Radiologist, Dr B

Southern District Health Board
(now Te Whatu Ora|Health New Zealand)

A Report by the

Health and Disability Commissioner

(Case 20HDC00693)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided by a radiologist at Southland Hospital. The radiologist's failure to diagnose a liver lesion correctly as cancer caused a delay in the man receiving timely and appropriate care.

2. The man presented to the Emergency Department in 2017 for stomach pain. He underwent several imaging procedures over the next few months to assess a liver lesion, which was ill defined. Following a liver MRI, the radiologist reported the liver lesion as a "benign haemangioma", and consequently the man received no further follow-up care.

3. In 2019, the man was admitted to hospital with abdominal pain. A follow-up ultrasound identified that the original liver lesion had increased in size substantially. An internal multidisciplinary radiology meeting found that the MRI read by the radiologist in 2018 was consistent with liver cancer.

4. The man was subsequently diagnosed with terminal liver and pancreatic cancer.

Findings

5. The Commissioner considered that in misdiagnosing the lesion as a "benign haemangioma", the radiologist's care fell significantly below the accepted standard for a consultant radiologist. The Commissioner found the radiologist in breach of Right 4(1) of the Code. The Commissioner also considered that the radiologist did not adhere to radiology reporting standards as set out in the RANZCR and IANZ guidelines, and found him in breach of Right 4(2) of the Code.

6. Southern DHB was found in breach of Right 4(1) of the Code. The Commissioner considered that there was an unacceptable delay in commencing an internal investigation once SDHB became aware of the radiologist's misread.

Recommendations

7. The Commissioner acknowledged the Medical Council of New Zealand's review of the radiologist's practice, and recommended that in addition, the radiologist provide a written apology; provide evidence that he has familiarised himself with the various radiological manifestations of liver cancer; participate in formal double reading; use a checklist when reporting liver MRIs; and provide recent copies of radiology reports that show compliance with relevant guidelines.

8. In response to the Commissioner's recommendation in the provisional opinion that SDHB undertake a further audit of all the radiologist's reading of liver imaging during his employment at SDHB, an independent third party performed the audit and found no significant errors. Also in response to the Commissioner's recommendation in the provisional opinion, Te Whatu Ora performed an audit to determine whether the necessary Severity Assessment Code events had been raised for any missed radiology diagnoses from

January to June 2022. The Commissioner was satisfied that the actions taken by Te Whatu Ora were appropriate.

Complaint and investigation

9. The Health and Disability Commissioner (HDC) received a complaint from Mr A about the services provided by a radiologist, Dr B, and Southern District Health Board (SDHB) (now Te Whatu Ora Southern).[1] The following issues were identified for investigation:

- *Whether Dr B provided Mr A with an appropriate standard of care in and after March 2018.*
- *Whether Southern DHB provided Mr A with an appropriate standard of care in and after March 2018.*

10. This report is the opinion of the Commissioner, Morag McDowell.

11. The parties directly involved in the investigation were:

Mr A	Consumer
Dr B	Provider/radiologist
SDHB	Provider/public hospital/DHB

12. Further information was received from:

Dr C	Consultant surgeon
ACC	New Zealand Crown entity
Medical Council of New Zealand	Regulatory body

13. Also mentioned in this report:

Dr D	Consultant surgeon
Dr E	Radiologist
Dr F	Radiologist
Dr G	Radiologist

14. Independent radiology advice was obtained from Dr Graeme Anderson (Appendix A).

[1] On 1 July 2022, the Pae Ora (Healthy Futures) Act 2022 came into force, which disestablished all district health boards. Their functions and liabilities were merged into Te Whatu Ora|Health New Zealand. All references in this report to SDHB now refer to Te Whatu Ora Southern.

Information gathered during investigation

Introduction

15. This report discusses the radiology care provided to Mr A (aged in his late sixties at the time of events) by SDHB and radiologist Dr B,[2] who misinterpreted Mr A's MRI[3] on 28 March 2018. This led to a delayed diagnosis of both pancreatic and liver cancer[4] for Mr A in 2020.

16. At the time of events, Mr A had numerous health conditions, including chronic obstructive pulmonary disease (COPD),[5] asthma, obstructive sleep apnea (OSA),[6] and gallstone pancreatitis.[7]

17. It is of note that Dr B no longer works at Te Whatu Ora Southern or Southern Hospital.

Presentations to Southland Hospital in 2017–2018

18. On 25 August 2017, Mr A presented to the Emergency Department (ED) at Southland Hospital[8] with stomach pain. An ultrasound scan of his abdomen showed multiple gallstones and a small liver lesion. Further examination was recommended, and a follow-up CT scan was arranged for 4 September 2017 at the Medical Imaging Department at Southland Hospital. Mr A was discharged from hospital on 25 August and advised to return if he had any further concerns.

19. On 4 September 2017, Mr A presented to the Medical Imaging Department at Southland Hospital for the recommended follow-up CT scan of his chest and abdomen. The radiologist who read the CT scan noted a "rather ill-defined and hard to see lesion in the liver". Subsequently, Mr A was referred for a follow-up ultrasound to be performed in three months' time to re-evaluate the structure in the liver.

20. The follow-up ultrasound took place on 17 November 2017, and was read and interpreted by Dr B. He indicated that the liver lesion seen on the 25 August scan had a similar shape but had increased in size (it measured 24 x 22 x 22mm). This was documented as: "Single well-defined liver lesion has similar echogenicity and shape to the previous ultrasound and possible slightly increased in size compared to the previous ultrasound."

---

[2] Dr B is a vocationally registered radiologist who was employed by SDHB at the time of these events.
[3] Magnetic resonance imaging (MRI) is a procedure that creates detailed images of the organs and tissues in the body.
[4] The primary diagnosis was multifocal hepatocellular carcinoma, with a secondary diagnosis of pancreatic adenocarcinoma. Hepatocellular carcinoma is the most common form of liver cancer, and can be a complication of chronic liver disease.
[5] Chronic obstructive pulmonary disease (emphysema) is a long-term lung disease that causes shortness of breath, wheezing, and/or a chronic cough.
[6] OSA is a disorder that occurs when the muscles at the back of the throat relax too much during sleep and obstruct normal breathing.
[7] Gallstone pancreatitis occurs when a gallstone blocks the pancreatic duct, causing inflammation and pain in the pancreas. Gallstones are pieces of solid material that form in the gallbladder (a small organ under the liver).
[8] Under SDHB.

21. A further follow-up ultrasound was recommended in three months' time.

22. On 22 January 2018, roughly three months after the previous ultrasound, Mr A presented to the surgical outpatient clinic in Southland Hospital for a health check-up with a surgical registrar. The registrar noted that he would arrange an MRI scan for Mr A and see him back in the clinic with the result.

23. An abdominal ultrasound was performed on 12 February 2018, and was read by another radiologist from SDHB. The radiologist commented that there was a slight increase in the size of the liver lesion,[9] which now measured 25 x 28 x 28mm. Accordingly, a further investigation by MRI was recommended.

MRI read by Dr B on 28 March 2018

24. On 28 March 2018, Mr A presented to the outpatient clinic at Southland Hospital for his first liver MRI scan. The MRI was read by Dr B. The MRI report noted the clinical ultrasounds and CT scans from August 2017, and the comparison with the ultrasound performed on 12 February 2018.

25. Dr B's report stated:

> "Single well-defined liver lesion seen in segment VI/VII, has typical appearance of a benign haemangioma.[10] Follow-up ultrasound in 12 months' time is recommended for stability."

26. Dr B documented that the lesion measured 21 x 21.5 x 17mm, and had increased in size over the past eight months when compared to the measurement taken on 25 August 2017.[11]

27. Dr B provided his clinical rationale to HDC for why he concluded that the tumour was a benign haemangioma.[12]

28. Dr B told HDC that he recommended a follow-up ultrasound for Mr A in 12 months' time because Mr A had been followed up three times already over the past eight months, despite no significant change in size of the lesion, and this was an "acceptable follow up period for a possible benign lesion or indeterminate lesion when previously followed".

---

[9] It is described as a hypoechoic lesion in this reading. A solid or dense lesion does not send back many sound waves (hypoechoic) and appears dark grey on the ultrasound image.

[10] A liver haemangioma is a benign (non-cancerous) mass in the liver that is made up of clusters of blood-filled cavities.

[11] The measurement of the lesion read in the 28 March 2018 MRI by Dr B was smaller than the diameter of the lesion on the ultrasound that was taken on 12 February 2018, which was 25 x 28 x 28mm.

[12] First, it was a single liver lesion with no "sign of invasion or other lesion", and it had peripheral arterial enhancement with no rapid washout of the contrast on the portal venous phase or delay phase to raise the possibility of a hepatocellular carcinoma (HCC) or non-benign lesion. Secondly, according to Dr B, the lesion had increased in size only slightly, and, thirdly, Mr A's liver function tests and a tumour marker test were normal.

29. According to Dr B, he specifically asked for an ultrasound because the lesion was well visualised by ultrasound, but was not well visualised by CT scan.

Subsequent follow-up of MRI results

30. On 21 May 2018, Mr A presented to the surgical department of Southland Hospital for follow-up of the results of the MRI scan taken in March 2018. Mr A was seen by consultant surgeon Dr C, who documented:

> "The patient has had an MRI scan which shows a 2 cm lesion in segment 6/7 with a typical appearance of a benign haemangioma, no suspicion of tumor. No further follow-up is needed. The patient feels well."

31. As a result of Dr C's assessment of the MRI scan report, the 12-month follow-up ultrasound recommended by Dr B was not arranged, and Mr A was discharged without any further plan. Dr C sent a letter to Mr A's family doctor advising that no further follow-up was needed.

32. Dr C told HDC that the MRI scan report made it "very clear" that Mr A's lesion was a "benign haemangioma". According to Dr C, no follow-up was necessary as it was "not [the] standard of care to follow up on benign hemangiomas".

33. Dr C also told HDC that there was no further explanation of the reason for a follow-up ultrasound in 12 months' time. He recalled a previous occasion on which he had asked Dr B about a radiology report where the necessity for a recommended follow-up proposed by Dr B had not been understood. On that occasion, Dr B had agreed with Dr C that follow-up was not necessary.

Subsequent events

34. After the 28 March 2018 MRI report had concluded that no further assessment was needed, Mr A continued with his life as usual, and he presented to various providers for his other health issues.

35. On 17 September 2019, more than a year after the MRI scan of March 2018, Mr A was admitted to Southland Hospital with abdominal pain. The discharge summary documented that the initial impression was likely gallstone pancreatitis, but it was recognised that Mr A had a known liver lesion "thought to be a benign haemangioma on MRI" 12 months previously. Because of this, a follow-up liver ultrasound scan was arranged.

36. The follow-up ultrasound was completed on 18 September 2019. The SDHB radiologist who reported on the scan found that the lesion had increased to a size of 5.3cm (53mm) — a "substantial increase in size since 2018". The discharge summary noted that the findings from Mr A's ultrasound would be discussed in a Southland Hospital radiology meeting, and that Mr A would be informed of the results.

37. Mr A was discharged from Southland Hospital on 19 September 2019 with the following relevant advice about the liver lesion: "Your ultrasound report of your liver lesion will be

discussed in our radiology meeting. You will then be contacted after this to discuss any follow up that is required."

38. On 25 September 2019, because of concern about the increasing size of Mr A's liver lesion, SDHB consultant surgeon Dr D made an urgent inter-departmental referral for Mr A to have an MRI at Southland Hospital. Although the MRI was prioritised and scheduled for 30 September 2019, it was not undertaken until 7 November 2019.

39. SDHB told HDC that its MRI staff were unable to recollect the reason for not having Mr A's scan completed at the initial appointment booked for him. Following the request made on 25 September 2019, an appointment was made for an MRI at Southland Hospital for 17 October 2019. The request had been graded "B" (due to be completed within three to five weeks). However, the scan did not proceed. SDHB said that the "most probable explanation" was that Mr A was too claustrophobic to be scanned in the smaller MRI scanner at Southland Hospital, and, accordingly, it had to be done at a private radiology service on 7 November 2019. In addition, the Southland Hospital scanner was experiencing technical issues, which necessitated outsourcing examinations. SDHB also told HDC that its current Radiology Information System (RIS) had replaced the old system used at the time, so the notes documenting the reason above could not be verified.

40. Mr A told HDC that he agrees that his claustrophobia caused the non-completion of the MRI scan at Southland Hospital. He expressed concern about SDHB not being able to access older clinical information with the change from the RIS to the MIT system.

41. The MRI summary noted that comparison should be made with the MRI scan performed on 28 March 2018. The MRI indicated that the liver lesion had now grown to 58mm in size and there were aspects of the imaging that suggested a malignancy (cancer).[13] Two other lesions (12mm and 7mm) were also noted by the reporting radiologist.

42. On 28 November 2019, Mr A's MRI results were reviewed and discussed at the Gastroenterology Cancer Multidisciplinary Meeting (MDM) at Southland Hospital, led by Dr D. The clinicians noted that there were at least two, possibly three lesions, consistent with hepatocellular carcinoma (HCC). Of most importance was that the clinicians acknowledged that the MRI read by Dr B in 2018 was "consistent with HCC (cancer) that could have been treated with curative intent".

43. At the conclusion of the MDM, Dr D wrote to Mr A's family doctor's practice to inform them of the results. The letter read:

> "The patient was recently on my service for gallstone pancreatitis which resolved. During that period an ultrasound revealed a liver lesion that was known from the past year. It had grown significantly.

[13] Findings included peripheral washout of contrast on delayed images, which is generally a finding characteristic of malignancy, and can be seen in some liver cancers.

> He had an MRI in 2018 which was interpreted as consistent with haemangioma. However the repeat MRI done currently appears to show findings consistent with hepatocellular carcinoma. There is also a second lesion which is thought to be consistent with the same diagnosis, and a third lesion which may have a pattern consistent with dysplastic lesion."

44. On 18 December 2019 (after seeing Mr A in clinic on 9 December 2019), Dr D wrote to Mr A's family doctor again to confirm that the reviewers at the MDM conference felt that the 2018 MRI "represented a preventable error in reading". As a result of the delayed diagnosis of the presumptive HCC for Mr A, an ACC claim was filed by Dr D on behalf of Mr A on 9 January 2020.

45. Subsequently, Mr A was referred to medical oncology at SDHB for further ongoing diagnosis and treatment. Unfortunately, the size of the primary lesion was greater than 5cm diameter, which meant that by 2019, Mr A's treatment had become palliative. Unfortunately, Mr A has been diagnosed with terminal liver and pancreatic cancer.[14]

46. SDHB told HDC that it raised a Severity Assessment Code (SAC) 2[15] adverse event for Mr A's case on 29 July 2020 after it was informed by HDC's written notification of the complaint dated 6 July 2020. The investigation was undertaken by the radiology service manager who stated that a "retrospective review of a sample of liver imaging reported by [Dr B] during his tenure at Southern DHB is recommended".

Further information

Mr A

47. Mr A told HDC that he would like the imaging reports by Dr B to be reviewed, as missed findings could also have an impact on other people and their health outcomes. Mr A feels strongly that both Dr B and SDHB should be held accountable for not having interpreted the imaging correctly.

Dr B

48. Dr B told HDC that he would like to apologise to Mr A for misdiagnosing the liver lesion and for causing any delay in Mr A's treatment. Since March 2018, Dr B has undertaken re-education programmes and courses mandated by the Medical Council of New Zealand (MCNZ). He has updated his MRI protocols and changed his reports to ensure that they meet the guidelines of MCNZ and the Royal Australian and New Zealand College of Radiologists (RANZCR).

[14] He has a primary diagnosis of multifocal hepatocellular carcinoma and a secondary diagnosis of pancreatic adenocarcinoma.

[15] District health boards classified the severity of adverse events using the Severity Assessment Code (SAC). Providers of health services are required to report SAC 1 and SAC 2 adverse events to the Health Quality & Safety Commission. An SAC 2 event is one that causes a permanent major or temporary severe loss of function.

SDHB

49. SDHB told HDC that it does not have procedures, policies, or guidelines concerning the diagnostic processes of radiologists at SDHB, as it is a matter of individual practice. SDHB stated that there are informal agreements between radiologists and their referring colleagues concerning reporting formats for specific examinations. SDHB also told HDC that no formal performance management or disciplinary procedures involving Dr B took place, as Dr B was undergoing review by the MCNZ and had left SDHB's employment before the MCNZ review had been concluded.

50. SDHB conducted an Adverse Event Review (AER), and an independent case review was performed by radiologist Dr E. The AER was conducted on 8 March 2021, and made the following findings in respect of Dr B's reporting:

> "The reviewing [independent] radiologist suggest[ed] that while an atypical haemangioma could not be excluded, neither could a neoplasm[16] be. On the basis of remarks made in ultrasound scans of the patients, there appeared to be a timeline of lesion growth preceding the MRI examination of 28 March 2018. This suggests that even if the lesion was indeed a haemangioma (albeit unlikely), shorter follow up with ultrasound than the 12 months recommended … was indicated at the time of the MRI examination."

51. Accordingly, the AER recommended that SDHB undertake a retrospective review of a sample of liver imaging reported by Dr B during his tenure at SDHB. The review was completed on 30 April 2021. SDHB told Dr B that it "felt there were no findings of concern arising from the audit and any non-conformities noted were in line with reasonable expectations". However, SDHB said that it is considering whether in the future there will be a requirement that all MRI liver perfusion studies are double read.

52. The independent case review conducted by Dr E found the following:

> "In summary, the lesion shown on the MRI is indeterminate and not characterized as a haemangioma, although an atypical haemangioma would remain a possibility. A neoplastic lesion is not excluded on the basis of the MRI findings, and this lesion would require short interval follow-up."

Separate investigation into Dr B's care at SDHB around 2019

53. As part of this investigation, HDC also gathered information from SDHB about another patient's liver scan that was misread by Dr B in January 2018. The misreading was discovered on 7 February 2019, and a separate adverse event review commenced in February 2019. Several recommendations were made, which included that once a delayed diagnosis error had occurred, the affected patient would be fast-tracked through the system for further investigation and treatment. The misreading of Mr A's liver scan was recognised by SDHB in late 2019, but there is no indication that Mr A was fast-tracked as per the recommendation.

[16] A tumour.

Furthermore, it was recommended that SDHB's Oncology Service review its acknowledgement of the referral letters and consider making direct contact with patients who may be experiencing delays.

54. The adverse event review also recommended that Dr B undertake additional training in liver study interpretation.

ACC

55. ACC asked an independent radiologist to review whether the "misreading of the MRI on 28 March 2018" by Dr B had resulted in the late diagnosis of hepatocellular carcinoma for Mr A.

56. The ACC radiologist stated that the three ultrasound examinations that were taken prior to Dr B's reading confirmed a focal lesion that had increased in size significantly over the six-month interval, and this was not the behaviour of a benign lesion.

57. The ACC radiologist concluded:

> "Diagnosing the focal lesion in segment 6 of the liver confidently as a hemangioma on the liver MR of 28/3/2018 was not appropriate. The lesion was increasing significantly in size over a 6 month interval and had imaging characteristics on CT and MR that did not fit with that diagnosis. Had suspicion that the lesion was not a haemangioma been raised at that time of the MR examination of 28/3/2018, then an earlier diagnosis of liver malignancy would have been possible."

58. Mr A's claim for treatment injury was accepted by ACC. ACC stated that the incorrect diagnosis of the lesion reduced the likelihood of successful curative treatment for Mr A.

MCNZ

59. MCNZ advised HDC that in May 2020, Dr B was required to undergo a six-month recertification programme under section 41 of the Health Practitioners Competence Assurance Act 2003.[17] The recertification programme commenced on 29 July 2020 and finished in February 2021. Following the review, MCNZ considered that Dr B had satisfied the requirements of the recertification programme, and that no further action was required.

Identification of pancreatic lesion

60. During Mr A's imaging for his liver lesion on 7 November 2019 and 21 February 2020, a lesion on his pancreas was also present. However, the pancreatic lesion was not identified or reported in the radiology reports, and it was not detected at the MDM review on 28 November 2019. The pancreatic lesion was recognised by June 2020, and subsequently it was diagnosed as pancreatic cancer.

[17] Section 41(1) of the Health Practitioners Competence Assurance Act 2003 states: "For the purpose of ensuring that health practitioners are competent to practise within the scopes of practice in respect of which they are registered, each authority may from time to time set or recognise recertification programmes for practitioners who are registered with the authority."

Response to provisional opinion

Mr A

61. Mr A was provided with an opportunity to comment on the "information gathered" section of the provisional opinion. His comments, which were made on his behalf by his legal counsel, have been incorporated where relevant.

62. Mr A was concerned that prospective clinicians being employed by the hospital were not given a form of orientation to ensure that their reporting was competent and up to New Zealand standards.

63. Mr A also raised other concerns about the care provided by SDHB, including whether SDHB's review of Dr B's liver imaging was sufficiently thorough given that Mr A's liver lesion and pancreatic abnormality were missed; the fact that Mr A's care was not fast-tracked once the discovery of the misread by Dr B was made by SDHB; whether other patients may have had their imaging misread by Dr B; and whether the Oncology Department at Southland Hospital has ensured that referral letters are acknowledged adequately and patients advised about any delays appropriately.

Dr B

64. Dr B and his legal counsel were provided an opportunity to comment on the relevant sections of the provisional opinion. His comments have been incorporated where relevant.

65. Dr B expressed his sincere apologies for the "errors when interpreting [Mr A's] MRI scan". Dr B said that he has reflected at length on what he could have done differently and has amended his practice accordingly.

66. Dr B told HDC that at the time of Mr A's MRI misreading, he was reporting up to 65 mixed cases[18] a day in both his public and private practice. This involved a heavy workload, as he was the only radiologist in the department reporting on MRI scans at the time.[19] Dr B also said that at the time he was suffering from severe pain, which required surgery, and the pain was affecting his sleep and performance. Dr B stated that his orthopaedic surgeon had recommended that he perform only light duties.

67. Dr B told HDC:

> "Any workload of work or interruption can result in an error in the reporting or misdiagnosis of a lesion. When overloaded, you lose the adequate timing that is required for reporting, and as a result, the quality of reporting reduces."

[18] Mixed cases included X-rays, USS, CT and MRI scans.

[19] Dr B further explained that at SDHB, CT and MRI scans were considered "heavy duties" that required the most amount of time and skill within a session. In 2018, Dr B was required by his Head of Department to increase the amount of reporting done from 8–10 sessions per day to 13 sessions. Dr B said that from January to May 2018 he reported more CT scans and ultrasounds than the other radiologists at Southland Hospital. He stated that he was the only radiologist in the department reporting on MRI scans during this period.

68. Dr B stated that SDHB was aware of his excessive workload at the time, but this was not reduced.

SDHB

69. SDHB was provided with an opportunity to comment on the relevant sections of the provisional opinion. SDHB's comments have been incorporated where relevant. SDHB said that it considered HDC's recommendation to enact a system requiring that all liver MRI perfusion studies are double read, but said that based on the clinical opinion from both the Medical Doctor and Clinical Director of Radiology, it does not think that formal processes or guidelines are required. SDHB told HDC:

> "As part of best practice and professionalism the expectation is that radiologists consult and undertake double reading or seek a second opinion on complex or difficult cases."

Opinion: Dr B — breach

Introductory comment

70. In cases of radiology reporting, it is generally accepted that errors of perception (such as a radiologist missing 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. However, as this Office has stated previously,[20] that is not determinative in assessing whether the standard of care has been met in a particular case. The standard of care is assessed on a range of factors, including the clinical history of the patient and the conspicuousness of the abnormality.

71. In this case, I have considered whether Dr B provided services to Mr A with reasonable care and skill, and have drawn on the advice provided by my independent advisor, radiologist Dr Graeme Anderson.

Care provided to Mr A

72. Dr Anderson advised that from his blind review of Mr A's MRI scan, Dr B's interpretation that the lesion had a "typical appearance of a benign haemangioma" was "clearly incorrect", and it did not have a typical appearance of a benign lesion or a haemangioma. Dr Anderson stated:

> "Haemangiomas are typically very high T2 signal[21] (sometimes are confused with cysts) and negative on B800 diffusion (high on ADC). This lesion is only very slightly T2 bright

[20] See Opinion 19HDC01960 (26 October 2021).

[21] T1 and T2 refer to different settings on the MRI machine that result in different but characteristic appearances of various tissues and aid differentiation of tissues, eg, cerebrospinal fluid is dark in T1 weighted images but bright in T2 weighted images.

> (a red flag) and demonstrates restricted diffusion [22] (another red flag) … [T]he conclusion that the lesion is a 'benign haemangioma' portrays a lack of the understanding of the principles of Liver MRI."

73. In addition, Dr Anderson noted that it was already known that the lesion was not "stable", as it was growing in size on the previous imaging.

74. Dr Anderson also advised that Dr B's report was substandard in a number of ways, in particular:

a) Dr B's report did not outline the sequence technique performed, including whether a specific contrast agent was used. This suggests a lack of familiarity with MRI liver techniques used.

b) The description of the signal characteristics of the lesion is vague and does not use standard descriptive language, e.g., "hyperintense" to describe diffusion, when the term to be used was "restricted diffusion".

c) The conclusion that the lesion was a "benign haemangioma" portrays a lack of understanding of the principles of liver MRI. The report departs significantly from the standard of practice, in that it goes against the principles that are outlined in readily available online resources and standard texts on the subject, and also the RANZCR curriculum, i.e., it is something that would be known by a radiology trainee presenting for their part 2 examinations.[23]

75. Whilst Dr B accepts Dr Anderson's criticisms that his reporting was incorrect, he disagrees that his report was substandard for a general radiologist reporting the scan. Dr B stated that it is not widespread practice to outline the sequences performed in the technique or whether a liver-specific contrast agent is used. Dr B claimed that in Mr A's case, a non-liver-specific agent[24] would have been used to assess Mr A's liver in most departments, and the majority of radiologists would not have used a liver-specific agent[25] as Dr Anderson has suggested.

76. Dr B stated:

> "I can only think that Dr Anderson's review is based on his subspecialty experience and that of his peers rather than how a general radiologist with more limited experience of liver cases would report these scans."

---

[22] Diffusion refers to how easily water molecules are able to diffuse into tissue in a particular region. Highly cellular tissues (such as tumours) or those with cellular swelling (such as brain tissue in acute stroke) exhibit restricted diffusion, which shows as bright on MRI imaging.

[23] A radiology trainee must complete several examinations and assessments during the clinical radiology training programme to become a specialist radiologist.

[24] Gadavist (gadobutrol) is a contrast agent commonly used in general MR imaging when contrast is required. It does not enter cells and is excreted by the kidneys.

[25] Primovist (gadoxertate) is a contrast agent that is taken up by liver cells and excreted in the bile and may be used in the evaluation of solid liver lesions.

77. In response to Dr B's points, Dr Anderson told HDC that he also works in general radiology and has no specialty training in liver MRI. However, Dr Anderson clarified that the principles of liver MRI and characterisations of lesions are part of the RANZCR curriculum, whereby it would be "best practice", especially with inexperienced readers, for double reading and collegial discussion to take place with difficult cases. This did not happen in Mr A's case.

78. Furthermore, Dr Anderson disagrees with Dr B's claim that it is not widespread practice to outline the sequences performed in the technique, or whether a liver-specific contrast agent is to be used. Dr Anderson cited the RANZCR and IANZ guidelines,[26] which stipulate that the sequence performed (when it is MRI) and contrast dose and type should be part of a radiologist's report.

79. Dr Anderson concluded by stating:

> "[Dr B] has made improvements with respect to his knowledge of MRI liver reporting which was the main departure from the standard of care. The additional moderate departures from standard of care, i.e. including sequences and contrast agents given, and also double reading, peer review and collegiality around reporting Liver MRI have as of yet not been addressed in his practice (from the information provided) … This case demonstrates the complexity and uncertainty in the discipline of Liver MRI."

80. Dr Anderson further commented that Dr B's report "departs significantly from the standard of practice, in that it goes against the principles that are outlined [in radiology]".

81. Lastly, Dr Anderson also considers that the recommendation from Dr B to arrange a "follow up in 12 months to assess stability" of the lesion did not adhere to any known standards for benign haemangiomas.

82. Dr B acknowledged that the 12-month follow-up recommended for benign haemangiomas was incorrect.

Findings

Misinterpretation of scan and misdiagnosis

83. In the latter stages of this investigation Dr B raised a number of factors that he considers increased the risk of error occurring, which included an injury at the time (which affected his performance) and his significant workload as the only reporting MRI radiologist in the department at the time.

[26] Subsection 5.5.4(c) of the "New Zealand Code of Radiology Management Practice: Radiology Services — Particular Requirements for quality and competence — Developed from ISO 15189:2007" states: "Specific instructions for the proper management of patients during examination shall be documented and implemented by radiology service management. These instructions shall be contained in appropriate procedure or modality-specific manuals. The procedure or modality-specific manuals shall include procedures and/or instructions for the following: … (c) type and amount of the contrast medium, whether intravenous, oral or other, required for imaging, if applicable."

84. I acknowledge that radiology reporting is a complex perceptual and cognitive task, and I accept that some degree of human error is unavoidable. I also note that working conditions (like those described above) may increase the risk of error.

85. However, as mentioned above, the fact that errors of perception in radiology occur is not determinative in assessing whether the standard of care has been met in a particular case. The standard of care is assessed on a range of factors.

86. I have carefully considered all the evidence gathered, including the clinical evidence, together with Dr Anderson's advice. I have also considered the standard of care to be expected in Mr A's case — namely the "care and skill" that an ordinary radiologist would exercise under similar circumstances as Dr B at the time of these events. I am satisfied that Dr B misdiagnosed the lesion on Mr A's MRI as a "benign haemangioma" when it was in fact suspicious of liver cancer, and that his diagnosis was unreasonable in the circumstances. This was not a case of perception error but rather of Dr B misinterpreting the image to the extent that called into question his understanding of the principles of liver MRI. It was also an error that fell significantly below the standard of care reasonably to be expected of a consultant radiologist in Dr B's position.

87. In addition, the recommendation for follow-up of the lesion in 12 months' time did not conform to any known standards, as stated by Dr C.

88. Accordingly, in relation to the matters discussed above, I consider that Dr B did not provide Mr A services with reasonable care and skill, in breach of Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[27]

89. Dr B has acknowledged his error, has undergone clinical training under MCNZ, and has made changes to his practice since these events (see the discussion below). His misinterpretation of the MRI resulted in a delayed diagnosis of Mr A's cancer, and led to Mr A not receiving timely treatment and follow-up. I note that clinical evidence provided to my investigation concluded that the misdiagnosis by Dr B resulted in Mr A's treatment of cancer changing from being potentially curative to becoming palliative.

Reporting standards

90. Dr Anderson also identified that Dr B failed to adhere to radiology reporting standards as set out in the RANZCR and IANZ guidelines in respect of the reporting for Mr A. Dr Anderson advised that Dr B's report did not outline the sequence technique performed, including whether a specific contrast agent was used, and Dr B's description of the signal characteristics of the lesion was vague and did not use standard descriptive language. Although Dr B offered arguments in defence of his reporting technique, I am not convinced that his explanation addressed Dr Anderson's criticisms. In my view, radiology reporting standards are important because they are the means of communication between providers. Accordingly, they must be communicated with clarity and certainty, using the correct terminology. Failure to do so can jeopardise the care provided to a patient. Accordingly, I

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

consider that Dr B failed to provide reporting services that complied with professional standards, in breach of Right 4(2) of the Code.[28]

Opinion: SDHB — breach

SDHB's responsibility for Dr B's misread

91. At the time of events, Dr B was a full-time employee of SDHB, as a consultant radiologist. As a healthcare provider, SDHB was responsible for providing services in accordance with the Code, and for ensuring that its employees were supported to adhere to relevant standards, guidelines, and policies. SDHB told HDC that although the diagnostic process is a matter of individual practice, there are informal agreements between radiologists and their referring colleagues concerning reporting formats for specific examinations.

92. At the time of events, Dr B had worked as a consultant radiologist at Southland Hospital for over a year. There was a reasonable expectation that SDHB could rely on Dr B's skill and expertise, as is expected with other consultant radiologists.

93. In May 2018, following Dr B's reporting of Mr A's MRI in March 2018, Mr A was seen by Dr C, who discharged Mr A with no further follow-up required. Dr C told HDC that Dr B's report made it very clear that Mr A's lesion was a benign haemangioma, and standard practice was that no further follow-up was required. Dr Anderson also commented on this aspect, and agreed with Dr C's position.

SDHB's internal investigation and delay in raising the SAC 2 event

94. SDHB told HDC that the SAC 2 event for Mr A's delayed diagnosis was raised on 29 July 2020. The radiology service manager then undertook an internal Serious Adverse Event investigation and recommended a "retrospective review" of the liver sampling by Dr B during his tenure at SDHB. A review was completed by external radiologists, and SDHB stated that it felt that there were no findings of concern from the audit, and that any non-conformities identified were in line with reasonable expectations. Neither review indicated that there were any other systematic factors in the working environment, such as interruptions or distractions that could have contributed to Dr B's error. SDHB's internal review did not mention Dr B's earlier liver scan misread in January 2018, nor the subsequent SAC 2 event raised in February 2019.

95. Despite the completion of the audits referred to above, I am concerned about SDHB's delay in commencing an internal investigation and reporting the SAC 2 event to the Health Quality & Safety Commission once SDHB was made aware of Dr B's misdiagnosis of Mr A's lesion. On 28 November 2019, Mr A's MRI results were reviewed and discussed at the

[28] Right 4(2) states: "Every consumer has the right to have services provided that comply with legal, professional, ethical, and other relevant standards."

Gastroenterology Cancer Multidisciplinary Meeting (MDM), which acknowledged that Mr A's lesion had been misdiagnosed by Dr B in 2018. On 18 December 2019, a letter was written to Mr A's family doctor to confirm that the reviewers at the MDM felt that the 2018 MRI "represented a preventable error in reading". An ACC claim was then filed on behalf of Mr A on 9 January 2020. However, SDHB told HDC that the SAC 2 event for Mr A's misdiagnosis was raised on 29 July 2020 only after HDC informed SDHB of Mr A's complaint on 6 July 2020.

96. As shown by the timeframe above, there was a delay of around nine months from when SDHB had knowledge of the misdiagnosis until it commenced an internal investigation and raised an SAC 2 event. I am very concerned about this length of delay.

97. The fundamental role of adverse event reports is to enhance consumer safety by learning from adverse events that occur in health and disability services and assist providers in maintaining a robust reporting system that is underpinned by principles of open communication, consumer participation, system changes, and accountability. Of most importance is that raising adverse events empowers consumers, whānau, and providers in promoting patient safety and a view that there is improvement of safety and reduction of the possibility of recurrence.

98. SDHB failed to respond appropriately when it identified Dr B's misread for Mr A in November 2019, in the context of being on notice about Dr B's earlier misread in another case. This suggests that the investigation and recommendations made from the earlier misread were not effective to ensure patient safety. For example, following the earlier misread, SDHB recommended that a patient affected by a delayed diagnosis error would be fast-tracked through the system for further investigation and treatment. There is no indication that Mr A was fast-tracked as a result of Dr B's error.

99. It appears that nothing was done from a systems point of view once SDHB was aware of the misdiagnosis. There is no explanation from SDHB on why it did not commence an internal investigation immediately, nor why the SAC 2 event was not at least raised by January 2020 once the ACC claim had been filed.[29]

100. SDHB had a responsibility to provide services with reasonable care and skill, and this included an obligation to take reasonable steps to put in place quality improvement strategies and systems to ensure patient safety. Given the significant delay in investigating the misread, and in raising the SAC 2 event for Mr A, and given that there was no further internal review into Dr B's care during his employment at SDHB, I consider that SDHB failed

[29] According to the Health Quality & Safety Commission and under the National Adverse Events Reporting Policy 2017, all SAC 1 and 2 related adverse events are required to be reported to the Health Quality & Safety Commission within 15 working days from the date the event is reported to the provider. This did not occur until HDC raised Mr A's complaint to SDHB on 6 July 2020, and even upon receipt, it took over 15 working days before the SAC 2 event was raised on 29 July 2020 (ie, it took 18 working days).

to respond appropriately. There was a concerning lack of focus on patient safety and improvement. Accordingly, I find that SDHB breached Right 4(1) of the Code.

Opinion: Pancreatic lesion — other comment

101. When Mr A underwent his MRI scans on 7 November 2019 (the scan that identified his liver cancer) and 21 February 2020 (the staging scan), there was a lesion present on his pancreas. This was later diagnosed as pancreatic cancer. However, neither of the reports from those scans refer to the pancreatic lesion.

102. My independent advisor, Dr Anderson, was initially critical of this, and said that the failure to identify and report on the pancreatic lesion was a moderate departure from the standard of care. However, on reviewing the responses to his criticism (by those radiologists involved — see Appendix B), and considering more information from the MDM meeting, Dr Anderson revised his opinion and concluded that there did not seem to have been a departure from the standard of care. He commented further on the subtlety of the pancreatic lesion (which had been missed by other "blind" readings subsequently), and the role of bias. Specifically, at the time of reading these scans, the radiologists concerned were focused on the liver lesions and liver cancer diagnosis.

103. I accept Dr Anderson's advice and am satisfied that there was no breach of the Code in respect of the pancreatic radiology reporting. Nevertheless, I acknowledge how distressing this must have been for Mr A in the context of an already inadequate review and missed diagnosis of his liver cancer.

Changes made since complaint

104. Dr B advised HDC that as a result of Mr A's complaint, and the subsequent investigations undertaken by both SDHB and MCNZ, he has undertaken the following:

- He has attended "more programs and courses since March 2018 and gained more knowledge about liver lesions".
- He has updated his MRI protocols and changed his reports to ensure that they meet MCNZ and RANZCR guidelines.
- He has changed his practice and reporting system, especially in regard to liver lesions, and is doing "everything possible to improve [his] skills and knowledge in radiology".
- He has published several radiology articles in collaboration with other departments, which has ensured that he continues to gain experience and develop his skills and practice.

- Difficult liver lesions with atypical features are discussed in MDMs and referred for a second opinion.
- He has discussed this case within the Radiology Department to gain more learnings for himself and the department.
- He attends the clinical meeting and MDM meetings with other departments regularly.
- He attends regular teaching meetings within the Radiology Department to discuss challenging cases and missed diagnoses.

Recommendations

105. In light of the changes already made by Dr B, and considering both the MCNZ review and Dr Anderson's comments, I recommend that Dr B:

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

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

c) Participate in formal double reading when performing similar cases to build experience, as per my independent advisor's suggestion. Evidence that this has been done is to be sent to HDC within six months of the date of this report.

d) Investigate the substantial online resources available that would enable him to put together a checklist when reporting liver MRI, as per my independent advisor's suggestion. Evidence that this has been done is to be sent to HDC within three months of the date of this report.

e) Provide recent copies of his radiology reports (2–3 anonymised examples) that show compliance with RANZCR and IANZ guidelines, including an outline of the sequence technique performed, within three months of the date of this report.

106. In response to my provisional recommendation for Te Whatu Ora Southern to provide further information from other staff who had concerns about Dr B's clinical reporting during his tenure at SDHB, Te Whatu Ora Southern stated that during Dr B's tenure at SDHB, no other staff member raised concerns about Dr B's clinical reporting.

107. In my provisional opinion, I recommended that Te Whatu Ora Southern arrange a further audit of all the liver imaging read by Dr B during his employment at SDHB and report to HDC on its findings. In response, Te Whatu Ora Southern instructed an independent third party to perform the audit. The Clinical Director of Radiology told HDC:

> "47 MRI liver scans of [Dr B] were reviewed by an independent radiologist and … other than the known case which subsequently was made aware to the HDC no significant errors were found."

108. Also in response to my recommendation in the provisional opinion, SDHB undertook an audit to determine whether the necessary SAC events had been raised for missed radiology diagnoses from January 2022 to June 2022 (inclusive) in accordance with the National Adverse Events Policy 2017.[30]

109. Te Whatu Ora Southern told HDC that the audit identified 71 incidents for Te Whatu Ora Southern's radiology services between January and June 2022.[31] Four of the 71 events were categorised as a "delayed diagnosis", with only one of the four being a missed diagnosis.[32]

110. Te Whatu Ora Southern acknowledged that the Adverse Events Management Policy (District) 55195[33] was not followed on the occasion of the missed diagnosis and resulted in a delayed notification of the incident and subsequent investigation. Te Whatu Ora told HDC:

> "[T]he relevant leadership team will remind the staff of their responsibilities in reporting adverse events pursuant to National Adverse Events Policy 2017 and Adverse Event Management Policy (District) 55195."

111. I have carefully considered Te Whatu Ora Southern's response to the recommendations in my provisional opinion. I am satisfied that Te Whatu Ora Southern has taken the appropriate steps to address any missed radiology diagnoses, and that there appear to be no ongoing issues. Nevertheless Te Whatu Ora Southern should remain vigilant to comply with its duties to report adverse events.

Follow-up actions

Referral to Director of Proceedings

112. Dr B will be referred to the Director of Proceedings in accordance with section 45(2)(f) of the Health and Disability Commissioner Act 1994, for the purpose of deciding whether any proceedings should be taken.

[30] SDHB was required to provide a report that set out the misreading, when the DHB and clinical staff became aware of it, and at what date the appropriate SAC 1 or 2 event was reported. SDHB was required to provide reasons for any delays, and the steps taken to resolve these.
[31] 79% of reported events had an actualised grading of SAC 4, 19.7% SAC 3 and 1.4% SAC 2.
[32] The other three events were incidents related to delays in access to examination requested.
[33] The relevant section for reporting an adverse event stated: "All adverse events or near misses must be reported immediately to the line manager or person in charge and entered into Safety 1st as soon as practicable before the end and of the working day, ensuring evidence is uploaded."

113. I note the significant departure identified by my independent advisor in the standard of care provided to Mr A by Dr B. As I have noted in this report, it is my view that Dr B is responsible for the poor standard of care Mr A received.

114. I have also considered Dr B's responsibility for a separate radiology misread at SDHB within a three-month period from Mr A's case (see also: 20HDC00404). His incorrect diagnoses of benign haemangiomas in both cases have resulted in devastating outcomes for the consumers involved.

115. In making this decision, I have considered Dr B's submissions. Dr B accepted the errors he made in both cases, but submitted that referral to the Director of Proceedings is unnecessary as he has been held accountable by the subsequent audits performed for his readings, the recertification programme imposed by the Medical Council of New Zealand, and the subsequent changes he made to his practice. Dr B also submitted that the systemic workplace issues at SDHB contributed to the errors, and that referring him to the Director of Proceedings would cause a potential chilling effect on the care provided by other radiologists.

116. Dr B continues to work in both the private and public sectors. While I acknowledge that Dr B has made several changes to his practice and has undergone review by the MCNZ and an audit of previous radiology cases by the RANZCR, there is a public interest in accountability for his serious individual failures and major shortcomings of care. I believe it is appropriate to refer Dr B to the Director of Proceedings to consider whether further action is necessary to hold Dr B to account for his serious breaches of the Code.

Publication

117. A copy of this report with details identifying the parties removed, except Te Whatu Ora Southern, Southland Hospital and the advisor 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 B's name in covering correspondence.

118. A copy of this report with details identifying the parties removed, except Te Whatu Ora Southern, Southland Hospital, and the advisor on this case, will be sent to the Health Quality & Safety Commission, Te Aho o Te Kahu|Cancer Control Agency, and the Ministry of Health|Manatū Hauora, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent clinical advice to Commissioner

The following independent advice was obtained from radiology consultant Dr Graeme Anderson:

"**Overview**

I was asked by the Commissioner to provide an opinion on Case Number C20HDC00693. This was initially a blind review of the imaging (completed 15/12/20).

This report has been requested after details of the case have been provided, including copies of radiology reports and clinical information (received 21/12/20).

I have read and agree to follow the Commissioner's Guidelines for Independent Advisors. I have no conflicts of Interest around this case.

Qualifications:

I am a Radiologist who has been qualified for over 20 years.

Degrees: BHB (Auckland) 1987

MBChB (Auckland) 1990.

FRANZCR 2000.

Post graduate training: Chest Imaging Brompton Hospital London 2007.

ACR PET Course (Reston VG) 2009.

Positions: Radiologist Counties Manukau Health 1999 to present.

Co-Lead of MRI Radiologist co-lead CMH/NDHB Lung Cancer MDM 2014 to present. Network Training Director Northern Region Radiology Training Program (2018 to present)

Radiologist Ascot Radiology 2007 to present (Current Lead of PET CT)

Northern Region PET Variance Committee Chair 2013 to Dec 2019.

I have been reporting MRI for over 20 years and have publications and international presentations in the area.

Referral Instructions from the Commissioner:

'Provide a blind review of the MRI scan undertaken on [Mr A] by Southern DHB on 28 March 2018. Scan reported by [Dr B]'

After the blind review was submitted I received advice 'The Commissioner is seeking your opinion on the care provided by [Dr B] to [Mr A] on 28 March 2018'.

Documents provided:

1. Memory stick containing the imaging files: MRI performed on 28/03/2018.
2. Letter of complaint referred to HDC from the Nationwide Health & Disability Advocacy Service dated **15 April 2020 (redacted)**
3. [Dr B's] response to HDC's letter dated **21 July 2020**
4. Radiology report completed by [Dr B] on **28 March 2018**
5. Southern DHB's response to HDC dated **7 August 2020**
6. Multidisciplinary meeting on 28 November 2019

I have been asked to advise whether 'you consider the care provided to [Mr A] by [Dr B] and Southern DHB was reasonable in the circumstances, and why?'. In particular, please comment on:

1. The standard of the radiology report by [Dr B] on 28 March 2018 and whether the finding/conclusions and recommendations were reasonable;
2. Any other matters in this case that you consider warrant comment. For each question, please advise:
   a. What is the standard of care/accepted practice?
   b. If there has been a departure from the standard of care or accepted practice,
3. How significant a departure do you consider this to be?
   c. How would it be viewed by your peers?
   d. Recommendations for improvement that may help to prevent a similar occurrence in future.

Background

In August 2017, [Mr A] presented to ED Southland Hospital with symptomatic cholelithiasis. A computed tomography (CT) was subsequently performed in September 2017 with a follow up ultrasound in November 2017 which showed an ill-defined hepatic lesion. An ultrasound on 12 February 2018 revealed an increase in the size of the liver lesion and a magnetic resonance imaging (MRI) was recommended. The follow up MRI was completed on 28 March 2018 and the imaging was reported by [Dr B], Radiologist at Southland Hospital. He interpreted the MRI as consistent with a benign haemangioma and a follow up ultrasound in 12 months' time was recommended for stability. [Mr A] was subsequently discharged and a letter was sent to [his] GP (from the SDHB Surgical Department) that no further follow up was needed. In September 2019, [Mr A] was admitted to Southland DHB surgical ward with abdominal pain. An ultrasound was completed on 18 September 2018 indicating the liver lesion had increased in size. A MRI was completed on 12 November 2019 which found the lesion to be consistent with hepatocellular carcinoma. [Mr A's] case was then referred to the multidisciplinary meeting on 28 November 2019 and a comment was made that the

appearances on the MRI imaging in March 2018 were consistent with hepatocellular carcinoma.

MRI Report. 28/03/2018

The report follows a standard layout and includes relevant clinical information noting 'ill defined hepatic lesion segment VI/VII increased in size from 19mm to 24 mm'. The 'TECHNIQUE' outlines 'Routine multisequences multiplanar MRI liver' with gadolinium contrast. This section would normally state which sequences were performed eg T1, T2 fat sat, and whether liver specific gadolinium agent such as Primovist was used. The addition of diffusion to the study (which was performed) should also have been mentioned here (as it is critical to diagnosis). The 'FINDINGS' section begins with 'well defined Liver lesions' which is confusing as only one is present. Measurements are given which are appropriate.

The next statement is crucial, it states the lesion is 'hyperintense on T2 and diffusion'. Haemangiomas are typically very high T2 signal (sometimes are confused with cysts) and negative on B800 diffusion (high on ADC). This lesion is only very slightly T2 bright (a red flag) and demonstrates restricted diffusion (another red flag). 'Post dynamic contrast there is nodular peripheral enhancement, with centrifugal filling'. This statement is partially true, but the enhancement would be best described as 'peripheral' rather than centrifugal (strictly this term is 'centripetal').

IMPRESSION

'Typical appearance of a benign haemangioma.' This statement is clearly incorrect. This is not the typical appearance of a benign lesion or a haemangioma. The recommendation for follow up in 12 months' time to assess stability is also discrepant in a number of ways.

1. A benign haemangioma would not be followed.
2. It is already known that the lesion is not 'stable' it is growing on other imaging.

What is the Standard of Care?

The standard of the MRI report by [Dr B] on 28 March 2018. I find the report to be substandard in a number of ways.

1. It does not outline the sequences performed in the technique (or whether a liver specific contrast agent was used). This suggests a lack of familiarity with MRI liver technique and the importance of the sequences used.
2. The description of the signal characteristics of the lesion is vague and does not use standard descriptive language eg 'hyperintense' to describe diffusion when the term is 'restricted diffusion'.
3. The conclusion that the lesion is a 'benign haemangioma' portrays a lack of the understanding of the principles of Liver MRI. The report departs significantly from

the standard of practice, in that it goes against the principles that are outlined in readily available online resources and standard texts on the subject (1) and also the RANZCR curriculum, ie it is something that would be known by a Radiology trainee presenting for their Part 2 exams.

The recommendation in the conclusion of 'follow up in 12 months to assess stability' also goes against any known standards in following up 'benign' haemagiomas, which would not be followed at all.

How would it be viewed by Peers?

Liver MRI has been with us in Radiology for the last decade. The use of Liver specific agents and the availability of diffusion has significantly increased the diagnostic certainty of Radiologists. In some areas it is only reported by subspecialty Radiologists (often only by those who attend hepatic subspecialty multidisciplinary meetings). This is the 'standard of care' in some places such as North America but for a number of reasons this is not advised in this country. It is however a very challenging technique both to perform and report. An experienced reporter will find these less challenging, but it makes it difficult for the less experienced radiologist to gain experience.

Liver MRI at our institution is read by a subset of radiologists who perform mostly body work, the experience across the group is wide however double reading occurs for all 'lesion characterization' cases and some of the members attend the Hepatic MDM so feedback is obtained by the group. Thus someone reporting Liver MRI outside of these boundaries would not be viewed favorably by peers.

Recommendations for Improvement:

[Dr B] states that he will be obtaining more training in the area and that he is 'motivated to attend more workshops and courses'.

1. It is therefore recommended [Dr B] investigate the substantial online resources available right now eg 'The Radiology Assistant' and 'STaT Dx' that would enable [Dr B] to put together a checklist when reporting Liver MRI rather than waiting for courses or workshops to be held.
2. Participating in formal double reading when performing these cases to build experience.
3. Attendance initially at the local Hepatic MDM, to enable feedback on cases reported.

Final Statements:

When performing the blind read of this case, I noted that not only did the patient have a hepatic lesion, but also a lesion in the pancreas (on the 2018 scan reported by [Dr B]). I note that subsequent imaging (an MRI in 12/11/19) now confidently calls the hepatic lesion a hepatocellular carcinoma but does not mention the enlarging pancreatic lesion.

It is not until the CT of 30/4/20 that the pancreatic lesion is identified and by 24/6/20 the lesion has grown larger and is now reported as a likely neoplasm.

I have shown 3 of my colleagues (who also report Liver MRI and 2 of which attend our local Liver MDM) the Original 28/03/18 MRI scan. Their 'blinded' opinion is that the hepatic lesion is unlikely to be a Hepatocellular Carcinoma. The favored diagnosis was a hypervascular metastasis. 2 of them identified the pancreatic lesion and were concerned that this might be a neuroendocrine tumor and that the Liver lesion (now lesions) may well be a metastasis.

Despite being provided with the entire patient record, I have been unable to discover any notes from a Hepatic MDM (or upper GI MDM). Although this case was ostensibly a review of 1 report, that was in itself an incorrect diagnosis, I remain unconvinced that the correct diagnosis has yet been reached.

A formal review of the entire case is therefore recommended.

Dr Graeme Anderson
Radiologist.
BHB MBChB
FRANZCR.

08/03/21

Reference:

1) Characterisation of Liver Masses, Richard Baron, University of Chicago The Radiology Assistant (Online resource)."

The following further advice was obtained from Dr Anderson on 30 August 2021:

"**Overview**

In 2020 I was asked by the Commissioner to provide an opinion on Case Number C20HDC00693.

This was initially a blind review of the imaging (completed 15/12/20). The final report was returned to the HDC on 20/3/21.

I have subsequently been asked to comment further, both around subsequent responses from [Dr B] and Southern DHB and around the questions raised at the time of the original review about the diagnosis and development of a

pancreatic mass not reported at the time of the original and initial subsequent imaging.

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

Referral Instructions from the Commissioner:

Expert advice requested

1) Advice on the misreported liver lesion

Please review the **enclosed** documentation and advise whether it causes you to add to or amend the conclusions drawn in your initial advice about whether the care provided to [Mr A] by [Dr B] and Southern DHB (regarding the misreported liver lesion) were reasonable in the circumstances, and why.

If you have added to or amended your previous conclusions, please explain your reasons for doing so.

2. Pancreatic lesion identified in initial blind review and expert report

In your blind review of the imaging (pg. 2), you indicated to this Office at the time that there was a potential lesion in the pancreas which had not been identified by [Dr B] and Southern DHB:

'*The most likely aetiology is therefore a hypervascular metastasis, with the lesion in the uncinate process of the pancreas potentially representing the primary (a neuroendocrine primary is most likely for a hypervascular metastasis)*.'

In your expert advice report (pg. 5), the pancreatic lesion was identified from the CT taken on 30 April 2020 and was reported to likely be a neoplasm by 24 June 2020.

As advised by you, this Office raised your concerns to Southern DHB on 9 March 2021.

Given the pancreatic lesion was identified by you (and two peer reviewers) during your blind review of the MRI, could you advise whether [Dr B's] omission in identifying the pancreatic lesion on 28 March 2018 constituted a departure of reasonable care.

Please advise:

1. What is the standard of care/accepted practice?
2. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, or severe) do you consider this to be, and why?

3. How would it be viewed by your peers?
4. Recommendations for improvement that may help to prevent a similar occurrence in future if appropriate.

Additional Documents provided:

1. Southern DHB's response dated 21 July 2021 to HDC's notification letter including the following 7 attachments:
   a. Enclosure 1 — SDHB Adverse Event Report
   b. Enclosure 1 (appendix 1) — [Dr E]
2. Group case review report dated 1 March 2021.
   a. Enclosure 1 (appendix 2) — RANZCR Review of Cases report completed by [Dr F] on [Dr B's] selection of cases.
   b. Enclosure 2 — Statement from consultant surgeon [Dr C] dated 20 July 2021.
   c. Enclosure 3 — SDHB's Consultant Radiologist Position Description at the …
3. MRI Liver scanning protocols.
   a. Enclosure 4 — Current Liver Imaging Protocol MRI (Southland Hospital release 20/03/21).
   b. Enclosure 5 — Previous Liver Imaging Protocol MRI (23/11/17).
4. [Dr B's] response dated 22 July 2021 to HDC's notification letter, including 6 supporting attachments in relation to the RANZCR and MCNZ Recertification Programme.

Advice on the misreported Liver lesion (MRI 28/3/18) Review of the reply from [Dr B].

My original review conclusions were as follows:

1. 'The report was found to be substandard in a number of ways: It did not outline the sequences performed in the technique (or whether a liver specific contrast agent was used)'

Subsequent comment from [Dr B].

'I accept that the report did not outline the sequences performed in the technique or whether a liver specific contrast agent was used, and whilst I agree that it is good practice to do so, this is not widespread in New Zealand. Most New Zealand departments do not describe the sequences performed. It does not make the report substandard.'

This is incorrect. RANZCR and IANZ guidelines (e.g. **New Zealand Code of Radiology Management Practice Radiology Services — Particular requirements for quality and competence Developed from ISO 15189:2007**) state that the sequences (when it is MRI) and Contrast agent given are to be included in the report.

2. The description of the signal characteristics of the lesion is vague and does not use standard descriptive language e.g. 'hyperintense' to describe diffusion when the term is 'restricted diffusion'.

3. The conclusion that the lesion is a 'benign haemangioma' portrays a lack of the understanding of the principles of Liver MRI.

Subsequent comment from [Dr B]:

'*I agree with Dr Anderson that my reporting of the MRI scan on 28 March 2018 as a benign haemangioma was incorrec*t. *Since that time, I have attended a number of courses and workshops on reporting liver scans. Additionally, I completed a 6-month recertification program for the Medical Council which focused on liver imaging and lesions. I attach details of this programme. This provided me with more experience in reporting liver lesions, and I now ensure they are reported following the Royal Australian and New Zealand College of Radiologists (RANCR) and Medical Council of New Zealand guidelines and recommendations regarding the liver imaging protocols and standard report structures.*

In retrospect and knowing what I now know, the liver lesion did not meet the criteria for a benign haemangioma. I accept therefore that the 12-month follow-up was incorrect. The 12-month follow up was recommended due to my diagnosis of benign haemangioma. Follow up for a benign haemangioma for stability differs from school to school and from department to department. In this case my recommendation for 12-month follow up was because of my view at the time being that it was an atypical haemangioma. '

This is encouraging that [Dr B] has upskilled in Liver MRI imaging.

4. The report departs significantly from the standard of practice, in that it goes against the principles that are outlined in readily available online resources and standard texts on the subject (1) and also the RANZCR curriculum, ie it is something that would be known by a Radiology trainee presenting for their Part 2 exams.

[Dr B's] Response

'*I can only think that Dr Anderson's view is based on his subspecialty experience and that of his peers rather than how a general radiologist with more limited experience of liver cases would report these scans. Following my recertification programme and courses attended on liver reporting, I am much more aware of the best practice in reporting these cases and have changed by reporting accordingly*.'

This is also incorrect. I like [Dr B] work in a General Radiology department and have no subspecialty training in Liver MRI either. While I am experienced in Liver MRI now that has been gained somewhat from both courses, conferences and reading, but mostly it

has been obtained from collegiality, and sharing of information and cases with colleagues.

The principles of Liver MRI and characterization of lesions are part of the RANZCR curriculum.

Liver MRI is challenging, and double reading and second opinions are to be encouraged especially in inexperienced readers.

When he states that he has changed his practice accordingly, I would hope that double reading and an avenue for advice and second opinions (possibly involvement in a hepatobiliary MDM) is also part of that practice.

What is the Standard of Care?

In Summary:

1. The inclusion of sequences performed, and contrast dose and type (and any adverse reaction) should be part of the report following both RANZCR and IANZ guidelines.
2. Although subspecialty training requirements for reporting of Liver MRI are not mandatory in NZ, best practice especially with inexperienced readers is for there to be double reading and/or collegial discussion about these difficult cases.
3. Liver MRI is currently part of the RANZCR curriculum.

Recommendations for Improvement:

Previously it was **recommended**

1. *[Dr B] investigate the substantial online resources available right now eg 'The Radiology Assistant' and 'STaT Dx' that would enable [Dr B] to put together a checklist when reporting Liver MRI rather than waiting for courses or workshops to be held*
2. *Participating in formal double reading when performing these cases to build experience*.
3. *Attendance initially at the local Hepatic MDM, to enable feedback on cases reported*.

1. I note that [Dr B] has availed himself of online courses in the interim on MRI which is excellent.

2. The information submitted is a review of formal peer review of his reporting of all Radiology which is outside my mandate to comment on.

Peer review (or formal double reading) of Liver MRI reporting was the recommendation as above.

In Conclusion:

[Dr B] has made improvements with respect to his knowledge of MRI liver reporting which was the main departure from the standard of care in this case.

The additional moderate departures from standard of care, ie including sequences and contrast agents given, and also double reading, peer review and collegiality around reporting Liver MRI have as of yet not been addressed in his practice (from the information provided).

Advice on the pancreatic lesion identified on the blind review. (MRI 28/3/18)

When performing the blind read of this case, I noted that not only did the patient have a hepatic lesion, but also a lesion in the pancreas (on the 2018 scan reported by [Dr B]).

I note that subsequent imaging (an MRI in 12/11/19) now confidently calls the hepatic lesion a hepatocellular carcinoma but does not mention the enlarging pancreatic lesion.

It is not until the CT of 30/4/20 that the pancreatic lesion is identified and by 24/6/20 the lesion has grown larger and now reported as a likely neoplasm.

I requested a formal review of the case as (as far as I can gather from the reports provided) the pancreatic lesion was also not identified on the MRIs from 7/11/19 or 21/02/20.

SDHB Response:

1. *A response to the issues raised in the expert advisor's report (enclosed), including our expert's concern that a pancreatic lesion has not been identified and whether a formal review of the entire case has been undertaken.*

[SDHB's radiology expert] has provided the following statement:

The pancreatic lesion was identified in June 2020 and [Mr A] was sent for endoscopic US which unfortunately was unsuccessful in obtaining tissue.

From what I can see the consensus from the GI MDM is that there are two processes occurring — HCC and a concomitant carcinoma in the head of the pancreas for which he was started on treatment.

So I'm not sure that a review of the entire case is necessary given the multiple imaging and clinical reviews that have occurred since then, and the consensus opinions that have been arrived at.

[Dr B] not identifying the pancreatic lesion on MRI 28/03/18:

The lesion in the pancreatic head is extremely subtle, not completely included in the majority of sequences and I note not identified on the review by [Dr E].

Therefore, [Dr B] not identifying the pancreatic lesion was not a departure from any standard of care.

My only statement would have been if the liver lesion was not viewed as a benign haemangioma on his report then he may have been prompted to search further for a potential primary and possibly discovered the pancreatic lesion.

SDHB not identifying the pancreatic lesion on subsequent MRI imaging 7/11/19 and 21/2/20:

The pancreatic lesion continues to grow across the series and is quite large (3cm) by the MRI from 21/2/20.

It is not mentioned in the reports for these scans either.

I have no record of a Liver/Upper GI MDM review or whether it was recognized at that time.

[SDHB's radiology expert] states the lesion was recognized by June 2020:

I have the report on the CT from that time when the pancreatic lesion was finally recognized.

The fact that the pancreatic lesion continued to grow, become more conspicuous and yet still not be recognized on the '*multiple imaging and clinical reviews*' **I find disappointing and is an example of both alliterative and framing bias (the reporting radiologists are influenced by the diagnosis proposed on previous imaging).**

The further delay in diagnosis by subsequent Radiologists reporting and reviewing the follow up MRIs is a moderate departure in standard of care.

Recommendations for Improvement:

A review of this case in a Regional Radiology/Upper GI Mortality and Morbidity meeting would seem appropriate.

If this has been performed already then inclusion of such a review would have been appropriate in the documentation provided by SDHB.

Final Impressions:

This case demonstrates the complexity and uncertainty in the discipline of Liver MRI.

Good reporting systems, standardized protocols and training are important, but this case emphasizes more the need for shared experience, collegiality, and a little humility.

Regional centers of experience and expertise should be open to supporting smaller centers with opinions, advice, and inclusion in MDMs, and pause before passing

judgement on 'the mistakes' of others less privileged than them, because no one gets it right every time.

Dr Graeme Anderson
Radiologist
BHB MBChB
FRANZCR

30/08/21"

Appendix B: Response from Dr G and Dr F in relation to Dr Graeme Anderson

The following excerpts were obtained on 19 November 2021 from the private radiology service and the two radiologists identified by Dr Graeme Anderson's report (dated 30 August 2021) to HDC in relation to the pancreatic lesion not being identified on subsequent imaging on 7 November 2019 and 21 February 2020.

"2. Statement from [Dr G], dealing his involvement in [Mr A's] care, including:

a) A description of his recollection of interpreting and reporting [Mr A's] MRI on 12 November 2019, with reference to any explanations for him not picking up the pancreatic lesion. If he does not have a recollection of this particular MRI, please request him to outline his usual process.

From my recollection of interpreting and reporting [Mr A's] MRI scan on 7 November 2019, there was a clinical concern regarding a liver lesion, which I reported on amongst the other liver lesions.

Based on my report, I had compared the liver lesion with the previous MRI scan performed 28 March 2018 and US scan performed 18 September 2019.

In hindsight, the pancreatic lesion was present, on that MRI performed 7 November 2019 and the previous MRI scan performed 28 March 2018, though not seen on the ultrasound.

On review of the case, there was an interim CT scan performed 1 April 2019, and the pancreatic lesion was present on that scan.

Given the complexity of the liver lesions and the clinical concern, there was a framing bias.

b) A response to the issues identified in Dr Anderson's radiology report, including our expert's concern that the pancreatic lesion had not been identified.

Dr Anderson, opined that there was a moderate departure from standard of care, and that both alliterative and framing bias were factors that may have influenced the reporting radiologist.

I would be in agreement with this.

As an Interventional Radiologist, who treats liver lesions, there would also be a satisfaction of search. In that I would have been biased, considering how to treat the liver lesion.

c) Details of his working environment at the time of these events, such as his workload, break lengths, level of interruptions and support/peer review availability.

I had been in Wellington that day for a meeting between RANZCR and ACC. I went to [the private radiology service] to help with the worklist, to clear the cases, after I had arrived back [home] at around 17:00.

d) Details of his level of experience at the time of these events, including how long he had been a radiologist at [the private radiology service].

[…]

e) Whether he has considered making any changes to his practice as a result of this incident and, if so, what.

I have made changes to my practice to review all other modalities, and have developed a checklist for reviewing other structures.

f) Any other information he wishes to provide in relation to the care provided to [Mr A].

No additional comments.

3. Statement from [Dr F], dealing his involvement in [Mr A's] care, including:

a. A description of his recollection of interpreting and reporting [Mr A's] MRI on 2 March 2020, with reference to any explanations for him not picking up the pancreatic lesion. If he does not have a recollection of this particular MRI, please request him to outline his usual process.

The MRI 21/2/20 clinical indication was 'HCC. For TAE'. The implication was that the diagnosis of HCC had been established, and I am aware that cases such as this are reviewed in a multidisciplinary meeting. This case had been reviewed at an MDM 28/11/19 which included radiology review and a liver transplant surgeon present. As a consequence of the clinical direction, my interpretation was primarily focused on progression or stability of the liver lesion.

The rest of the scan I would routinely review for any incidental findings. The pancreas lesion was not detected during this routine review, which was a perception error, as in retrospect the lesion is visible.

b. A response to the issues identified in Dr Anderson's radiology report, including our expert's concern that the pancreatic lesion had not been identified.

Dr Anderson describes alliteration and framing bias, and I would agree that the clinical question influenced my interpretation of the scan. The clinical details definitively states that the patient has 'HCC', i.e. not possible HCC or ?HCC, and it would not be my standard practice to revisit an established diagnosis. As the purpose was to check the liver lesion this is where most of my focus was when interpreting the scan. The pancreas

lesion was not perceived on my review for other abnormalities which I would usually perform (see 'c' below).

The case was reviewed at a multidisciplinary meeting 28/11/19 prior to my report, although it seems Dr Anderson was not privy to this information. According to the medical record the consensus at this meeting was that the liver lesion was consistent with an HCC despite the absence of known cirrhosis or elevated AFP.

The pancreatic lesion was not detected in the MDM review.

Often a biopsy would be performed to confirm the diagnosis although this was not thought to be required by the MDM, possibly influenced by the patient's severe COPD requiring home oxygen.

Dr Anderson's presumed diagnosis is pancreatic neuroendocrine tumour with liver metastasis. Although I agree that this is most likely, there is no proven diagnosis as biopsies have not been performed at any stage during the patient's care.

Assuming Dr Anderson's diagnosis is correct, then the patient had a pancreatic neuroendocrine metastatic to the liver which was first imaged 12/2/18 on ultrasound. The error on my MRI report 21/2/20 added a further 2 months to the already 24 month delay.

Dr Anderson references framing by the clinical and radiology history as a source of bias. The framing for Dr Anderson (and the two peer reviewers) is that of an HDC case which unavoidably influences the scan review process causing bias.

c. Details of his working environment at the time of these events, such as his workload, break lengths, level of interruptions and support/peer review availability.

The working environment and workload were busy but within expected range. Interruptions are not recorded, however the report does not have my typical report structure which usually would include a statement regarding the rest of the scan, and an interruption near the end of the report may have occurred.

Peer support was available, but wouldn't be requested due to the perception error (rather than interpretative difficulty).

d. Details of his level of experience at the time of these events, including how long he had been a radiologist at [the private radiology service].

[…]

e. Whether he has considered making any changes to his practice as a result of this incident and, if so, what.

To help improve detection of incidental findings not related to the clinical details/presentation, I will implement a more structured reporting style. This should

facilitate a more careful and stepwise review of individual organs, and hopefully reduce perception errors such as this. Structured template reporting may also reduce errors caused by interruptions.

f. Any other information he wishes to provide in relation to the care provided to [Mr A].

The lead medical oncologist for [Mr A] was made aware of the HDC's radiology opinion by us following review of the case. I note Dr Anderson's letter is dated 30/8/21. In the overall context of the case, the further delay of communicating the diagnosis to the patient's treating specialist by Dr Anderson was probably not significant.

However, I would suggest that the HDC reviewers could be instructed to communicate significant changes in the current diagnosis to the treating physician as soon as possible.

4. A response from [the private radiology service] to the issues identified in Dr Anderson's radiology report, including our expert's concern that the pancreatic lesion had not been identified.

Much of the supplementary case report authored by Dr Graeme Anderson on 30.08.2021 that has been provided to us has been redacted. Notably, it is not clear what question has been asked by the Commissioner in regards to the misreported liver lesion. All additional documentation provided for his review is censored. Offering a cogent response is challenging.

A mistake has been made. This is not disputed. We agree with Dr Anderson's interpretation that the reports of [Dr G] and [Dr F] were influenced by alliterative and framing bias.

Lessons have been learnt. [Mr A's] case has reinforced the importance of critically reviewing prior imaging and using systematic reporting of all studies.

5. Comments from [the private radiology service] with respect to details of the radiologist's working environment such as workload and the level of interruptions at the time of these events.

This has been partially covered in sections 2c and 3c above.

Reporting occurred in a purpose built reporting room. This has two workstations, but at the time of reporting both radiologists would likely have been alone (for [Dr G] after business hours, for [Dr F] the other assigned radiologist was performing procedures).

The reporting stations meet RANZCR and IANZ criteria, for instance monitor calibration and room luminescence.

Occasional phone calls from referrers are answered from this location, and this is the radiologist position that MRTs and sonographers would go to with questions, so

interruptions do occur. With the passage of time the number or timing of any interruptions is unknown.

Neither radiologist can recall any other significant distraction (such as construction) or environmental issues.

6. Details of what, if any, oversight or peer review was available to [private radiology service] radiologists at the time of these events.

Both radiologists are fellowship trained in abdominal imaging, practicing within their scope of practice as per FRANZCR and The Medical Council of New Zealand.

[The private radiology service] has a collaborative culture, where second opinions of colleagues are both freely available and encouraged when there is clinical uncertainty.

[Mr A's] imaging was reviewed by multiple other radiologists, who did not make the diagnosis of malignancy prior to two MRIs at the centre of this investigation. It was also reviewed in Southern District Health Board's GI (gastrointestinal) cancer MDM, 28.11.2019 attended by radiology, surgery and oncology. Transcripts have been submitted as attachments (**Attachments 1 and 2**).

…

13. Any other information [the private radiology service] considers relevant.

In preparing this response, [Mr A's] abdominal imaging was reviewed in its totality. It is unclear whether the HDC's expert Dr Graeme Anderson was aware of these due to redaction of this section in his submitted opinion.

On **25.08.2017** [Mr A, in his sixties] underwent an ultrasound of his abdomen at Southland Hospital for investigation of 'severe RUQ and epigastric pain and tenderness'. This was reported by [a Southern DHB radiologist] who noted as 19 mm low echoic mass in liver segment 6/7; concluding with the comment 'Uncomplicated cholecystolithiasis. Normal sized abdominal aorta. hypoechoic liver mass, further characterisation by means of CT is recommended.'

On **04.09.2017** CT was performed, reported by [a different Southern DHB radiologist]. This observed the lesion, noting in the comment section 'this is hard to evaluate' and recommending a follow up ultrasound study in 3 months to review.

On **17.11.2017** US was repeated, reported by Southern DHB radiologist [Dr B]. This documented a solitary 24 mm hypoechoic lesion, noting 'possible increase in size compared to previous ultrasound' commenting 'for repeat and follow up ultrasound in 3 months time'.

Commentary: *Whilst variable, the classic ultrasound appearance of a haemangioma is a well circumscribed hyperechoic lesion. Whilst they may appear hypoechoic, this is comparatively rare and typically when on a background of a fatty liver.*

On **12.02.2018** US was repeated, reported by [a Southern DHB radiologist]. The lesion measured 28 mm. Concluding comment: 'There is a further slight increase in size of the hypoechoic lesion in segment 6/7 of the liver. This could be a haemangioma but lesions not ruled out. Further investigation by means of MRI should be considered.'

On **28.03.2018** MRI of the liver was performed, reported by [Dr B] of Southland DHB. This noted a 22 mm lesion and concluded: 'Single well-defined liver lesion seen in segment VI/VII, has typical appearance of a benign haemangioma. Follow-up ultrasound in 12 months time is recommended for stability.'

On **01.4.2019** a CT of the chest and upper abdomen was performed with the clinical detail: 'Left vocal cord paralysis. Ex-smoker. Assess for pathology.' This was reported by [a teleradiology service]. With regards to the upper abdomen this documented 'The liver, pancreas and spleen are normal. Adrenals are normal. Both kidneys enhance normally. Multiple gallbladder calculi. There is mild inflammatory change in the root of the small bowel mesentery related to the pancreatic head. This involves also the third part of the duodenum.' It concludes: '*No CT evidence of a left vocal cord palsy. Emphysema. Right lower lobe atelectasis with soft tissue thickening around the right middle lobe and right lower lobe bronchi proximally. I note that the x-ray dated 10/08/2016 had a similar appearance. There is associated bronchial wall thickening/adjacent soft tissue and specialist review is recommended. Inflammatory change around the third part of the duodenum and small bowel mesentery may be consistent with mild duodenitis*.'

Commentary: *With the benefit of directed review, there is a 41 mm mass in the liver and what was interpreted as inflammatory change adjacent to the pancreas is actually a pancreatic lesion.*

On **08.07.2019** CTPA was performed, reported by [a radiologist] of Southern DHB, clinical indication: Query pulmonary embolus. Diagnosis cholecystitis previously.' With regards to the upper abdomen it records: 'Below the diaphragm the gallstones are noted. There is quite marked distension of the stomach with fluid'. In the comment section: 'No acute lung changes to account for the patient's symptoms.'

On **18.09.2018** US of the abdomen was performed, read by [a radiologist] of Southern DHB. indication: 'GS pancreatitis with question cholecystitis and known liver mass in segment 6 and 7'. This documents: The lesion in the right lobe of liver has been followed, it is now 5.3 cm, a substantial increase in size since 2018 which has been worked up on an MRI in 2018 and felt to reflect a haemangioma. It is avascular on colour Doppler. The growth is of some concern and may be worth re-evaluating with MR or tissue sampling, which of course can be high risk for bleeding if it is a haemangioma. There are gallstones. Limited study, question fatty liver as well.'

On **07.11.2019** (see response to question 12 below) MRI of the liver was undertaken, reported by [Dr G] of [the private radiology service]. This is the first subject of this HDC

complaint. This concluded: '58 mm lesion in segment 6 of the liver in keeping with hepatocellular carcinoma. Second 12 mm lesion laterally in segment 6 also in keeping with hepatocellular carcinoma. Third lesion measured at 7 mm in keeping with a dysplastic nodule'. The findings section of the report noted: 'No other abnormality is seen in the upper abdomen.'

On **21.02.2020** MRI was repeated with the clinical details of: 'Claustrophobic. Hepatocellular carcinoma for TAE last scan November 2019. Requires update'. This was reported by [Dr F] and is the second subject of this complaint. The findings recorded '66 x 50 mm hypervascular lesion with non-peripheral washout, moderate patchy T2 hyperintensity and possible capsule in keeping with HCC. This has enlarged from previously. Satellite 15 mm hypervascular nodule with non-peripheral washout and T2 hyperintensity lso consistent with HCC. No other hypervascular lesion seen. There are a few small T2 hyperintense lesions scattered throughout the liver parenchyma in keeping with hepatic cysts. Note is made of moderate diffuse hepatic steatosis with fatty sparing around the liver lesions.' It concludes: 'Known HCC, mildly increased in size from previously.'

Commentary: *The MRIs reported by [the private radiology service] both used Primovist, a liver specific contrast agent. This contrast is used specifically for identification and characterisation of liver lesions, which was the objective of these studies. Transient severe respiratory motion is a well-known phenomenon after administration of Primovist, that might impede image interpretation especially of the hepatic arterial phase. This motion artifact significantly reduced conspicuity of the pancreatic lesion on the two studies performed. This was likely exaggerated by breathing difficulties related to underlying COPD.*

The best chance of earlier diagnosis of the pancreatic lesion was on the MRI 28.03.2018, where a non liver specific contrast agent was used. On that MRI (admittedly shaped by the benefit of hindsight) the liver lesion did not exhibit classical imaging features of a haemangioma. An apparent diffusion coefficient (ADC) map was not obtained/ submitted, limiting interpretation of the signal on diffusion weighted imaging (DWI). If obtained (as should be routine) the diagnosis of malignancy may have been made earlier.
[1]

To summarise, 10 imaging series of different modalities were undertaken on [Mr A's] abdomen before he underwent TACE (Transarterial chemoembolization by interventional radiology). The last 2 were reported by [the private radiology service], the first 8 by Southern DHB and [the teleradiology service]. The opportunity for diagnosis of hepatic malignancy was not made prior to the first [the private radiology service] reported MRI of 07.11.2019. The two reports which are core to this HDC investigation were the last in a series.

In addition, two further studies occurred before pancreatic mass was first reported, both by Southern DHB radiologists.

An independent radiologist who is fellowship trained in oncology imaging reviewed [Mr A's] imaging in a Southern DHB GI MDM. This was attended by a number of local surgeons and oncologists. Following MDM discussion it was elected not to biopsy the liver lesion despite (a HCC tumour marker) alpha fetoprotein not being abnormal, and with no history of cirrhosis (which predisposes to HCC development). This was informed by [Mr A's] significant comorbidities- mainly COPD requiring supplemental oxygen 16 hours per day, meaning a large operation was considered to not be the best course of action. TACE was considered a more appropriate approach.

Whilst Dr Anderson describes his and his colleagues review as being blind, in medicine this means that authors names and the clinical background are unknown. It is important to note whenever a case is reviewed by an expert (and delegated colleagues) at the request of the HDC, this very much tempers the review. The study is clearly contentious, and therefore (perhaps unconsciously) looked at far more critically than a case one of many on a worklist of a busy practice. The lack of preceding studies also removes the alliterative and framing bias that Dr Anderson identifies as likely contributory to misreporting in this instance.

In The HDC's 'Guidelines for Independent Advisors' the question is asked: 'How would it be viewed by your peers?'. We believe that the fact that multiple other radiologists involved in [Mr A's] care did not perceive the liver malignancy and pancreatic mass earlier should be considered by The Commissioner. These reviews were truly 'blind' reviews by peers."

Appendix C: Advice from Dr Graeme Anderson in relation to the private radiology service's response

The following advice was obtained from Dr Graeme Anderson in relation to the private radiology service's response to Dr Anderson's report (dated 30 August 2021):

"**Overview**

In 2020 I was asked by the Commissioner to provide an opinion on Case Number C20HDC00693.

This was initially a blind review of the imaging (completed 15/12/20).

The final report was returned to the HDC on 20/3/21.

A subsequent supplementary report was tabled in 26/8/21 relating to the delay in the detection of an additional pancreatic lesion that was identified during the course of the above review in addition to the hepatic lesion(s)

Now I have received the response from [the private radiology service] regarding their role in reporting subsequent studies and the reasons that failed to identify the pancreatic lesion.

This will be my final report regarding this complex case.

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

Referral Instructions from the Commissioner

Expert advice requested:

'I recommend producing a short written report (1–2 pages) that explains your reasoning on why the care provided by [Dr G] and [Dr F] could not be classified as either mild/moderate/severe departures in light of [the private radiology service's] response.

You might consider whether the error made (not identifying the pancreatic lesion) was reasonable under the circumstances and the challenges faced by the radiologists, including any other relevant factors.

In your final report to HDC (in relation to [Dr B] and the pancreatic lesion), it was stated that "the further delay in diagnosis by subsequent radiologists reporting and reviewing the follow up MRIs is a moderate departure in standard of care".

Explain why this statement might no longer apply in light of [the private radiology service's] response.'

Additional Information received:

1. [Private radiology service's] Response:
    a. Response from [Dr G].
    b. Response from [Dr F].
    c. Response from [the private radiology service].
2. Upper GI cancer MDM report(s) 28/11/2019 and list of attendees.
3. [Private radiology service] MRI Liver scanning protocols.
4. Request forms for above.

Review of the [private radiology service's] Response:

1. Statement from [Dr G].

[Dr G] agreed that there was framing bias 'the form states "HCC for TAE"'.

As an interventional radiologist his focus is evaluating the lesion for Radiologist lead treatment (that was the purpose of the scan to assess for suitability). A subtle pancreatic lesion incompletely imaged has a low likelihood of being identified.

Other mitigating factors such as a busy travel schedule and limited time available for reporting are chronic issues almost universal in Radiology departments in this country.

He has however changed his practice now using template reporting which has been shown to reduce error mitigating both perceptual and framing bias and reducing the likelihood of such a lesion being missed again.

2. Statement from [Dr F].

[Dr F] notes the framing and alliterative biases at play, especially after the MDM had made the consensus diagnosis of HCC of the liver lesion(s).

Again, his focus was to assess the response of the liver lesion to TAE.

He notes that in retrospect a pancreatic neuroendocrine tumour with some (or all) of the liver lesions being metastases is the most likely diagnosis.

He also confirms that the case was reviewed in an Upper GI MDM and the consensus diagnosis of HCC of the liver that was made at that time (This meeting also generated an ACC claim for treatment injury as to the original incorrect diagnosis of the liver lesion of 'haemangioma').

[Dr F] also notes the significant framing bias of my own and other reviewers of this and other HDC cases.

This is emphasizes the limitations of the HDCs use of 'Blinded review of cases' as the framing bias is immense as one knows that something has been 'missed'.

Search patterns and time spent on the 'Blinded review' is often more than is afforded to the radiologist reporting the case and lacking the alliterative and other localized framing biases present.

3. Statement from [the private radiology service]

a. Comments on Radiologist workload and working environment.

Appropriate working environment, limited interruptions and lack of any extenuating circumstances.

b. Comments on oversight and peer review.

Appropriate training and experience of both [Dr G] and [Dr F].

Case reviewed at upper GI MDM as appropriate (this did not include [Dr F] or [Dr G]) and also did not identify the pancreatic lesion.

No note of formal or informal double reading of these cases.

Notes that blinded peer review via the 'InteleRad One Worklist Peer Review Module' has now been implemented.

c. Additional information including the implementation of structured and template reporting, employment details of said radiologists and imaging protocols (which have been sighted before) also included.

What is the Standard of Care?

Now additional information has been provided (most importantly the MDM summary and present personnel) there does not seem to have been a significant departure from standard of care.

The decision to consider the Hepatic lesion an HCC was made at the MDM by an appropriately composed and experienced team.

This resulted in significant framing and alliterative biases that impacted on the reports of [Dr G] and [Dr F].

The pancreatic lesion was subtle and not identified by other blind readers (who also had the different HDC framing influences).

Recommendations for Improvement and conclusions:

[Dr G] and [Dr F] have implemented template reporting in their reporting of Liver imaging which will help reduce such perceptual, alliterative and framing errors.

It is recommended that these templates are also used by other radiologists reporting Liver MRI at [the private radiology service] and at Southern DHB.

There has been review of this case at a Radiology discrepancy meeting which is appropriate.

I have no correspondence if the case has also been re-reviewed at a subsequent Upper GI MDM in light of the discovery of the pancreatic lesion and the confidence of the original consensus diagnosis of HCC of the original lesion in a patient with no risk factors for HCC.

This is recommended also if it has not been performed already.

Dr Graeme Anderson
Radiologist.
BHB MBChB
FRANZCR.
18/03/22”