant-to-consultant discussion about patient management, and stated that there is an expectation that if a patient's treatment can be undertaken safely by an OMFS in their home DHB, then this is the first choice of treatment modality.

103. Dr D then performed a pulpectomy on tooth 23, which confirmed the tooth to be non-vital, and Dr B incised and drained the abscess and placed a drain in situ.

104. Over a month later, on 5 December 2018, Ms A was seen at DHB2, when she self-presented to its ED. She was operated on by Dr F, who found a "large bony defect with multiple sequestra and granulation tissue".

105. My independent expert advisor, OMFS Dr Brian Whitley, commented:

> "I have grave concern about the inability of [Dr B's] team to arrange an admission to [DHB2] under the care of the Oral and Maxillofacial Surgery Service for admission, appropriate intravenous antibiotic and supportive management, imaging in terms of a CT scan of the face and jaws, appropriate blood tests and exploration with aggressive incision and drainage and irrigation under general anaesthetic."

106. Dr Whitley considers that DHB2 should have accepted Ms A's referral from CCDHB as if she had presented directly to the ED at DHB2.

107. Similarly, my independent expert advisor, dentist Dr Andrea Cayford, stated that accepted practice would have been for Ms A to see the specialist at DHB2 earlier, because it appears that the specialist there had the skills and knowledge to carry out the correct diagnosis and treatment.

108. Dr G was concerned that DHB2 refused to accept Ms A as a patient, and commented that a CT scan and a collection of pus at that stage would have been useful in the management of Ms A's infection. Dr G considered that this would have been done had DHB2 not refused to admit Ms A.

109. I acknowledge DHB2's statement that there is an expectation that if a patient's treatment can be undertaken safely by an OMFS in their home DHB, then this is the first choice of treatment modality. I do not dispute that Dr B and Dr D were able to carry out the treatment recommended by DHB2 safely at the CCDHB Dental Department. However, it is

clear that Dr B was seeking more specialised treatment than he considered CCDHB could provide, and this was declined, in part because of DHB2's workload. Dr B's concern that the referral was declined is endorsed by three expert advisors. I share that view, and am concerned that the referral for specialist input was not accepted by DHB2.

110. I support the initiative of the Central Region DHBs in recruiting an additional surgeon to the service, to be the lead after-hours provider in the region.

Changes made since these events

111. CCDHB advised that the following actions and learnings have been undertaken as a result of Ms A's experience:

a) Discussion has occurred at team level regarding clear communication around procedures with patients, and considering the response when a patient declines to be seen by a recommended clinician.

b) In recognition of the rareness in presentation of osteomyelitis, an OMFS ran a training session on osteomyelitis during an in-house dental seminar in September 2019.

c) Ms A's case has been used as a teaching opportunity for the Dental and Oral Health Service. Two training sessions were held, covering acute OMF diagnosis and treatment, including infections.

d) There is an ongoing weekly clinical session for dental house officers, with all senior staff present, where cases can be presented and advice sought.

e) The leadership team of the Central Region DHBs has recently agreed to changes to the regional Oral and Maxillofacial Service, and recruitment for an additional surgeon position is being commenced by DHB2, as the lead after-hours provider to the region.

Recommendations

112. CCDHB confirmed it would comply with my proposed recommendations and I have incorporated CCDHB's feedback and suggestions in the below recommendations. I note that CCDHB has taken a number of initiatives to improve its services in response to Ms A's complaint. Taking these into account, I recommend that CCDHB:

a) Provide a written apology to Ms A for the failings identified in this report. The apology should be sent to HDC, for forwarding to Ms A, within three weeks of the date of this report.

b) Provide a further training session to Dental Department staff on the management of odontogenic infections. This should cover obtaining pus swabs and the use of different types of antibiotics.

c) Have the dental and microbiology services consult with each other about Dr Whitley's recommendation that the microbiology service routinely be advised of all cases of serious odontogenic infections.

d) Make explicit the expectation that any presentations that are unusual/out of the ordinary, including non-resolving infections, will be brought to the weekly clinical sessions for discussion, and implement guidelines for this.

e) Establish a process for a single senior Dental Department staff member to oversee the management plan for patients who repeatedly present with unresolved issues.

f) Include guidance for the diagnosis, treatment, and management of non-resolving/ recurrent odontogenic swelling in the house officer orientation booklet, and ensure that this is discussed during orientation.

g) Provide feedback to HDC, within three months of the date of this report, on the implementation of recommendations b) to f).

113. I recommend that the Regional Oral and Maxillofacial Service consider, in consultation with DHBs in its region, whether any further changes to its service are necessary in light of the circumstances in which Ms A's referral was declined on 29 October 2018, including whether written guidelines are required for referrals to its service. Feedback on this recommendation should be provided to HDC within three months of the date of this report.

Follow-up actions

114. A copy of this report will be sent to DHB2.

115. A copy of this report with details identifying the parties removed, except CCDHB and the experts who advised on this case, 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.

116. A copy of this report with details identifying the parties removed, except CCDHB and the experts who advised on this case, will be sent to the Dental Council of New Zealand and the New Zealand Dental Association. The Dental Council will be advised of Dr B's name in covering correspondence, for the purpose of advising the outcome of the investigation into Dr B's care.

Appendix A: Independent advice to the Commissioner

The following expert advice was obtained from a general dentist, Dr Andrea Cayford:

> "I have been asked to provide an opinion to The Health and Disability Commission on case C19HDC00256. Patient: [Ms A]/Dentists: [CCDHB] Dental and Oral Health Department specifically [Dr D] and [Dr C]. I have read and agree to follow the 'Guidelines for Independent Advisors'.
>
> I am a General Dentist. I graduated from Otago University Dental School in 1983. In my first year I worked as a Dental House Surgeon at Christchurch Public Hospital. Since then I have worked in several practices in London and New Zealand. For the last 28 years I have been part of a large group practice in New Zealand.
>
> **Documents Provided**
>
> Letter of complaint dated 12 February 2019
>
> Capital and Coast DHB's response dated 10 April 2019 including input from [Dr B], [Dr C] and [Dr D]
>
> Clinical records from Capital and Coast DHB covering the period 21 October 2018 and 31 October 2018, including:
>
> Oral radiograph images of [Ms A] taken 27 and 29 October 2018 and 22 and 23 November 2018
>
> Results of [Ms A's] CT scan taken 27 November 2018 at [the radiology service]
>
> Clinical records labelled [CCDHB] 27/10 18 to 25/11/18
>
> **Outline of Treatment**
>
> [Ms A] is [woman in her seventies] with some previous medical conditions in particular cardiomyopathy and chronic pelvic pain. On 27 October 2018 she went to her usual dentist presenting with pain in the upper left hand side (LHS) of her mouth. He diagnosed a dental abscess due to a non-vital tooth 21 and commenced root canal therapy. He was however unable to progress as he wanted due to a difficult canal to negotiate and so referred her to a specialist. Two days later when she developed swelling and eye pain she went to [CCDHB] Dental Department ([DD]). Tooth 21 was found to be tender to tap had pus discharge from the gingival margins, deep pocketing between the tooth and the gingiva and was mobile. Tooth 21 was extracted at [CCDHB] DD. She was admitted to hospital and given IV amoxicillin antibiotic. The next day her symptoms had improved and she was discharged with oral amoxicillin.
>
> On 29th October 2018 she presented again to [the] DD with increased swelling upper LHS and difficulty in opening her left eye. She was uncomfortable and felt unwell. She was also seen by ophthalmology and they found no eye problems. Tooth 23 was now tender to tap and appeared to be non-vital. Tooth 23 was opened this confirmed the diagnosis of a non-vital pulp. Tooth 23 was cleaned and dressed. The swelling above

this tooth was drained and a drain placed. She was kept in for two nights and placed on IV Augmentin.

[Ms A] was discharged on 31 October 2018. The swelling was still present but had diminished.

On 22 November she had the root canal treatment at 23 completed by her general dentist as instructed. However the patient still had some swelling, some pus in the area of 21 socket and tooth 22 was now loose. An x-ray revealed a large radiolucent area above teeth 22 and 23. The dentist prescribed amoxicillin and told her to go back to [the] DD.

On 23 November she had tooth 22 removed at [the] DD.

On 25 November [Ms A] felt generally unwell with a fever increased swelling in the upper LHS of her mouth and some paraesthesia. No treatment was given although she was offered to have the area drained again which she declined. She continued to take antibiotics.

On 26 November [Ms A] returned to [the] DD. Her symptoms of pain, draining pus and swelling persisted. Her recent course of antibiotics was complete. She was given Metronidazole antibiotic and requested a CT scan. This was denied and she opted to have it done privately. The scan indicated '… evidence of bony destruction centred on the alveolar ridge of the maxillary antrum to the left of the midline suggesting chronic infection at this site' as reported by the radiologist.

[Ms A] was unable to get satisfactory care at [the] DD. On 5 Dec she presented at [DHB2] ED and is referred to [the Dental Department]. An extensive debridement surgery is carried out. The surgeon names the presenting appearance of the lesion as osteomyelitis.

[Ms A] has lost three teeth and some bone. She has a bony defect and lacking some lip support in the area.

Of note tooth 21 appeared to have had two existing restorations (fillings). Teeth 22 and 23 had had no previous dental work. There does not appear to have been a known history of trauma to the area.

Issues Requiring a Response

Overall care and Appropriateness of Treatment by [Dr D]

The treatment/care for [Ms A] by [Dr D] at Dental and Oral Health Department (DOHD) was from 29/10/18 to 29/11/18. On 29/11/18 [Ms A] presented with swelling and the left eye was closed. This followed the extraction of tooth 21 days ago. [Dr D] discussed the case with [Dr B] (OMFS). They both reviewed her after hours due to a heavy work load. [Dr D] also contacted an OMFS at [DHB2] due to the size of the swelling and the orbital involvement. [DHB2] didn't have the resources to see [Ms A] and advised [Dr B] and [Dr D] to drain the swelling and remove any infection from

non-vital tooth 23. Tooth 23 was opened, cleaned and dressed and an incision was made above the tooth and infection drained and a drain inserted. When the patient was discharged 31/10/18 the symptoms had reduced somewhat.

When [Dr D] saw the patient on 2/11/18 the swelling was continuing to reduce in size. The drain was removed and she was referred back to her dentist for definitive care. However the patient did not feel well and asked to see a specialist according to [Ms A]. This is in contrast to [Dr D's] notes which say [Ms A] was understanding about the swelling resolving on its own.

The next time [Dr D] saw [Ms A] was 25/11/18 when she presented with mild LHS facial swelling. She was seen in the waiting room of ED as all rooms were full. [Ms A] had been given oral Amoxil on 23/11/18 when tooth 22 was removed. [Dr D] sought advice from '[Dr E], [Dr C], HS and SMO' (See notes labelled [public] Hospital). They agreed that IV antibiotics were not warranted as the swelling was minor. [Dr D] offered to incise and drain the infection but this was declined.

[Dr D's] clinical care for [Ms A] appears to be adequate. It is unusual for several teeth to become non-vital at the same time. It is unusual for infection not to respond to extraction of the teeth concerned and antibiotics. [Dr D] sought a second opinion most times she attended to [Ms A]. She consulted with [Dr B] on 29/10/18 and worked with him treating [Ms A]. On 25/11/18 she consulted with Dr E and [Dr C]. [Dr D] attempted to get help with her care for [Ms A] from a more senior clinician. [Dr D] drained tooth 23 when required. She arranged follow up care for the patient either at DOHD or privately as appropriate. [Dr D] attempted to get good care for the patient and asked advice frequently. She tried to get care for the patient at [DHB2].

The appropriateness of her care for [Ms A] breached accepted practice when she examined and consulted the patient in the ED waiting room. This is a breach of privacy and would be seen as inappropriate by my peers. It would be seen as a mild departure from acceptable standard of care.

[Ms A] describes [Dr D's] care as inadequate. [Ms A] said her concerns were rejected and [Dr D] didn't appear to listen. There may be some communication issues that [Dr D] could improve on. The clinical notes labelled '[public] Hospital' attempt to describe the clinical situation, presentation of the patient, any discussions with the patient and the treatment [Dr D] carried out. [Dr D] also notates when she asked for advice from senior clinicians.

The care provided indicates a lack of resources. On 29/11/18 [Dr D] treated [Ms A] afterhours due to a heavy work load. On 25/11/18 the exam/consult was done in the waiting room due to a lack of suitable venue. As a second year house officer [Dr D] would probably have little control over the environment she works under. In the described circumstances she appeared to do her best. It was unfortunate that [Ms A] did not respond to the dentistry that [Dr D] helped provide.

Overall my peers would view the care [Dr D] provided as adequate under the circumstances. [Dr D] endeavoured to get good care for [Ms A] under a difficult clinical setting for a challenging clinical case.

Overall care and Appropriateness of Treatment by [Dr C]

[Dr C] met [Ms A] for the first time 23/11/18. She was referred in by her general dentist due to a radiolucent area on a radiograph at tooth 22, some pus in the area and some mild swelling. Tooth 22 was non-vital and loose. [Dr C] recommended extraction of this tooth and this was consented, pus was drained and the patient was instructed to continue on the antibiotics. Tooth 22 looked like a good tooth with no previous dental history.

The standard of care with any oral infection is to find the cause of the infection, remove the cause of the infection and if possible drain any infection in the tissues or from the tooth. On 23/11 [Dr C] concluded the cause of the infection was tooth 22 and he removed it. There is no alternative treatment option with a moderately mobile tooth other than extraction.

It is unusual to have two teeth requiring removal within the space of a month and a third tooth requiring a root filling. He did enquire about a history of trauma in an attempt to explain this. He expected that the removal of this infected tooth 22 would result in resolution of the active infection. This would be seen as acceptable standard of care. This clinical notes for this appointment are adequate.

[Dr D] consulted [Dr C] 25/11/18 when [Ms A] presented with ongoing swelling. He recommended that [Ms A] continue with the oral antibiotics. As the symptoms were described as minor this was appropriate. The patient declined having the area drained at this time.

When [Dr C] saw [Ms A] 29/11/18 the patient had improved somewhat. There was no evidence of swelling extra orally however there was still blood and pus draining intra orally. She had had a CT scan done 27/11/18. He suggested the scan didn't show anything he didn't already know and gave a further course of metronidazole which had been started 26/11/18.

On 30/11/18 [Dr C] saw [Ms A] who had pus continuing to drain. He offered to incise and curette the area and she declined. There are no clinical notes of this appointment. She said he '… applied lengthy painful pressure without LA to extract blood and pus …'. He suggested she see [Dr B] however [Ms A] did not want to. She said he wondered about a tooth fragment and didn't take an x-ray. The scan didn't mention a tooth fragment so there was probably no need for an x-ray as this had been superseded by a scan. The teeth were straightforward extractions so a tooth fragment would be very unlikely. There is a possibility he felt or saw a bony fragment.? There are no clinical notes on the treatment provided by [Dr C] on 30/11/18. There are no notes to indicate he wanted her to see [Dr B]. [Dr C] arranged to see her in 1 week. However by then she had had surgery at [DHB2].

In the period of time 25/11 to 30/11 [Dr C] was aware of the size of the bony defect and that [Ms A] was not responding quickly to antibiotics. By this time [Ms A] had had some symptoms for around 30 days. She still had blood and pus draining from the sockets.

On 29/11 when [Ms A] presented with pus still draining [Dr C] needed to reassess the treatment given. The apparent cause of the infection had been removed (two teeth by now and a root filling) but the infection remained and needed to be drained. If the patient refused treatment or a referral to a more senior clinical this needed to be recorded. Giving her a further course of oral metronidazole which she had been on already for 3 days was possibly insufficient. She had a scan by now which indicated the amount of bone loss. There is nothing in the clinical notes to indicate she declined care or that he wanted to refer her to [Dr B] OMFS. [Dr C] needed to be insistent that she seek more advanced care than he could provide. If it's not recorded in his notes that she declined care and a referral then it may not have happened. The lack of referral in a timely manner would be viewed as a mild–moderate departure from accepted practice by my peers. This consideration takes into account the duration of the time she was being cared for under [CCDHB] the duration of time and number of appointments when she has pus visibly draining and the amount of bone lost in a short space of time.

My peers would disapprove of the lack of clinical notes by [Dr C] for 30/11/18. This would be seen as a mild departure from accepted practice. In his written statement for 30/11/18 he states twice '… from memory …' indicating he has no notes to refer to.

CT scan

I have been asked to comment on whether [Ms A] should have had a CT scan earlier. Her initial presentation did not indicate a scan should be carried out. Most oral swellings are resolved quickly and completely with the removal of a tooth and use of antibiotics.

It is difficult to suggest when and if a CT scan should have been carried out earlier than it was. It would be assumed everything would settle after the removal of tooth 21. When the swelling continued and became extensive on 29/10/18 they were able to determine a non-vital tooth 23 and treat that. Again assuming everything would now settle.

Over the next few days indeed the swelling did appear to reduce in size.

However when the patient presented 23/11/18 with a third tooth involved and pus draining should a scan have been considered here? The treatment [Dr C] carried out was logical. He arranged to see her in 3 days. Given the ongoing nature of the swelling, the number of teeth involved, the various courses on antibiotics he should have arranged to see her the next day. If there was little/no resolution this would be the time to review the approach and increase the level of care.

If [Dr C] did not want to make the call to have a CT scan on 24/11/18 'the next day' as I have suggested he should have referred her to a specialist then. Due to the hospital situation it is probable that the request for a CT scan must come from an OMFS. So a referral needed to be done and noted at this time.

[Ms A] was seen on 26/11/18 by [Dr E] who asked [Dr B] to attend. This would have been an opportunity to consider a CT scan.

It is difficult to say if a scan should have been done earlier. Each time the patient presented a logical treatment was provided. However the continuing nature of the infection and number of teeth involved would mean your level of caution needs to be high and a scan would be an obvious next step. I would suggest a scan should have been considered by the appropriate person (even if that meant a referral) within a day/s of having tooth 22 removed. Sometime after 24/11/18.

Treatment by Dental and Oral Health Department

Overall there seem to be issues with the care provided for [Ms A]. They compound to describe an unsatisfactory treatment provision for this patient.

There seems to be a lack of cohesion of care. There is a hierarchy of abilities but it is very reactive care rather than looking at the big picture and having one person who is overall responsible for the patient. She was seen by several clinicians over the duration of care. They did communicate but no one seemed concerned that [Ms A] still had active infection with blood and pus still draining after the loss of two teeth and several courses of antibiotics. Radiographically the lesion was almost non-existent initially, a month later it was very large. [Ms A] was not responding to the treatment. She needed to be treated by a specialist clinician earlier than she was. If she refused treatment it needed to be recorded.

Accepted practice would have been for [Ms A] to see the specialist at [DHB2] earlier. It appears that the specialist there had the skills and knowledge to carry out the correct diagnosis and treatment. This is a mild (potentially) moderate departure from appropriate standard of care. It is difficult to assign this departure to one clinician so that is why I have it recorded under the general hospital care. [Dr D] did try and get help from [DHB2] on 29/10/18. Again it could be attributed to a lack of resources ie available space at [DHB2].

Photographs may also have been useful and easy to record the various stages of the swelling intra and extra oral. They could have been useful along with more radiographs to send to [DHB2] to attempt to get an appointment earlier.

The notes are lacking in general. They are not a complete enough record. It is important in hospital based dentistry to record the communications with the patient which helps describe the consent or not to treatment or referrals. Notes provide essential information as there is often no formal handover of care of the patient. It is important to record when people are consulted and what was discussed etc.

The consultation in the waiting room has been covered and should be discouraged as routine care.

[Ms A] was left a while until she was treated after hours on 29/10/18. Was she triaged correctly? Was there a better place for her to wait?

In retrospect a CT scan could/should have been provided earlier. Maybe it didn't show what they didn't already know but after a month of unresolved infection it is important to get as much information as possible. The size of the lesion on the radiograph 23/11/18 is very large.

Metronidazole was only prescribed for the first time 26/11/18. It would have been appropriate to change to this antibiotic earlier. Metronidazole is a very appropriate drug of choice for this type of infection. It could have been used concurrently with what she was already on. One of the clinicians should have considered this earlier. Maybe there needs to be a clearer algorithm of antibiotic use and when to change if something isn't working. In private practice if a course of Amoxicillin or Augmentin was not resolving the infection a course of metronidazole would be considered early.

Only after the last surgery at [DHB2] was it recommended she rinse with a chlorhexidine mouth wash. It may have been useful to start this earlier. It may not have changed things much but it would be useful to keep the mouth as free of bacteria as possible.

Notes provided labelled '[CCDHB]' are out of order the dates don't align with the page numbers. I am not sure if they are therefore accurate.

Consultation with other specialties

This has mostly been covered but I will summarise under this heading as requested for clarification.

[Ms A] received a consultation with ophthalmology in a timely manner when appropriate.

The treating dentists in general did consult with each other during the course of her care.

Initially asking for her to be cared for at [DHB2] was appropriate especially given the outcome. It may have been appropriate to re-request that again in November.

During [Dr D's] treatment of [Ms A] she almost always asked for advice from senior clinicians which was appropriate. This is well documented. During [Dr C's] treatment for her he didn't consult anyone else on 23/11/18. However given he diagnosed and removed abscessed tooth 22 he would have considered she was now on the way to improvement. This treatment was acceptable.

On 30/11/18 when [Ms A] returned to the dental department and still had pus after two extractions, a root filling and several courses of antibiotics it would have been

appropriate to request a referral to a specialist. [Dr C] said 'from memory' he did suggest that she see [Dr B] OMFS and she declined. This is not written in his notes. He does not have any clinical notes for that appointment. This lack of referral would be viewed by my peers as a mild to moderate departure from acceptable practice.

Conclusion

[Ms A] previously had a reasonable dentition. The teeth she had removed had previously had little or no dentistry.

There are no notes from [Dr C] for the treatment on 30/11/18. It was inappropriate to treat [Ms A] in the waiting room.

[Dr C] should have referred [Ms A] to a specialist earlier. This needed to be recorded in the notes. The most appropriate location appears to be [DHB2] or [Dr B] (OMFS).

There was no one taking overall charge of the care for [Ms A]. The lack of appropriate resources is evident.

A CT scan should probably have been done earlier. The size of the lesion radiographically would suggest that being a reasonable option. If the resources were not available she could have been encouraged to have it done privately which indeed she did.

[Ms A] should probably have been prescribed a different antibiotic eg Metronidazole earlier."

The following further advice was received from Dr Cayford:

"I have reviewed my case report alongside the responses from the clinicians involved and various supporting documents.

I am pleased that as a favorable outcome from this case that some changes have already been implemented and indeed this particular case has been used in a teaching situation.

I have only a couple of small comments. In general the opinions I have written in my case report are still relevant and accurate as I understood the care for [Ms A] was carried out.

A couple of comments from the response from [Dr C]. Re the bony fragment. I commented that there could have been one and it was a possibility to consider. It was not a criticism hence I did not comment on it again. A bony fragment in itself usually would be asymptomatic and not produce the same degree of swelling and discomfort.

It was an astute comment from [Dr C] regarding that he may have considered [Ms A] had two separate infections rather than one continuous one. If he had done this he may have considered a more aggressive treatment approach?

The guidelines regarding antibiotic use do not state that you can't consider the use of metronidazole and amoxicillin. It does say there is no advantage in using it with augmentin.

Regarding the use of antibiotic one must always consider altering the drug being used if the patient is slow to respond or indeed becoming worse. A comment from a specialist is probably more relevant here.

I think that is all I have to add."

Appendix B: Independent advice to the Commissioner

The following expert advice was obtained from OMFS Dr Brian Whitley:

"Thank you for your letter dated 20 June 2019 requesting that I provide expert advice to the Health and Disability Commissioner regarding care provided by Capital & Coast District Health Board (DHB) to [Ms A] between 27 October 2018 and 30 November 2018 during her admission to [CCDHB], specifically the Dental and Oral Health Department (DOHD). You have requested that I submit my report by 31 July 2019.

The documents provided include:

1. Letter of complaint dated 12 February 2019.
2. Capital & Coast DHB's response dated 10 April 2019, including:
   a) input from [Dr B]
   b) input from [Dr C] dated 26 March 2019
   c) input from [Dr D]
3. Clinical records from Capital & Coast DHB covering the period 21 October 2018 and 31 October 2018, including:
   a) oral x-ray images of [Ms A] taken on 27 and 29 October 2018 and 22 and 23 November 2018
   b) results of [Ms A's] CT scan conducted on 27 November 2018 at [the radiology service]

By way of background, you informed me that [Ms A] is a [woman in her seventies] who underwent emergency debridement surgery at [DHB2] following a diagnosis of maxillary osteomyelitis. [Ms A] first presented to the Emergency Department (ED) at [CCDHB] on 27 October 2018 due to left facial and eye pain, and facial swelling. She was subsequently discharged from DOHD with antibiotics. [Ms A] presented to [CCDHB] four times over the course of four weeks but she was discharged each time with the clinical impression that her condition was improving with antibiotic treatment. Ophthalmologic assessment also indicated that there was no threat to her eye. As her condition continued to deteriorate, [Ms A] made the decision to obtain a private CT scan from [the radiology service] on 27 November 2018, the results for which indicated a destruction of both the anterior and posterior cortex of bone. On 5 December 2018, she was admitted to [DHB2] where a peripheral ostectomy was performed.

You have requested that I review the enclosed documentation and advise whether I consider the care provided to [Ms A] by Capital & Coast DHB was reasonable in the circumstances, and why. In particular you have asked that I comment on:

1. The adequacy of the assessment undertaken by Oral and Maxillofacial Surgeon, [Dr B] on 29, 30 and 31 October 2018, and 26 November 2018.

2. The appropriateness of the treatment provided to [Ms A] by [Dr B] on 29 October 2019;
3. Whether a CT scan should have been taken earlier; ie when [Ms A] presented to, and before her decision to obtain one privately on 27 November 2018.
4. Any other matters in this case that I consider amount to a departure from accepted standards of care.

Each question you have asked me to 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 I consider this to be?

c) How would it be viewed by my peers?

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

1. The adequacy of the assessment undertaken by Oral and Maxillofacial Surgeon, [Dr B] on 29, 30 and 31 October 2018, and 26 November 2018.

[Dr B] (Oral and Maxillofacial Surgeon), who has a part-time appointment at Capital & Coast DHB Dental and Oral Health Department as a Consultant Oral and Maxillofacial Surgeon, was requested to see [Ms A] by the on-call Dental House Surgeon, [Dr D], on 29 October 2018. [Ms A] had presented to the Emergency Department at [CCDHB] following a tooth extraction of tooth 21 on 27 October 2018 by [a] (Dental House Surgeon) at [CCDHB] who was on-call at the time. Tooth 21 was extracted under local anaesthetic and [Ms A] remained in the Emergency Department overnight on intravenous antibiotics. The Emergency Department Clinical Record, recorded [Ms A] to be febrile with a temperature of 38.5 degrees, tachycardic with a heart rate of 109 bpm, hypertensive with a blood pressure of 166/78 and tachypnoeic with a respiratory rate of 20. Her CRP was 74 mg/L which is well in excess of the normal range of less than 6. CRP is a non-specific marker of infection. These are all indications of a systemic illness. The Complete Blood Count results of 27-10-18 demonstrate an elevated WBC of 16.4 (4–11) and an elevated Neutrophil Count of 14 (1.9–7.5). These results are indicative of a bacterial infection.

[Ms A] was discharged the following day, 28 October 2018, feeling better and with the swelling having decreased in size. She was discharged on a course of oral Amoxicillin antibiotics with a review arranged in three days' time in the Dental Department. [Ms A's] vital signs that day demonstrated an improvement with her temperature down to 37.9 degrees and heart rate to 98 bpm. Her WBC, however, remained elevated at 14.4 with the Neutrophil Count also above the normal range at 11.6.

On 29 October 2018 [Ms A] re-presented to the Emergency Department with a report of increased facial swelling. At the time, she was also being reviewed by General Medicine and Ophthalmology, as well as the Emergency Department Consultant. [Ms A] was noted by [the Medical Registrar] to look unwell and uncomfortable with left

anterior chain cervical lymphadenopathy, indicative of a left-sided facial infection. [Ms A's] Complete Blood Count taken at 9:21 pm revealed a worsening bacterial infection with the White Blood Cell count now elevated to 18.1 and the Neutrophil Count to 15.1. At 5am on 29-10-18 the WBC was noted to be 20.7 and the Neutrophil Count 17.9. The patient's condition was worsening when the results are compared with those of October 27 and 28.The CRP had increased from 74 on 27-10-18 to 186 on 29-10-18, also indicating a worsening infection. A blood sample was taken for blood culture which was reported as no aerobic or anaerobic growth after 5 days incubation on 3-11-18. In other words, there was no evidence of septicaemia.

[Dr D] (second year Dental House Surgeon) undertook a review of [Ms A's] presentation to the Dental Department and discussed the situation with [Dr B] (Oral and Maxillofacial Surgeon) who was coming to the Dental Department for his afternoon clinic. Due to the outpatient workload, according to [Dr D], [Ms A] was unable to be seen until after-hours. She was reviewed by [Dr B] and [Dr D] in the Dental Department. Clinical examination at the time revealed swelling involving the left canine space of the maxilla with periorbital involvement and the left eye was closed. Of the teeth in quadrant 2 (upper left quadrant), tooth 23 (canine tooth) was extremely tender to percussion and tender to palpate in the apical region, according to [Dr D's] notes. [Dr B] notes in his report to the Health and Disability Commissioner, that the patient's left eye was closed but she had normal light perception, full ocular movements and her vision was intact. An urgent Ophthalmology review was requested. A small amount of pus exudate was manually palpated from the extraction socket 21. It was noted that [Ms A] had a negative cold response in teeth 22, 23, 24 and 25. Several teeth were non-vital, which would indicate the potential for a more wide-spread infection. There is no further reference to this observation in the notes and it does not appear that the significance of this finding has been recognized.

Due to the size of the swelling and orbital involvement, the on-call Oral and Maxillofacial Surgeon at [DHB2], [Dr F], was contacted for treatment and further management of [Ms A] at [DHB2]. However, [Ms A] was not accepted under [Dr F's] team's care due to a high workload and [Dr B] and [Dr D] were advised to carry out the treatment in the department after-hours under local anaesthetic.

The incision and drainage procedure was undertaken under local anaesthetic. According to [Dr B's] letter to the Health and Disability Commissioner, 'a possibility of general anaesthetic would have been discussed with [Ms A] but, in view of her past medical history, the risks of general anaesthetic were considered to be significant and as the procedure could be safely performed under local anaesthetic this was the preferred option. The treatment instituted, ie incision and drainage of both the tooth and abscess would have been the same regardless of the mode of anaesthesia. [Dr D] (Dental House Surgeon) performed a pulpectomy on tooth 23 (which confirmed the tooth to be non vital) and [Dr B] incised and drained the abscess placing a drain in-situ. According to [Dr D's] notes, when opening up the root canal of tooth 23, this was necrotic and empty. The tooth was dressed with Odontopaste and closed with Cavit and Fuji-VII. [Dr D] noted that the swelling around the left eye showed marked

improvement following dental treatment and she was able to open her eye by the time she was brought back down to the Emergency Department. Due to the original size of the swelling, [Ms A] was kept in the Emergency Department overnight on intravenous Augmentin antibiotics and monitoring to ensure that the swelling did not continue to increase in size.

The following day, 30 October 2018, at 8am, [Dr D] reviewed [Ms A] and noted that she was improving. The patient reported feeling better compared to the previous day and [Dr D] noted that the swelling had decreased in size overnight. The swelling was still present around the left eye and, on discussion with [Dr B], it was decided to keep [Ms A] in the Emergency Department Observation Unit for one more night on intravenous Augmentin to ensure that the swelling did not worsen. The plan was for discharge the following day and both Ophthalmology and General Medicine were consulted and comfortable for [Ms A] to be discharged once the Oral and Maxillofacial Surgery Service were happy for her discharge.

The following day, on 31 October 2018, [Ms A] was reviewed twice by [Dr D] at 8am and again at 1.15pm. According to [Dr D's] report to the Health and Disability Commissioner, the swelling had completely resolved around the left eye and eye opening was now normal. [Ms A] expressed concern that the swelling was still firm and tender on the left cheek. She was also concerned about ongoing pain in the upper left quadrant and, on examination, [Dr D] noted general inflammation and fluctuance in the area around the incision. Fluctuance indicates the presence of on-going acute infection i.e. pus, which has not been drained. [Dr D] explained to [Ms A] that both these symptoms were expected, given the original size of the swelling and the time since discharge — 'it can take time for the swelling to completely resolve, and for the intraoral soft tissues to heal'. [Dr D] discussed the situation with [Dr B] once again who advised that, given the swelling had dramatically improved since [Ms A's] initial presentation, she be discharged on oral Amoxicillin (500mg tds for five days) and an appointment was made for her to be seen the following day. [Dr D] informed [Ms A] that she would need to see her private dentist to complete the root canal treatment on tooth 23 as soon as possible. [Ms A] was discharged from [CCDHB's] Emergency Department Observation Unit at 6.30pm on 31 October 2018 and an outpatient appointment arranged for 1 November 2018.The nursing notes that day record a temperature of 37.5 degrees, which is normal. [Ms A] was still noted to be tachycardic with a heart rate of 120 bpm. The patient reported that she had been sweating overnight.

[Dr B's] last contact with [Ms A] was on 26 November 2018. [Dr E] (Dental House Surgeon) requested that [Dr B] review [Ms A] at her outpatient review. [Dr E] noted that there was a significant improvement in the swelling, compared to previous assessments. [Ms A] was advised accordingly and prescribed Metronidazole antibiotics 400mg twice daily in accordance with the [CCDHB] protocol. At that time, [Ms A] and her husband requested a CT scan of the jaws. [Dr B] advised them that, at that stage, a CT scan would not alter or add to the clinical management/diagnosis as clinically the infection was localised at the anterior maxilla. According to [Dr B's] report to the Health and Disability Commissioner, [Ms A] and her husband advised him that they

had private medical insurance and would like to proceed with a CT scan. In his written report, [Dr B] recalls reassuring [Ms A] that the infection was unlikely to progress to a point where it would become life-threatening and he arranged to review [Ms A] two days later.

[Dr B] has a part-time appointment at CCDHB Dental and Oral Health Department as a Consultant Oral and Maxillofacial Surgeon which involves outpatient clinics and operating sessions. He is not on the on-call roster and the on-call Consultants are primarily based at [DHB2]. In spite of this, [Dr B] was prepared to see [Ms A] after-hours on 29 October 2018 in the Emergency Department Observation Unit (EDOU). Treatment was undertaken a short time later in the Dental Department. I believe [Dr B's] assessment was adequate. Clinical examination determined a left maxillary canine space infection secondary to a non-vital tooth 23. Treatment involves the pulpectomy of the offending tooth in an effort to save it, where possible, or extraction, if the tooth is non-restorable, along with incision and drainage of the appropriate space or spaces involved with the infection. It also requires the use of parenteral antibiotics and admission to hospital for observation, intravenous fluids, analgesia, anti-emetics and appropriate nutrition.

[Dr B] was contacted the following day by his House Surgeon [Dr D] for advice regarding further management. [Ms A] was appropriately assessed by [Dr D] twice that day, initially at 8am and then swelling was found to have significantly decreased in size. Appropriately, [Ms A] remained in the Emergency Department Observation Unit for one more night on intravenous Augmentin with a view to discharge the following day. Appropriately again, Ophthalmology and General Medicine had been consulted. The following day, on 31 October 2018, [Ms A] was again reviewed twice by [Dr D], at 8am and again at 1.15pm. The swelling had completely resolved around the left eye and eye opening was normal. [Dr B] was consulted once more by [Dr D] and he advised that, given the swelling had dramatically improved since [Ms A's] initial presentation, she be discharged home on oral Amoxicillin (500mg tds for five days) and an appointment made to see her the following day. This, again, was an adequate assessment given that [Ms A's] condition was improving. There was no evidence of any deterioration in her condition. She was discharged at 6.30pm that day and an outpatient appointment scheduled the following day. This is appropriate management. The ongoing monitoring of an odontogenic infection is important until resolution is achieved.

Fellow Oral and maxillofacial Surgeons in New Zealand would consider the assessment undertaken by [Dr B] on 29, 30 and 31 October, 2018 to be adequate. It would meet the standard of care or accepted practice provided by a specialist Oral and maxillofacial Surgeon.

The adequacy of the assessment undertaken by [Dr B] on 26 November 2018, I believe, is inadequate. It had been almost a month since [Ms A's] initial presentation with a left sided canine space infection relating to a non vital tooth 23. On the days leading up to the 26 November assessment by [Dr B], [Ms A] was seen by [Dr C] (Senior Dental Surgeon) on 23 November 2018 for facial swelling which was not

resolving. Root canal treatment on tooth 23 was completed by a private dentist the previous day who noticed pus draining intraorally from the 21 socket and tooth 22 was non-vital. The dentist had prescribed a course of oral Amoxicillin the previous day. On presentation, [Dr C] noted a mild infraorbital swelling on the left side. Clinical and radiographic examination, confirmed the private dentist's findings and, following discussion of treatment options with the patient, ie root canal treatment of tooth 22 or extraction, [Ms A] decided to have tooth 22 extracted, which was carried out under local anaesthetic.

[Ms A] presented two days later to [CCDHB's] Emergency Department with a mild facial swelling on the left side and was seen by [Dr D] who was the on-call Dental House Surgeon. [Dr D] noted a visible swelling adjacent to the left side of nose which she described as 'mild'. There was no orbital involvement and intraoral examination revealed tenderness to palpation in the buccal sulcus adjacent to tooth 22 socket, with a possible small buccal swelling in this region. The 21 and 22 extraction sockets were noted to be healing as expected with no drainage of pus. [Ms A] enquired about her being placed on intravenous antibiotics however this was discussed with Drs [Dr E] and [Dr C] over the telephone who agreed that IV antibiotics were not warranted at this time, given the mild size of the swelling. [Dr D] in her report to the Health and Disability Commissioner noted the following 'It was also not of significant size that would warrant contacting the on-call Oral and Maxillofacial Surgeon and, from experience, they would not have accepted a patient with a swelling of this mild size over the weekend. I advised [Ms A] that the only other option at this stage would be to incise the area adjacent to tooth 22 socket to try and achieve drainage or at least relieve pressure as this had been successful in the past with [Dr B] on 29 October 2018.' According to [Dr D], [Ms A] declined treatment after-hours and would prefer to see [Dr E] the next day during working hours.

There was clearly clinical evidence of persistent ongoing infection with swelling and discharge and [Dr B] failed to act upon this by arranging further imaging, in terms of a CT scan of the head and neck and a formal exploration/debridement procedure in the operating theatre.

Fellow Oral and maxillofacial Surgeons in New Zealand would see this as a serious departure from the accepted standard of care in the management of a serious, persistent infection of the anterior Maxilla.

2. The appropriateness of the treatment provided to [Ms A] by [Dr B] on 29 October 2019.

Incision and drainage of an abscess or fascial plane infection is the standard of care and accepted practice in the management of an odontogenic infection. This is in addition to removal of the cause of the infection, which is a non-vital tooth or teeth. The involved tooth or teeth either require extraction or, if restorable, pulpectomy and dressing in preparation for eventual root canal treatment, once the acute infection has resolved.

I have grave concern about the inability of [Dr B's] team to arrange an admission to [DHB2] under the care of the Oral and Maxillofacial Surgery Service for admission, appropriate intravenous antibiotic and supportive management, imaging in terms of a CT scan of the face and jaws, appropriate blood tests and exploration with aggressive incision and drainage and irrigation under general anaesthetic. It appears that [Dr D] had contacted the Oral and Maxillofacial Service at [DHB2], however, given the decision not to accept [Ms A] on the basis of a high patient workload, [Dr B], I believe, should have spoken directly with [Dr F] to express his concern and the serious nature of the canine space infection. Although the incision and drainage under local anaesthetic was appropriate, given the circumstances, it is often difficult to obtain adequate local analgesia in an infected environment and, therefore, adequately explore and debride the fascial space infection involved. This can often lead to a residual infection being present and a protracted chronic infection which can then develop into an osteomyelitis, as was the case with [Ms A].

A CT scan undertaken at that time would have revealed the extent of the infection and, specifically, the areas or pockets of infection often isolated by loculations which require breaking down and adequate drainage and irrigation. It would have also revealed any abnormal bone present at that stage. It was appropriate to place a drain in the wound to keep the wound patent and continue to drain. The choice of antibiotics was also appropriate. Augmentin is a commonly prescribed broad spectrum antibiotic which is effective against most gram positive micro-organisms found in an odontogenic infection. It does have some anaerobic cover as well.

The intra-oral peri-apical radiographs taken on 27-10-18, reveal a poorly-defined radiolucency extending from the distal aspect of tooth 23 to the mesial surface of tooth 21 and from the alveolar crest to the floor of the nose. Peri-apical radiographs taken two days later, on 29-10-18, once again demonstrate this abnormal radiolucency in the bone. Tooth 21 had been extracted by this stage. The OPG radiograph taken on 29-10-18 did not demonstrate this area of interest clearly and was non-diagnostic, as a consequence. Of concern, is that there is no reference to the abnormal appearance on these plain radiographs by the Clinicians involved in [Ms A's] care at the time. Recognition of the abnormal appearance of the bone on the radiographs would have prompted further investigation with CT imaging followed by exploration/debridement/ bone biopsy under General Anaesthesia, or Intra-Venous Sedation and Local anaesthetic with monitoring with an Anaesthetist, if the Anaesthetist believed this to be the safest option for the patient.

It is likely, based upon the peri-apical radiographs provided, that there was already infection (Osteomyelitis) in the bone related to the upper left central and lateral incisor teeth along with the upper left canine tooth on 27-10-19.There appeared to be no reference in the notes of a history of trauma to these teeth in the past. This would be the most likely explanation for the loss of vitality of these 3 teeth, necessitating extraction of teeth 21 and 22 and root canal treatment of tooth 23 as well as the extensive infection in the associated bone. This would also explain the protracted nature of the infection, without resolution, over a period of five weeks before the

diagnosis of Osteomyelitis was finally made and the appropriate treatment undertaken at [DHB2] on December 5th by [Dr F] (Oral and maxillofacial Surgeon). In addition, there is no reference in the notes that a pus swab was taken at the time of incision and drainage on 29 October 2018 which is standard practice. A gram stain would have identified the likely micro-organisms involved in this infection and therefore the most appropriate antibiotics to target them. The antibiotics may have then required alteration depending upon the results of the microbiological culture and sensitivity.

With respect to [Dr B's] comments about the risk associated with general anaesthesia for [Ms A] on the basis of her cardiomyopathy and bronchiectasis, this should not have prevented admission to [DHB2] and aggressive exploration and debridement of the upper left canine space infection. In consultation with the Consultant Anaesthetist at the time, if general anaesthesia was considered too risky then monitoring under local anaesthetic and conscious intravenous sedation in the main operating theatre would have been appropriate.

In terms of the appropriateness of [Dr B's] treatment provided to [Ms A] on October 29, 2018, I believe that it was appropriate. Through no fault of his own, however, the incision and drainage under Local Anaesthetic alone was probably inadequate. [Dr B] was placed in a position where he had little option but to undertake urgent surgical drainage of the left maxillary space infection under local anaesthetic alone. The on-call Oral and maxillofacial surgery service at [DHB2] had refused to accept [Ms A] as an acute admission from [CCDHB], on the basis of work-load. More aggressive exploration with bone biopsy and debridement, preceded by a CBCT scan, to guide the surgery, would have been preferable. Surgery is best undertaken in a main operating theatre with an Anaesthetist under either General Anaesthetic, if deemed to be safe, or using intra-venous sedation, local anaesthetic and monitoring, if a General Anaesthetic was contraindicated.

Fellow Oral and maxillofacial Surgeons in New Zealand would consider [Dr B's] treatment provided to [Ms A] on 29 October 2018, to be adequate and there has been no departure from the accepted standard of care or accepted practice.

3. Whether a CT scan should have been taken earlier; ie when [Ms A] presented to, and before her decision to obtain one privately on 27 November 2018.

As discussed above in answering question 2, the appropriateness of the treatment provided to [Ms A] by [Dr B] on 29 October 2018, it is my opinion that a CT scan should have been arranged along with acute admission to the [DHB2] on 29 October 2018. This is the standard of care and accepted practice in a specialist department for management of a fascial space infection, particularly where the eye and infraorbital foramen are involved with the risk of ascending infection. It is not acceptable or appropriate, in my opinion, for the patient to have to arrange her own CT scan in the private sector, almost a month following her initial presentation with a significant odontogenic infection. Given the protracted course of this infection, with multiple presentations to various clinicians over several weeks, a CT scan should have been arranged weeks earlier through the Radiology Department at [CCDHB] or, preferably,

upon her acute admission for treatment on 29 October 2018 at [DHB2], had her transfer been accepted. This is especially the case given the abnormal, lytic appearance of the bone over an extensive area in relation to teeth 21, 22 and 23 on the peri-apical radiographs taken on 27-10-19 and 29-10-19. I believe this represents a significant or serious departure from the standard of care or accepted practice for patients who present with an infection that spreads beyond the bone and into the adjacent soft tissues and fascial space(s).

Fellow Oral and Maxillofacial Surgeons in New Zealand would be surprised that a CT scan of the head and neck was not arranged, if not prior to the incision and drainage of the left maxillary canine space, certainly within a few days following it, given that there was no resolution in the infection. They would consider this a serious departure from the accepted standard of care.

4. Any other matters in this case that I consider amount to a departure from accepted standards of care.

With respect to the incision and drainage of an odontogenic infection, it is standard practice to obtain an aspirate of pus to collect anaerobes for culture and sensitivity. These organisms are extremely difficult to culture and grow, if not impossible, from a pus swab which often demonstrates normal commensals, including candida albicans yeasts. An aspirate of pus was never undertaken at any stage throughout [Ms A's] treatment. In addition, the opinion from a Microbiologist was never sought at any stage for this non-resolving infection. This would have been of value in terms of identifying and targeting the specific micro-organisms involved with the most appropriate antibiotic or combination of antibiotics. This would also have assisted in establishing the correct diagnosis of Osteomyelitis, based upon the micro-organisms cultured. On a number of occasions over the four week period, [Ms A] was prescribed Amoxicillin, Augmentin or Metronidazole empirically, without reference to culture results or the input from a Microbiologist.

Continuity of care in such situations is very important for consistency and for monitoring any improvement or deterioration in the patient's condition. This is often difficult to achieve when senior staff are part-time, as in [Dr B's] case. Over the four weeks of treatment, [Ms A] was essentially seen and managed at Dental House Surgeon level. She was seen on several occasions by two different Senior Dental Officers, although these were not Specialist Oral and Maxillofacial Surgeons. I believe that [Ms A] would have benefited from being under the care of a Specialist Oral and Maxillofacial Surgery Service, such as is available at [DHB2]. It would appear that there is no Registrar at [CCDHB] in Oral and Maxillofacial Surgery. Although not a registered specialist, an Oral and Maxillofacial Surgery Registrar in training would be expected to have advanced training, experience and knowledge in the management of complex odontogenic infections of the head and neck area. An example of the lack of experience on behalf of the Dental House Surgeons managing [Ms A's] case is evident in [Dr D's] report on 29 November 2018. In this report, she mentions: 'A CT scan was done privately on 27 November 2018 according to the letter of complaint — the report states destruction of the upper left anterior maxillary alveolar bone consistent

with chronic infection: which is expected as we already know there is a chronic infection in this area.' It was recognised on behalf of [Dr D] and others that there was a chronic, non-resolving soft tissue infection in the area. However, until the CT scan was taken, the presence of osteomyelitis involving necrotic destruction of bone was not recognized by the staff in the Dental Department at [CCDHB], at all. Had this been identified earlier, with the aid of a CT scan, as recommended by me in answering earlier questions, then it is my opinion, the infection would have been managed much more aggressively at an early stage. The debridement and sequestrectomy of the necrotic bone would have brought about an earlier resolution of the infection with considerably less stress and inconvenience to [Ms A].

Of concern, also, is the fact that [Ms A] underwent a privately funded CT scan at [the radiology service] on 27 November and this was reported that day with features consistent with osteomyelitis involving the alveolar ridge on the left side of the maxilla with changes extending into the floor of the nose in this region. The report noted destruction of both the anterior and posterior cortices of bone. According to [Ms A's] complaint to the Health and Disability Commissioner, under Point 26 for December 2018, 'I feel weak, feverish, ill.' [Ms A's] GP] sends urgent referrals to Consultant [at DHB2]. [Consultant] is not available until 20 December. It was not until 5 December when [Ms A] was seen and treated by [Dr F] (Oral and Maxillofacial Surgeon) in the Dental Department at [DHB2]. A debridement of the alveolus on the left side of the maxilla with removal of bone fragments and tooth fragments was undertaken. This was performed under local anaesthetic. It concerns me that there was an eight-day delay between the CT scan being undertaken, with the results back that day, and the eventual debridement of the area for the management of the osteomyelitis. This delay caused further stress for [Ms A] who was already distressed and anxious because of the extreme seriousness of her medical situation. If made aware of the true serious nature of the infection and its protracted course, most Surgeons would set aside time to treat this problem on an urgent or acute basis. Once again, as with the [DHB2] experience of having the request for an acute admission declined, I don't believe the seriousness of the situation was conveyed to [the] Oral and maxillofacial Surgeon in the private sector at the appropriate level by a fellow Senior Dentist or Dental Specialist.

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

In terms of recommendations for improvement that may help to prevent a similar occurrence in the future, I believe that this is best achieved through continuing education, particularly of the junior staff and involving the senior staff and, in particular, the Oral and Maxillofacial Surgery Consultants. Most departments throughout New Zealand offer a teaching program throughout the year, whereby the junior staff learn the important aspects of patient management. One of the most important topics to be addressed early on in their training is the management of odontogenic infections, be they small dental abscesses or extensive space infections such as in [Ms A's] case. The junior dental staff are then in a better position to be able to assess the seriousness of an infection and the urgency in terms of early aggressive

treatment. This will hopefully then prevent future cases whereby an acute infection develops into a chronic longstanding infection over a period of five weeks with ultimate development of osteomyelitis and necrotic bone necessitating a sequestrectomy.

The Microbiology service should be advised of all cases of serious odontogenic infections, as a routine. This should be part of a protocol on the management of serious infections of dental origin. The Microbiologists are well placed to provide specialist information on organisms identified on Gram Stain, pus swab, aspirate or blood culture and their Sensitivity to various Antibiotics. They are also able to provide advice on Antibiotic selection and assist in monitoring the course of the infection.

I have already mentioned my concern regarding the inability of [DHB2] to accept [Ms A] as an acute admission on 29 October 2018. This issue of hospital-to-hospital transfer in the region, in the management of serious odontogenic infections with periorbital involvement needs to be seriously addressed. Agreed protocols or guidelines need to be established and adhered to. It is appropriate that urgent transfers should be made at Consultant to Consultant level through direct verbal communication supported with the appropriate written documentation, of course.

There needs to be a mechanism whereby radiographs taken in the Dental Department by junior staff are reviewed on a regular basis by the Senior Dental Surgeons or Dental Specialists, to identify abnormalities which are acted upon in a timely fashion. This might also involve interaction with the Radiology service to have the radiographs further assessed and further imaging arranged. It is common for Oral and Maxillofacial Surgery Departments to hold regular meetings with a Radiologist to review unusual or serious cases as part of the audit process.

Reference:

How Can We Diagnose and treat Osteomyelitis of the Jaws as Early as Possible? Koorbusch GF, Deatherage JR pages 557–567 in Oral and Maxillofacial Surgery Clinics of North America Oral and Maxillofacial Infections: 15 Unanswered Questions. Flynn TR, Haug RH. Volume 23 No 4 November 2011."

The following further advice was received from Dr Whitley:

"Thank you for your email dated the 19th of April requesting that I review the attached information you provided and advise if any of the attached information caused me to change my initial advice.

I previously provided advice to the Health and Disability Commissioner in relation to a patient complaint by [Ms A] regarding the care provided by Capital and Coast DHB (CCDHB)/[Dr B].

The information you provided included the following:

1. A report from [Dr G] (Oral and Maxillofacial Surgeon) dated the 17th of March 2020.
2. A letter from [Dr B] (Oral and Maxillofacial Surgeon) dated the 17th of March 2020 in response to my initial report.
3. A letter from [the lawyer] representing [Dr B], dated the 17th of March 2020.

I have also reviewed my initial report to the Health and Disability Commissioner dated the 23rd of July 2019.

I was aware from [Dr B's] report dated the 10th of April 2019, that he had a part-time appointment at CCDHB Dental and Oral Health Department as a Consultant Oral and Maxillofacial Surgeon. This involved outpatient clinics and operating sessions. The on-call Consultants are primarily based at [DHB2], with cover from [two other] District Health Boards. [Dr B] indicated that he was not on the on-call roster. What I was unaware of, however, and highlighted in [Dr B's] response to my letter, sent to Meenal Duggal (Deputy Health and Disability Commissioner), dated the 17th of March 2020, 'whilst not recorded in the notes, [Dr D] has confirmed that I spoke directly to [DHB2] recommending immediate transfer to [DHB2] for admission and treatment, which was declined and suggested the case be dealt with under local anaesthetic. The department does not have admission rights and, if admission is required, the patients are admitted under the care of the Ear Nose and Throat Clinicians'. Clearly, [Dr B] did contact [DHB2] to arrange an admission for [Ms A] due to his concern regarding the serious nature of the upper left canine space infection. I concur with [the lawyer] and [Dr G] in that, given the circumstances (namely not on-call or responsible for the patient), it cannot be reasonable to expect [Dr B] to contact [Dr F] (Consultant Oral and Maxillofacial Surgeon at [DHB2]) to request admission to [DHB2]. I also agree with [Dr G's] comment that he considers that the [DHB2] should have accepted [Ms A's] referral from the Capital and Coast DHB, as if she had presented to the Emergency Department at [DHB2].

I therefore confirm that I consider the assessment undertaken by [Dr B] on the 29th, 30th and 31st of October 2018 to be adequate. It would meet the standard of care or accepted practice provided by a Specialist Oral and Maxillofacial Surgeon in New Zealand. I also consider the appropriateness of the treatment provided to [Ms A] by [Dr B] on the 29th of October 2018 to be adequate and there has been no departure from the accepted standard of care or accepted practice.

Whether a CT scan should have been taken earlier; i.e. when [Ms A] presented and before her decision to obtain one privately on the 27th of November 2018, is at the discretion of the Consultant Oral and Maxillofacial Surgeon under whom the patient is admitted. In my initial report dated the 23rd of July 2019, under Heading 2, the appropriateness of the treatment provided to [Ms A] by [Dr B] on the 29th of October 2018, I reported that 'a CT scan undertaken at that time would have revealed the extent of the infection and, specifically, the areas or pockets of infection often isolated by loculations which require breaking down and adequate drainage and irrigation. It would have also revealed any abnormal bone present at that stage'. I stand by that

statement and [Dr G], in his report dated the 17th of March 2020, agrees and states 'I do agree that the appropriate time for a CT scan was in the acute phase, as this was more likely to provide critical information than a CT scan later in the infection process'. Both [Dr G] and [Dr B] disagree with the view that a CT scan should have been ordered on the 26th of November 2018. [Dr G] does not believe that the CT scan was necessary or essential for the diagnosis of osteomyelitis. He considered that there was adequate evidence clinically and radiographically to make the diagnosis. He therefore considered that [Dr B] had not deviated from an accepted standard of care by not referring for a CT scan at that time.

In [Dr B's] response to my report dated the 17th of March 2020, he regards the care provided by him on the 26th of November 2018 to be reasonable. [Dr B] writes 'again, I was asked for advice by [Dr E]. The notes indicated that, following the removal of tooth 22, which was considered to be the tooth that was causing the issues experienced by [Ms A], her situation had improved (reduced swelling etc). This was also confirmed to me by [Dr E]. Given the improvement in her condition, I considered it reasonable to continue to treat conservatively but with a review after two days. Had [Ms A's] condition not continued to improve or worsened, a CT scan and surgical intervention could have been considered at that time. I was not in the position to access the patient in the interim'. [Dr G] considers that, in the circumstances, where review was to be undertaken two days later, a conservative approach was not unreasonable and was not a departure from the standard expected. [Dr B] concurs with this view. I agree with [the lawyer's] statement that, ultimately, the decision to request a CT scan and its timing is 'a judgement call'. Inevitably, there will be differences of opinion between surgeons in terms of how an individual patient is managed. I stand by my opinion in my initial report that a CT scan should have been arranged, along with acute admission to the [DHB2] on the 29th of October 2018. This is the standard of care and accepted practice in a specialist department for the management of a fascial space infection, particularly with the eye and infraorbital foramen involved with a risk of ascending infection. [Dr B] saw [Ms A] in an advisory role only. He was not her admitting surgeon and not responsible for her day-to-day management.

I agree with [the lawyer] in that the accepted standard of care must incorporate both views and, therefore, [Dr B] should not be considered to have departed from it on the basis that another surgeon, i.e. myself, would have managed the issue differently. Clearly, with [Dr G] agreeing with [Dr B] that a CT scan should not have been ordered on the 26th of November 2018, there is some consensus. [Dr B] was prepared to request a CT scan be taken for [Ms A] and arrange any surgical intervention required, had her condition worsened upon review 48 hours later. Due to the nature of his appointment to the CCDHB, [Dr B] informed us in his report that he was not in the position to assess [Ms A] between 31 October 2018 and 26 November 2018. Therefore, the decision not to request a CT scan on 26 November 2018 cannot be considered a serious departure from the accepted standard of care.

In summary, in my opinion, [Ms A's] care was compromised due to a systems failure and not due to any decisions made or treatment offered by [Dr B]. He was acting in an advisory capacity, offering the appropriate advice and treatment when required. He was not [Ms A's] admitting Surgeon, with ultimate responsibility on a day-to-day basis. At all times, [Dr B] behaved in a professional manner and his treatment was appropriate. He met the accepted standard of care, for an Oral and maxillofacial Surgeon, on each occasion he was involved in [Ms A's] management.

I agree with [Dr G's] statements and observations in the 'other comments' section of his report. He acknowledges the unusual and difficult circumstances in which [Dr B] found himself, due to major systems failure in the case and a refusal on behalf of [DHB2's] on-call service to accept [Ms A]. Her treatment was prolonged in an attempt to conserve her teeth in the presence of significant infection. I concur with his recommendations for improvement, which may help to prevent a similar occurrence in the future. These suggestions are supported by my own recommendations in my initial report."