Radiologist, Dr A
Radiology Service
District Health Board

A Report by the
Deputy Health and Disability Commissioner

(Case 19HDC01960)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided to a woman by a radiologist at a radiology service, as well as the district health board (DHB). In particular, it concerns the reporting of the woman's CT scan of 6 June 2018, and the care provided during her admission to the public hospital from 30 July to 7 August 2018.

2. On 6 June 2018, the woman underwent a CT scan of the chest, abdomen, and pelvis for symptoms including abdominal and lumbar back pain, and weight loss. Her scan was reported by the radiologist, who noted that there were "unremarkable" findings. However, a tumour on the woman's pancreas was visible on the scan but not picked up by the radiologist.

3. The woman's symptoms continued, and she was admitted to the public hospital, where her CT scan images and report from 6 June 2018 were imported into the DHB system, with the purpose documented as for "clinical review". However, the scan was not reviewed during her stay at the hospital.

4. In October 2018, the woman's symptoms continued and she was reviewed privately by a consultant physician and gastroenterologist. At this time, the woman's CT scan images from June 2018 were reviewed, and were noted to be suspicious of pancreatic cancer. Shortly afterwards, the woman was diagnosed with advanced pancreatic cancer, and, sadly, she died in 2019.

Findings

5. While acknowledging that perception errors will occur, after careful consideration of the factors in this particular case, the Deputy Commissioner's opinion was that the woman's pancreatic mass and other secondary signs related to the mass should have been identified by the radiologist when he reported the June 2018 CT scan. In this instance, she considered that the radiologist did not provide the woman services with reasonable care and skill, in breach of Right 4(1) of the Code.

6. The Deputy Commissioner considered that the radiology service had appropriate systems in place to support its staff in the provision of radiology services, and found that the radiology service was not vicariously liable for the radiologist's breach of the Code.

7. The Deputy Commissioner considered that aspects of the care provided to the woman by the DHB could have been improved, and should have included undertaking a radiology review of the woman's imported CT scan, and having greater consideration, and a lower threshold, for undertaking an MRI of the abdomen during her hospital stay.

Recommendations

8. The Deputy Commissioner recommended that the radiologist implement a "checklist" structured reporting style, to provide a cue for each abdominal organ to be evaluated carefully, and familiarise himself with the various radiological manifestations of pancreatic

cancer. The Deputy Commissioner also recommended that the radiologist provide a written apology to the woman's family for the failing identified in this report.

9. The Deputy Commissioner recommended that the radiology service consider the comments made by the radiologist in regard to the staffing at the radiology service, and consider whether any further improvements could be made to address these issues.

10. The Deputy Commissioner recommended that the DHB formalise its process for placing external imaging on the speciality/radiology weekly meeting list by way of a policy or guideline.

Complaint and investigation

11. The Health and Disability Commissioner (HDC) received a complaint from Ms B about the care provided to her friend, Mrs C (deceased), by a radiologist, Dr A, a radiology service, and a district health board. The following issues were identified for investigation:

- *Whether Dr A provided Mrs C with an appropriate standard of care in June 2018.*
- *Whether the radiology service provided Mrs C with an appropriate standard of care in June 2018.*
- *Whether the DHB provided Mrs C with an appropriate standard of care in July and August 2018.*

12. This report is the opinion of Deputy Commissioner Deborah James, and is made in accordance with the power delegated to her by the Commissioner.

13. The parties directly involved in the investigation were:

Dr A	Provider/radiologist
Ms B	Complainant/consumer's friend
Radiology service	Provider
District health board	Provider

14. Also mentioned in this report:

Dr D	General practitioner
Dr E	General surgeon
Dr F	Gastroenterologist
Dr G	Consultant radiologist

15. Independent advice was obtained from a radiologist, Dr Remy Lim (Appendix A), and a gastroenterologist, Associate Professor Alan Fraser (Appendix B).

Information gathered during investigation

Background

16. This case concerns the reporting of Mrs C's CT scan of 6 June 2018, as well as the care provided during her admission to a public hospital from 30 July to 7 August 2018. Unfortunately, Mrs C died in 2019. I take this opportunity to extend my condolences to her friends and family.

17. In early May 2018, Mrs C (aged in her seventies) presented to her GP, Dr D, with left-sided abdominal pain, constipation, lack of appetite, and a recent weight loss of 6kg. Dr D referred her to a private general surgeon, Dr E, for further investigations. On 22 May 2018, Mrs C underwent a gastroscopy[1] and a colonoscopy,[2] and the findings showed no abnormalities.

18. To further investigate the cause of Mrs C's symptoms, Dr E sent a referral to the radiology service for a computerised tomography (CT) scan[3] of the chest, abdomen, and pelvis (CAP). The referral form documented Mrs C's symptoms as "abdominal and lumbar back pain. Loss of weight. Normal panendoscopy[4]".

CT scan and report

19. Mrs C's CT scan was undertaken on 6 June 2018 at the radiology service. Radiologist Dr A[5] reported the findings of the scan on 8 June 2018, and concluded that there were "unremarkable intrathoracic and intra-abdominal CT findings".

20. However, as discussed below, a tumour on Mrs C's pancreas was visible on the scan.

21. Dr A told HDC that given the time that has passed since these events, he has no memory of having reviewed the scan and prepared the report.

22. On receipt of the unremarkable CT scan, Dr E wrote to Dr D on 18 June 2018 to refer Mrs C back to GP care. Dr E's letter stated:

> "I certainly have not found anything from my speciality point of view to account for [Mrs C's] abdominal pain and loss of weight. I have not made any further follow up arrangements with [Mrs C] but [Dr D], please feel free to send her back to me at a later date if there are any new developments."

23. After the CT scan, Mrs C was still experiencing bloating, diarrhoea, and renal and back pain. She was seen by Dr D on 20 July 2018. Dr D noted Mrs C's normal CT scan and normal gastroscopy and colonoscopy results, and queried whether gluten intolerance, a diverticular

[1] A procedure to examine the upper part of the digestive system.
[2] An examination used to detect changes or abnormalities in the large intestine (colon) and rectum.
[3] A CT scan combines a series of X-ray images taken from different angles. It provides more detailed information than a plain X-ray.
[4] A visual examination of the lining of the oesophagus, stomach, and upper section of the small intestine.
[5] Dr A is a Fellow of the Royal College of Radiologists, and a Fellow of the Royal Australian and New Zealand College of Radiologists. He currently works overseas as a radiologist.

abscess,[6] a kidney infection, gastroenteritis,[7] or depression could be causing her symptoms. Despite treatment for these conditions, Mrs C continued to have aches and pains and reduced energy, and at a subsequent appointment with Dr D on 30 July 2018, it was noted that she had lost more than 5kg since May.

24. Dr D arranged for Mrs C to be admitted to the public hospital for further investigation.

Admission to public hospital

25. Mrs C was admitted to the public hospital on 30 July 2018, under the care of the General Surgery team. Her recent medical history was documented as:

> "3 months of lower abdominal pain and lower back pain, reduced appetite and weight loss — 52kg to 41kg over 3 months. Nauseous when trying to eat, feels food gets stuck. Loss of energy. No recent infective symptoms. Seen by [Dr E] in [outpatient clinic] in May 2018 — CT CAP, gastroscopy and colonoscopy [no abnormalities detected]."

26. Mrs C's CT scan images and report from 6 June 2018 were imported into the DHB system on 2 August 2018, with the purpose documented as for "clinical review". The importing request also documented that "no formal report shall be forthcoming from [the DHB]" (ie, that there was no intention for the image to be reported formally by the radiologists at the DHB).

27. The DHB told HDC that treating specialists/clinicians periodically request imaging (both private and public) to be imported from other sites onto the DHB system to support patient management. However, the DHB stated that treating clinicians are not trained to read or review complex diagnostic imaging, and therefore would not be expected to review imaging. The DHB also noted that its Radiology team does not re-read imported studies that have been requested by the treating clinician, and would not necessarily be aware that images had been imported.

28. The DHB stated that its Radiology team does review imaging from other sites (DHB and private) at the treating clinician's request, and usually this is performed formally at the Speciality/Radiology combined weekly meeting. The DHB said that this requires the Speciality team to place the patient on the Clinical Conference list for discussion; however, in Mrs C's case, this did not occur and, as such, the CT scan was not reviewed formally or reported by the Radiology team.

29. While the DHB could not determine which clinician requested the CT scan or for what purpose, the DHB noted that during this admission there is no documentation regarding whether the scan was considered for review in the weekly Radiology conference. The DHB stated that it is possible that this did not occur, because the scan had been reported as "normal".

30. During Mrs C's admission, she underwent an oesophago-gastro-duodenoscopy (a procedure to look at the upper part of the gastrointestinal tract), a stool sample, and blood tests, all of

[6] A condition where pockets in the colon wall collect pus.
[7] Irritation of the digestive tract caused by a viral, bacterial, or parasitic infection.

which revealed no abnormalities. A referral for an MRI[8] of the lumbar spine was also made during this admission, querying cancer of the plasma cells (myeloma), but the referral was declined because the pre-screening tests for myeloma returned normal results.

31. The DHB said that an MRI of the abdomen could have been considered during this admission, but noted that when initial imaging results (such as a CT scan) are normal, as was the case for Mrs C, generally an MRI does not provide any additional diagnostic clues.

32. Mrs C was also reviewed by the General Medicine team and the Dietetics team, and started on supplements. On 7 August 2018, her diarrhoea and back pain had settled, and she was discharged from the hospital with "as needed" laxative medication, dietary supplements, and a plan to be seen by both the General Medicine team and a dietitian as an outpatient. The discharge diagnosis was documented as: "[W]eight loss, abdo[minal] pain, reduced appetite — no cause found."

Subsequent events

33. Despite the investigations undertaken at the public hospital, the cause of Mrs C's symptoms was still unknown. On 23 October 2018, Mrs C was reviewed privately by a consultant physician and gastroenterologist, Dr F, who arranged for blood tests[9] and a chest X-ray owing to her persistent back pain and weight loss. The X-ray was performed on 24 October 2018 at Hospital 2, and the imaging was reviewed and reported by consultant radiologist Dr G.

34. When reading the results of the chest X-ray, Dr G also referenced Mrs C's CT scan images from June 2018. Dr G noted that the CT scan images were suspicious of pancreatic cancer. After confirming the findings with his colleagues, Dr G emailed Dr E on 7 November 2018, recommending that Mrs C undergo a further CT scan to determine the current situation.

35. The second CT scan was performed at another radiology service on 14 November 2018. The scan findings were highly suspicious of pancreatic cancer, with local invasion and lymph node involvement. Shortly afterwards, Mrs C was diagnosed with advanced pancreatic cancer, and palliative chemotherapy was recommended. Sadly, Mrs C died in 2019.

Further information

Mrs C's friend

36. Ms B told HDC:

> "[Mrs C] suffered both physically and psychologically, after the misinterpretation of the initial CT scan. This resulted in months of unnecessary investigations and skepticism relating to her symptoms. She and her family were deeply saddened by the eventual diagnosis and the circumstances that led to it."

[8] Magnetic resonance imaging — a scan that produces detailed images of the organs and tissues in the body.
[9] The blood test results were normal.

Radiology service

37. The radiology service stated that it is "very regretful of the outcome of this case and extends its sympathy to the family of [Mrs C]".

38. The radiology service told HDC that Dr A's workload between May 2018 and April 2019 was below average for a radiologist at the radiology service, and at the time of this event he did not have any added duties that may have been a potential distraction and/or increased his interruptions (such as administration, study, or clinical lead responsibilities). In response to this, Dr A disagreed that his workload was below average, and noted that the measurement used to calculate his workload does not capture the time spent liaising with clinicians.

39. The radiology service also noted that whenever a radiologist is reporting an examination, there will always be other radiologists available in the clinic to offer support or a second opinion, and/or to offer a second read. It stated that according to its records, at the time Dr A reported Mrs C's CT scan, there was one senior radiologist on site who would have been available to discuss the findings or offer a second opinion.

40. On discovery of the missed finding, the radiology service performed a peer review audit of Dr A's work. The review analysed 20 CT scans of the chest, abdomen, and pelvis performed in 2018 and reported by Dr A. All 20 reports achieved the highest scores (both in the scan interpretation and the quality of the reporting), and the review concluded that "the perception and interpretation of radiological findings is excellent".

Dr A

41. Dr A told HDC that he believes he is a competent, careful, and caring radiologist. He said that this is the only complaint he is aware of ever having been made about his work. He stated:

> "On respective review a tumour can be identified on [Mrs C's] CT scan that I reported on 6 June 2018 and I missed this at the time. I am very sorry for this error. I am truly saddened to hear about [Mrs C's] passing and the family struggle coping with the diagnosis of pancreatic cancer."

42. Dr A said that the radiology service is a busy practice, and is a known site with chronic understaffing. He stated that there were three radiologists in total, but often only two were working at any time. He said that the CT and MRI practice is in a separate clinic, and often is manned by a single radiologist, who would be doing multiple tasks. He noted that "interruptions were frequent but unavoidable, given the resourcing situation".

43. Dr A told HDC that he believes a contributing factor for his error was likely that the CT scans were not tailored towards the pancreas, and the indications on the request form were non-specific. In addition, he noted that the lesion did not enhance,[10] was poorly defined, and had minimal secondary findings to alert one to its presence.

[10] Non-enhancing lesions are those that do not have a definite border.

44. Dr A submitted that radiologists can strive for perfection, but experience tells us that unfortunately, rare mistakes are very difficult to eliminate.

Responses to provisional opinion

45. Ms B was provided with an opportunity to comment on the "information gathered" section of the provisional opinion, and met with Mrs C's husband to discuss it. She stated:

> "[Mrs C] wanted to do all she could to prevent others suffering the way she had prior to being given a diagnosis that could have been made nearly 6 months prior. She certainly suffered after finally receiving the diagnosis but at least she [k]new why.
>
> We were pleased to see that [the DHB] noted more of a willingness for clinicians to review prior scans where symptoms persist without explanation, even if it is only anecdotally …
>
> We look forward to seeing the final report and hope that, as [Mrs C] wanted, it can go some way to avoid even one other person facing the scepticism she encountered, for months, when detailing her severe and ongoing symptoms."

46. The radiology service was provided with an opportunity to comment on the relevant sections of the provisional opinion. It agreed with Dr A's comments that the radiology service is a busy practice, and noted that this is the same for all other radiology practices and DHB radiology departments in New Zealand. The radiology service reiterated the supports that it has in place for its staff, and the changes it has since made. It stated:

> "[The radiology service] believes it provides strong support for its 35 radiologists in its city and provincial branches with the ability to provide opinions and double reads. These processes are well documented and have been reinforced at [the radiology service's] Clinical Day [in] 2021 …"

47. The Clinical Board of the radiology service again extended its sympathy to the family of Mrs C.

48. Dr A was provided with the relevant sections of the provisional opinion, as they related to him, for his comments. On behalf of Dr A, his lawyer advised that since these events, Dr A has undertaken continuous professional development (CPD), and noted that this shows that he is a diligent clinician open to learning. It was also noted that several of the CPD activities undertaken focused on imaging of the abdomen.

49. The DHB was provided with the relevant sections of the provisional opinion for its comments, and noted the comments made by my expert, and the findings made in my opinion.

Opinion: Dr A — breach

Introductory comment

50. First, I wish to acknowledge Dr A's submissions regarding the nature of radiology reporting and the fallibility of human perception. My independent expert radiologist, Dr Remy Lim, agrees that errors in radiology are well recognised and acknowledged in the industry, owing to the complexity of the work and typically high volume of work. He stated: "Whilst no one would disagree on the ideals of zero error rate on all radiology interpretations, this is neither a realistic goal nor is it achievable currently."

51. Whilst I am mindful of this submission, previously this Office has noted[11] that just because it is accepted that errors of perception (such that a radiologist misses an apparent abnormality that would have been detected by most of his or her peers in similar circumstances) occur in a small but persistent number of radiology interpretations, that is not determinative in assessing whether the standard of care has been met in a particular case. Whether the standard of care has been met will be assessed on a range of factors, including the clinical history of the patient and how obvious the abnormality is.

52. In this case, I have considered whether Dr A provided services to Mrs C with reasonable care and skill, and have drawn on the advice provided by Dr Lim.

Care provided to Mrs C

53. On 8 June 2018, Dr A reported the findings of Mrs C's CAP CT scan, and concluded that there were "unremarkable intrathoracic and intra-abdominal CT findings". Subsequently, in November 2018, consultant radiologist Dr G reviewed the June 2018 CT scan imaging when comparing it with a recent X-ray, and noted that despite having been reported as unremarkable, it was suspicious of pancreatic cancer owing to the presence of a tumour. Shortly afterwards, Mrs C was diagnosed with advanced pancreatic cancer.

54. I have carefully considered the standard of care to be expected in a case such as this. My advisor, Dr Lim, stated that from his blind review of Mrs C's CT scan of 6 June 2018, he was able to identify a significant mass in the mid-pancreatic body, in addition to several other abnormal secondary findings. He stated that "none of these findings were noted on the initial CT report provided by [Dr A]".

55. Dr A has submitted that the lesion did not enhance, was poorly defined, and had minimal secondary findings to alert one to its presence. However, Dr Lim respectfully disagreed with this statement, and advised that the CT scan as performed on Mrs C adequately depicted the mass and other associated abnormalities. Dr Lim stated:

> "The mass is not a subtle finding on [Mrs C's] CT scan and there are several other secondary findings which might have alerted [Dr A] to the presence of the pancreatic mass."

[11] See opinions 15HDC00685 and 17HDC00415.

56. In addition, Dr Lim noted that the ill-defined and poorly enhanced characteristics of the mass are, in fact, typical for pancreatic adenocarcinoma.

57. Dr A told HDC that he believes a contributing factor for his error was likely that the CT scans were not tailored towards the pancreas, and the indications on the request form were non-specific. However, in response, Dr Lim advised that "although non-specific symptoms such as abdominal/back pain and weight loss have a vast range of potential [causes], these symptoms are some of the recognised presentations of pancreatic cancer".

58. Dr Lim advised that detecting and documenting the pancreatic mass and the secondary findings associated with the mass would be considered as accepted standards of practice, and that the failure to do so, in his view, constitutes a "severe" departure from accepted standards of practice for the above reasons. I accept this advice.

59. The standard of care applicable in this case is the care and skill that an ordinarily careful radiologist would exercise under similar circumstances. I note that both Dr Lim and Dr G picked up concerning signs of pancreatic cancer from the CT images. While acknowledging that perception errors will occur, after careful consideration of the factors discussed above, it is my opinion that Mrs C's pancreatic mass and other secondary signs related to the mass should have been picked up by Dr A when reporting the June 2018 CT scan. While it is uncertain whether earlier detection could have affected the eventual outcome, later detection meant that Mrs C was subjected to unnecessary investigations in an attempt to discover the cause of her symptoms. In this instance, I consider that Dr A did not provide Mrs C services with reasonable care and skill, in breach of Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[12]

60. I wish to acknowledge the peer review audit of Dr A's work undertaken by the radiology service on discovery of the missed finding, which concluded that the perception and interpretation of radiological findings by Dr A was excellent. I also agree with Dr Lim's statement that his categorisation of a severe departure from standards of practice pertains specifically to the failure in perception in this case, and "does not, and should not, be construed as a reflection of [Dr A's] general competence in radiology".

Opinion: Radiology service — no breach

61. Mrs C presented to the radiology service for her CAP CT scan on 6 June 2018. Radiologist Dr A reported the scan as having "unremarkable intrathoracic and intra-abdominal CT findings". In November 2018, it was discovered that Dr A had missed findings in the scan that were suspicious of pancreatic cancer.

62. At the time of this event, Dr A had been a Fellow of the Royal College of Radiologists since 2012, and had worked at the radiology service since February 2016. I also note that at the

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

time of reporting, there was one senior radiologist on site who would have been available to discuss the findings or offer a second opinion.

63. Dr Lim reviewed the CT examination protocols at the radiology service and stated that he has no issues with the protocols as provided. He noted that Mrs C's CT scan images were of good quality and were "fit for purpose", and concluded that there was no departure from standards of accepted practice in terms of the imaging performed on Mrs C at the radiology service.

64. Dr Lim also commented that the actions by the radiology service following the discovery of Dr A's error were appropriate, and commended the radiology service for instigating an audit soon after the error was discovered, and for conducting a Clinical Board review. Dr Lim considered the audit to be "comprehensive and objective", and also commended the radiology service for de-identifying the case and discussing it at a Clinical Day as a learning case for other radiologists. Dr Lim stated: "I expect my peers would also agree this is a good remedial move to minimise the chance of similar errors being repeated in the future at the radiology service."

65. I agree. I consider that this was a case of individual error alone, and am satisfied on the evidence that the systems in place at the radiology service were reasonable and appropriate. Accordingly, I find that the radiology service did not breach the Code directly.

66. In addition to any direct liability for a breach of the Code, section 72(2) of the Health and Disability Commissioner Act 1994 (the Act) states that an employing authority is vicariously liable for any acts or omissions of its employees. A defence is available to the employing authority of an employee under section 72(5) if it can prove that it took such steps as were reasonably practicable to prevent the acts or omissions.

67. I have already found that the radiology service had appropriate systems in place to support its staff in the provision of radiology services, and there is no evidence to indicate that the omission that occurred was anything but an individual error on Dr A's part. Accordingly, I find that the radiology service is not vicariously liable for Dr A's breach of the Code.

Opinion: District health board — adverse comment

68. On 30 July 2018, Mrs C was admitted to the public hospital with weight loss, abdominal and back pain, and reduced energy and appetite. While in hospital, she underwent an investigation to look at the upper part of the gastrointestinal tract, and a stool sample and blood tests were taken. All investigations revealed no abnormalities. The CT scan imaging and report from 6 June 2018 was imported to the DHB system during this admission, but the "normal" findings were accepted, and the images were not reviewed formally by the DHB's Radiology team. Mrs C was discharged on 7 August 2018, with no cause found for her symptoms.

69. My independent gastroenterologist advisor, Associate Professor Alan Fraser, advised that obtaining the correct clinical diagnosis was difficult in this case. He noted that there were distracting features such as a variable bowel habit, which raised a potential diagnosis of Crohn's disease, and there was a wide range of descriptions of the site and radiation of Mrs C's pain. However, he noted that an MRI of the abdomen could have been considered during Mrs C's admission.

70. The DHB acknowledged that an MRI of the abdomen could have been considered during this admission, but stated that when initial imaging results are reported as normal, as was the case for Mrs C, generally an MRI does not provide any additional diagnostic clues. While I accept my expert advisor's comment that an MRI of the abdomen could have been considered, I acknowledge that Mrs C's CT scan having been reported as normal may have influenced the clinicians' decision-making during this admission — particularly in regard to undertaking further investigations.

71. Associate Professor Fraser also noted that although Mrs C's CT scan was imported to the DHB's system during her admission, it was not placed on the list for the weekly radiology session. He advised that this was a "definite oversight", and stated:

> "The films should have been added to a Radiology meeting for the surgical ward and also for a meeting of the involved physicians (this should be a routine part of a consultation process of a patient in another service particularly if there is uncertainty about the diagnosis). The notes acknowledge that the clinicians were aware that the private films had been imported as requested. The films were not placed on the list for the weekly radiology session; this is usually the responsibility of junior staff …"

72. The DHB told HDC that it is not its normal practice to re-read radiology scans. It said that it cannot determine which clinician requested the CT scan or for what reason, and noted that during Mrs C's admission there is no documentation regarding whether the scan was considered for review in the weekly Radiology conference. The DHB stated that it is possible that this did not occur owing to the scan having been reported as "normal".

73. Regarding the care provided to Mrs C by the DHB, my advisor stated that "the overall level of care was within a reasonable standard". I accept this advice, but consider that aspects of the care provided could have been better, including undertaking a radiology review of Mrs C's imported CT scan, and having greater consideration and a lower threshold for undertaking an MRI of the abdomen. While the diagnosis in Mrs C's case was difficult, and was hindered by the reportedly normal CT scan, the above further investigations may have provided an opportunity to make the diagnosis earlier.

Changes made since events

Dr A

74. Dr A stated that after being alerted to the error, he adopted a methodology that ensures that he pays particular attention to the pancreas, even in cases where the referral and imaging are non-specific.

Radiology service

75. The radiology service told HDC that it considers Dr A's reporting of Mrs C's CT scan to be a "one-off" serious adverse event, which can be attributed to human error. The radiology service said that it does not consider it necessary to make any changes to its service, but it presented Mrs C's case anonymously at a Clinical Day for discussion.

DHB

76. As a result of this case, the DHB recommended that its clinicians have a low threshold for placing external imaging on the Speciality/Radiology weekly meeting list for inpatients with a complicated medical history. The DHB told HDC that since having made this recommendation, anecdotally radiologists have indicated an increase in complex cases being presented across the meetings.

Recommendations

77. I recommend that Dr A:

a) Implement a "checklist" structured reporting style, with clear headings for each organ in the body, to provide a cue for each abdominal organ to be evaluated carefully, as per Dr Lim's advice. Evidence that this has been done, and examples of five (anonymised) cases where this new reporting style has been used, are to be sent to HDC within three months of the date of this report.

b) Familiarise himself with the various radiological manifestations of pancreatic cancer, by way of self-initiated research and/or attendance at an upper gastrointestinal multidisciplinary meeting where cases with typical or unusual manifestations of pancreatic cancer are shown. Evidence that this has been done is to be sent to HDC within nine months of the date of this report.

c) Provide a written apology to Mrs C's family for the failing identified in this report. The apology is to be sent to HDC, for forwarding to Ms B and Mrs C's family, within three weeks of the date of this report.

78. I recommend that the radiology service consider the comments made by Dr A in regard to the staffing at the radiology service, and consider whether any further improvements could be made to address these issues. The outcome of the radiology service's considerations should be provided to HDC within one month of the date of this report.

79. I recommend that the DHB formalise its process for placing external imaging on the Speciality/Radiology weekly meeting list by way of a policy or guideline. The policy or guideline should include examples of circumstances when imaging should be placed on the Speciality/Radiology weekly meeting list, and should reflect the DHB's recommendation that its clinicians have a low threshold for doing so. Evidence that this has been done is to be sent to HDC by April 2022.

Follow-up actions

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

81. A copy of this report with details identifying the parties removed, except 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.

Appendix A: Independent clinical advice to the Commissioner

The following report was prepared by radiologist Dr Remy Lin after a blind reading of Mrs C's CT scan:

"Indication: Abdominal lumbar back pain and loss of weight.

Correlation: None

Technique: Post contrast CT of the chest, abdomen and pelvis.

FINDINGS:

Thoracic nodes: No thoracic adenopathy.

Lungs: Mild centrilobular emphysema. No suspicious pulmonary nodules.

Pleura/pericardium: No effusion.

Hepatobiliary: Scattered well defined low densities in the liver, too small to characterise. No biliary obstruction. Gallbladder is thin walled with no radio-opaque gallstones.

Spleen/Pancreas/Adrenal glands: A hypoenhancing mass in the pancreatic body, midline abdomen level, measures 4.0 x 2.8 cm, 3.3 cm craniocaudal. There is obstruction of the main pancreatic duct which is dilated to a calibre of 4mm and atrophy of the distal pancreatic body and tail. Celiac trunk is completely encased and is narrowed due to tumour encasement. The tumour also contacts the SMA origin by at least 180 degrees with a cuff of soft tissue density surrounding the vessel, suspicious for perivascular tumour infiltration along the SMA. Tumour extends to the superior margin of the SMV/IMV confluence. The splenic vein is thrombosed. The tumour contacts the left adrenal body and median arcuate ligament/crus of the right hemidiaphragm without gross invasion. Right adrenal gland is unremarkable. Normal sized spleen.

Renal tracts: No solid lesions or hydronephrosis. Left lower pole cortical cyst.

Abdominopelvic nodes: No retroperitoneal, mesenteric or pelvic adenopathy.

GI tract/peritoneum: No bowel masses, obstruction or peritoneal nodules. No ascites.

Pelvic organs: Unremarkable appearance of the pelvis.

Bones/soft tissue: No suspicious osseous lesions. Severe L3/4 lumbar spondylitic change.

IMPRESSION:

1. Locally advanced mid pancreatic body malignancy with encasement of celiac trunk and SMA. There is associated distal pancreatic parenchymal atrophy, dilatation of the pancreatic duct and splenic vein thrombosis. Left adrenal body, median arcuate ligament and right crus of the diaphragm are contacted but not grossly invaded.

2. No regional adenopathy.

3. Tiny low densities in the liver, too small to characterise but probably cysts. MRI could be considered to confirm benignity."

The following expert advice was obtained from Dr Lim:

"I, Dr Remy Lim, have been asked to provide an opinion to the Commissioner on case number19HDC01960. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors, and I am not aware of any conflicts of interest.

I am a diagnostic radiologist trained in Auckland and Hamilton. I received my diagnostic radiology fellowship from RANZCR in 2009. My subspecialty interest lies in body and oncology imaging, PET/CT and genitourinary imaging.

I have reviewed the following imaging for the purpose of this report:

1. CT Chest, Abdomen and Pelvis performed on 6 June 2018 on [Mrs C] and provided an initial blind read of the CT scan.

Subsequent to this, I have also received the following for review:

1. Letter of complaint dated 17 October 2019.
2. Responses and clinical notes from [the radiology service].
3. Response from [Dr A] dated 9 June 2021.

I have been asked to specifically comment on the following:

1. The accuracy and standard of [Mrs C's] CT report dated 6 June 2018 provided by [Dr A]. I am also asked to comment to what degree, if any, does the CT reporting in this case depart from accepted standards of practice. My comments to both requests are as below.

[Mrs C's] CT scan of June 6, 2018, demonstrates a significant mass in the mid pancreatic body. The mass is associated with several other secondary findings, namely atrophy of the distal pancreas, splenic vein thrombosis, dilated pancreatic duct and perivascular infiltration. The documentation of the pancreatic mass and of the secondary findings associated with the mass would be considered as accepted standards of practice.

None of these findings were noted on the initial CT report provided by [Dr A].

I note HDC's request for extent of departure from accepted standards of practice to be considered in terms of 'mild, moderate or severe' departure.

The failure to perceive the mass and other secondary signs related to the mass, in my view, constitutes a 'severe' departure from accepted standards of practice.

The departure from accepted standards of practice is considered 'severe' for the following reasons:

a. The mass is not a subtle finding on [Mrs C's] CT scan and there are several other secondary findings which might have alerted [Dr A] to the presence of the pancreatic mass.

I respectfully disagree with [Dr A's] response that the mass was subtle and that there are minimal, if any ancillary findings ('*The lesion in question does not enhance, is poorly defined and has minimal, if any, ancillary findings to alert us to its presence*'). Although a dedicated pancreatic multiphase CT may have drawn one's attention to the mass by its very nature, the CT scan as performed on [Mrs C] adequately depicted the mass and other associated abnormalities. The ill-defined and hypoenhancing characteristics of the mass are, in fact, typical for pancreatic adenocarcinoma.

b. The seriousness of the condition which ultimately resulted in [Mrs C's] death.

It would be purely speculative to consider whether [Mrs C's] prognosis would have been altered by the reporting of the mass or lack thereof at the time of the CT scan.

Nevertheless, it should be noted that [Mrs C's] pancreatic cancer was locally advanced at the time of the scan and the extent of vascular involvement would have precluded curative surgery at the time.

c. Although non-specific symptoms such as abdominal/ back pain and weight loss have a vast range of potential aetiology, these symptoms are some of the recognised presentations of pancreatic cancer.

For avoidance of doubt, the categorisation of 'severe' departure from standards of practice pertains specifically to the failure in perception of the pancreatic mass and other secondary signs related to the mass. This categorisation does not, and should not, be construed as a reflection of [Dr A's] general competence in radiology.

In regard to how this would be viewed by my peers, I would expect most of my peers would consider this an error that could potentially happen in a 'perfect storm' situation, such as when there is a combination of constant interruptions during reporting, pressure to report as quickly and as many scans as possible and brief moment of inattention.

In terms of recommendation, [Dr A] may want to consider a 'checklist' structured reporting style, with clear headings for each organ in the body. This may provide a cue

for each abdominal organ to be carefully evaluated. [Dr A] may also want to consider familiarising himself with the various radiological manifestations of pancreatic cancer as some findings can be subtle. Attendance at Upper GI multidisciplinary meeting where cases with typical or unusual manifestations of pancreatic cancer are shown may also be beneficial.

2. The adequacy and appropriateness of the review completed by [the radiology service] in relation to the incident in question.

I commend [the radiology service] for instigating an audit soon after [Dr A's] error was discovered at the end of 2018 and for conducting a Clinical Board review. The audit appears to be comprehensive and objective.

I conclude there has been no departure from standards of accepted practice in terms of the review completed by [the radiology service] in relation to the incident in question.

I also commend [the radiology service] for de-identifying the case and discussing it at [the radiology service's] Clinical Day as a learning case for other radiologists. I expect my peers would also agree this is a good remedial move to minimise the chance of similar errors being repeated in the future at [the radiology service].

3. The adequacy of the systems in place at [the radiology service] at the time of these events (including policies and processes, staffing and support provided to its radiologists).

I have reviewed the CT examination protocols at [the radiology service] and have no issues with the protocols as provided.

In [Mrs C's] case, the clinical indication is of non-specific symptoms of back pain, lumbar pain and weight loss with no particular mention of concern for pancreatic malignancy.

The CT examination of the abdomen and pelvis was therefore performed in a portal venous phase. This is a standard, catch all imaging protocol when there are no specific requests for a particular organ to be examined. I concur with the [the radiology service] Clinical Board findings that the images are of good quality and 'fit for purpose'.

I conclude there has been no departure from standards of accepted practice in terms of the imaging performed on [Mrs C] at [the radiology service]. I expect my peers would also agree.

I have also reviewed a series of email correspondence from Dr … and [Dr A]. It would appear that Dr … was supportive of [Dr A] once the error was discovered and provided guidance on the appropriate next steps.

However, I do note [Dr A's] comment in his response that [the radiology service] is chronically understaffed and this may have contributed to the error.

It is impossible to comment on whether this is in fact the case, but it does raise the wider issue of radiologist workload and the chronic nationwide shortage of radiologists, particularly in the regional centres, which potentially may have contributed to this error.

4. Comments on acknowledged error rates in CT reporting and how this issue is best addressed.

I note [Dr A's] response and comment on error rates in radiology. I agree with [Dr A] that errors in radiology are well recognised and acknowledged in the industry due to the complexity of work and typically high volume of work. Whilst no one would disagree on the ideals of zero error rate on all radiology interpretations, this is neither a realistic goal nor is it achievable currently.

I am encouraged to read [Dr A's] comment that he has now adopted a particular methodology that ensures he pays particular attention to the pancreas. I am also fairly certain that [Dr A] has learned from this experience and is a much better radiologist for it.

Errors in radiology can be minimised with ongoing educational meetings, reporting cues, managed workload and lately, deployment of artificial intelligence in some fields of radiology. As radiologists, we work in the perpetual hope that errors like [Mrs C's] case can eventually be eliminated with the combination of these mitigation strategies.

Dr Remy Lim MBChB, FRANZCR, CMInstD
Radiologist"

Appendix B: Independent clinical advice to the Commissioner

The following expert advice was obtained from a gastroenterologist, Associate Professor Alan Fraser:

"I am a gastroenterologist (since 1992) and Associate Professor of Medicine (1992–2004; now Honorary A/P). I have extensive clinical experience (over 30 years) in gastrointestinal and liver disease.

I have reviewed:

- The data submission by [Ms B] dated 18/10/2019
- The clinical notes from [Dr D], [Medical Centre 2], [Hospital 2], [the public hospital] and [Hospital 3].
- Correspondence from [Dr E], Surgeon and from [Dr F], Gastroenterologist
- Letters of response to the complaint from
  - [the radiology service]
  - Radiology Department, [the public hospital]
  - [Dr F], Gastroenterologist
  - … Gastroenterologist
  - … Surgeon

Case summary

[Mrs C] presented to her GP on the 19th April, 2018. She described weight loss, loss of appetite, sore back and a mild fever. She had blood tests and an MSU. The urine sample showed *E.coli* > 10^8 with WBC 40. The serum sodium was 132 mmol/L. The initial diagnosis was pyelonephritis. She was given antibiotics. On follow-up visit the back pain had resolved but weight loss of 5 kg was of concern. She was referred privately to [Dr E], Surgeon on the 5th May and seen on the 18th May. She described residual peri-umbilical discomfort and some discomfort in both renal angles. There had been some constipation but she stated that her bowels were now back to normal. Gastroscopy and colonoscopy were arranged at [a private hospital] on the 22nd May; both these procedures were normal.

The patient returned to see [Dr E] on the 28th May. She continued to have weight loss and abdominal pain. The choice of next investigation was for CT of the chest, abdomen and pelvis (CAP) rather than ultrasound because of the significant weight loss. The CT CAP was performed 6th June at [the radiology service]. The referral stated 'abdominal and lumbar back pain; loss of weight. Normal panendoscopy'.

The CT was performed with standard protocol using 100 mls intravenous contrast (Omnipaque 350). The examination was reported by [Dr A], Radiologist. The report was essentially normal apart from some lumbar spine changes (focal L3–L4 spondylosis and features suggestive of disc prolapse). In particular the pancreas was stated to be normal.

She was seen by [Dr E] for follow-up on the 18th June. The symptoms were unchanged. No follow-up was arranged but he suggested to the GP that referral to Urology or Orthopaedics might be helpful. The GP arranged a follow-up MSU that showed no growth.

On the 29th June she was given antibiotics (Metronidazole and Amoxicillin) by her GP for possible diverticulitis.

She self-presented to the Emergency Department at [Hospital 2] on the 23rd of July. She described 3 months of back chest and abdominal pain. She stated that she 'could not eat because of nausea'. She was taking Codeine for pain. She was discharged the same day with a script for Tramadol, Ondansetron and Naproxen with a plan for GP follow-up in one week.

On the 30th July she was admitted by her GP to the Surgical ward, [the public hospital].

She was seen by the Surgical registrar on admission and by the Surgical consultant on 31st July. Weight loss of 9 kgs was noted (probably more as she was normally around 52–4kgs). Weight was 41 kgs; she was described as 'skinny'. The notes state that she was miserable with anorexia and low back pain that radiated to the abdomen. Blood tests were normal apart from a Na of 124 mmol/L and K 3.4 mmol/L. Myeloma was suggested as a diagnosis and medical referral requested. She was seen by [a] Locum physician on the same day. Small bowel ischaemia was also suggested as a diagnosis. He requested CT mesenteric angiogram and MRI lumber spine. The diagnosis of SIADH (syndrome of inappropriate ADH) was also considered because of the hyponatraemia. Fluid restriction to 1000mls per day was suggested. Another gastroscopy was performed on the 31st July (to exclude gastric cancer) and this was essentially normal.

She was seen by [a] General Physician and Nephrologist on the 1st August. Serum and urine osmolality together with urine sodium were consistent with SIADH (although this diagnosis is difficult to make while the patient is on a thiazide diuretic; cilazapril/hydrochlorothiazide). Constipation was noted and she was prescribed Laxsol. Tramadol was stopped because of the constipation. The notes on the 2nd August confirm that the clinicians were aware that the CT scan in private had been received in the hospital system 'and the report is pending'. She had dietitian review on the ward on 3rd August with follow-up review arranged. Special authority was arranged for Fortisip.

The MRI lumbar spine request was deferred by radiology department awaiting myeloma screen (blood tests and urine). The myeloma screen came back as normal and the MRI was declined. She was reviewed by the Medical team on 7th August and discharged. The issue of reviewing the previous CT scan or requesting a CT angiogram was not addressed.

She was seen by GP on the 21st August and given repeat treatment with metronidazole (possible diagnosis of Giardia).

On the 28th August she was referred to [Dr F], Gastroenterologist because of persisting symptoms. She was seen on the 4th Sept 2018 in his private clinic. The patient described four months of anorexia, weight loss and nausea. There was also right lower abdominal pain. The weight loss had stabilised because of the liquid food supplement (Fortisip). The patient raised the issue of an MRI (this is mentioned in the complaint letter but not in the clinic letter). She was told this would not help. It is not clear whether the conversation was about an MRI lumbar spine or MRI of the abdomen and pelvis.

13th Sept she was seen by the registrar for [Dr F]. She was changed to cilazapril rather than the combination (i.e the diuretic was discontinued).

On the 27th September she was seen at Dietitian outpatients. Weight was 42 kgs (an increase from 40.4 kgs; the inpatient weight 1st August). She described pain down the left side of her abdomen and had gained some relief with a hot wheat pack. On the 23rd Oct she was reviewed again by [Dr F]. There was no improvement but weight was stable. There was right-sided chest pain that radiated down to her right abdomen. He arranged for blood tests and a CXR and arranged for review on the 26th Oct. The blood tests were normal; CRP 2, sodium 130 mmol/L, normal full blood count and liver tests (there were also tests to check for carcinoid and pancreatic disease). Malabsorption was considered because of the weight loss and loose bowel motions. The diagnosis was still unclear and she was given a trial of steroids.

The CXR was performed at [Hospital 2] on the 24th Oct and reported by [Dr G].

He also reviewed the CT CAP from the 6th June and considered that there was a mass in the pancreas. An urgent referral for chest, abdomen and pelvis was received by [the public hospital] on the 8th November.

She had a dietitian review on the 8th November. She was tolerating Fortisip 2 x 200ml bottles per day. She was also seen by a speech language therapist on the same day for possible dysphagia (referred 13th September). On review it was clear that the history suggested nausea as the main reason for poor oral intake and weight loss.

She was seen by [Dr E] on the 12th November. The missed diagnosis on previous CT scan was discussed. He arranged for urgent CT (iv contrast) at [another radiology service] on 14th November. She was only taking Panadol as necessary. The scan was reported by Dr … There was a mass involving the pancreatic body and tail. There was an extensive extra-pancreatic mass with local invasion. There was vascular encasement of the aorta, coeliac axis and SMA. There was occlusion of the portal and splenic vein. There was intra- and extra-hepatic biliary dilatation due to the mass extending into the porta hepatis and also lymph nodes. This scan was compared to the scan from the 6th June which confirmed progressive disease with new biliary dilatation.

19th Nov. Seen by [Dr E]. The patient was told that there was a large irresectable tumour.

Specific questions

1. **What was the standard and appropriateness of investigation into [Mrs C's] gastrointestinal symptoms and weight loss in 2018?**

This is the main complaint; the missed diagnosis on the CT scan 6th June. The complainant refers to a similar misdiagnosis in a previous complaint to the HDC 17HDC00415 reported on 31/5/18. This is another case of missed diagnosis of pancreatic carcinoma on CT scan. This illustrates the difficulty in observing an ill-defined low density mass in the pancreas particularly if the clinical information is not suggestive of a pancreatic lesion. In this case there was considered to be a breach of reasonable conduct and care. The tumour was in the pancreatic head (compared to the current case) with dilatation of the pancreatic duct and atrophy of the pancreas — two signs that should have alerted to the problem or at least the need for further testing. In both cases another radiologist or specialist has made the diagnosis on review of the CT scan but this retrospective review is more careful because of the clinical setting — i.e persistent symptoms without a diagnosis and perhaps symptoms that became more suggestive of a pancreatic cancer.

The complainant raises the issue of using oral contrast or not. This is not relevant; both procedures had standard protocol with intravenous contrast. The letter from [the radiology service] confirms the appropriate training of [Dr A]. A revised CT report was issued on the 23rd November, 2018. As well as the pancreatic mass there was evidence of vascular involvement.

'The tumour envelopes coeliac trunk as well as 3 coeliac branches. The tumour abuts the SMA but involves <180 degrees of the SMA. There was likely involvement of the right adrenal.'

A peer review audit of [Dr A's] reporting was performed December 2018; 20 CT CAP procedures were reported by [Dr A]; all were reported with a high degree of accuracy.

Radiology research shows that findings are regularly missed but are usually of no consequence. It is not practical to double report all examinations. It is difficult to maintain high vigilance throughout a busy day of reporting. In contrast when a radiologist is under scrutiny (as in an audit process) standards are very high reflecting a good level of training.

I have not had the opportunity of the necessary expertise to review the films. I can only summarize the overall issue — the miss is regrettable and did have an impact on subsequent care but this is not to be seen as evidence of an inadequate standard of care.

2. Would you have expected each individual clinician or multi-disciplinary team to review CT images from 6th June 2018 despite the radiologist reporting these images as unremarkable?

The CT scans were imported into the system at [the public hospital] during a 7-day hospital admission but not reviewed by the clinicians. This is a definite oversight. The diagnosis remained unresolved during the admission. The films should have been added to a Radiology meeting for the surgical ward and also for a meeting of the involved physicians (this should be a routine part of a consultation process of a patient in another service particularly if there is uncertainty about the diagnosis). The notes acknowledge that the clinicians were aware that the private films had been imported as requested. The films were not placed on the list for the weekly radiology session; this is usually the responsibility of junior staff. There may have been confusion regarding who had the lead care and responsibility — the Surgeons or the physicians.

3. On the basis of [Mrs C's] clinical presentation at the time are there any specific investigations that you feel were clinically indicated over the period in question but not performed?

The main opportunity for a diagnosis was the surgical admission on the 30th July. An MRI abdomen could have been considered. It would be routine to review previous CT scans before proceeding to an MRI scan. The instructions from the ward round were actually for a CT angiogram and an MRI of the lumbar spine. The CT angiogram may not have been possible for reasons not given in the notes, perhaps some technical or staffing reasons. This examination, while not appropriate given the final diagnosis, would have probably given the diagnosis. An MRI of the lumbar spine would not have helped. The request for this test shows that the type of pain was difficult to evaluate. The main site of pain was described in several different locations which complicated the assessment and ordering of appropriate tests. The myeloma screen was normal and the MRI lumbar spine was declined. This was an appropriate method of limiting unnecessary tests.

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

Many aspects of care were performed well. Tests and follow-up appointments were arranged without delay using both private and public services.

The correct clinical diagnosis was difficult. There were distracting features.

a) Hyponatraemia — this was possibly just due to the thiazide but she may also have had SIADH due to pancreatic cancer.

b) Variable bowel habit, both diarrhoea and constipation was described to the extent that the diagnosis of Crohn's disease was raised. Constipation became a significant problem needing laxatives such as Laxsol.

c) There was a wide range of descriptions of the site and radiation of the pain. Lumbar back spine distracted from the main diagnosis. The abdominal pain was located in various sites and also in both loins. This deep seated widely radiating pain is a feature

of metastatic disease particularly locally invasive pancreatic cancer. It is often difficult to focus on the pancreas, a central upper abdominal organ, and several other potential diagnoses are often raised.

The outcome if the CT scan had correctly reported the carcinoma of the body of the pancreas would not have changed the prognosis. The cancer was clearly irresectable on the initial scan, however the final months would have been better managed by the patient and her carers if the diagnosis had been confirmed earlier. Unnecessary investigations would have been avoided. There would have been focus on appropriate pain relief from an early stage. There may have been an opportunity to choose palliative chemotherapy at a time when this treatment could have been better tolerated. The advantage of chemotherapy would have been a few months extension of life at best. The additional time with a certain knowledge of a terminal illness should not be underestimated. Much time was lost to prepare for death in a dignified manner.

Summary

Was the care provided to [Mrs C] reasonable in the circumstances?

The outcome would not have changed if the CT scan had been correctly interpreted on the 6th June. The revised report clearly shows that the pancreatic carcinoma could not have been successfully resected; surgery would have been declined in June, 2018. The clinicians acted with care and in good faith. They arranged prompt follow-up and considered a range of diagnoses. The delay to final diagnosis was unfortunate but within the range of reasonable management. The palliative care at [Hospital 3] was arranged in good faith by a competent team but the outcome was not successful. These procedures are usually straightforward but can be technically challenging. It is easy to understand the dissatisfaction of the patient and family with the outcome but the overall level of care was within a reasonable standard.

Dr Alan Fraser
Associate Professor of Medicine"