

**Radiologist, Dr C  
Radiology Service**

**A Report by the  
Health and Disability Commissioner**

**(Case 19HDC01991)**



## Contents

Executive summary .....	1
Complaint and investigation .....	1
Information gathered during investigation.....	2
Opinion: Dr C .....	8
Opinion: Radiology service — no breach .....	11
Recommendations.....	12
Follow-up actions .....	12
Appendix A: Independent advice to the Commissioner .....	13



## Executive summary

1. This report concerns a radiologist's failure to identify free gas in the abdomen on a CT scan. As a result, an opportunity to consider surgical review and treatment options was missed. The report highlights the importance of radiologists identifying significant findings on CT scans.

## Findings

2. The Commissioner was critical that the radiologist did not identify and describe the free abdominal gas on the scan, and found him in breach of Right 4(1) of the Code. The Commissioner considered the omission to be an individual error, with no contributing systemic or other issues.

## Recommendations

3. The Commissioner recommended that the radiologist provide a written apology to the family, and that the radiology service provide an update on the level of internal audit of its radiologists.

## Complaint and investigation

4. The Health and Disability Commissioner (HDC) received a complaint from Mr A about the services provided to his father, Mr B, at a public hospital. The following issues were identified for investigation:

- *Whether Dr C provided Mr B with an appropriate standard of care in 2019.*
- *Whether the radiology service provided Mr B with an appropriate standard of care in 2019.*

5. The parties directly involved in the investigation were:

Mr A	Complainant/consumer's son
Radiology service	Provider
Dr C	Radiologist

6. Also mentioned in this report:

Dr D	Radiology advisor for ACC
------	---------------------------

7. Further information was received from:

The Office of the Coroner  
 Medical Centre  
 District Health Board (DHB)  
 The Accident Compensation Corporation (ACC)  
 The Medical Council of New Zealand

8. Independent expert advice was obtained from a radiologist, Dr Gregory Hunt (Appendix A).
- 

## Information gathered during investigation

### Introduction and background

9. On 3 Month3,<sup>1</sup> Mr B (in his eighties at the time) had a CT scan at a public hospital to investigate abdominal pain and diarrhoea. The scan showed that Mr B had free gas in the abdominal cavity (indicating a bowel perforation), but the finding was missed in the scan report, and Mr B was discharged from hospital. Two days later, his GP referred him to the Emergency Department (ED), and he was re-admitted to hospital. On 7 Month3, Mr B's condition deteriorated suddenly, and, sadly, he died as a result of septic shock due to the unrecognised bowel perforation.
10. At the time of these events, the DHB contracted the radiology service to provide services, which included tele-radiology services (ie, when medical images are reviewed and reported on at a different site from where the images were taken).

### Events leading up to CT scan

11. On 29 Month1, Mr B collapsed and was admitted to the public hospital. He was diagnosed with gastroenteritis and atrial fibrillation (an abnormal heart rhythm), and prescribed dabigatran (blood-thinning medication) and digoxin.<sup>2</sup> In the preceding days, Mr B had experienced diarrhoea and minor rectal bleeding. The DHB stated that according to the Health Pathways guidelines,<sup>3</sup> Mr B's symptoms did not indicate referral for further bowel investigations such as CT scan or colonography. On 2 Month2, Mr B was discharged home with a plan for further cardiac review as an outpatient, and GP monitoring.
12. Mr B's symptoms of indigestion/abdominal pain continued, and he presented to his medical centre three times in Month2 for GP review and medication management. At the third appointment, on 31 Month2, the general practitioner (GP) referred Mr B to the public hospital's Radiology Department for a CT scan of the abdomen to investigate his bowel symptoms. The referral noted: "[Rectal] bleeding 1/12 ago — persisting slightly. Lower left abdo pain, diarrhoea and appetite suppression." Mr B presented to the Emergency Department (see below) before this CT was scheduled.

### ED presentation — CT scan of abdomen

13. At 9.12am on Saturday, 3 Month3, Mr B's wife called for an ambulance owing to Mr B's ongoing abdominal symptoms. Ambulance staff completed an assessment and documented: "Transport required due to increasing dehydration, unable to manage and nil GP or afterhours available."

---

<sup>1</sup> Relevant months are referred to as Months 1–3 to protect privacy.

<sup>2</sup> Used to treat some heart conditions including atrial fibrillation.

<sup>3</sup> A web-based information portal that supports primary care clinicians to plan patient care through primary, community, and secondary healthcare systems.

14. Subsequently, Mr B was transferred to the public hospital ED and admitted at 10.55am. Following assessment by an ED consultant at 11.10am, Mr B was referred for a CT scan of the abdomen. The referral form noted the clinical indication for the scan as: “Diarrhoea worsening. Pain.”
15. Radiologist Dr C<sup>4</sup> reviewed and reported on the scan as part of the radiology service’s after-hours reporting service. At this time, Mr B also had bloods taken, which showed markers<sup>5</sup> suggestive of inflammation and an immune response.
16. In relation to the CT scan, Dr C stated:
- “I reviewed the CT scan images, looking through solid organs and the small and large bowel, looking for free fluid or free gas, or an abscess. I checked the gall bladder, lymphadenopathy and pelvic organs. I then review[ed] lung bases and bones ...”
17. Dr C reported on the scan as follows:
- “Indication:**  
Worsening diarrhoea. Pain.
- Findings:**  
The liver, kidneys, pancreas and spleen appear unremarkable.
- There is [no]<sup>6</sup> evidence of small or large bowel obstruction. There is sigmoid<sup>7</sup> diverticulosis which is thick walled, but no gross inflammatory changes or obstruction seen. No abscess seen.
- No free fluid seen abdomen or pelvis.
- Conclusion:**  
There is no evidence of bowel obstruction. There is sigmoid diverticulosis, but no convincing evidence of diverticulitis<sup>8</sup> or abscess.”
18. Dr C stated that he saw no evidence of local perforation at the time. However, having reviewed the scan retrospectively he accepts that there were “locules<sup>9</sup> of free gas around the more proximal large bowel [in the] upper abdomen, at the hepatic flexure and transverse colon, as well as around the inferior liver”. Dr C told HDC that these are areas that he normally checks for free gas, and said that he is unable to explain why he did not

---

<sup>4</sup> Dr C is vocationally registered as a diagnostic and interventional radiologist, and was employed by the radiology service.

<sup>5</sup> Elevated levels of C reactive protein (CRP — normal range less than 5mg/L), and a high white cell count (WCC). Mr B’s WCC was 141mg/L and 21.4 x10<sup>9</sup>/L. The normal WCC range is 4–11 x10<sup>9</sup>/L.

<sup>6</sup> The original scan report omitted the word “no”. The DHB’s Serious Adverse Event Review of this case found that the ED staff on 3 Month3 considered that the omission of the word “no” was a typographical error, given that the conclusion of the report stated there was “no evidence of bowel obstruction”. The radiology service told HDC that this omission occurred because of a dictation error.

<sup>7</sup> The part of the colon immediately above the rectum.

<sup>8</sup> When small pouches in the bowel (diverticuli) become inflamed.

<sup>9</sup> Small cavities.

see this when reporting the scan on 3 Month3. He stated that had he recognised the free gas, it would have changed his reporting process significantly, and he would have telephoned the referring physician directly.

19. When free gas is present in the abdominal cavity, this can indicate bowel perforation.

20. Dr C further stated:

“In this case, I felt the finding of sigmoid diverticulosis was sufficient to explain the presenting symptoms of diarrhoea and abdominal pain. I was not aware the symptoms had been present for 6 weeks, or that there were raised inflammatory markers on the blood test, but I’m not sure that my having knowledge of these factors would have changed how I ultimately reported this case.”

21. Dr C said that he was moderately busy that day, but not exceptionally so. He stated that there were no workload issues or other factors that would have affected his standard of care or contributed to the finding being missed.

22. Mr B was discharged from ED at 5.10pm on 3 Month3. The discharge summary stated: “Have noted the labs which demonstrate a mild leucocytosis<sup>10</sup> and mild elevation of CRP. CT demonstrates mild wall thickening, but no diverticulitis.” Mr B was prescribed antibiotics for suspected colitis.<sup>11</sup> The discharge form also documented that Mr B had been advised to follow up with his GP for further evaluation, and to “return for worsening pain, fever, nausea, vomiting or any other concern”.

### **Subsequent events**

23. On 5 Month3, Mr B presented to his GP for a further review. The GP was concerned about Mr B’s blood results<sup>12</sup> and other persisting symptoms including diarrhoea and indigestion, so she sent a referral to the public hospital ED for Mr B to be seen urgently. Mr B re-presented to ED at 5.45pm that day, and was assessed at 7pm. The documented clinical impression was “[d]iarrhoea [and abdominal pain] ?cause”. Mr B was admitted to the Medical Ward at 8pm with a plan for further bowel investigations (colonoscopy or CT colonography) and his vital signs were monitored overnight.

24. The DHB’s Serious Adverse Event Review (SAER) report states that on 6 Month3, the consultant physician reviewed the CT scan report from 3 Month3 and briefly reviewed the associated image before seeing and assessing Mr B. The SAER report states that “no formal request was made for an urgent surgical review due to lack of suspicion of an abdominal catastrophe”.

25. At 5.55am on 7 Month3, Mr B was found to be extremely short of breath, with a bluish skin colour,<sup>13</sup> and an emergency call was activated. While being assessed, Mr B deteriorated suddenly and was transferred to ICU. However, despite intensive care, Mr B

---

<sup>10</sup> An elevated white cell count. This is usually suggestive of an infection.

<sup>11</sup> Inflammation of the colon.

<sup>12</sup> The elevated C-reactive protein and white cell count.

<sup>13</sup> Referred to as cyanosis, and caused by deficient oxygen in the blood.

suffered a cardiac arrest<sup>14</sup> and, sadly, he died at 8.22am. The cause of death was recorded by the consultant physician as severe septic shock caused by an unrecognised bowel perforation.

26. Shortly after Mr B died, a radiologist at the radiology service retrospectively reviewed the CT scan from 3 Month3. The radiologist detected the free gas and informed the DHB. Mr B's son was then informed by DHB staff of the missed CT finding of a small bowel perforation.
27. In relation to why the scan was not reviewed by another clinician before this time, the radiology service told HDC:

"It is usual practice that a CT scan is not reviewed, unless a clinician has concerns that the radiology report and clinical findings are discordant. In this case no such request was made. A case may also be discussed at the weekly radiology review meeting, again this is at the request of the attending clinician."

28. Similarly, Dr C told HDC:

"I would not routinely ask for a second opinion on an acute abdominal CT, nor is it considered routine in our practice to do so. There are situations when I would seek a second opinion, however, if I could not understand the pathologies I had identified, or unsure if multiple pathologies may be present."

### **Further information**

#### *ACC advice*

29. A radiologist, Dr D, provided external clinical advice to ACC in relation to Mr B's care. Dr D reviewed a copy of the CT scan from 3 Month3 and reported "a small volume of free intra-peritoneal<sup>15</sup> air located anteriorly in the right upper quadrant under the diaphragm". His impression was: "Perforated viscus<sup>16</sup> accounts for the free intra-peritoneal air. This is most likely due to a colonic perforation. An urgent surgical opinion is advised."
30. Dr D asked two other radiologists to review the scan, and they also found free intra-peritoneal air likely due to a perforated viscus. Dr D stated:

"Had [the free gas and perforation] been recognised at the time, a surgical opinion would have been recommended and almost certainly, [Mr B] would have had a laparotomy for the purpose of identifying the cause of the bowel perforation and correcting this."

31. Dr D further noted that "errors of omission and interpretation" are common in clinical radiology, and they "should not give rise to concerns regarding competence of the reporting radiologist if isolated".

<sup>14</sup> Mr B went into asystole, when there is no cardiac electrical activity.

<sup>15</sup> Intra-abdominal (within the abdomen).

<sup>16</sup> An internal organ of the body.

*Dr C*

32. In relation to the missed finding of free gas, Dr C stated: “I am sincerely sorry for the error and disappointed in myself that I made it. I have reflected at length on this.” He further stated that no issues similar to this case have arisen previously in relation to his practice.
33. On further review of the scan, Dr C commented on the possibility that the scan could have also indicated the existence of a colonic tumour, which may have been the cause of the bowel perforation. Dr C said that this would have been a “subtle finding”, and noted that colleagues who reviewed the scan informally at the time the issue was identified made no mention of a possible bowel mass.
34. Dr C submitted that the situation of his reporting on this case “may differ quite dramatically” from the situation of a peer reviewing the scan retrospectively, and may account for any difference in reporting between himself and those who reviewed the scan after the events. Dr C stated:

“Whilst not making any excuses for, or trying to diminish my failure in this case to detect the free intra-abdominal gas, my report was performed in real time, after hours, with not insignificant time pressure, reporting from a worklist of urgent CT, MRI and plain xrays generally. There was also limited clinical information available at the time of reporting, as is common in these cases. This can make it difficult to know where to specifically focus your attention when reviewing the many hundreds/thousands of images presented. This is a very different situation to an MDT<sup>17</sup> meeting, or careful case review, with accumulated information, which those reviewing, even if doing so blind, are likely to speculate or know has significant findings.”

*Radiology service*

35. The radiology service said that the CT scan of 3 Month3 demonstrated free intraperitoneal gas around the liver and gallbladder with perforated viscus. It acknowledged that Dr C made a “perceptive error” in not detecting the free gas. The radiology service said that all radiologists are subject to making perception errors, and that “no specific or outlier perception error issue has been noted with [Dr C]”.
36. The radiology service told HDC that, as with all of its radiologists, Dr C participates in regular regional peer learning meetings and is subject to RANZCR<sup>18</sup> and Medical Council continuing professional development requirements. The radiology service also provided HDC with relevant policies in place at the time of this case, including the “[Radiology service] [after hours] Reporting Tasklist” and the “[Radiology service] Radiologists Procedures Manual”, which it said outlines “priorities, duties and processes for [the radiology service] radiologists reporting for the [radiology service’s] [after-hours reporting service]”.

---

<sup>17</sup> Multi-disciplinary team.

<sup>18</sup> Royal Australian and New Zealand College of Radiologists.

**DHB**

37. The DHB completed an SAER report into these events. The report found the following:
- The missed finding of free gas on the CT scan of 3 Month3 contributed to the missed diagnosis of a bowel perforation.
  - If the free gas had been identified, a surgical consultant review could have been requested with the option of surgery to repair the perforation or conservative management with intravenous antibiotics.
  - Ultimate responsibility for interpreting scans lies with the diagnostic radiologist.
  - The DHB's level of monitoring and auditing of the radiology service's tele-radiological services needs to be reviewed. The DHB advised that a new Radiology Services Agreement, commencing in 2021, will include quality auditing clauses that have been reviewed in light of this case.
  - Mr B's case should be discussed at a Morbidity and Mortality meeting in relation to the care and treatment provided, and the outcome. The DHB advised that this occurred in 2019.
38. The DHB told HDC that it has provided verbal and written apologies to Mr B's family.

**Changes made since these events**

39. Dr C told HDC that as a result of this incident, the radiology service carried out an audit of 50 of his acute abdominal CT scans, and no significant issues were identified in relation to his reporting.
40. In relation to further training he has undertaken, Dr C stated:
- “We also set up an educational process, including 2 days of intensive, supervised acute abdominal CT reporting, ... with 2 subspecialty trained abdominal radiologists. I also underwent training in more advanced use of structured reports, including multiple checklists for confirmation of review areas.”

41. The radiology service confirmed that it had undertaken an audit of Dr C's abdominal CT scans, and that Dr C had undergone remedial training. It has also introduced a new worklist in one of its branches, which includes further peer review, and an internal audit of its radiologists. The radiology service plans to roll out this system across its services by mid 2021.

**Responses to provisional opinion**

42. Mr A was given an opportunity to respond to the “information gathered” section of the provisional opinion, and had no further comment.
43. Dr C and the radiology service were given an opportunity to respond to the provisional opinion, and had no further comments.

## Opinion: Dr C

### Summary

44. It is established that Dr C, in reviewing and reporting Mr B's CT scan from 3 Month3, failed to identify free gas in the abdomen, indicative of a bowel perforation. Because this finding was overlooked, no further actions were taken at that time to assess and treat the perforation. Mr B was prescribed antibiotics for suspected colitis and discharged later that day. Subsequently, he was re-admitted to the public hospital on 5 Month3 as he remained unwell. While awaiting further investigations, Mr B collapsed suddenly on 7 Month3, and died owing to septic shock caused by an unrecognised bowel perforation.
45. Dr C accepted that in this case he missed the finding of free abdominal air, and that no specific factor contributed to him not seeing it on his initial review of the scan. He told HDC that had he recognised the free gas it would have changed his reporting process significantly, and he would have telephoned the referring doctor. At the time, he felt that the finding of diverticulosis was sufficient to explain the presenting symptoms of diarrhoea and abdominal pain. While he did not have knowledge of Mr B's other clinical history from the previous 4–6 weeks, or that there were raised inflammatory markers on Mr B's blood tests, Dr C acknowledged that knowledge of that history may not have changed how he reported the case.

### Missed finding of free abdominal air — breach

46. My independent clinical advisor, radiologist Dr Gregory Hunt, advised that the clinical history noted on the referral form for the 3 Month3 scan (ie, diarrhoea and worsening abdominal pain) was adequate for the purposes of imaging and interpretation. Dr Hunt carried out a blind read<sup>19</sup> of the scan and noted that the CT scan images were of good quality. The following is an extract of Dr Hunt's blind report on the scan:

**“Indication:**

Worsening diarrhoea and pain

...

**Findings:**

There is a moderate amount of free peritoneal gas, predominantly in the upper abdomen anterior to the liver and around the gallbladder, although several small bubbles are also present around the sigmoid colon. ... Diverticular disease affects the proximal half of the sigmoid colon, however there is no evidence [of diverticulitis]. In the mid sigmoid, at the distal end of the diverticular segment, there is an area of particular bowel wall thickening measuring 60 mm in length with a rather lobulated contour distally, protruding into the gas-filled lumen. This is suspicious for a primary colonic mass. ... Additionally, there is a 17mm polypoid filling defect arising from the posterior wall of the large bowel at the rectosigmoid junction,<sup>20</sup> compatible with a colonic polyp. ... There are two low density lesions in the liver measuring 8 mm

---

<sup>19</sup> When a scan image is presented for interpretation with minimal other information regarding the case.

<sup>20</sup> The area where the sigmoid colon transitions into the distal rectum.

inferiorly in the right lobe and 5 mm, laterally on the right. These are too small to characterise fully, but most likely represent cysts.

...

**Conclusion:**

There is free peritoneal gas in the abdomen, indicating gut perforation. The site of the leak is not clearly shown, but I suspect it relates to a probable primary colonic mass in the mid sigmoid at the distal end of a segment of diverticular disease. An additional small polyp is present at the rectosigmoid junction. Lesions in the liver are probably cysts, but in view of the colonic appearances, further evaluation may be appropriate to exclude metastasis. ...”

47. Dr Hunt advised that the free gas in Mr B’s abdominal cavity was the first and most important finding he observed on review of the scan. Dr Hunt said that he also sought peer review from a panel of six specialist radiologist colleagues by providing them with anonymised copies of the images and clinical information. Dr Hunt stated that his finding of free abdominal air was also “immediately observed” by his colleagues when they viewed the scan.
48. Dr Hunt advised that, in his view, Dr C’s failure to identify and describe the free abdominal air on Mr B’s scan represents a “significant departure from the standard of care”. He further noted that as there is no evidence of systemic failure in this case, the omission can be considered to be “due to individual error alone”.
49. Dr Hunt said that this error would have had a major impact on the planning of Mr B’s care, and that if Dr C had recognised the free gas in his viewing of the scan, Mr B would have been considered for emergency abdominal surgery.<sup>21</sup> Dr Hunt said that surgery would “almost certainly have been the preferred treatment”, as the cause of the bowel leak would have been established and closed off, with any leaked contamination from the bowel removed to reduce the risk of infection.

**Possible cause of free abdominal air — other comment**

50. In addition to identifying the free gas, Dr Hunt identified a further issue from the scan that was not described on Dr C’s report, namely a mass/tumour. Dr Hunt advised:

“There is a mass-like (polypoid) protrusion at the downstream (distal) end of the abnormal [diverticular] segment and this finding prompted me to suggest a probably coexisting tumour, which is otherwise very difficult to see in the scan. The possibility of tumour becomes a little more likely when the smaller 17mm growth (polyp) is recognised a little more distally. These possibilities are not raised in [Dr C’s] report, but were recognised and suggested by my colleagues on peer review.”

51. In relation to his above findings, Dr Hunt advised that the “probable coexisting bowel tumour is quite likely to be the cause of the perforation in [Mr B’s] case”. He advised that

---

<sup>21</sup> ACC advisor Dr D’s report of the scan also noted that owing to the likely presence of a colonic perforation, the need for an urgent surgical opinion was indicated.

it was a minor departure from the standard of care that this possibility was not raised in Dr C's report, and noted that that omission alone would not have altered Mr B's immediate clinical course.

52. In response, Dr C told HDC that none of his colleagues who reviewed the scan made any mention of a possible bowel mass, and said that this would have been a "subtle finding". I am not critical that Dr C did not identify the possible bowel mass, noting that this was a more subtle finding compared with the more easily identifiable intra-abdominal free gas.

#### *Other matters*

53. Dr C stated that while not excusing any errors of perception in his review of Mr B's scan, there are factors that can make reviewing a scan more challenging in real time compared to when it is being peer reviewed by radiology colleagues after the event.
54. In relation to this, Dr Hunt advised that some risk factors such as excessive workload and interruptions while reporting are well known to increase the risk of radiologist error, and that "even the minutest distraction ... might cause an experienced and well-trained Radiologist to overlook a vital finding". Dr Hunt advised that while acute radiology imaging is usually carried out under a constant pressure of work, the reports generated remain the definitive report for any given scan, and in many cases there is no second examination for a "subtle but important observation to be made".
55. Dr Hunt advised that a reporting radiologist must be confident that he/she has "taken the correct amount of time to make all of the observations necessary to generate a full and complete report".
56. Additionally, in relation to Mr B's clinical history leading up to the scan, Dr Hunt commented that if Dr C had been informed about Mr B's four-week history of symptoms, including loose bowel motions, abdominal pain, and previous fresh rectal bleeding, it may have prompted a more thorough examination of the colon and possibly detection of the free gas. However, Dr C told HDC that even had he known of those factors, it may not have changed how he reported the case.
57. I am mindful of environmental factors and work pressures that can impact on a clinician's ability to deliver quality care. That said, Dr C has indicated that there were no specific workload issues or other factors (such as distractions) that would have affected his performance or levels of concentration on that day. I accept Dr C's frank comments in this respect and am satisfied that there were no extenuating environmental circumstances beyond the usual pressures — for which radiologists are trained and under which they are expected to work — that would have made Dr C's task of accurately reporting the scan unreasonably difficult.

#### **Conclusion**

58. Having regard to Dr Hunt's expert advice, I conclude that Dr C's failure to identify and describe the free abdominal air on Mr B's scan was a significant departure from the expected standard of care. As a result of this failure, an opportunity to consider surgical

review and surgical treatment options for Mr B was missed. It appears that these omissions were an individual error, and that there were no contributing systemic or other issues. Accordingly, I find that Dr C breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).<sup>22</sup>

59. Dr C has acknowledged and apologised for his error. Since these events, Dr C has undertaken considerable reflection on this case and, together with the radiology service, has taken appropriate steps, including an audit of 50 abdominal CT scans, to ensure that his practice is meeting the required standard.

---

### **Opinion: Radiology service — no breach**

60. As a healthcare provider, the radiology service had a duty to provide services to Mr B in accordance with the Code. This included an organisational duty to facilitate reasonable care. I note that it employed Dr C at the time of these events.
61. My independent clinical advisor, Dr Gregory Hunt, advised that the radiology service had adequate policies and procedures in place at the time of Mr B's scan to support reporting radiologists and minimise the chance of errors occurring. He noted that its "[radiology service's after hours]" policies (in place at the time of Mr B's scan) are described in detail and appear to be a flexible system "designed to cope with any overwhelming demand that might increase the risk of Radiologist error". Dr Hunt further noted that the radiology service's practice of holding regular Peer Learning meetings provides the opportunity for radiologists to discuss educational cases to improve their performance and raise the quality of the service.
62. Dr Hunt considered that Dr C's error in this case was "due to individual error alone", with no evidence of contributing systemic failure, and that the radiology service responded rapidly and appropriately to investigate the issues raised by this case. Dr Hunt also advised that there are no additional policies or procedures that the radiology service could consider to lessen the risk of an event similar to Mr B's case in the future.
63. I accept this advice and am satisfied on the evidence that the systems in place at the radiology service were reasonable and appropriate. Accordingly, I find that the radiology service did not breach the Code directly.
64. In addition to any direct liability for a breach of the Code, section 72(2) of the Health and Disability Commissioner Act 1994 (the Act) states that an employing authority is vicariously liable for any acts or omissions of its employees. A defence is available to the employing authority of an employee under section 72(5) if it can prove that it took such steps as were reasonably practicable to prevent the acts or omissions.

---

<sup>22</sup> Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."

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

## Recommendations

66. I recommend that Dr C provide a written apology to Mr B's family for the breach of the Code identified in this report. The apology should be provided to HDC within three weeks of the date of this report, for forwarding.
67. Dr C has confirmed to HDC that he has reflected on these events and has completed appropriate training and audits of abdominal scan reporting. Accordingly, I consider that no further recommendations are required.
68. I recommend that the radiology service provide an update on the introduction of a new system across its services, which it reported will increase the level of internal audit of its radiologists, and the effect that this has had on its services. The update should be provided within two months of the date of this report.
- 

## Follow-up actions

69. A copy of this report will be sent to the Coroner.
70. A copy of this report will be sent to the Medical Council of New Zealand, and it will be advised of Dr C's name. However, all details identifying the other parties will be removed, except the expert who advised on this case.
71. A copy of this report with details identifying the parties removed, except the expert who advised on this case, will be sent to the Royal Australian and New Zealand College of Radiologists.
72. A copy of this report with details identifying the parties removed, except the expert who advised on this case, will be placed on the Health and Disability Commissioner website, [www.hdc.org.nz](http://www.hdc.org.nz), for educational purposes.

## Appendix A: Independent advice to the Commissioner

The following expert advice was obtained from radiologist Dr Gregory Hunt:

### **“Independent Advisor’s Report to the Health and Disability Commissioner**

**Complaint:** [Dr C]/[the radiology service]

**HDC Ref:** 19HDC01991

**Author:** Dr Gregory Hunt  
Radiologist  
Lakes District Health Board, Rotorua  
Hamilton Radiology Ltd, Hamilton

I have been asked to provide an opinion to the Commissioner on case number 19HDC01991.

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

I am a vocationally registered Diagnostic Radiologist and have been routinely reporting general hospital abdominal CT scans since 1988. I am a Consultant Radiologist and Senior Medical Officer of Lakes District Health Board at Rotorua Hospital and also work in private practice for Hamilton Radiology Ltd, where I am a partner. My qualifications are MB ChB (1981), Otago University and I am a Fellow of the Royal Australian and New Zealand College of Radiologists.

I have reviewed the following documents provided by email:

1. Letter of complaint dated 9 [Month3] (and attached documents).
2. [The radiology service’s] responses dated 29 April 2020 and 15 May 2020.
3. [Dr C’s] response dated 19 May 2020.
4. Clinical records from [the DHB] relevant to this case.
5. Clinical records from [the medical centre] from [Month1] onwards.

I have also studied the CT scan of [Mr B’s] abdomen and pelvis performed at [the public hospital] on 3 [Month3], supplied on a USB drive.

### **Expert Advice Requested**

Thank you for providing your blind review of [Mr B’s] CT scan imaging.

We would now appreciate your commenting on [Dr C’s] report dated 3 [Month3], and whether there has been a departure from the expected reporting requirement in this case. Other questions are also outlined below.

Please review the enclosed documentation and advise whether you consider the care provided to [Mr B] by [Dr C] and [the radiology service] was reasonable in the circumstances, and why.

In particular, please comment on:

1. The adequacy of [Dr C's] scan reporting on 3 [Month3].
2. The impact that a missed finding of free abdominal air would have had on [Mr B's] subsequent care.
3. The adequacy of relevant policies and procedures in place at [the radiology service] at the time of [Mr B's] care.
4. The adequacy of actions taken and changes made in response to these events by [Dr C] and [the radiology service].
5. Any other matters in this case that you consider warrant comment.

For each question, please advise:

- a. What is the standard of care/accepted practice?
- b. If there has been a departure from the standard of care or accepted practice, how significant a departure do you consider this to be?
- c. If there has been a departure from the standard of care or accepted practice, do you attribute it to systemic factors, individual error, or both?
- d. How would it be viewed by your peers?
- e. Recommendations for improvement that may help to prevent a similar occurrence in future.

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

### **Background**

On 3 [Month3], [Mr B] presented to [the public hospital's] Emergency Department on advice from his GP. A chest x-ray and CT scan of the abdomen and pelvis were undertaken. The CT scan reported no evidence of bowel obstruction, but some evidence of diverticulosis with wall thickening and no evidence of diverticulitis.

However the reporting radiologist, [Dr C], missed some free air in the abdomen shown on the CT scan, indicative of a perforation. [Mr B] was discharged later that day.

On 5 [Month3], [Mr B] saw his GP as his abdomen was tender and he was feeling unwell. His GP contacted a doctor at [the public hospital] who commented that [Mr B's] white blood cell count was too high and that he should be admitted to hospital. He came to ED and was admitted to the medical ward.

On the morning of 7 [Month3], [Mr B] had a sudden collapse, and passed away due to sepsis secondary to a bowel perforation. After his death the missed finding of free air was discovered on the 3 [Month3] CT scan.

I have since been informed that although [Mr B's] case was referred to the coroner, no post mortem examination was performed.

### **Review Process**

Initially, the HDC provided me with a copy of [Mr B's] [public hospital] CT scan from 3 [Month3], along with the relevant radiology request form. They requested me to provide a 'blind report' of the study, to simulate the process of the original reporting radiologist.

After I had submitted my requested blind report of the CT scan, copies of the documents listed above were sent to me. I have reviewed all of these and re-examined the imaging in the light of the new information available.

I subsequently sought peer review by presenting anonymised images and clinical information to a panel of six other specialist radiologists convened for the purpose of peer review at Rotorua Hospital. Experience of these colleagues ranges from one to more than thirty years in specialist radiology practice and all are involved with the reporting of CT scans of patients with acute abdominal symptoms

### **CT Abdomen & Pelvis — 3 [Month3]**

The given clinical details were 'diarrhoea, worsening (abdominal) pain.' The provided clinical history is adequate for the purposes of imaging and interpretation, although there was no description of findings from physical examination or any laboratory data.

Despite a little image unsharpness in the upper abdomen from patient breathing, the CT scan images are of good quality, performed on a contemporary multislice scanner providing axial, coronal and sagittal image reconstructions for analysis.

My blind report is as follows:

***Indication:***

*Worsening diarrhoea and pain.*

***Technique:***

*Portal phase images from diaphragm to symphysis.*

*There is some motion artefact in the upper abdomen from breathing.*

*No previous imaging for comparison.*

**Findings:**

*There is a moderate amount of free peritoneal gas, predominantly in the upper abdomen anterior to the liver and around the gallbladder, although several small bubbles are also present around the sigmoid colon. No free peritoneal fluid or loculated collection is visible. Diverticular disease affects the proximal half of the sigmoid colon, however there is no evidence of surrounding inflammatory change, pericolic collection or extraluminal gas to suggest diverticulitis. In the mid sigmoid, at the distal end of the diverticular segment, there is an area of particular bowel wall thickening measuring 60 mm in length with a rather lobulated contour distally, protruding into the gas-filled lumen. This is suspicious for a primary colonic mass. An adjacent 5 mm lymph node is present, but no significant lymphadenopathy is visible within the abdomen or pelvis. Additionally, there is a 17 mm polypoid filling defect arising from the posterior wall of the large bowel at the rectosigmoid junction, compatible with a colonic polyp. Proximal to the suspected mass and diverticular segment, there is no large or small bowel dilatation to suggest obstruction. There are two low density lesions in the liver measuring 8 mm inferiorly in the right lobe and 5 mm, laterally on the right. These are too small to characterise fully, but most likely represent cysts. The biliary tree, pancreas and spleen are unremarkable. There is focal parenchymal scarring, with some thinning of renal parenchyma in the left midpole and scattered simple renal cysts. No significant renal abnormality. The aorta is ectatic, but undilated. On bone windows, there has been a compression fracture of the T11 vertebral body. This appears to be of longstanding and there is no bone destruction. No other skeletal findings. No findings on lung windows.*

**Conclusion:**

*There is free peritoneal gas in the abdomen, indicating gut perforation. The site of the leak is not clearly shown, but I suspect it relates to a probable primary colonic mass in the mid sigmoid at the distal end of a segment of diverticular disease. An additional small polyp is present at the rectosigmoid junction. Lesions in the liver are probably cysts, but in view of the colonic appearances, further evaluation may be appropriate to exclude metastasis. The T11 vertebral body fracture is old and there is no evidence of a pathologic fracture.*

*Dr Greg Hunt  
Radiologist.  
21/09/2020*

**[Dr C's] Report**

[Dr C's] report does not describe the free air in [Mr B's] abdominal cavity. This is the most important finding on the images obtained and was my first observation when reviewing the scan. This finding was also immediately observed when I showed the scan to colleagues for peer review.

[Dr C's] report does describe the presence of diverticular disease (diverticulosis) in the sigmoid colon, without evidence of diverticulitis (inflammation complicating

diverticulosis). I agree with this interpretation, which was also supported on peer review.

[Dr C] describes some wall thickening of the colon in the region of diverticulosis. Thickening is a common consequence of diverticulosis, but in [Mr B's] scan the appearances are not typical of diverticulosis alone. There is a mass-like (polypoid) protrusion at the downstream (distal) end of the abnormal segment and this finding prompted me to suggest a probable coexisting tumour, which is otherwise very difficult to see in the scan. The possibility of tumour becomes a little more likely when the smaller 17 mm growth (polyp) is recognised a little more distally. These possibilities are not raised in [Dr C's] report, but were recognised and suggested by my colleagues on peer review.

In my view, the failure to identify and describe free abdominal air on [Mr B's] scan unfortunately represents a significant departure from the standard of care and this belief is supported on peer review. Following review of the provided documentation, there is no evidence of systemic failure and I consider this omission to be due to individual error alone.

The probable coexisting bowel tumour is quite likely to be the cause of the perforation in [Mr B's] case; diverticulosis without diverticulitis is only rarely the cause of perforation. While this possibility was not raised in [Dr C's] report, this omission alone would not have made a difference to [Mr B's] immediate clinical course and should therefore be considered as a minor departure from the standard of care.

Any other differences between [Dr C's] report and mine are largely stylistic and not of particular clinical relevance.

### **Impact of Overlooking Free Abdominal Air**

Overlooking the presence of free air in [Mr B's] abdomen had a major impact on the planning of his care and probably also a significant effect on his outcome.

The diagnosis of free abdominal air is commonly considered to be a clinical emergency and almost always leads to urgent abdominal surgery. This is aimed at identifying and hopefully treating the cause of the gut perforation, closing the leak and clearing the abdomen of leaked bowel contents which can cause life-threatening infection from faecal peritonitis.

*Certain radiographic findings confidently predict the need for operation. These include pneumoperitoneum and radiologic evidence of gastrointestinal perforation. Patients presenting with abdominal pain and free intra-abdominal gas seen on radiograph warrant operation with limited exceptions<sup>1</sup>.*

---

<sup>1</sup> Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice, 17th ed. Townsend et al., 2004

If free abdominal air had been recognised on initial viewing of [Mr B's] CT scan, abdominal surgery would have almost certainly have been the preferred treatment. Emergency surgery would not have been without risk in an [elderly] gentleman with hypertension, chronic airways disease and atrial fibrillation. The risk of an operation always needs to be balanced against the risk of not operating and this would be a determination made by a surgeon and his/her anaesthetist.

### **Policies and Procedures at [the radiology service]**

The available documents show that [the radiology service] had an adequate number of policies and procedures in place at the time of [Mr B's] scan, to support reporting Radiologists and minimise the chance of error.

The [after-hours reporting service] is described in detail. On the day in question, there were two rostered Radiologist shifts as well as a 2nd On Call Radiologist ([Dr C]) to support them in times of high demand and to provide some additional rostered reporting. This appears to be a flexible system, designed to cope with any overwhelming demand that might increase the risk of Radiologist error.

A number of mechanisms are outlined which enable a reporting Radiologist to obtain assistance, should he come upon a case where additional input is required. The stipulated process of additionally phoning through any report with serious abnormality is very appropriate to reduce the chance of communication error.

Furthermore, [the radiology service's] practice of holding regular Peer Learning meetings and case review sessions gives all participating Radiologists the opportunity to review cases where errors may have occurred and raise awareness of potential pitfalls in their own practice. This has the dual benefit of improving individual Radiologist performance as well as raising the quality of the service in general.

In my view there are no additional policies or procedures that [the radiology service] could consider to lessen the risk of a similar event in the future.

### **Subsequent Actions**

Following recognition of the error in [Mr B's] scan report, it appears from the emailed and other documents that both [Dr C] and [the radiology service] responded quickly and appropriately to address the issues raised.

[Dr C] discontinued reporting studies from [the public hospital] and urgently met with [the radiology service's] Managing Radiologist ... and their Chief Medical Officer ... to discuss the issues and arrange a very thorough remediation and audit process.

Fifty of [Dr C's] CT reports were audited by two Radiologists, experienced in abdominal imaging and no significant errors were detected. [Dr C] underwent two days of supervised abdominal CT reporting with subspecialty trained Radiologist colleagues which further validated his competence. The use of templated reports was

encouraged and this 'checklist' approach may further reduce the chance of overlooking the presence of a vital finding such as free abdominal air.

I believe that the responses to this event were appropriate and very thorough. I believe that there is nothing further that could be suggested or expected in this regard. I am sure that anonymised images from this case will have been presented at a [radiology service] Peer Learning meeting and been a very valuable learning opportunity for the assembled Radiologists.

### **Other Matters**

The referral data for [Mr B's] CT scan on 3 [Month3] described worsening diarrhoea and abdominal pain. The clinic notes from that date also mention weight loss of around 10 kg over the preceding few months although this history of weight loss was not given to the reporting Radiologist.

Additionally, [Mr B] had previously been an inpatient at [the public hospital] just one month before, from 29 [Month1] until 2 [Month2] following a collapse at home. Clinical data from that admission describe fatigue, loose bowel motions and fresh rectal bleeding. I suspect this history of rectal bleeding was not discovered by the ED staff when [Mr B] presented again in [Month3] and was certainly not known to [Dr C] when he reported [Mr B's] scan.

In my blind report of [Mr B's] scan I was suspicious of a bowel tumour close to the area of diverticulosis in the sigmoid colon and I suspect that this may have been the cause of perforation causing free abdominal air. If the full picture had been presented to [Dr C], of an elderly gentleman with a more than four week history of loose bowel motions, abdominal pain, weight loss and previous fresh rectal bleeding, the scan report may have been rather different; the additional concern raised by the extra clinical data may have prompted an even more thorough examination of the colon and possibly correct detection of the free air.

I have been informed that the coroner decided that a post mortem examination was not necessary in [Mr B's] case, so this possibility cannot be explored further. In my view however, a bowel perforation complicating a tumour of the sigmoid colon is more likely than perforation from uncomplicated diverticulosis.

This case highlights the importance and the difficulty of achieving perfection in every case reported by a diagnostic Radiologist. Even when supported by a high-quality system and presented with good quality images, all practising Radiologists face the risk of human error, which we try to minimise as much as possible.

Some risk factors such as excessive workload and interruptions while reporting are well known to increase the risk of Radiologist error, but even the minutest distraction such as a conversation outside the reporting room, a sudden noise or a cold room from poor heating can lead to a break in concentration which might cause an experienced and well-trained Radiologist to overlook a vital finding.

Optimal reporting conditions are a key factor in reducing the risk of errors in perception and interpretation in Radiology.

### **Conclusion**

At its simplest, [Mr B's] CT scan from 3 [Month3] shows free abdominal air suggestive of a bowel perforation. Unfortunately, this finding was overlooked by [Dr C] and not reported.

If this finding had been recognised and communicated, [Mr B] would have been considered for emergency surgery, although the risks from his airways disease and arrhythmia would have required consideration. With surgery, the cause of the bowel leak would have been established, the leak would have been closed and leaked contamination from the bowel would have been removed to reduce the risk of infection.

It is likely that [Mr B] would have had a better outcome, but not certain.

From my review of the materials available, [the radiology service] operate[s] a well-resourced and high quality Radiology reporting service for [the public hospital] with well documented procedures and policies and I have no suggestions for improvement of this service. They responded rapidly and appropriately to investigate the issues and in my view, could have done no more.

[Dr C] is a qualified and experienced Radiologist. His work has been audited both before and after [Mr B's] unfortunate case and found to be of a good standard. The remedial work undertaken demonstrates a keen desire to address any deficiencies that may have been present.

Unfortunately, a single error of perception has contributed to a major negative outcome for [Mr B] and his family. I am sure that every Radiologist who has reviewed this case understands the significance of what has occurred and will keep it in mind when evaluating similar cases in the future.

Dr Gregory Hunt

19 October 2020"

### **Further expert advice:**

**"Independent Advisor's Report to the Health and Disability Commissioner**

**Complaint:** [Dr C]/[Radiology service]

**HDC Ref:** 19HDC01991

**Author:** Dr Gregory Hunt

Radiologist

Lakes District Health Board, Rotorua

Hamilton Radiology Ltd, Hamilton

I have been asked to provide further comment to the Commissioner on case number 19HDC01991.

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

I am a vocationally registered Diagnostic Radiologist and have been routinely reporting general hospital abdominal CT scans since 1988. I am a Consultant Radiologist and Senior Medical Officer of Lakes District Health Board at Rotorua Hospital and also work in private practice for Hamilton Radiology Ltd, where I am a partner. My qualifications are MB ChB (1981), Otago University and I am a Fellow of the Royal Australian and New Zealand College of Radiologists.

I have reviewed the following document provided by email:

1. [Dr C's] response to expert advice dated 13 November 2020.

In addition to [Dr C's] comments, this file also contains a report on this case prepared for the Accident Compensation Commission by [Dr D] and dated 5 February 2020.

### **Background**

On 3 [Month3], [Mr B] presented to [the public hospital]'s Emergency Department on advice from his GP. A chest x-ray and CT scan of the abdomen and pelvis were undertaken. The CT scan reported no evidence of bowel obstruction, but some evidence of diverticulosis with wall thickening and no evidence of diverticulitis.

However the reporting radiologist, [Dr C], missed some free air in the abdomen shown on the CT scan, indicative of a perforation. [Mr B] was discharged later that day.

On 5 [Month3], [Mr B] saw his GP as his abdomen was tender and he was feeling unwell. His GP contacted a doctor at [the public hospital] who commented that [Mr B's] white blood cell count was too high and that he should be admitted to hospital. He came to ED and was admitted to the medical ward.

On the morning of 7 [Month3], [Mr B] had a sudden collapse, and passed away due to sepsis secondary to a bowel perforation. After his death the missed finding of free air was discovered on the 3 [Month3] CT scan.

I have since been informed that although [Mr B's] case was referred to the coroner, no post mortem examination was performed.

### **Suspected Bowel Tumour**

I agree that the area suspicious for a bowel tumour is a subtle finding and more likely to be detected when suspicion is heightened by a case review process. Nevertheless my local colleagues who reviewed the case made the same observation.

[Dr D] did not comment on this finding in his review of the imaging, but I note that one of his colleagues did raise the issue of a colonic tumour:

*CM: Free gas — visceral perforation. No free fluid or walled off collection. Can't identify site of perforation, **but do see 2 x 1.3 cm polyp at the distal aspect of a sigmoid diverticular segment, concerned that immediately proximal to this there is a 5cm length of tumour.** No diverticulitis. Likely site for perforation. Patient not obstructed. (my emphasis)*

The presence of free peritoneal air on [Mr B's] scan was the major finding. Identification of this may have made a significant difference to his outcome.

The identification of any subtle bowel tumour which may have been the culprit was much less critical in the acute situation and as I commented in my original report, 'it would not have made a difference to [Mr B's] immediate clinical course ...'

### **Pressure of Work**

Most radiology services suffer from a surplus of work and a shortage of radiologists. This creates a constant pressure of work and a need to move from one interpretation to the next with maximum efficiency.

While acute radiology imaging may be reported under such pressure, the report generated remains the definitive report for that study. In many cases, there is no second examination of the images and no second chance for a subtle but important observation to be made.

Given that he must take professional responsibility for the accuracy of his report, it behoves the reporting radiologist to be confident that he has taken the correct amount of time to make all of the observations necessary to generate a full and complete report.

If the pressure or work or time is too great for a radiologist to thoroughly examine the case in front of him, then steps should be taken to modify the systems in place and create an environment conducive to accurate and high quality reports.

Dr Gregory Hunt  
Radiologist  
21 November 2020"