Whanganui District Health Board

Anaesthetist, Dr C

Consultant Radiologist, Dr D

Anaesthetist, Dr E

A Report by the

Health and Disability Commissioner

(Case 12HDC00112)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. In December 2008 Mrs A, aged in her mid-sixties, was referred by her general practitioner, Dr H, to the dental unit at a public hospital owing to gross dental decay. She had a history of heavy smoking. On 6 May 2009, Mrs A saw a locum dental surgeon, Dr F, who completed a health questionnaire and operation booking form. Mrs A was to undergo removal of all her teeth under a general anaesthetic. A pre-anaesthetic assessment was requested by Dr F. Dr F's understanding was that any abnormal test findings would be reported to and acted on by the anaesthetic team.

2. On 22 October 2009, Mrs A saw an anaesthetist, Dr C, for assessment. Dr C recorded Mrs A's history (including chronic obstructive pulmonary disease) and her medications. Dr C examined Mrs A and noted that she had a heart murmur. An ECG showed sinus tachycardia. Her chest was clear. Dr C requested a chest X-ray and echocardiogram be done before surgery. Dr C did not document that she had ordered a chest X-ray and echocardiogram, or Mrs A's smoking history. Dr C's signature on the X-ray request form was unclear.

3. On 22 October Mrs A had an echocardiogram. The referrer listed on the echocardiogram report was incorrect, and it was not copied to Dr H, Dr F, or Dr C. The next day, Mrs A had a chest X-ray reported by Dr D. He reported an abnormal opacity on the lung and recommended a follow-up investigation. However, the wording of his report was unclear, and it was not copied to Dr H. Dr D was not aware that dental unit X-rays were not copied to general practitioners — a DHB practice contrary to other outpatient X-rays. Dr D did not follow the process in place to "red flag" abnormal results electronically.

4. Mrs A's abnormal chest X-ray result was automatically faxed to the dental unit. The referrer listed on the report was a generic "Dr Dental Dental" rather than a specific surgeon. No one clinician was responsible for overseeing the dental unit. No one in the Unit sighted the results of Mrs A's chest X-ray, and staff did not put the results in Mrs A's health record.

5. Neither Dr F's nor Dr C's name appeared on Mrs A's X-ray report, and it was not copied to Dr F, Dr C, or Dr H.

6. On 6 November 2009 Dr E, an anaesthetist, saw Mrs A in the surgical day unit. He checked her medical history and went through Dr C's preoperative assessment notes. Dr E did not review Mrs A's heart murmur. As there was no record of the X-ray request on the preoperative assessment, he did not expect Mrs A to have had a chest X-ray. The DHB could not confirm whether the X-ray report accompanied Mrs A to theatre. Surgery went ahead, and Mrs A was discharged home.

7. Dr H's original referral letter was addressed to the dental unit, but the unit did not formally correspond with Dr H. A year later, Mrs A visited a general practitioner owing to chest pain. A chest X-ray showed an upper lobe lung mass. Subsequent investigations confirmed this to be an inoperable carcinoma with metastases. On 14

January 2011, DHB staff met with Mrs A to explain what had happened and apologise. Sadly, Mrs A died later in 2011.

8. On 13 December 2011, the DHB completed a Root Cause Analysis Report, made recommendations, and instigated changes to improve services.

Findings summary

9. The failure to follow up the abnormality identified on Mrs A's chest X-ray occurred in the context of a number of serious organisational and systemic failures on the part of Whanganui District Health Board (DHB). Primarily, if the DHB process in place at the time meant that responsibility for following up the X-ray did not lie with the clinician ordering the test, there should have been an explicit and documented process that provided clarity and identified the clinician who *would* be responsible for reviewing and following up the test. An effective and formalised system was not in place for reporting test results. Accordingly, Whanganui DHB did not provide services to Mrs A with reasonable care and skill and breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code).[1]

10. Adverse comment was made about Dr C's deficiencies in documentation. Relevant clinical information and the nature of investigations ordered were not brought to the attention of the anaesthetist who would be administering anaesthesia on the day of surgery.

11. Dr D's reporting of the chest X-ray was unclear. An opportunity for Mrs A's abnormal chest X-ray result to be brought to the attention of clinicians caring for Mrs A was lost when Dr D failed to "red flag" the electronic system. Dr D did not provide services with reasonable care and skill and, therefore, breached Right 4(1) of the Code.

12. Dr E's preoperative assessment did not comply fully with professional standards, as he did not address all the elements that were identified in Dr C's pre-anaesthetic assessment, most notably Mrs A's heart murmur. Accordingly, Dr E breached Right 4(2) of the Code.[2]

13. Detailed recommendations were made to Whanganui DHB, to be attended to as a matter of priority.

[1] Right 4(1) of the Code states: "Every consumer has the right to have services provided with reasonable care and skill."
[2] Right 4(2) of the Code states: "Every consumer has the right to have services provided that comply with legal, professional, ethical, and other relevant standards."

Complaint and investigation

14. The Commissioner received a complaint from Mr B about the services provided to his partner, Mrs A. The following issues were identified for investigation:

- *Whether Whanganui DHB provided an appropriate standard of care to Mrs A between 6 May 2009 and 6 November 2009.*
- *Whether Dr C provided an appropriate standard of care to Mrs A between 22 October 2009 and 6 November 2009.*
- *Whether Dr D provided an appropriate standard of care to Mrs A between 22 October 2009 and 6 November 2009.*
- *Whether Dr E provided an appropriate standard of care to Mrs A between 22 October 2009 and 6 November 2009.*

15. An investigation was commenced on 7 January 2013. The parties directly involved in the investigation were:

Mr B	Complainant
Whanganui DHB	Provider
Dr C	Anaesthetist
Dr D	Consultant radiologist
Dr E	Anaesthetist
Dr F	Dental surgeon
Dr G	Dental surgeon
Dr H	General practitioner

16. Information was also reviewed from ACC (oncologist Dr I).

17. Independent expert advice was obtained from anaesthetist Dr Vaughan Laurenson, and is attached as **Appendix A.**

18. Independent expert advice was obtained from radiologist Dr David Milne, and is attached as **Appendix B.**

Information gathered during investigation

Background

19. On 15 December 2008 Mrs A, aged in her mid-sixties, was referred by her general practitioner (GP), Dr H, to the dental unit (the unit) at the public hospital for management of her poor dental status and gross dental decay. Dr H's referral letter was addressed to the Unit's referral centre. It noted Mrs A's medical history as

including diabetes, chronic obstructive pulmonary disorder (COPD), arthritis, and mild to moderate hypertension. She was noted to be a heavy smoker.

Booking sheet

20. On 6 May 2009 Mrs A attended an outpatient appointment and completed a pre-assessment health questionnaire. Dr F, a locum dental surgeon at the unit, completed a Patient Booking Sheet. After discussion with Mrs A, it was decided that Mrs A would have a full dental clearance[3] under general anaesthesia, followed by the fitting of dentures.

21. The booking sheet describes Mrs A's "gross dental decay" and the intended procedure of "full dental clearance with immediates under [general anaesthesia]". Dr F's instruction noted: "Please arrange for anaesthetic assessment — Patient is heavy smoker and has COPD." The pre-assessment questionnaire shows that Mrs A had raised her own concerns about having an anaesthetic owing to her smoking history.

22. Dr F told HDC:

> "My understanding of the process from this point is that an anaesthetist assesses the patient for a general anaesthetic and orders any tests they think are necessary. If the patient is not suitable for the general anaesthetic procedure then they notify us of their decision and we work through with the patient other ways of dealing with the clearance of their teeth."

Pre-anaesthetic clinic

23. On Thursday 22 October 2009, Dr C, a specialist anaesthetist, saw Mrs A for a preoperative assessment at the Pre-Anaesthesia Clinic. This was the only time Dr C was involved in Mrs A's care.

24. Dr C told HDC that her role in the Pre-Anaesthesia Clinic is to "review the patient clinically, order relevant investigations, discuss anaesthesia options, and pros and cons with the patient".

25. Whanganui DHB stated:

> "The practice is that the anaesthetic team will contact the dental unit only if [the anaesthetic team] find that the patient is not suitable for a general anaesthetic. Any special requirements are documented by the anaesthetist and they order investigations that they think are appropriate to ensure the patient is fit for the proposed surgery."

DHB anaesthetic record — preoperative assessment

26. The DHB Anaesthetic Record Document (the Anaesthetic Record) has a printed patient label affixed to the top right-hand corner. This records Mrs A's details, including her GP's and surgeon's names. The form is headed with a space recording

[3] Removal of all teeth.

the operation type (dental clearance), the anaesthetist (Dr E), the surgeon (Dr F), and a technician.

27. Dr C made her notes in the dedicated area on the Anaesthetic Record marked section 2 "preoperative assessment". She recorded Mrs A's history of type 2 diabetes, COPD, hypertension, and arthritis. Mrs A gave a history of smoking 30–40 cigarettes per day. Dr C noted Mrs A's medications at that time — metformin, omeprazole, diclofenac, Accuretic, and frusemide. Dr C documented that Mrs A weighed 99kg.

28. Dr C physically examined Mrs A's cardiovascular system. The findings documented included blood pressure of 130/80mmHg,[4] oxygen saturation 95%, and "S_1 S_2 ESM — 4/6" — a grade 4/6 ejection systolic murmur.[5] An ECG was performed that day, and the results showed sinus tachycardia. Auscultation of the lungs was clear, and Mrs A did not have any wheeze. Dr C assessed Mrs A to have an ASA rating of three.[6]

29. Dr C told HDC that, as is consistent with her practice, she explained the anaesthesia process for dental clearance to Mrs A. This was not documented by Dr C. The Nursing Assessment notes record that Mrs A had attended the Pre-Admission Clinic and had been given educational information pertaining to anaesthesia.

30. Dr C told HDC that she requested a chest X-ray be done before Mrs A presented for surgery, as this was clinically indicated given Mrs A's history of heavy smoking and COPD.

Chest X-ray request form and echocardiogram request form

31. Dr C completed an X-ray request form (a request to the Radiology Department), which notes Mrs A's history of COPD, diabetes, and arthritis.

32. Dr C stated to HDC:

> "It is routine to order a [chest X-ray] in these circumstances and any anaesthetist would expect to review one pre-operatively … I ordered the film so that this may be reviewed by the anaesthetist who would be rostered to that operating list."[7]

[4] Ideal blood pressure for an adult is 120/80mmHg.

[5] A murmur is a series of vibrations of variable duration, audible with a stethoscope at the chest wall, which emanates from the heart or great vessels. A systolic murmur is a murmur that begins during or after the first heart sound and ends before or during the second heart sound.

[6] The American Society of Anaesthesiologists rating scale regarding fitness for anaesthetic: **ASA 1**: A normal healthy patient; **ASA 2**: A patient with mild systemic disease; **ASA 3**: A patient with severe systemic disease; **ASA 4**: A patient with severe systemic disease that is a constant threat to life; and **ASA 5**: A moribund patient who is not expected to survive. The purpose of the grading system is to assess the degree of a patient's physical state prior to selecting the anaesthetic or prior to performing surgery. Describing patients' preoperative physical status is used for record-keeping, for communicating between colleagues, and to create a uniform system for statistical analysis. The grading system is not intended for use as a measure to predict operative risk.

[7] The anaesthetist undertaking preoperative assessments is not necessarily the same as the anaesthetist administering the anaesthetic, and this was the case with Mrs A.

33. The X-ray request form has Mrs A's patient label information affixed to the top left-hand corner of the form. The label contains the names of Mrs A's GP, Dr H, and surgeon, Dr F.

34. The reasons for requesting radiological investigations were recorded on the chest X-ray form as: "1. Pre-op screening 2. Incidental murmur."

35. Dr C specified the investigations she wanted Mrs A to have — a chest X-ray, PA view[8] and, secondly, a "2DE" — a 2D cardiac echo study.[9]

36. Dr C signed the X-ray request form using her initials. Her name is not printed. Dr C told HDC: "It is clear from my signature on the Radiology request form that the [chest X-ray] had been requested by me, from the Pre-Anaesthesia Clinic." In response to the provisional opinion, Dr C stated "I regret that I used initials and that my signature was not obvious on the request form … it would have been relatively easy to trace the person requesting the X-ray as the request had been made from the Pre-assessment anaesthesia clinic only the day before the films were reported … it would have been a simple matter for the Radiologist to contact me as per the 'Reporting procedure for diagnostic alerts' process". Dr C said that the DHB takes specimen signatures of all physicians for identification purposes.

37. Mrs A's significant smoking history was not recorded on the X-ray request form. Dr C said that she regretted this oversight. Her response to HDC noted that the history of COPD and smoking was, however, recorded in the pre-anaesthetic review data.

38. Dr C told HDC: "In view of the incidental finding of a cardiac murmur, on 22 October 2009 I also referred [Mrs A] for an Echocardiogram, also to be done before the date of surgery." A separate form was used to request an echocardiogram. The "report to" section of the form states: "[Dr F]". Dr C was not identified on the echocardiogram request form.

39. In the preoperative assessment part of the Anaesthetic Record, Dr C made no reference to a chest X-ray or echocardiogram being ordered. The Anaesthetic Record did not have a dedicated section to record any investigations ordered. Dr C told HDC:

> "[I]t is not common practice to indicate on the Pre-operative assessment a list of investigations ordered. It is expected that all these results will be printed out and be available and provided to the relevant surgeon and/or anaesthetist to review on the day of surgery."

40. Dr C said that the anaesthetist who provides the anaesthetic for a procedure has the responsibility to verify the history and physical examination (which may have changed in the interim) and review routine blood results and other investigations such as chest X-ray and echocardiogram. She stated:

[8] Posteroanterior (from the back toward the front) aspect.
[9] A non-invasive method of imaging the heart.

> "[W]hile working as part of the team, it is not the responsibility of the anaesthetist in the Pre-Anaesthesia Clinic to receive or review those results, even where ordered by him/her."

Echocardiogram

41. At 1.35pm on 22 October 2009, the same day as her pre-anaesthetic assessment, Mrs A had the ultrasound echocardiogram performed by a sonographer. The result, reported by the sonographer, indicated moderate aortic stenosis and recommended re-scan in one year's time or as clinically indicated.[10] The referrer listed on the report was "[Dr G]" (a dental surgeon), with a copy of the results to be sent to the sonographer. A copy of the echocardiogram report was not sent to Mrs A's GP, so no follow-up was arranged at that time.

42. Dr G told HDC that she had no involvement in Mrs A's case at any stage. Although her name appeared on the 22 October 2009 echocardiogram report, she was not involved in ordering the test or seeing the results of the test ordered by the anaesthetist at the pre-anaesthetic assessment. She was concerned that her name had been used to order the tests, and noted that it was not within her scope of practice to be involved in interpretation of the tests.

43. The DHB's response to HDC noted that the echocardiogram request form had recorded Dr F as Mrs A's clinician, but the result was listed on the report as being referred by Dr G. The DHB could not explain how or why this had occurred. However, the DHB told HDC that "[a]fter electronic reporting became available with the system, Concerto, being implemented, [Dr G] became the default results recipient for the dental unit".[11]

Chest X-ray report

44. At 10.35am on 23 October 2009, Mrs A's chest X-ray was undertaken. The report on the X-ray was completed by Dr D, a consultant radiologist, at 12.14pm.

45. Dr D's response to HDC noted that Mrs A's smoking history was not mentioned on the referral form. Dr D said that he routinely reviews any previous imaging related to the current reporting case and, in this case, there was no previous imaging available for comparison.

46. Dr D made an incidental finding. He identified a left hilar[12] lesion of uncertain significance. His report on the X-ray stated:

> "There is an ill defined opacity seen at the level of the left hilar region measuring 13x17mm which could be vascular in origin."

47. Dr D's report gave the following advice:

[10] A follow-up was undertaken approximately one year later.
[11] The DHB advised that Concerto was installed on 10 March 2009 and went live some time in mid-2009.
[12] The hilum is the wedge-shaped area on the central portion of each lung where the bronchi, arteries, veins, and nerves enter and exit the lungs.

> "A review of a lateral view or previous x-rays would be helpful for further assessment. Otherwise, if the lesion was seen earlier a follow-up chest x-ray after 2 months is suggested. The rest of both lung fields are essentially normal."

48. There are no clinical indications or relevant history listed on the report. Dr D's response to HDC stated that clinical indications, particularly smoking history, should be documented on request forms and radiology reports.

49. The chest X-ray report was not copied to Mrs A's GP. Dr D said:

> "I was unaware that dental unit x-rays were not copied to general practitioners and my expectation was that the administrative staff would have sent it to the general practitioner, as with all other reports."

Reporting of X-ray results

50. The results of the chest X-ray and echocardiogram were not made known to Dr C. Dr C stated that she would not expect the results to be sent to the anaesthetist.

51. Dr F stated in his report to ACC: "I did not request any chest X-rays for this patient, and had no contact regarding the results of these X-rays taken."

52. The DHB stated:

> "The process at the time was that results of any X-ray or other test ordered by the anaesthetist as part of their assessment were referred back to the doctor who made the original referral for an anaesthetic assessment. [Dr F's] understanding, however, was that any abnormal findings would be reported to the anaesthetic team. He expected abnormal findings would be acted on by the anaesthetic team and that the dental unit would only be notified if their decision was that the patient was not suitable for the proposed dental surgery under a general anaesthetic."

53. Dr C told HDC that her understanding of the process at the DHB at the time of these events was that if there was an abnormal finding or investigation result, the physician receiving the result had the responsibility to act upon it in a manner that he or she deemed appropriate. She said that it was her expectation that radiology would have brought the abnormality in the chest X-ray to the attention of the primary physician in charge. She said that in this instance, that would be the dental surgeon, Dr F. Dr C advised that it was very rare for results to be reported directly to the anaesthetist. She stated that when she ordered the chest X-ray for Mrs A (as part of the pre-anaesthesia work-up for a dental patient), she expected the films and report to be available in the patient notes when Mrs A presented on the day of surgery.

Receipt by dental unit

54. Once the chest X-ray report was verified by the radiologist, it was automatically faxed from the radiology information system to the dental unit's fax. The referrer listed on the report is "Referred by: Dr Dental Dental". Neither Dr F's nor Dr C's name appear on the X-ray report. The report was not copied to Dr F, Dr C, or Dr H.

55. The DHB stated that the chest X-ray report was faxed to the Unit and marked "Referred by: Dr Dental Dental" rather than a specific dental surgeon because, historically, the Unit was staffed by locum dentists, and it was not considered appropriate to send radiology reports to a specific doctor in case they were not back in Whanganui for some time. This was an attempt to ensure that all dental X-rays would be reviewed irrespective of who was on duty.

56. The DHB explained that around this time the Unit was staffed by a number of dentists who were contracted to the DHB. There was no one clinician responsible for overseeing the Unit at the time of these events.

57. The DHB told HDC that, at the time of these events, when faxed results were received by the Unit, an administrator would put the results into folders that were placed in individual consultants' pigeon holes. The DHB advised: "At this time, the number of consultants coming into the public hospital meant there could be delays in the results being sighted." The DHB said that once the results were reviewed by a consultant, they would be signed off and placed on the patient's notes. However, the DHB could not firmly establish what happened to Mrs A's chest X-ray report when it came off the fax in the Unit.

58. The DHB told HDC that it does not believe anyone in the Unit sighted the results of Mrs A's chest X-ray ordered by Dr C as part of the anaesthetic assessment, and the results were not put on Mrs A's health record by Unit staff. The DHB told HDC that, until this complaint was brought to its attention, the dental unit was not aware that non-dental X-ray results, ordered as part of the anaesthetic assessment, were not sent back to the anaesthetist who ordered them.

Red flag protocol

59. At the time the X-ray was reported, the Radiology Department had a "Red Flag" process in place for radiologists to flag abnormal results on the radiology information system. The red flag process resulted in a monthly report being run by an administrator, and letters being generated to all flagged patients' GPs reminding them of the abnormality and the need for follow-up. The red flag process was outlined in the *DHB Adverse Results Process (Red Flagging and Follow-up)*,[13] which states:

> "As part of the risk management process abnormal findings on radiology reports should be used as a red flag to indicate those patients that require follow-up."

60. The red flag process stated that findings meeting certain diagnostic criteria will be flagged for follow-up. The "Diagnostic alert criteria (red flags)" included:

> "• Malignancy — Any suspicious lesion found on plain film, CT [computed tomography], MRT [magnetic resonance therapy], US [ultrasound] or contrast study. This includes primary or Metastatic Pathology.
>
> …

[13] Together with a flow chart *Radiology Diagnostic Alert Protocols*.

- Any other lesions which based on clinical merit may require urgent intervention."

61. The "Reporting procedure for diagnostic alerts" states that once a report that requires a Diagnostic Alert (red flag) is produced, the radiologist must make contact with the requesting physician immediately. If the doctor is not directly contactable, a message must be left. The patient's name, age, the diagnostic test and finding, and the suggested management plan should be shared with the requesting doctor. Contact with the requesting doctor must be documented by the radiologist.

62. Dr D stated to HDC that he was aware of the red flag process. He said that the process was developed in 2004, but was implemented with little input from radiologists. Dr D also stated that the DHB radiology information system ("Comrad") did not have a red flag cue or "forcing function" in 2009, meaning a radiologist could finalise a report without applying a red flag. Dr D said that, in the process of verifying a report as abnormal, the system was often slow, and "required several pushes of the button", which would sometimes result in errors involving earlier read reports appearing on the screen.

63. Dr D did not apply a red flag to Mrs A's report. He told HDC that he cannot explain why the report was not flagged, other than to say that he is certain he would have intended and endeavoured to verify it as abnormal.

64. Dr D and the DHB told HDC that the chest X-ray film and Dr D's report were subsequently reviewed at a radiology peer review meeting, attended by a number of physicians and junior doctors, and all present concurred with the report. The DHB advised that it believed that this meeting was held in December 2010 or January 2011, but there are no minutes or list of attendees for the meeting.

Missing chest X-ray film

65. The three 23 October 2009 (analogue) chest X-ray films central to Mrs A's care were not able to be provided to HDC. The DHB told HDC that the films had been misplaced. HDC sought clarification, requesting that the DHB detail how this had transpired and what steps it had taken to locate and recover the films.

66. The DHB told HDC that a physical search of the radiology film storage room and the offices of the doctors known to have removed the films for viewing during HDC's investigation did not recover the films. Those doctors are adamant that the entire X-ray packet was returned. The DHB believe that the films may have been referred to someone for review but that this was not recorded. The X-ray packet was last taken out of storage for viewing on 5 July 2012. The DHB was of the view that this was the last time the packet was taken for viewing, so the films would have been mislaid sometime after that date. The packet came back into the radiology department (recorded as returning 9 July 2012) and it was discovered only later that the films were missing. The DHB provided HDC with copies of computer screen dumps of electronic procedural documents tracking the history of the packet's movements. ACC advised HDC that it had viewed the original analogue films in 2011 and returned the X-rays to the public hospital radiology department on 1 June 2011. It is the practice of

ACC to return all X-rays to the provider once it has completed its assessment of a claim.

Anaesthesia

67. Mrs A was scheduled for the full dental clearance surgery as a day case on the morning of 6 November 2009.

68. Dr E, an anaesthetist, saw Mrs A in the day unit waiting area a few minutes prior to her surgery at 9am. Dr E told HDC that he checked her medical history by going through the preoperative assessment notes (made by Dr C 15 days earlier, and including reference to the grade 4/6 ejection systolic murmur, sinus tachycardia, and the chest being clear with no wheeze).

69. Dr E outlined to HDC his usual practice for reviewing patient records and pre-anaesthesia documentation prior to administering anaesthesia. He said that patients are admitted to the day ward about 30 minutes before the scheduled time for surgery. The patient's notes, printed results of special investigations, with nursing observations clipped together, are presented at the same time. He said that he "read[s] through the pre-operative assessment record to see what problems have been identified", and checks the printed results of any investigations done. He then introduces himself to the patient, double checks any issues recorded in the pre-anaesthetic record, asks additional questions, and performs any additional examinations he considers necessary before obtaining consent to the anaesthesia.

70. Dr E told HDC that as Mrs A "was seen in the pre-admission clinic for a relatively minor procedure, [he] did not go through her old medical notes". Details like allergies, medications, and fasting status were double checked with Mrs A. He explained anaesthesia and postoperative pain relief to Mrs A and obtained her consent. Dr E then administered a general anaesthetic to Mrs A.

71. Dr E told HDC that Mrs A was a known smoker and had a degree of COPD. She was not on any regular bronchodilators[14] at the time of surgery, meaning that the COPD was unlikely to have been severe. Dr E noted that Dr C's preoperative anaesthetic assessment of Mrs A had showed no wheeze, meaning that there were no signs of bronchospasm. Mrs A did not require any bronchodilators preoperatively.

Test results

72. Dr E stated:

> "According to [Dr C's] examination of chest and relevant respiratory history, I did not expect [Mrs A] to have a chest x-ray for the day surgical procedure she was scheduled. As a result, there was nothing to alert me to check for any reports or x-rays."

73. In relation to whether Mrs A's ECG and chest X-ray films were available to him on 6 November 2009, Dr E told HDC:

[14] Medication that dilates the bronchi or bronchioles.

> "[T]he ECG had been reviewed at the pre-admission clinic and documented by my colleague as 'Sinus Tachy' and no other abnormality was mentioned, so I did not check it."

74. Dr E also commented to HDC that it is not clear on the X-ray report who actually requested the X-ray, there was no record of the X-ray request on the preoperative assessment section of the Anaesthetic Record, he did not expect Mrs A to have had a chest X-ray so he did not specifically search for one, and the X-ray report was not contained in the information he had for the anaesthesia he performed.

Day unit

75. The DHB told HDC that in 2009 it was not using a digital (X-ray) system, and the usual process in the Surgical Day Unit was for the patient's X-ray packet and health record to be sent to the day unit the day before the patient's surgery, and then accompany the patient to theatre. The DHB stated that it has no reason to think that this process did not occur. In response to the provisional opinion, the DHB reiterated that while it was not recorded that the X-rays went with Mrs A to theatre, this was standard practice at the time, and, in addition, doctors had electronic access to all radiology reports from any computer, including in theatre. The DHB "Checklist for Pre-operative Patients" for Mrs A, dated 4 November 2009, completed by nursing staff, includes ticks in the ward preparation column, for "pre-operation examination", "electrocardiogram", "haemoglobin", "old notes/current", and "X-rays". There is no form or documentation on file to confirm or detail which patient records were later sent to theatre.

76. Dr E told HDC that Mrs A had some bronchospasm after the start of anaesthesia, which was treated by administering a salbutamol inhaler through the tracheal tube. Dr E noted in the clinical records "high airway pressure". There were no obvious complications experienced intra-operatively. Mrs A had another dose of salbutamol as a nebuliser in the post-anaesthetic recovery room. Dr E told HDC that "[i]t is not unusual to develop bronchospasm during and in immediate post-operative period in patients who are heavy smokers as they have irritable airways. As a result, I did not have reason to specifically look for any chest X-Ray results during my contact with [Mrs A]." Recovery was otherwise uneventful and Mrs A was discharged home at 2.30pm.

77. The DHB advised HDC that "[a] handwritten form called 'Day Surgery Post Op Telephone Check/Discharge Summary' was, and is still used by the Surgical Day Unit, primarily to check in with the patient the day after their procedure to make sure all is well. A copy isn't given to the patient but a copy is sent to the patient's GP …" The form records contact with Mrs A on 9 November 2009. Mrs A reported to a nurse that she could tolerate a light diet and had pain relief. No further follow-up was suggested on the form. A discharge letter was not sent to Mrs A's GP.

78. Dr E told HDC that his understanding of the DHB process in place for reporting abnormal investigation findings was that if there were any immediate life-threatening findings, the person requesting the investigation was to be informed immediately. He stated: "Other abnormal investigation results will be flagged but need to be viewed

electronically. The requesting person needs to check these results and sign off electronically. Any abnormal finding detected will be acted upon or referred to the appropriate clinician."

79. Dr E stated that he "felt let down by the system". He said that there was no record of the chest X-ray requested on the preoperative assessment section of the Anaesthetic Record, and no printed report of the abnormal findings available to view. He feels that this case "has been a system error and not a personal fault. (The person requesting an investigation should document the request and review the results. Additional reports are sent routinely to the patient's GP.)"

80. Dr E told ACC that if he had known about the X-ray report at the time Mrs A presented for her anaesthesia, he would still have given her an anaesthetic for the scheduled procedure, but he would have referred her to her GP for follow-up of the X-ray result.

81. Dr E told HDC that he has looked into his practice carefully to see how he could improve his pre-anaesthetic care to avoid such incidents in future.

Subsequent events

82. On 29 December 2010, Mrs A attended a GP with a two-week history of left-sided intermittent chest pain. An ECG showed changes suspicious of anterolateral ischaemia,[15] and Mrs A was transferred to the public hospital by ambulance. History obtained there included possible recent weight loss attributed by Mrs A to commencement of the drug metformin for her diabetes. A chest X-ray showed a mass on the upper lobe of her left lung,[16] identified as being new when compared with the chest radiograph report from October 2009. Subsequent investigations confirmed this to be an inoperable carcinoma[17] with metastases.[18] Mrs A was subsequently referred to a radiation oncologist for palliative treatment.

83. On 14 January 2011, DHB staff including the Clinical Quality Advisor and the Clinical Director Medicine, met with Mrs A and her partner to explain how the error had occurred and to apologise formally.

84. Sadly, Mrs A died later in 2011.

ACC

85. Whanganui DHB initiated an ACC treatment injury claim in early 2011. The claim was accepted in July 2011.

86. ACC received expert opinion, including from one of its advisors, oncologist Dr I. Dr I's advice to ACC included the following:

[15] Reduced blood supply to the anterior lateral part of the heart.
[16] The right lung consists of three lobes, while the left lung is slightly smaller, consisting of only two lobes (the left lung has a "cardiac notch" allowing space for the heart within the chest).
[17] Cancer or malignancy.
[18] Spread of cancer to other parts of the body.

> "In my opinion the lung cancer should have been diagnosed in the weeks following the chest x-ray in October 2009, rather than in late 2010, being a year later. On review of the chest X-ray from October 2009, there is an abnormal opacity visible in the left upper zone, adjacent to the aortic arch. I am unsure whether [Dr D] identified this opacity, as his report suggested a possible abnormality at the left hilum, rather than more superiorly, at the level of the aortic arch. However, [Dr D's] report indicated the need for further investigation."

87. Dr I also commented: "I have trouble to fully understand [Dr D's] report, which does not suggest a cause for concern or alarm."

Root Cause Analysis Report

88. On 13 December 2011, Whanganui DHB finalised a Root Cause Analysis Report (RCA). The case was categorised as an SAC1 event.[19] Two key causal/contributing factors were identified:

1. The abnormal radiology report was not sent to Mrs A's GP because it was assumed that all dental X-rays involved teeth and would not be relevant to the GP. GPs automatically receive a copy of all other speciality outpatient X-rays. This led to the GP being unable to request a further X-ray in two months' time as the radiologist had suggested.

2. The radiologist did not follow the red flag protocol as there was no "forcing function" in the radiology system **(**Comrad). Mrs A therefore did not appear on the red flag report, and no letter to her GP was generated.

89. Two recommendations arose from the DHB RCA:

1. That all dental X-ray reports be automatically sent to patients' GPs.

   - The DHB advised HDC that after extensive discussion it was decided that it was not practicable to send the results of all dental X-ray reports to patients' GPs. To meet this recommendation, the DHB decided that if an X-ray is ordered as part of a patient's proposed dental care that is not a dental X-ray, the X-ray report should be sent to the patient's GP automatically. This process was duly implemented, but the radiology information system was then replaced. The new radiology information system now automatically sends all X-ray reports to the patient's GP as recorded in the DHB's electronic patient management system (Oracare).

2. That the Radiology Information System be modified to ensure that completion of the "red flag" field is mandatory before an X-ray report can be finalised.

   - The modification was made in July 2011.

[19] The New Zealand Incident Management System *Guide to using the Severity Assessment Code* outlines that the Severity Assessment Code (SAC) is the method used by any person who has identified an incident, to determine the appropriate action to take. The score is ascertained by rating the consequence of the incident and its likelihood of occurrence. SAC 1 events are the most severe.

90. The Whanganui DHB Chief Executive Officer acknowledged:

> "[T]here were multiple process and systems failures, as well as some human factors, that led to the delay in diagnosis of [Mrs A's] condition, and ultimately, her likely premature death. This truly was an example of what can happen when all the 'holes in the cheese' line up. We remain truly sorry for our failings and have worked hard to ensure that a situation like this won't happen again."

Changes and improvements to DHB services

91. The DHB informed HDC that the following improvements were put in place as a result of Mrs A's case. Some occurred immediately and some were developed as part of system upgrades.

- All requests from dental consultants have their name stamped on the request so that it is clear who the results are being sent to.
- Dental consultants are now aware that they are responsible for reviewing and signing off any results in their name, and discussing any non-dental results with medical staff from other specialities.
- There was regular auditing to check adherence to the red flag protocol. The clinical director for Radiology Services subsequently met with the radiologists and reinforced the need to comply with the protocol.
- The patient's GP automatically receives a copy of the report from any X-ray taken.
- The preoperative assessment section of the Anaesthetic Record has been revised and now includes a section where the assessing doctor can circle any special investigations he or she has ordered. This ensures that the anaesthetising doctor on the day of surgery has a visual prompt to view/review results.
- There is now a computer in each theatre for the purpose of viewing results.
- The practice of using "Dr Dental" for radiology reports in respect of dental patients ceased immediately after Mrs A's diagnosis. The name of the specific dental surgeon is now recorded on the request forms so that the results/reports go back to that clinician, who is responsible for reviewing and signing off any results in his or her name.
- The new radiology information system has a reporting template with a field to list clinical indicators for an examination.
- Implementation of the PACS[20] electronic system means that clinicians are no longer reliant on hard copies of X-ray films, and digitised information can be accessed online by clinicians from all over the hospital.
- On 1 August 2012 the DHB authorised and implemented a process for tracking film packets to include in its *Radiology Department Specific Procedure Administration Procedure Manual.*

92. In addition:

[20] Picture Archiving and Communication System.

- Dr D said that he is now acutely aware of reporting subtle changes and ill-defined lesions and regards his reporting as more thorough. He lists clinical indications in his radiology reports as a routine.
- In response to the provisional opinion, Dr D advised that as part of his routine work, there is a daily peer review morning meeting with different specialties discussing cases of concern and making a clear management plan. He said that he also conducts a regular weekly audit with Pacific Radiology radiologists who work with him where eight cases are randomly selected from different specialties – MRI, CT, ultrasound and plain films. The cases are re-reported independently by him and Pacific Radiology, followed by a meeting where any discordant results are discussed. Documented records of all audits are held in the Radiology Department. Dr D stated that he believes that this case has been a great teaching lesson for WDHB as "the system needs to reliable, robust and deliver the radiology report to the intended health professional".
- Dr E advised that theatre management has introduced a system of anaesthetic alerts to be sent by email to all anaesthetists with details of any expected problems a day prior to the theatre list. He said that he also personally goes through investigation results electronically when the theatre list is published. He also said that, due to this incident, there is better communication regarding patients with problems.
- Dr C advised that, since learning of this incident, she has reviewed her practice and improved her record-keeping, and makes more detailed entries to her anaesthesia reviews and charts. She also advised that she double-checks to ensure that all relevant information has been transferred to any investigation request forms that she completes. In addition, if she knows which anaesthetist will be providing anaesthesia to difficult or complex cases, she makes a point of personally informing the anaesthetist in question about any problems surrounding the case. If there are critical investigations that may result in a case proceeding or being cancelled, she now follows up the review of those results.
- In response to the provisional opinion, Dr C advised that in her current practice she reviews patients and all investigations and charts prepared by the Day Ward in detail, regardless of whether the patient has been seen at a pre-assessment clinic. Dr C also reviews this information electronically if the investigations are recorded as ordered but are not physically available.
- Dr C advised that in order to avoid any ambiguity in future, she will have a stamp made with her name, so that she may use it on all forms and charts that require her signature.
- Dr C stated:

> "I am truly sorry for how this case has turned out and how it has caused much grief and pain to [Mrs A's partner] and also to [Mrs A's] family. This case has caused profound changes in the way I document findings and has reinforced for me the importance of detailed documentation. I am also reminded of the importance of diligent follow-up of any investigations ordered as well as alerting colleagues to any potential problems with regards to anesthesia or significant investigations. Currently, if I am unable to review the results personally, then I will alert the appropriate person to review the test I have

> requested. I am now working in a place where any investigation ordered by myself will have results copied electronically into my electronic records system so that as soon as I log in I can review them and email/alert the relevant primary physician. I now also document discussions with any patient that I review, with regards to any anaesthesia or procedures planned."

93. In March 2014, HDC sought a further update from Whanganui DHB regarding its process for follow-up of the results of tests ordered at pre-anaesthetic clinic assessments. The DHB advised that the system for signing off results of preoperative/anaesthetic radiological investigations is for results to be sent to the surgical consultant who initially referred the patient for the pre-anaesthetic assessment. This system is the same as that in place in 2009. The DHB acknowledged that this is an area of potential risk, and advised that it is currently reviewing the multidisciplinary process. The DHB expects the review process to be completed within a few months, and advised that the new process will be governed by a policy and/or a formal procedure.

Responses to provisional opinion

94. Responses to the provisional opinion were received from all parties and have been incorporated into the "information gathered" section where relevant.

95. In addition, the Whanganui DHB CEO stated that "I accept your findings and the recommendations you propose making and expect to be able to report on the compliance with the recommendations within the timeframes given".

96. Dr D stated:

> "I acknowledge that I did not use the Red Flag system at the time and I apologise for that. Although red flagging in this particular case may not have been helpful … Since then I have taken measures to avoid such errors happening again in the future by making clear red notes in front of my work station and with the addition of the use of the current electronic facilities of PACS and the RIS system, which were not available at that time."

97. In relation to the contents of the chest X-ray report, Dr D responded:

> "I believe that the report was acceptable given the subtle lesion in the absence of clinical information given by the requesting clinician. However, had the request stated that the patient was a smoker, I believe that I would have mentioned the possibility of the lesion being malignant. The point of concern I believe is the distribution system, as the report was not delivered and not seen at all by any of the clinicians treating the patient. If my advice given in the report (follow-up after 2 months) was followed then such a situation would not have arisen."

98. Dr C stated that:

> "…not all patients presenting for an anaesthetic will have had routine Chest X-rays, even though their history (e.g. COPD, smoking) may suggest that one might

> be useful. Clinically when I examined [Mrs A], her lungs were 'clear' but given her history of hypertension, COPD and smoking, as a precaution I ordered a pre-operative chest X-ray … having ordered the X-ray, in hindsight it clearly should have been indicated on the pre-anaesthetic portion of the form that such an investigation had been ordered, and I regret that oversight".

99. Dr C also said that had she been alerted to any abnormal finding (as per the red flag process) she would have been able to take further action to alert the anaesthetic team, and specifically the administering anaesthetist. Dr C said she had no ability to predict that the process would not occur.

100. Dr C stated that "unfortunately both [Dr E] and I were deprived of the opportunity to refer [Mrs A] to her GP for follow-up of the X-ray result. Like [Dr E], while recognising my documentation could have been better, I also feel very let down by the system …"

101. Dr C said "I do accept that I had a responsibility to have either viewed the report when the X-Ray had been reported or else indicated on the anaesthesia chart that an X-Ray had been ordered and that the results needed to be viewed prior to anaesthesia."

102. Dr E advised HDC that he had no comments and accepted the provisional opinion.

Opinion: Preliminary comments

103. Mrs A's medical and smoking history meant that she was referred for a preoperative anaesthetic assessment before her proposed surgery. During the course of that assessment on 22 October 2009, a chest X-ray was ordered. The chest X-ray was not performed because of any suspicion of lung cancer, but rather as part of a routine preoperative review of a heavy smoker with COPD scheduled to undergo dental surgery under general anaesthesia. While a suspicious opacity was detected on the chest X-ray performed on 23 October 2009, the abnormal result was not appropriately followed up and acted on. Unfortunately, this meant that Mrs A's lung cancer was not diagnosed until 12 months later.

104. In my opinion, these events were characterised by a series of missed opportunities for the identified abnormality to have been followed up. An effective system was not in place at the DHB for reporting test results. The lack of follow-up occurred because of a number of organisational and systemic failures, including the lack of clearly established and explicit processes for following up investigation test results, and poorly understood lines of responsibility, coupled with associated deficiencies on the part of a number of individual clinicians.

Opinion: Dr C

Pre-admission anaesthetic assessment — No breach

105. Dr C saw Mrs A in the anaesthetic pre-assessment clinic on 22 October 2009 after Dr F had requested an assessment due to Mrs A's smoking history and COPD.

106. Dr C took Mrs A's history, examined Mrs A, and then ordered further investigations. The ECG was performed the same day, and Dr C commented on it in the Anaesthetic Record. She also ordered an echocardiogram, which was done later that day, and a chest X-ray, which was done the following day.

107. Dr Laurenson has advised that Dr C's assessment was in line with the appropriate standard, which is the Australian and New Zealand College of Anaesthetists (ANZCA) professional document PS07, "Recommendations for the pre-anaesthetic consultation".[21] I accept that advice and, accordingly, find that Dr C did not breach the Code in respect of her pre-admission anaesthetic assessment of Mrs A.

Dr C's reporting and documentation — Adverse comment

108. Dr C's documentation in the dedicated preoperative assessment section of the Anaesthetic Record records Mrs A's relevant history, medications, and the findings of her physical examination, including that Mrs A had a heart murmur and her ECG had showed sinus tachycardia.[22] Dr C requested a chest X-ray given Mrs A's history. She said that ordering the test was routine and that she "ordered it so that this [could] be reviewed by the anaesthetist who would be rostered to that operating list".

109. The X-ray request form has Mrs A's patient label information affixed to the top left-hand corner of the form, containing the names of Dr H and Dr F. Dr C documented on the X-ray request form that Mrs A had COPD and an incidental murmur.

110. However, Dr C did not document on the preoperative assessment section of the Anaesthetic Record that she had ordered a chest X-ray and an echocardiogram, or that she had discussed the anaesthetic procedure with Mrs A. I note that there was limited space on the form to record such information. Dr C also did not document Mrs A's smoking history on the chest X-ray request form. Dr C's signed initials are on the X-ray request form, but her name is not printed on the form.

111. My expert advisor, radiologist Dr Milne, advised:

> "The Anaesthetist who requested the examination, [Dr C], was identified by signature only which is inadequate identification in my opinion. The Radiology Department would have had little chance of identifying this doctor by [her] signature alone and [Dr C's] assertion that [her] signature is 'on record' at WDHB with the implication that the Radiology Department should invest time in checking

[21] See: http://www.anzca.edu.au/resources/professional-documents/pdfs/ps07-2008-recommendations-for-the-pre-anaesthesia-consultation.pdf/view.
[22] Heart rhythm with an elevated rate of impulse.

> hospital records for a clinician with a signature match whenever they received such illegible referral details is totally impractical."

112. I am concerned that Dr C did not document on the Anaesthetic Record the investigations she ordered, or that she had discussed the anaesthetic procedure with Mrs A. This meant that particular clinical information and the nature of investigations ordered were not brought to the attention of the anaesthetist administering the anaesthetic on the day of surgery (Dr E). Dr Laurenson advised me that Dr C's failure to document these investigations on the Anaesthetic Record would be seen with mild disapproval by her peers. While I do not find that Dr C breached the Code in these circumstances, I am critical of her failure to document this information and recommend that she reflect on her actions in this case.

Follow-up — Adverse comment

113. At the outset, I am mindful of the purpose of the pre-anaesthetic clinic, summarised by my expert advisor, Dr Vaughan Laurenson:

> "Apart from the obvious information gathering and patient education at the pre-anaesthetic clinic, one of the important functions of the clinic is to identify any factors that can be improved before the anaesthetic and organise treatment or referral if appropriate. Otherwise the anaesthetist who is scheduled to do the case may be presented with a patient who has correctable conditions. They are then faced with anaesthetising the patient under sub-optimal circumstances or postponing the case with resultant disruption for the patient, and the surgical team."

114. I have considered Dr C's role in follow-up of the chest X-ray, as she was the clinician who actually ordered the investigation. She did so due to the clinical indications presented to her, and as part of her assessment of Mrs A's suitability for a general anaesthetic. As such, in my view she clearly had an interest and associated clinical responsibility in relation to the outcome of Mrs A's chest X-ray.

115. Dr C told HDC that the anaesthetist who provides the anaesthetic for the procedure (Dr E in this case) has the responsibility to verify the history and physical examination and review results and other investigations. She said that it is not the responsibility of the anaesthetist in the Pre-Anaesthetic Clinic to receive or review those results, even when ordered by him or her.

116. Dr Laurenson advised:

> "There is an adage that the person who orders the test checks the result. However in [the] modern hospital team approach to medicine this is often not the case. The report was sent to the dental department as the admitting team. For all other services the Whanganui DHB apparently sends a copy of the report to the GP. However they make an exception for the dental department reports. This system problem is compounded by the dentist in charge of the patient who apparently does not look at non dental results."

117. Although he is not a peer of Dr C, Dr Milne's view was:

> "[T]he clinical ownership of the result of the examination lies with the clinician who requested the examination. This is the Anaesthetist who saw [Mrs A] in the pre-operative assessment clinic, [Dr C]. Although the existing protocol for report distribution for dental patients was to distribute to the generic 'Dr Dental', the radiology department was denied the opportunity of sending the report to [Dr C] as [her] name was not identifiable on the referral."

118. In my opinion, doctors owe patients a duty of care in handling patient test results, including advising patients of, and following up on, abnormal results.[23] In general, I consider that the primary responsibility for advising patients of, and following up on, abnormal results rests with the clinician who ordered the tests.[24] No formal deputising of that responsibility had been undertaken here.

119. However, I am cognisant of the many mitigating systemic factors here, in that the results of the X-ray and echocardiogram were not routinely reported to the anaesthetic department or the anaesthetic clinic. Instead, the DHB had a process where the X-ray report and the echocardiogram report for a dental patient were, contrary to other outpatient results, sent to the dental department. As Dr Laurenson has also pointed out, the DHB system in place at the time clearly did not expect or give the anaesthetist who actually ordered the investigation the opportunity to review the results. Dr C expected that both the Unit and her anaesthetist colleague would review the chest X-ray report prior to surgery.

120. I have concerns about a system that sees a clinician order an investigation as part of a pre-assessment of patient suitability for anaesthesia — purposefully arranged to identify any issues or contraindications promptly — and that then defers the responsibility for review of the report of that investigation to either another service that does not have clinical expertise in general medical issues or to a colleague to review on the actual day of surgery, in this case two weeks later, outside of the clinical context of the original pre-assessment. I agree with Dr Laurenson's view:

> "[I]f patients are to gain full benefit from a pre-anaesthetic clinic the results of tests done at the clinic need to be reviewed before the patients are admitted for anaesthesia in the interests of patient safety and convenience."

121. In my opinion, although I do not find that Dr C breached the Code in this particular set of circumstances, Dr C must accept some degree of responsibility for Mrs A's abnormal result not being followed up in a timely manner. If Dr C knew that she would not be following up the X-ray she ordered, she needed to be confident that the appropriate person had been alerted that the test had been ordered. Dr C's documentation does not indicate that an appropriate person was alerted.

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[23] For example, 08HDC06165, 08HDC06359, 09HDC01505.
[24] See opinions 08HDC06359 and 10HDC01419.

Opinion: Dr D

Interpretation and reporting of chest X-ray — Adverse comment

122. HDC's investigation has been hampered by the unavailability of the chest X-ray dated 23 October 2009 and the DHB's inability to recover that X-ray film.[25]

123. Dr D prepared a report on the chest X-ray approximately an hour and three quarters after it had been performed. Dr D made his finding and reported:

> "There is an ill defined opacity seen at the level of the left Hilar region measuring 13x17mm which could be vascular in origin.
>
> A review of a lateral view or previous X-rays would be helpful for further assessment. Otherwise, if the lesion was seen earlier a follow-up chest X-ray after 2 months is suggested. The rest of both lung fields are essentially normal."

124. There are no clinical indications or relevant history listed on Dr D's report. He has acknowledged that clinical indications should be documented on radiology reports. In addition, the chest X-ray report was not copied to Mrs A's GP. Dr D told HDC that he was not aware that dental unit X-rays were not copied to GPs — a DHB practice that was contrary to all other outpatient X-rays.

125. ACC's advisor, oncologist Dr I, had an opportunity to review the 23 October 2009 chest X-ray film in 2011.

126. Dr I advised ACC:

> "On review of the chest X-ray from October 2009, there is an abnormal opacity visible in the left upper zone, adjacent to the aortic arch. I am unsure whether [Dr D] identified this opacity, as his report suggested a possible abnormality at the left hilum, rather than more superiorly, at the level of the aortic arch. However, [Dr D's] report indicated the need for further investigation."

127. Dr I also commented: "I have trouble to fully understand [Dr D's] report, which does not suggest a cause for concern or alarm."

128. Given the relevant films are lost and HDC's expert advisor has been unable to review them, I am inclined to take into account Dr I's advice to ACC despite the fact that he is not a radiology colleague or peer of Dr D.

129. It appears from Dr I's report that Dr D was concerned that the chest X-ray was not normal. However, I have several concerns about the clarity with which Dr D reported the X-ray results. As noted by Dr I, the report does not suggest a cause for concern or alarm. Furthermore, my expert advisor, Dr Milne, advised me (based on the information available to him) that what was not clear in the report was that the cause of the possible abnormality could be a lung cancer. He advised:

[25] Discussed further at paragraphs 173 and 174.

> "In my experience, such wording [of the report] does two things in the mind of the clinician reading the report. It initially raises concerns about malignancy (as these may appear as opacities on a chest radiograph) and then attempts to dismiss the findings as possibly due to normal anatomy. This is not helpful."

130. Dr Milne further advised:

> "My concern is that the potential serious nature of the possible abnormality identified by [Dr D] is not highlighted to the clinician in the report on the [chest X-ray]. There is no mention of lung cancer as a possible explanation for the observations made by [Dr D]. I therefore find that the report falls short of a gold standard of care by [Dr D], though I accept that the report would be within the range of reporting by radiologists."

131. I accept Dr Milne's advice that Dr D's presentation of radiological observation and subsequent recommendations within the report would be viewed with mild disapproval. While I do not find that Dr D breached the Code in these circumstances, I am critical of the lack of clarity in his reporting in this case, and I recommend that he reflect on this aspect of his care.

Red flag failure — Breach

132. When Dr D reported on Mrs A's chest X-ray, there was a system in place for radiologists to flag abnormal results and follow these up. The DHB policy outlined that diagnostic alert criteria for a red flag included any unexpected or unknown suspicious lesion found. The process for follow-up included making contact with the requesting physician.

133. Dr D told HDC that he was aware of the DHB protocol that was to be applied for unexpected abnormal results. The red flag was not applied by Dr D in this case. Dr D said that he could not explain why he did not flag the report, other than to say that he would have intended and endeavoured to verify it as abnormal. Dr D said that the DHB radiology information system in 2009 did not have a red flag cue or "forcing function", meaning a radiologist could finalise a report without applying a red flag.

134. I accept Dr Milne's advice that "[i]n this particular case if the report had been 'red flagged' it would not necessarily have been escalated to anyone with clinical responsibility for the patient as the referring doctor's name, Dr C, was illegible on the [chest X-ray] referral, [and] the oral surgeon … and the GP [were] not included in the report distribution pathway".

135. While I appreciate that Dr D may not reasonably have been able to identify the requesting physician as Dr C, in order to contact her with the X-ray result as per the "red flag" policy, a potential opportunity for the abnormal result to be brought to the attention of a clinician caring for Mrs A was nevertheless lost when Dr D failed to apply a "red flag" to the X-ray result. In my view, by failing to apply a "red flag" to Mrs A's X-ray result in this case, Dr D did not provide services to Mrs A with reasonable care and skill and therefore breached Right 4(1) of the Code.

Opinion: Dr E

Preoperative anaesthetic assessment — Breach

136. Dr E saw Mrs A in the day unit just prior to her surgery. Dr E told HDC that he checked her medical history by going through the preoperative assessment notes (Dr C's notes included reference to Mrs A's medical history, smoking history and medications, as well as reference to a grade 4/6 ejection systolic murmur, sinus tachycardia, and Mrs A's chest being clear with no wheeze).

137. Dr E told HDC: "I read through the pre-operative assessment record to see what problems have been identified." He said that usually he would double check any issues recorded in the pre-anaesthetic record, but because Mrs A "was seen in the pre-admission clinic for a relatively minor procedure, [he] did not go through her old medical notes".

138. Dr E also told HDC:

> "[T]he ECG had been reviewed at the pre-admission clinic and documented by my colleague as 'Sinus Tachy' and no other abnormality was mentioned so I did not check it."

139. Dr E said that Mrs A was not on any regular bronchodilators, so her degree of COPD was unlikely to have been severe. He noted that Dr C's preoperative anaesthetic assessment had shown no wheeze and no signs of bronchospasm. Mrs A did not require any bronchodilators preoperatively, but after the start of anaesthesia she experienced bronchospasm, which was treated with salbutamol. There were no obvious complications during surgery. Mrs A also had a dose of salbutamol as a nebuliser in the post-anaesthetic recovery room. Recovery was otherwise uneventful and Mrs A was discharged home.

140. Dr Laurenson advised me that Dr E appears to have undertaken a superficial assessment of Mrs A prior to administering anaesthetic.

141. The Australian and New Zealand College of Anaesthetists (ANZCA) professional document PS07, "Recommendations for the pre-anaesthetic consultation", states:

> "2.2 Even if a pre-anaesthetic consultation has been performed by some other person, the medical practitioner responsible for administering the anaesthesia must be satisfied that all elements of that consultation have been adequately addressed."

142. This means that patients are entitled to expect that the treating practitioner will be aware of, and appropriately consider, all the relevant information. Mrs A had a significant murmur clearly recorded on the pre-anaesthetic assessment. Dr E has told HDC that he "read[s] through the pre-operative assessment record to see what problems have been identified". Yet, Dr E did not make enquiries about the murmur. This leads me to conclude that either Dr E reviewed the information supplied by Dr C and did not interpret the murmur as being significant, or he did not review the documentation sufficiently, and therefore overlooked the murmur finding.

143. As Dr Laurenson advised:

> "[Mrs A] had a significant murmur (S1S2 ESM 4/6) which is recorded on the anaesthetic assessment. That should have alerted him to enquire whether it had been investigated. [Mrs A] would have been aware that an echocardiogram had been done as it is a separate test taking some time. Had she been asked I am sure she would have told him it had been done and he could have looked for the result … Had he looked for the echocardiogram result he may have also found the X-ray result as both were issued by the department of radiology. The murmur was recorded as loud and may have been a symptom of significant cardiac disease and anaesthesia risk. The investigation showed that while care was indicated it was not a contraindication to proceeding. [Dr E] was apparently not aware of this result, and he does not appear to have noted the presence of a potentially significant murmur. An omission that while contributed to by the system deficiencies remained his responsibility and would be, in my opinion, regarded as a moderate deficiency by his peers."

144. In my view, Dr E's preoperative assessment did not comply fully with professional standards, as he did not appropriately address all the elements that were identified in Dr C's pre-anaesthetic assessment, in particular, Mrs A's significant murmur. Accordingly, in my opinion, Dr E failed to comply with professional standards and therefore breached Right 4(2) of the Code. I note that Dr E's failure to address Mrs A's significant murmur appropriately was a further missed opportunity to identify the abnormal chest X-ray result.

Knowledge of chest X-ray result — No Breach

145. As previously discussed, Dr C did not document on the preoperative assessment section of the Anaesthetic Record that she had ordered a chest X-ray and an echocardiogram, or discussed the anaesthesia procedure with Mrs A.

146. Dr E told HDC:

> "[A]ccording to [Mrs A's] examination of chest and relevant respiratory history, I did not expect [Mrs A] to have a chest X-ray for the day surgical procedure she

> was scheduled. As a result, there was nothing to alert me to check for any reports or X-rays."

147. Dr E also told HDC that there was no record of the X-ray request on the preoperative assessment section of the Anaesthetic Record, and he had not expected Mrs A to have had a chest X-ray, so he did not specifically search for one, and the X-ray report was not contained in the information he had for the anaesthesia he performed.

148. Dr Laurenson advised:

> "[Dr E] had no particular reason to look for a chest X-ray report based on the information from the pre-anaesthesia clinic. The patient had had no wheeze or other respiratory signs on examination."

149. The DHB told HDC that the standard process at the time for the Surgical Day Unit was for the patient's (analogue) X-ray packet and health record to be sent to the day unit the day before the patient's surgery, and then accompany the patient to theatre. The DHB told HDC that it "had no reason to think that this process did not occur", but it was unable to confirm or provide documentation to support this in Mrs A's case.

150. The DHB "Checklist for Pre-operative Patients" dated 4 November 2009, completed by nursing staff in the lead-up to Mrs A's surgery, includes ticks in the ward preparation column, for "electrocardiogram", "old notes/current", and "X-rays". However, this does not provide clear evidence of precisely what test results were available on the ward, and what information was available later in theatre just prior to surgery. Therefore, I am unable to make a finding on whether or not the test results, including the chest X-ray, were available to Dr E at the time of his assessment of Mrs A prior to surgery.

151. In any event, Dr E told ACC that if he had known about the X-ray report at the time Mrs A presented for her anaesthesia, he would still have given her an anaesthetic for the procedure, but he would have referred her to her GP for follow-up of the X-ray result.

152. I accept Dr Laurenson's advice that "[t]his is the appropriate course of action. Even if the report had said there was a small lung cancer present, there was no suggestion that that was contributing to [Mrs A's] symptoms or increasing the risk of anaesthesia or surgery at that stage." Accordingly, in these circumstances I find that Dr E did not breach the Code for failing to identify Mrs A's X-ray report prior to surgery.

Opinion: Whanganui District Health Board

Introduction

153. While I have identified deficiencies in the care provided to Mrs A by a number of individuals, their care was provided in the context of serious systemic flaws. Mrs A's

care was marked by very concerning communication and system failures. These existed in the pre-anaesthetic clinic, radiology services, the dental unit, and in postoperative communications.

154. Individual clinicians need to be competent in their clinical assessment and management of patients, and staff need to be supported by systems that guide decision-making appropriately and promote a culture of safety.[26] In my view, the people and systems wrapped around Mrs A were not effectively connected. I agree with my expert advisors that a holistic approach to care was not evident, and I note that Mrs A's care lacked continuity. As I have stressed previously, systems and individuals need to work together to ensure that, regardless of when and where a patient presents, he or she receives seamless services.

155. The failure to act on an abnormal result must be regarded as a severe departure from expected standards. The DHB has accepted responsibility for the system failures that resulted in substandard care being provided to Mrs A.

System failures — Breach

156. Dr H formally referred Mrs A to the dental unit at the public hospital. Dr F requested Mrs A have the pre-anaesthetic assessment. These two providers were clearly identified on Mrs A's patient label affixed to the Anaesthetic Record.

157. Dr F correctly understood that the anaesthetic team would contact the dental unit if the anaesthetic team found that Mrs A was not suitable for a general anaesthetic.

158. Dr C ordered a chest X-ray and an echocardiogram. The referrer listed on the echocardiogram report was "[Dr G]", despite Dr G having had nothing to do with the case and being unaware that when electronic reporting was made available, her name was used as the default results recipient for the dental unit. The report was copied only to the sonographer. It was not copied to Mrs A's GP, Dr F, or to Dr C. The DHB could not explain how this had occurred (although I note that the changeover to the digital Concerto system, and a default use of the surgeon's name, is likely to have gone live in mid-2009, and may have been a factor).

159. The DHB process in place at the time was that results of any X-ray or other test ordered by the anaesthetist as part of his or her assessment prior to dental surgery were referred back to the dental department, as the admitting team. There was a lack of consistent understanding amongst clinicians about this. Dr F's understanding was that any abnormal findings would be reported to, and acted on by, the anaesthetic team. Dr C told HDC that her understanding of the process at the DHB at that time was that if there was an abnormal finding or investigation result, the physician receiving the result had responsibility to act upon it. It was her expectation that radiology would have brought the abnormal chest X-ray result to the attention of the dental unit.

[26] Opinion 09HDC02089, 4 July 2012.

160. Dr D reported on the abnormal chest X-ray result on the same day as the request. Dr Milne advised me that the completion of an examination, dictation, typing and distribution of the final report within 24 hours was a very good standard of practice for a DHB in New Zealand, particularly in 2009.

161. However, Dr Milne also advised:

> "The quality of a radiology service however is not just determined by the timeliness of the imaging, reporting and report verification. One of the key quality indicators concerns the report distribution and this is the principal area of poor performance by the Radiology department and Wanganui DHB … the report was not distributed to any clinical service or individual clinician who believed that they had clinical responsibility for [Mrs A's] general medical conditions and this result[ed] in a poor quality of overall service and the subsequent delay in diagnosis of [Mrs A's] lung cancer."

162. I note that neither Dr F's nor Dr C's name appeared on the chest X-ray report, and the report was not copied to Dr F, Dr C, or Mrs A's GP. Dr D said to HDC that he was not aware that Unit X-rays were not copied to GPs — a DHB practice that was contrary to all other DHB outpatient X-rays.

163. When the abnormal chest X-ray result was automatically faxed by radiology to the dental unit, the referrer listed on the report was a generic "Dr Dr Dental Dental" rather than a specific surgeon. This process was adopted because, at the time of these events, the Unit was staffed by a number of locum dentists contracted to the DHB. There was no one clinician responsible for overseeing the Unit.

164. The DHB could not establish what happened to the report when it came off the fax in the dental unit. No one in the Unit sighted the results of Mrs A's chest X-ray, and the results were not put on Mrs A's health record by Unit staff. Until the DHB review of this case, the Unit was not aware that non-dental X-ray results, ordered as part of the anaesthetic assessment, were not sent back to the anaesthetist who ordered them.

165. Dr Milne advised:

> "The issue that created the defect was that the report was not distributed to a specific clinician. Despite the radiology referral having the name of the referring oral surgeon ([Dr F]) and the patient's GP ([Dr H]) on the patient ID label, the report was distributed only to the Dental Service as a generic entity rather than to the specific clinician. This apparently was the arranged protocol for distribution of radiology reports to the Dental Service."

166. The distribution of Mrs A's X-ray result ultimately failed, as there was no one clinician charged with taking clinical responsibility for it. Dr Milne advised:

> "There must be a closed loop system in place where the clinician who requests an examination is clearly identified, accepts responsibility for the result and has that result distributed to them."

167. The failure to have such a system in place was met with severe disapproval by Dr Milne. I agree that the DHB's systems failures in this case were not acceptable.

168. I also note that the DHB Root Cause Analysis indicates that, had a report of Mrs A's abnormal chest X-ray been sent to her GP, as was the usual practice, her GP would have taken responsibility for ensuring that the advice in the report was followed up.

169. The situation was exacerbated because the Dental Service did not have clinicians with expertise in general medical issues. GPs were not routinely included in report distribution, as most films requested by the Dental Service were dental images.

170. There were other instances of failing to inform Mrs A's GP, Dr H. Notably, Dr H's original referral letter was addressed to the dental unit at the hospital, and Mrs A had been admitted on his referral and had undergone general anaesthesia. Accordingly, I would have expected the dental unit to have corresponded formally with Dr H regarding Mrs A's surgery and investigation results.

171. I have emphasised previously that individual clinicians need to be competent in their management of patients, and staff need to be supported by appropriate systems. I acknowledge that since these events some improvements have been made by the DHB, including the development and use of enhanced electronic information systems. However, I remain concerned that a formalised policy to provide clarity on the clinical responsibility for follow-up of the results of tests ordered at pre-anaesthetic assessment has yet to be finalised by the DHB.

172. The abnormality identified on Mrs A's 23 October 2009 chest X-ray was not followed up appropriately and acted on in a timely manner. This occurred because of a number of organisational and systemic failures on the part of Whanganui DHB. Primarily, if the DHB process in place at the time meant that responsibility for following up the X-ray did not lie with the clinician ordering the test, there should have been an explicit and documented process that provided clarity and identified the clinician who *would* be responsible for reviewing and following up the test. A clear, effective, and formalised closed loop system was not in place for reporting test results. Accordingly, in my view, Whanganui DHB did not provide services to Mrs A with reasonable care and skill and breached Right 4(1) of the Code.

Missing X-ray films — Adverse comment

173. This Office has consistently stressed the importance of good record-keeping. I am concerned that my investigation has been hampered and delayed by the X-ray films dated 23 October 2009 being misplaced by the DHB and not recovered. I acknowledge that the DHB made efforts to locate the films, but these were unsuccessful.

174. This raises issues regarding the DHB's compliance with Rule 5 of the Health Information Privacy Code 1994, *Storage and Security of Health Information*,[27] and the Health (Retention of Health Information) Regulations 1996.

Recommendations

175. I recommend that Dr D undertake the following:

- Provide a formal apology to Mrs A's partner for Dr D's breach of the Code. The apology is to be sent to HDC within three weeks of issue of this report, for forwarding.

- Arrange for a clinical peer review of the standard of his radiology reporting, and report back to HDC within three months of this report being issued.

176. I recommend that Dr E undertake the following:

- Provide a formal apology to Mrs A's partner for Dr E's breach of the Code. The apology is to be sent to HDC within three weeks of issue of this report, for forwarding.

- Arrange for clinical peer review of the standard of his pre-surgery anaesthetic review and provide the results to HDC within three months of issue of this report.

177. I recommend that Whanganui DHB undertake the following:

- Provide a formal apology to Mrs A's partner for its breach of the Code. The apology is to be sent to HDC within three weeks of issue of this report, for forwarding.
- Provide to HDC, within three months of issue of this report, an evaluative update report on the effectiveness of all system changes implemented as result of this case. The report should contain specific reference to:
    a. the radiology service's performance since these events in relation to the distribution of dental X-ray reports;
    b. adherence to the Radiology Information System Red Flagging Protocol and interpretation of the red flag criteria;
    c. collective feedback from the pre-anaesthesia assessment clinic staff and anaesthetists performing on the day of surgery, on the improvements made to their communication and new Anaesthetic Record templates;
    d. audit of the dental unit's compliance with the new system of review and sign-off of investigation results it receives;
    e. the electronic radiology information system and its reporting templates; and

[27] Rule 5 states: "A health agency that holds health information must ensure: (a) that the information is protected, by such security as it is reasonable in the circumstances to take, against: (i) loss …"

f. the system of anaesthetic alerts sent by email to all anaesthetists with details of any expected problems a day prior to the theatre list being produced.

- As a matter of priority, ensure that the Anaesthesia Department reviews and develops a formalised process governing follow-up of all investigations ordered at the Pre-Anaesthesia Clinic stage. If this follow-up is not to be undertaken by the anaesthetist ordering the test, formal deputising of this responsibility should be clear, and explicitly documented in the process.

178. Dr C has agreed to arrange a formal peer review of her pre-anaesthesia assessment documentation and report back to HDC on the results within three months of this report being issued.

Follow-up actions

179.
- A copy of this report with details identifying the parties removed, except the experts who advised on this case and Whanganui DHB, will be sent to the Medical Council of New Zealand, and it will be advised of Dr C's, Dr D's, and Dr E's names.
- A copy of this report with details identifying the parties removed, except the experts who advised on this case and Whanganui DHB, will be sent to the Royal Australian and New Zealand College of Radiologists (RANZCR) and the Australian and New Zealand College of Anaesthetists (ANZCA).
- A copy of this report with details identifying the parties removed, except the experts who advised on this case and Whanganui DHB, will be sent to the Health Quality and Safety Commission (HQSC) and the Director-General of Health (Ministry of Health), and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A — Independent Anaesthetist's advice to the Commissioner

The following expert advice was obtained from Dr Vaughan Laurenson, anaesthetist:

"I have been asked by the Commissioner to provide advice on case number 12/00112 regarding [Mrs A].

I am a specialist anaesthetist in active clinical practice in a major metropolitan centre. I am also employed by ANZCA as a Director of Professional Affairs in the role of deputy assessor. I qualified MBChB 1972, FFARACS 1981, and FANZCA 1992.

I have been asked by the Commissioner to provide expert advice as to whether there are concerns about the care provided by Wanganui DHB, [Dr E], and [Dr C].

I have received copies of the following documents which I have read. I have based my opinion on the information provided by these documents.

- [Mr B's] complaint dated […] [A]
- Wanganui DHB initial response to HDC and RCA report, dated 24 February 2012 [B]
- GP records for [Mrs A] received 1 March 2012 [C]
- Further DHB response to HDC dated 25 July 2012 enclosing pre-admission anaesthetic assessment review form for 6 November 2009, the 22 October 2009 echocardiogram, and chest X-ray request form. [D]
- Further DHB response dated 15 August 2012 enclosing echocardiogram report. [E]
- HDC letters of notification of investigation dated 7 January 2013. [F]
- WDHB response to notification dated 25 February 2013. [G]
- Response to notification from [Dr C] dated 25 January 2013. [H]
- Response to notification from [Dr E] dated 25 January 2013. [I]
- DHB correspondence to ACC dated 25 March 2011 (including a statement from [Dr F] dated 24 March 2011) and 2 May 2011 (including a statement from [Dr E] dated 29 April 2011). [J]
- WDHB clinical records for [Mrs A]. [K]

Summary of events.

[Mrs A] ([DOB]) was referred by her GP to the dental clinic at Whanganui Hospital for management of gross dental decay. The operation booking sheet for a dental clearance under general anaesthesia was completed on 6 May 2009. At that time an anaesthetic assessment was requested because of her heavy smoking and COPD (chronic obstructive pulmonary disease).

A pre-admission clinic was held on 22 October 2009. She was seen by [Dr C] who in addition to taking a history and examining her ordered a chest X-ray

because of her history of heavy smoking and COPD, and an echocardiogram because a heart murmur was heard on examination.

The chest X-ray was taken the next day. It was reviewed by a radiologist who reported his findings later that day. The report was sent to the dental department. The report records that there was a normal sized heart and the lung fields were clear. It also noted that there was 'an ill defined opacity seen at the level of the left hilar region'. There is a suggestion in the report that a follow up chest X-ray may be indicated.

[Mrs A] had a general anaesthetic administered by [Dr E] and dental clearance performed by [Dr F] on 6 November 2009. She apparently made a normal recovery from this surgery.

[Mrs A] was diagnosed with an inoperable lung carcinoma in December 2010. There appears to have been potential for the cancer to have been diagnosed at a treatable stage when a suspicious lesion was opportunistically detected on the chest X-ray of 23 October 2009. The abnormal result was not followed up.

She died [in] 2011.

[Mr B] made a claim to ACC in December 2010/January 2011. The claim was accepted in July 2011. The matter subsequently was brought to the attention of HDC.

Expert Advice Requested

1. **Please comment on the overall standard of care provided to [Mrs A] by Wanganui DHB.**

I can only comment on [Mrs A's] perioperative care for the dental extractions. I am not qualified to comment on the subsequent diagnosis and management of her cancer.

It appears that the technical aspect of her care; assessment, anaesthetic, dental extraction, and immediate phone follow up were carried out in an appropriate fashion. However the whole episode of care is, in my opinion, marked by a lack of a holistic approach to the patient.

There were communication and system failures in the pre-anaesthetic assessment clinic, the radiology department, the dental department, operating theatre, and post-operative communications to the referring practitioner. These failures resulted in substandard care and contributed to an opportunity for early intervention in [Mrs A's] cancer being missed.

2. **Please comment on the quality of [Dr C's] pre-admission anaesthetic assessment review.**

[Dr C] saw [Mrs A] in the anaesthetic pre-assessment clinic on 22/10/09. In her response to the HDC she has written a detailed account of the interaction which is supported by the anaesthesia record part 2 which she filled out at the time.

Assisted by the information in the Whanganui DHB pre-assessment adult questionnaire which [Mrs A] had filled out in May, she took a history, examined the patient, and ordered further investigations. The ECG was done the same day and [Dr C] has commented on it in the anaesthetic record. She also ordered an echocardiogram which was done later that day and a chest X-ray which was done the next day. This is in line with the appropriate standard which is: ANZCA professional document PS07, Recommendations for the pre-anaesthetic consultation, which can be found on the ANZCA website.

3. Please comment on the quality of [Dr C's] reporting, documentation, communication, and follow-up of the review.

Reviewing the documentation made by [Dr C], she has appropriately recorded the relevant history and clinical findings including the ECG. She has not documented that she ordered a chest X-ray, echocardiogram or discussed the procedure with the patient. She is documented as having performed the first two activities and I have no reason to doubt her report that she did discuss the anaesthetic procedure with the patient. There is very limited space on the form in use at that time to document these activities. The modified form provided by Whanganui DHB has appropriate space for these details to be recorded. It would have been useful if these investigations, especially the echocardiogram, had been brought to the attention of the anaesthetist administering the anaesthetic. The failure of [Dr C] to document these investigations, would in my opinion, be seen with mild disapproval by her peers.

The results were not sent to the anaesthetic department or the anaesthetic clinic. Instead the X-ray report and the echocardiogram report were sent to the dental department. Clearly the system in place at the time did not expect or give the anaesthetist who ordered the investigation ([Dr C]) the opportunity to review the results. This is a significant system failure. Apart from the obvious information gathering and patient education at the pre-anaesthetic clinic, one of the important functions of the clinic is to identify any factors that can be improved before the anaesthetic and organise treatment or referral if appropriate. Otherwise the anaesthetist who is scheduled to do the case may be presented with a patient who has correctable conditions. They are then faced with anaesthetising the patient under sub-optimal circumstances or postponing the case with resultant disruption for the patient, and the surgical team.

4. Please comment on the quality and appropriateness of test result reporting systems and the communications and management of such results, in place at Wanganui DHB at the time of the events in question.

My understanding of the system in place at the time, is that the results were only sent to the dental department, the admitting team. The X-rays (and therefore presumably the results inside the packet) were sent to the ward preoperatively, but they are not recorded as being sent to theatre. I find it interesting that a dental clearance would be done without reference to dental X-rays, if they existed. While that is outside my field of expertise, I question whether the documentation is correct. If the X-rays were not sent to theatre [Dr E] had no chance of reviewing

the results, as the results were not filed in the notes. This represents a significant system error.

5. In your view, who had primary responsibility for ensuring abnormal results were acted upon at the various stages of this case?

There are a number of suggestions in the notes as to what should have happened and who was responsible which have been made with the wisdom of hindsight.
The report was made by a radiologist. It is therefore reasonable for other staff to rely on the accuracy of the report initially. The radiologist suggested that a review of a lateral view or previous X-rays would be helpful. However the radiology department did not recall the patient to complete the suggested examination (a lateral view) or apparently review any old films (if these existed).

Had it been reviewed by an anaesthetist, the presence of a normal cardiothoracic ratio and the rest of the lung fields being essentially normal, would have reassured him that there were no cardiac signs on the X-ray. The absence of gross lung changes such as might be seen in emphysema were not present. There was an abnormality but it was reported that this could be vascular in origin, rather than the retrospective diagnosis of cancer.

Subsequent comments were made once the diagnosis was known:

The medical team thought that there were possibly two lesions present.
The oncologist thought that the patient should have proceeded to a CT scan.

These suggestions differ significantly from the slightly confusing report that was presented to the dental team. 'Otherwise, if the lesion was seen earlier a follow-up xray after 2 months is suggested.' The team do not know if it was seen earlier because radiology who store the films have not told them. I note that the HDC is requesting independent advice on the radiology report.

There is an adage that the person who orders the test checks the result. However in modern hospital team approach to medicine this is often not the case. The report was sent to the dental department as the admitting team. For all other services the Whanganui DHB apparently sends a copy of the report to the GP. However they make an exception for the dental department reports.

This system problem is compounded by the dentist in charge of the patient who apparently does not look at non-dental results. It would have been wise to put the suggestion for a follow up X-ray in the dental discharge letter to the GP. However there is no evidence that such a letter was written. Nursing staff phoned the patient 3 days later. I would expect that if a patient has been admitted to hospital and had a general anaesthetic the GP should be notified especially as her GP referred her to the dental department. This appears to be another system failure in this case on the part of the dental department.

The final responsibility for the follow-up at 2 months rests with her primary physician, her GP, Dr H, but he was never notified:

a. Despite his name being on the X-ray request form radiology did not send him a copy of the report.
b. The report issued at the time was not clear on what action should be taken.
c. The dental department received the report but apparently did not read it and so did not notify the GP.
d. There was no notification from the hospital that [Mrs A] had had surgery let alone a chest X-ray.

6. Please provide your view on the standard of [Dr E's] pre-operative assessment and review of [Mrs A].

[Dr E] appears to have done a superficial assessment of [Mrs A]. The modern hospital system puts pressure on anaesthetists to assess patients rapidly on the day of admission just before surgery. The standard PS07 states:

'2.2 Even if a pre-anaesthetic consultation has been performed by some other person, the medical practitioner responsible for administering the anaesthesia must be satisfied that all elements of that consultation have been adequately addressed.'

Patients are entitled to expect that the treating practitioner will be aware of the relevant information. In this case [Dr E] did not appropriately assess the murmur. The complaint is about the failure to review the chest X-ray, however that was not an essential element of [Dr E's] pre-operative assessment. (See below).

7. In your view, should [Dr E] have enquired about other test results as he has said he was aware that [Mrs A] had been seen by a colleague at pre-admission clinic, and based on his pre-assessment findings relating to chest auscultation, wheeze, and cardiac murmur?

[Dr E] had no particular reason to look for a chest X-ray report based on the information from the pre-anaesthesia clinic. The patient had had no wheeze or other respiratory signs on examination. [Dr C] commented she just did the X-ray for completeness in case the anaesthetist who was doing the anaesthetic wanted it.

However [Mrs A] had a significant murmur (S1S2 ESM 4/6) which is recorded on the anaesthetic assessment. That should have alerted him to enquire whether it had been investigated. [Mrs A] would have been aware that an echocardiogram had been done as it is a separate test taking some time. Had she been asked I am sure she would have told him it had been done and he could have looked for the result which does not appear to have been printed out in the notes. ('I then check the printed results of any investigations done.' — which should have included the chest X-ray and echocardiogram. The haemoglobin and blood sugar results were recorded.) Had he looked for the echocardiogram result he may have also found the X-ray result as both were issued by the department of radiology.

The murmur was recorded as loud and may have been a symptom of significant cardiac disease and anaesthesia risk. The investigation showed that while care was indicated it was not a contraindication to proceeding. [Dr E] was apparently not

aware of this result, and he does not appear to have noted the presence of a potentially significant murmur. An omission that while contributed to by the system deficiencies remained his responsibility and would be, in my opinion, regarded as a moderate deficiency by his peers.

8. Had [Dr E] been aware of the chest X-ray result, would this have influenced the administering of anaesthesia in this case?

[Dr E] stated that had he known the X-ray result he would have proceeded. This is the appropriate course of action. Even if the report had said there was a small lung cancer present, there was no suggestion that that was contributing to her symptoms or increasing the risk of anaesthesia or surgery at that stage. However if it was known that there was a cancer present (and it wasn't) [Mrs A] may have felt differently about her surgery.

9. Please comment on the appropriateness of the recommendations stemming from the RCA completed on 13 Dec 2011.

The RCA correctly recognised that the basic error was failure to send a copy of the report to the GP. The proposed flag system is only good if the radiologist identifies the need for a follow up X-ray. In this case the reported vascular lesion does not show in the flag list. It may be covered by 'any other lesions which based on clinical merit may require urgent intervention'. I note that the HDC is requesting independent radiology advice.

10. Are there any aspects of the standard of care provided by the DHB, [Dr C] or [Dr E], that you consider warrant additional comment?

The Whanganui DHB needs to review the information flow and checking systems. I note that [Dr E] reports that there is now a computerised results system which may have already greatly improved the accessibility of the results.

If patients are to gain full benefit from a pre-anaesthetic clinic the results of tests done at the clinic need to be reviewed before the patients are admitted for anaesthesia in the interests of patient safety and convenience. The dental department needs to take a more holistic approach to the management of their patients.

…

Yours sincerely,

Vaughan Laurenson"

Appendix B — Independent Radiologist's advice to the Commissioner

The following advice was received from Dr David Milne, radiologist:

"**RE: [Mrs A] Ref # 12/00112**

I have been asked for opinion in this case of claimed missed lung cancer. **In particular, I am asked whether the care offered to [Mrs A] by [Dr D] and the Wanganui DHB was of an appropriate standard.**

I have read the extensive medical file provided to me by HDC comprising Wanganui DHB clinical notes related to the oral surgery that [Mrs A] had on 6 November 2009, the subsequent oncology notes dating from 29 December 2010, statements from the oral surgeon [Dr F], the Anaesthetist who assessed [Mrs A] prior to her surgery, [Dr C], the Anaesthetist who performed the general anaesthetic for the oral surgery, [Dr E], the Radiologist who reported on [Mrs A's] preoperative chest radiograph, [Dr D] and correspondence between HDC and the [CEO of Whanganui DHB].

Specifically, I have been requested to provide advice on questions raised by HDC.

What was the overall standard of radiology services provided to [Mrs A] by Wanganui DHB?

I have not reviewed the chest X-ray (CXR) taken on 23/10/2009 as a preoperative assessment recommended by [Dr C], Anaesthetist prior to the surgery performed on 6 November 2009, as the image is missing. The radiograph was performed at Wanganui DHB. I must assume that the image was of good quality. The PA chest radiograph was reported by [Dr D] the day of the examination and authorized for distribution the same day. The completion of the examination, dictation, typing and distribution of the final report within 24 hours is a very good standard of practice for a DHB in New Zealand, particularly in 2009.

I will make comments on the content and appropriateness of [Dr D's] report of the CXR examination in the following two sections of my advice.

The quality of a radiology service however is not just determined by the timeliness of the imaging, reporting and report verification. One of the key quality indicators concerns the report distribution and this is the principal area of poor performance by the Radiology department and Wanganui DHB. As mentioned in a subsequent section of my advice, the report was not distributed to any clinical service or individual clinician who believed that they had clinical responsibility for [Mrs A's] general medical conditions and this result[ed] in a poor quality of overall service and the subsequent delay in diagnosis of [Mrs A's] lung cancer. **Severe Disapproval.**

Based on the limited information available, please comment on the clinical soundness and rationale of [Dr D's] response to HDC.

I understand that there is conflicting opinion as to whether the abnormality identified by [Dr D] on the CXR report was the only finding to be made on the image. In a letter from HDC to [the CEO of Whanganui DHB] on 7 January 2013, it is mentioned that [Dr H] and [the clinical director of medicine] have suggested in advice to ACC that there was an additional mass adjacent to the aortic arch to identify. I do not know who these doctors are or what medical specialties they are trained in and I have not had an opportunity to personally read their advice to ACC**.** However, it is clear from [Dr D's] report that he was concerned that the CXR of [Mrs A] was not normal. What was not clear in the report was that the cause of the possible abnormality could be a lung cancer.

The report by [Dr D] notes

'There is an ill defined opacity seen at the level of the left Hilar region measuring 13x17mm which could be vascular in origin'

In my experience, such wording does two things in the mind of the clinician reading the report. It initially raises concerns about malignancy (as these may appear as opacities on a chest radiograph) and then attempts to dismiss the findings as possibly due to normal anatomy. This is not helpful.

I will discuss the recommendations made by [Dr D] in the next section of my advice.

The rationale of [Dr D's] response to HDC does not raise concerns for me. He describes how he completed his review and reporting of the examination in a timely fashion. The content of the report is short of gold standard in my opinion but he has made an observation and has made some recommendations that I can accept are within the range of standard practice for a Radiologist. Indeed he states that the radiograph was subjected to peer review by 5 colleagues and they agreed with his report. There is no supporting evidence that this occurred however. He describes what he thought happened to the report that he had generated and that he understood the 'red flag' protocol for notification of significant unexpected findings.

While he cannot explain why he did not 'red flag' the report, such systems are prone to failure. The indications for, the mechanism of, and the clinical effectiveness of 'red flagging' varies from DHB to DHB across the country. In this particular case if the report had been 'red flagged' it would not necessarily have been escalated to anyone with clinical responsibility for the patient as the referring doctor's name, [Dr C], was illegible on the CXR referral, [redacted — unrelated to the radiological care provided] and the GP was not included in the report distribution pathway.

I comment further on the 'red flagging' of reports in my advice on the recommendations stemming from the RCA completed by Wanganui DHB on 13 Dec 2011.

Please comment on [Dr D's] stated follow up instructions and actions after reporting the image.

[Dr D's] report comments:

'A review of a lateral view or previous x-rays would be helpful for further assessment. Otherwise, if the lesion was seen earlier a follow-up chest x-ray after 2 months is suggested. The rest of both lung fields are essentially normal.'

I understand that there were no images in the film packet of [Mrs A] which [Dr D] could use for comparison. He appears to be asking the unspecified referring doctor or any doctor who believed that they have clinical responsibility for [Mrs A's] medical problems (again unspecified) to hunt for old images in order to resolve this imaging issue. This is optimistic at best.

His subsequent recommendation is that if the lesion was seen previously (less concerning) that a follow up CXR be performed in 2 months' time. I suspect this recommendation contains a typing error and that the meaning of the recommendation is that if the lesion was not seen previously then the follow up should be performed.

My concern is that the potential serious nature of the possible abnormality identified by [Dr D] is not highlighted to the clinician in the report on the CXR. There is no mention of lung cancer as a possible explanation for the observations made by [Dr D]. I therefore find that the report falls short of a gold standard of care by [Dr D], though I accept that the report would be within the range of reporting by radiologists.

Mild disapproval on grounds of less than gold standard presentation of radiological observation and subsequent recommendations within the report.

Please comment on the quality and appropriateness of test result reporting systems (with particular reference to radiology) and the communications and management of such results in place at Wanganui DHB at the time of the events in question.

The chest radiograph was performed, reported, typed, verified and distributed during a single working day. This is good performance from the Radiology Department. The issue that created the defect was that the report was not distributed to a specific clinician. Despite the radiology referral having the name of the referring oral surgeon ([Dr F]) and the patient's GP ([Dr H]) on the patient ID label, the report was distributed only to the Dental Service as a generic entity rather than to the specific clinician. This apparently was the arranged protocol for distribution of radiology reports to the Dental Service.

The Anaesthetist who requested the examination, [Dr C], was identified by signature only which is inadequate identification in my opinion. The Radiology Department would have had little chance of identifying this doctor by [her] signature alone and [Dr C's] assertion that [her] signature is 'on record' at WDHB with the implication that the Radiology Department should invest time in checking hospital records for a clinician with a signature match whenever they received such illegible referral details is totally impractical.

I fully understand that the Dental Service was not staffed by clinicians who have expertise in general medical problems. I also understand why the patient's GP was not routinely included in the report distribution as most of the radiographs requested by the Dental Service were images of teeth and of little interest to a general practitioner.

However the distribution failed as there was no single point of accountability. No single clinician who would be charged with taking clinical responsibility for the abnormal findings reported by the radiologist. As I previously mentioned, even if the report had been 'red flagged' by the Radiologist, there was still no identified clinician who would be named as responsible for acting on the report findings and this is a major failing.

In my opinion, the clinical ownership of the result of the examination lies with the clinician who requested the examination. This is the Anaesthetist who saw [Mrs A] in the pre-operative assessment clinic, [Dr C]. Although the existing protocol for report distribution for dental patients was to distribute to the generic '[Dr E]ental', the radiology department was denied the opportunity of sending the report to [Dr C] as [her] name was not identifiable on the referral.

Severe disapproval in respect of the system in place at Wanganui DHB for report distribution for Dental Service patients as there was no closed loop of referral back to a single accountable clinician. **Moderate disapproval** of the lack of clinical responsibility of [Dr C] who did not follow up the examination [she] had requested, though I accept that [she] was likely following standard behavior for Anaesthetists at the preoperative assessment clinic at Wanganui DHB. *I would be interested to have it confirmed that was standard behavior at this time by the Clinical Director of Anaesthesia at Wanganui DHB. If it is and remains so then this should be changed.*

In my view, who had the primary responsibility for ensuring abnormal results were acted upon at the various stages of this case?

As commented in the previous section, I believe that it was the Anaesthetist who requested the investigation, [Dr C]. I accept that the hospital systems were not developed to facilitate this closed loop of referral by a specific clinician followed by report distribution back to that specific clinician. However, I cannot accept that a clinician orders investigations that they have no interest in following the results of.

My comments on the appropriateness of the recommendations stemming from the RCA completed on 13 Dec 2011.

The recommendation that all dental X-ray reports be automatically sent to the patient's General Practitioner is acceptable but not ideal. Such a policy will lead to the GP receiving lots of reports they are not clinically interested in. As stated, the majority of such reports are of teeth only. This leaves the GP responsible for assessing the significance of investigations that they did not request and did not anticipate results for. They may not even be aware of the clinical situation that resulted in the examination being requested.

The recommendation that the radiology information system be modified to ensure that the completion of the 'red flag' field is mandatory before an x-ray report can be finalized is also something that I have mixed feelings about. In my opinion, this can create different classes of reports. Those without red flags which can be superficially inspected or discarded as they do not contain anything of importance and those reports which must be read. The consideration of what reports need to be 'red flagged' or not is dependent on the radiologist interpreting what findings might be significant or unexpected, often with little or no useful clinical information supplied by the referring clinician. In this case, I have no certainty that a 'red flagged' version of the report faxed to Dr Dental would have been treated any differently than the report on [Mrs A] that was faxed to the service.

In my opinion, the root cause analysis fails to identify the main contributing factor which led to the defect in this case. **The clinician who referred [Mrs A] for the CXR examination did not believe that they were responsible for following up the result. There must be a closed loop system in place where the clinician who requests an examination is clearly identified, accepts responsibility for the result and has that result distributed to them.**

Yours sincerely

Dr David Milne

Chest Radiologist"