Capital and Coast District Health Board

A Report by the

Health and Disability Commissioner

(Case 07HDC07977)

Overview

This case involves the care provided to Mrs A, a 72-year-old woman who presented to the Emergency Department (ED) at Wellington Hospital on four occasions over a ten-day period early in 2007. On each occasion, she presented with slightly different symptoms, and it was only on the fourth attendance that she was diagnosed with a thoracic aortic aneurysm. The aneurysm ruptured before Mrs A could be operated on, and she died in ED. This investigation considers the standard of care provided to Mrs A during her four ED attendances.

Complaint

On 9 May 2007, the Health and Disability Commissioner (HDC) received a complaint from Ms B about the services provided by Capital and Coast District Health Board (CCDHB) to her mother, Mrs A. The following issue was identified for investigation:

- *The appropriateness of the care provided to Mrs A by CCDHB.*

An investigation was commenced on 26 September 2007.

Parties involved

Mrs A (dec)	Consumer
Ms B	Complainant/Mrs A's daughter
Capital and Coast DHB	Provider
Dr L	CCDHB Clinical Director Clinical Support Services
Wellington Hospital medical staff	
Day 1	
Dr C	ED senior house officer
Dr D	ED registrar
Dr E	Cardiology registrar
Day 7	
Dr F	ED house officer
Dr G	ED registrar

Names have been removed (except Capital and Coast DHB/Wellington Hospital) to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's actual name.

Day 8	
Dr H	ED house officer
Dr I	ED consultant
Dr J	Cardiology registrar
Day 10	
Dr K	ED consultant

Information reviewed

Information from:

- Ms B
- Dr K
- The Coroner
- Capital and Coast DHB

Independent expert advice was obtained from emergency medicine specialist Dr Garry Clearwater.

Information gathered during investigation

Background
Mrs A suffered a heart attack. She was admitted to Wellington Hospital, where she had a coronary angiogram, during which stents were inserted into a coronary artery to improve blood flow. She was discharged after a week.

Four days later, Mrs A was readmitted with palpitations and back pain. Atrial fibrillation was diagnosed. Following treatment, she was discharged home the next day.

First presentation — Day 1
At 2.23pm on Day 1, about a month after her heart attack, Mrs A presented to Wellington Hospital ED. She was triaged as Code 4[1] and assessed by senior house officer Dr C at 2.41pm.

Mrs A reported that she had back pain that had started four hours earlier; she reported that the pain was "sharp, not heavy". Mrs A was also short of breath and mildly

[1] Triage Code 4: a patient should be seen by a doctor within an hour of arrival.

nauseous. She said that the pain was similar to that she had suffered when she had her heart attack five weeks earlier — except that on this occasion there was no pain in her jaw and arm.

Mrs A added that she had felt tired in the last week, and had consulted her GP, who found that she had developed some renal impairment. Dr C made a preliminary diagnosis of either a cardiac problem ("acute coronary syndrome"), pneumonia, or pulmonary embolism. Dr C discussed Mrs A with ED registrar Dr D, who concurred with her view that Mrs A's presentation was consistent with acute coronary syndrome, and it was decided to obtain an opinion from the cardiology team. Dr D did not assess Mrs A in person. A chest X-ray was also obtained, and the findings were reported to be "within normal limits for age".[2]

As a result of the referral to the cardiology team, Mrs A was assessed at 5.31pm by cardiology registrar Dr E. Dr E recorded that Mrs A's pain was unlike the pain she had experienced when she had her heart attack. Dr E added that Mrs A had "never had pain like this before".

Dr E decided that the pain was not caused by Mrs A's heart condition, but noted that Mrs A had "acute on chronic renal impairment". Following a later review (at 6.02pm) Dr E discharged Mrs A home, with the advice to return to ED or consult her GP if the pain returned. Dr E recorded:

> "GP follow-up of new renal impairment — patient agreed to make an appointment [for] this next week."

Mrs A was not provided with a discharge summary, nor was one sent to her GP.[3]

Second presentation — Day 7
At 8.49pm on Day 7, Mrs A re-presented to Wellington Hospital ED. She was triaged as Code 3[4] and seen by house officer Dr F at 9.59pm.

Mrs A described a sudden "sharp" pain across her back, which was very bad at times (described as 9, on a scale of 1 to 10) and was not eased by taking paracetamol. It is recorded in the clinical record that Mrs A had been generally unwell since her heart

[2] Performed at 4.54pm, reported at 2.41pm the following day.

[3] No discharge summary was provided following Mrs A's presentations to ED on Day 1, Day 7 and Day 8 because of an error in the system. The error was discovered following Mrs A's admission on Day 10. It led to a "Reportable event serious review report" by CCDHB, which revealed that 4,372 of 23,027 patients were potentially affected by problems in the ED Information Systems. The problem in the electronic system was promptly rectified and retrospective discharge summary information for all 4,372 affected patients was manually printed and sent to GPs with a cover letter explaining the issue.

[4] Triage Code 3: a patient should be seen by a doctor within 30 minutes of arrival.

attack; she was not sleeping or eating well, and was feeling the cold. Her blood pressure was noted to be high, at 198/93mmHg.

Dr F ordered a chest X-ray, which was performed at 11.50pm. Having reviewed the X-ray, Dr F noted:

> "Unfolded aorta, which has been present on past [X-ray]."

The X-ray was also reviewed by ED registrar Dr G, who noted an abnormality on Mrs A's chest X-ray,[5] but did not feel that the results were consistent with an abdominal aortic aneurysm. His impression was "Back pain ? cause". Dr G also noted Mrs A's worsening renal function and raised blood pressure.

Dr G advised that he was "very happy with the detailed history provided by Dr F and did not feel it necessary to assess Mrs A in person". Mrs A was discharged home at 1am, with codeine prescribed to manage the pain. Again, no discharge summary was generated for Mrs A's attendance at ED.

Third presentation — Day 8
At 5.50pm on Day 8, Mrs A presented again to Wellington Hospital ED. She was triaged as Code 2[6] and assessed by house officer Dr H within 10 minutes of arrival. Dr H recorded that this was Mrs A's third presentation in the last week with pain, and on this occasion there was a "sharp pain" in her back and under her left breast. The pain was not eased when Mrs A used her angina medication. As the pain had not settled using codeine, she had called an ambulance. Dr H also noted that Mrs A had high blood pressure (200/99mmHg).

Dr H stated:

> "It was a rule in ED that every case handled by a junior doctor had to be discussed with an ED registrar or consultant and, in the case of unscheduled re-presentations, CCDHB's policy required the re-presenting patient to be seen or reviewed by an ED registrar or consultant."

Accordingly, Dr H consulted ED consultant Dr I. He advised that Dr H discussed Mrs A's presentation "at length" with him. He added:

> "I was made aware that [Mrs A] had presented to ED on occasions over previous days. I recall that [Mrs A's] chest pain was mentioned, and that the description of the chest pain sounded cardiac in nature. I was also made aware of [Mrs A's] cardiac history and a number of cardiac risk factors. For example, I was aware that [Mrs A] had had a heart attack requiring coronary angiography, she had recently

[5] Loss of the left costo-phrenic angle.

[6] Triage Code 2: a patient should be seen within 10 minutes of arrival.

> undergone a further coronary artery stent procedure, and that she was on medication for her angina.
>
> …
>
> Based on the detailed description given by [Dr H], and the very recent history of cardiac problems, I concluded that there was a high likelihood that [Mrs A's] problems were cardiac in nature, and that it was appropriate to refer [her] to the cardiology department.
>
> …
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> Due to workload considerations, it is not possible for me (or my colleagues) to physically see every patient who presents at ED with a potentially life-threatening [complaint]. However, in this case, I was satisfied from the discussion with [Dr H], my review of the case, and on the basis of the referral to cardiology, that I did not need to assess [Mrs A] personally.
>
> …
>
> The [ED] policy refers to the returning patient being seen or *reviewed* by an ED registrar or consultant. I did review [Mrs A's] case in accordance with the policy. 'Review' does not mandate an 'in person' assessment or direct examination of the patient. When consulted, the supervising doctor must make a judgement based on the manner of the consultation, the knowledge and experience of the doctor who has directly assessed the patient, and the way the case is presented. This is what occurred in this case."

At 8.44pm, Mrs A was reviewed by cardiology registrar Dr J. Dr J noted that, in her opinion, the chest X-ray taken on Day 7 was normal, and that the pain Mrs A was suffering from was "quite different from anginal pain". Dr J ordered an X-ray of Mrs A's spine "in view of the recurrent presentation". The report concluded that there were "osteoarthritic changes of the thoracic spine", with no fractures seen.

Dr J stated:

> "At the time I [reviewed Mrs A], I had worked 16 hours straight. During that time, there had been a number of patients where, if the world was ideal, I would have been able to admit them to hospital for observation … I had tried to get [Mrs A] admitted by ringing CCU [coronary care unit] and had been told there were no available beds. The short-stay unit was full, and we already had a backlog of patients in the Emergency Department waiting long periods to be admitted to medical beds. The Emergency Department was very busy and there was a laboratory strike on. All of these factors made for a very difficult and very long shift …"

Following a further assessment at 10.11pm, Dr J concluded that Mrs A's pain was as a result of osteoarthritis rather than having a cardiac or renal cause. Dr J advised Mrs A to take paracetamol as well as codeine, and for her GP to consider a physiotherapy referral. Mrs A was discharged at 10.49pm. Again, no discharge summary was generated for Mrs A's attendance at ED.

Fourth presentation — Day 10
Mrs A consulted her GP on Day 10 because of chest pain and vomiting. She was assessed by a locum medical practitioner. Having reviewed Mrs A, he referred her to Wellington Hospital. He provided a letter addressed to the ED for Mrs A to present on arrival in the hospital:

> "Problem: Chest pain associated with vomiting and inability to keep fluids or tablets down.
>
> …
>
> [Mrs A] has been seen [three times] in [ED] this week with this pain (I have not received any correspondence from [ED] about these visits). It appears as though it has been diagnosed as musculoskeletal pain and she has been prescribed Codalgin. In the last 48 hours she has been in continuous pain and has been unable to eat because of nausea and vomiting immediately after eating. As a consequence she has not been able to take her medication.
>
> Clinically it appears as though she may be experiencing oesophageal pain but I would appreciate specialist assessment and advice."

Mrs A presented to Wellington Hospital ED at 11.09am. She was triaged as Code 3, and assessed by ED consultant Dr K within 53 minutes of arrival.

Dr K recorded that Mrs A had been experiencing central and left-sided chest pain for the past three days. Dr K noted that Mrs A had been assessed by the cardiology team, and the pain was "thought to be chest wall pain". However, Mrs A stated that the pain had worsened the previous day, and that she had vomited after she had taken codeine. She had been unable to keep any fluids down, and had managed only a "couple of spoons of Weetbix" that morning for breakfast.

Dr K recorded his impression that the pain was "probable chest wall pain", but decided to discuss Mrs A with the cardiology team. Meanwhile, he prescribed morphine to be given intravenously.

At 1.45pm, Dr K reassessed Mrs A as he was concerned that there was an alternative diagnosis to chest wall pain. During that review, Dr K noted the report of the chest X-ray taken on Day 7. (CCDHB advised that the X-ray report would have been available as an "unauthorised" report at 9.10am on Day 10.) The report by a consultant radiologist stated:

> "Suggestion of fusiform aneurysm of the descending aorta. In the absence of previous investigation, CT scan might be indicated."

As a result of his review, Dr K was concerned about the possibility of a dissecting thoracic aneurysm, and at approximately 2pm ordered a CT scan. However, he was advised by the radiology department that, due to workload, a CT scan could not be done until 4pm. In the meantime, Dr K prescribed treatment to reduce Mrs A's blood pressure (metoprolol). However, soon after the metoprolol was commenced, Mrs A became unresponsive, and a resuscitation procedure was commenced. Unfortunately, the resuscitation attempt failed, and Mrs A was certified dead at 3.34pm.

CCDHB case review
Dr L completed a case review of the care provided to Mrs A. CCDHB advised:

> "[Dr L] concluded that the reported event did not meet the policy criteria for a classification as a serious or sentinel review event requiring further review.
>
> [Dr L] noted that patients who re-present to the Emergency Department are recognised as at risk for having undetected or progressing problems and CCDHB policy states 'In order to minimise the risk to these patients a second opinion is required. All patients with an unscheduled return to the ED within 72 hours for the same or similar problems are to be seen or reviewed by an ED Registrar or Consultant.'
>
> On review, it appeared that [Mrs A's] symptoms and presentation were carefully assessed, investigated and reviewed with reference to previous admissions and presentations on each occasion she presented to ED. Senior medical staff reviewed [Mrs A] and relevant referrals to Cardiology were made."

CCDHB also advised:

> "Having completed a review of [Mrs A's] care, [Dr L] concluded that the reported event did not meet the policy criteria for a classification as a serious or sentinel event requiring further review.
>
> …
>
> On review, it appeared that [Mrs A's] symptoms and presentation were carefully assessed, investigated and reviewed with reference to previous admissions and presentations on each occasion she presented to ED. Senior medical staff reviewed [Mrs A] and relevant referrals to Cardiology were made."

Radiology issues

Radiology reporting
In relation to the X-ray performed on Day 7, Dr L stated:

> "As a risk management process, the [ED] doctor records their interpretation of the X-ray on a sticky note. If the Radiologist's findings are discrepant to the ED doctor's observations the radiologist will phone the ED with their findings. A simple example of this process is where the Radiologist identifies a fracture where the ED observations might have 'No abnormalities detected'.
>
> The sticky note system at CCDHB was implemented in 2003 utilising a physical sticker attached to X-ray film. When PACS (electronic image system) was implemented the hard copy sticky note was replaced with an electronic sticky note which provided the same mechanism in the new electronic medium.
>
> …
>
> The ED doctor in their observations (sticky note) on the [Day 7] film identifies the tortuous aorta.[7] The report by the Radiologist is not discrepant to the ED observations and the comment regarding CT suggests that if previous evaluation has not been performed then CT may be indicated. The impression is that this refers to outpatient CT evaluation rather than emergency CT scanning given the report also states there has been no change from previous films.
>
> …
>
> The film was reported the next day. The film was typed [Day 10] at 9.10am due to the statutory holiday [the previous day]. The report was signed off later on [Day 10]. Reporting was within timeframe allowing for statutory holiday."

CCDHB initially accepted that there was a slight delay in the reporting of the Day 7 X-ray. It was suggested that this was because the X-ray was ordered late on the evening of Day 7; Day 9 was a public holiday; there was a shortage of radiologists; and there had been an increase in the number of radiology investigations.

CCDHB subsequently stated:

> "[W]e can not determine the exact time that the Radiologist made [his] report, it would have been recorded onto a tape on [Day 8] in order for the typist to have it transcribed by 9.10am on [Day 10].
>
> The reason for reaching this conclusion is that practice at that time was for Radiologists [to] report in batches of at least half a session per tape. The tape would have been waiting for the typist on the morning of [Day 10]. The Radiologist would not have reported the film on [Day 9] as it was a public holiday

[7] On Day 7, the electronic "sticky note" completed by ED house officer Dr F stated:

> "Unfolded thoracic aorta — noted [previous]. Loss of [left costo-phrenic] angle. Probably [chronic obstructive pulmonary disease]. [No] evidence of pneumonia."

> nor is it possible that the Radiologist reported the film on [Day 10] because if this was the case, it would not have been typed until that afternoon or the next day."

The radiologist stated:

> "The findings as recorded in my report are consistent with the preliminary report of the ED doctor. An 'unfolded thoracic aorta' is consistent with a tortuous aorta and the suggestion of a fusiform aneurysm. This consistency was an important factor in me not making direct and immediate contact with the ED."

Dr L stated that random audits are undertaken to check the completion of the electronic sticky note system. In April 2007, there was a 60% compliance by ED doctors. Dr L stated:

> "ED doctors are regularly reminded through a number of methods that completion of sticky notes is not only a departmental requirement, but also important for good quality assurance and patient care/safety purposes. Individual doctors are specifically followed up in person by the designated ED Consultant who oversees this audit. Improving compliance is an ongoing issue. The importance of applying preliminary findings via the 'sticky note' has been highlighted in previous internal, Coroner and HDC review findings."

Radiology staffing

In relation to radiology staffing, three full-time radiologists were being recruited that month. In the short term, two locum radiologists were appointed and on each Monday there was "negotiated additional assistance from [a] private radiology provider" to clear any backlog of reporting.

CCDHB advised that a Clinical Leader in Radiology has been appointed, and a further radiologist appointment is in progress. Dr L stated:

> "[T]here is a well recognised international shortage of radiologists and this creates a risk that CCDHB has to manage in order to meet our prescribed timeframes for reporting. … We believe that our system is robust and that the issue is one of resources, which we are making every effort to access. ED patients and the one working day standard for reporting ED films and procedures remain a priority and the standard was met in [Mrs A's] case.
>
> When this standard has not been able to be met this has been notified. Factors that have contributed to this include typing resource issues now resolved, reporting resource issues including the contracted private radiology provider not able to increase their support to CCDHB due to other commitments and their own vacancies."

Independent advice to Commissioner

The following expert advice was obtained from emergency medicine specialist Dr Garry Clearwater:

> "I have read and agreed to follow the Guidelines for Independent Advisors provided by the Office of the Health & Disability Commissioner.
>
> I am an Emergency Medicine Specialist, qualified MB ChB in 1982 and a Fellow of the Australasian College for Emergency Medicine (FACEM) since 1999. I currently work as a full-time staff specialist in 2 Emergency Departments (EDs) at Waitemata District Health Board and I was Clinical Director of the Emergency Medicine service between 2000 and early 2006. I have previously worked as a GP in a semi-rural practice and as a Medical Officer of Special Scale at Middlemore Hospital ED. Our service employs specialists, Senior Medical Officers and registrars in training. We employed Senior House Officers up until 2005.
>
> I have been asked to review the ED case notes of [Mrs A] to provide expert advice about whether staff of Wellington Hospital ED provided an appropriate level of care to [Mrs A] in four separate visits to Wellington Hospital in [month] 2007 ([Days 1, 7, 8, and 10]).
>
> I was asked to comment on some specific issues:

[At this point Dr Clearwater lists the documents sent to him and the questions asked of him — which he repeats in the body of his report. This information has been omitted for the purposes of brevity.]

> I did not see any discharge summaries from the ED.
>
> I have not seen any other correspondence from the ED staff involved in the case to supplement the electronic notes.
>
> I do not have information about what resources (guidelines, staffing levels, availability of support services) or constraints (workload, delays) were available in this ED at the time of the events.
>
> In this review I have concentrated on the 3 visits to ED between [Day 1 and Day 8] inclusive, where the patient presented with the symptoms that probably reflected progression of a leaking Thoracic Aortic Aneurysm. On the fourth visit, on [Day 10], the diagnosis was eventually made but the patient died while undergoing investigation.
>
> I have not commented on the component of care provided by the Cardiology registrars who discharged the patient from ED on 2 of the 3 occasions, as they work in a separate medical speciality.

There were 4 separate visits to ED and 81 pages of evidence so I have formatted this report as follows:

- A summary of the key points.
- A discussion of the particular points raised by the Office of the Health & Disability Commissioner, incorporating information from commonly-available Emergency Medicine textbooks regarding diagnosis and management of Thoracic Aortic Aneurysm.
- A summary of the events outlined in the ED notes for the visits between [Day 1 and Day 10].

SUMMARY

This 72-year-old patient presented to ED on 4 separate occasions over the course of 10 days with pain in her back at the thoracic level and sometimes in her chest that did not have a clear cardiac or musculoskeletal origin. In retrospect, this pain was almost certainly the manifestation of a leak from the patient's small localised Thoracic Aortic Aneurysm and underlying severe artery disease.

Diagnosis of Thoracic Aortic dissection or leak is very difficult. However, this patient had a number of 'red flags' that pointed to the possibility of vascular pathology: her age, a long history of tobacco use, hypertension, renal impairment (that was getting worse) and coronary artery disease.

On 3 of these visits she was initially seen by an ED House Officer or Senior House Officer: they wrote detailed notes that indicate thorough history and examination was performed each time; none of them documented the possibility of a Thoracic Aortic Aneurysm or leak. It is understandable and reasonable that junior medical staff did not consider the diagnosis.

The features of Thoracic Aortic Aneurysm and Dissection are part of the core knowledge of Emergency Medicine and it seems reasonable to expect that had a senior Emergency Medicine trainee or consultant assessed the patient personally, they would have been more likely to consider the possibility of Aneurysm/Dissection in an elderly patient with markers of significant arterial disease who presented with unexplained back pain.

On 3 separate occasions, the patient was discussed with other, presumably more senior, supervising ED doctors: perhaps registrars or Senior Medical Officers. These doctors did not write any notes so it is unclear whether they received an accurate report from the House Surgeons, whether they examined the patient and whether it was reasonable that they did not consider or pursue the possibility of a Thoracic Aortic Aneurysm.

Thus there is a 'systems issue' regarding the departmental policy that a registrar or consultant should review patients who present to ED as an unplanned return. The

issue relates to the extent to which a patient should be assessed by the senior staff. Alternatively, this may be a 'resource issue': supervising staff may not have had the time to assess the patient if their overall workload was heavy.

There is a second 'systems issue' about generating a Discharge Summary from ED: the GP had not received any discharge summaries relating to 3 previous ED visits even though the ED and Cardiology staff had identified issues that needed follow-up — such as deteriorating kidney function and change in medication. A Discharge Summary is an important safety net as well as communication tool.

On 2 of the 3 visits, the ED House officer was advised to refer the case to the Cardiology service and the patient was subsequently discharged home on both occasions by the Cardiology service registrars (independent of Emergency Medicine). In view of the patient's component of chest/thoracic pain, her recent history of cardiological problems, hypertension and renal impairment, the decision to refer to Cardiology seems reasonable. It is reasonable and efficient to refer patients at an early stage if it seems likely that the patient will need the expert advice of the subspecialty service, especially in a busy department. In that scenario, it would be expected that the patient could be fully assessed by the (appropriate) inpatient service without the 'double handling' of being assessed by the supervisor as well. This acts as a significant mitigating factor in two of the visits.

There were discrepancies between the 2 radiology reports of the Chest X-rays taken on [Day 1] and [Day 7]. The report by a radiologist on the film of [Day 1] was that it was normal. The report of the second Chest X-ray by another radiologist paradoxically states that it was unchanged from previously while describing an abnormality of the aortic outline that warranted CT. In my opinion there seems to also be evidence of a small left-sided pleural effusion that was not noted on either report. Thus there are essentially 3 different interpretations. Perhaps an independent radiology opinion would be warranted.

There is a 'resource issue' regarding timely reporting of ED X-rays. If the Chest X-ray of [Day 7] had been reported by a radiologist within 24 hours and the recommendations promptly reported to ED, it is likely that the patient's case would have been reviewed and the patient recalled for consideration of further tests (such as a CT) 1–2 days before her fatal collapse. The radiology service has indicated that there are staff resource limitations to fulfilling the ideal system.

Finally, leaking Thoracic Aortic Aneurysm is a serious life-threatening condition: there is a significant chance that the patient would have died or suffered serious disability even if it had been diagnosed before her collapse.

Addressing the specific questions asked by the Commissioner's office:

1. General care provided by Wellington Hospital ED
Overall, this was of a reasonable standard, particularly the electronic note system and the detailed assessment and documentation by the nurses and ED House Officers who assessed [Mrs A].

There were three general areas that were suboptimal:

1. The limited assessment of the patient by a supervising registrar or Senior Medical Officer with Emergency Medicine expertise, despite the ED policy that this should have occurred on at least one of the return visits. A doctor with Emergency Medicine expertise ideally would have recognised the 'red flag' of repeated visits by a patient with an unresolved problem and the constellation of features that raised the possibility of thoracic aorta pathology (unexplained thoracic back pain, hypertension, smoking history, cardiovascular disease, renal impairment). Ideally they would have interviewed and examined the patient and written in the notes. If this had occurred, it was more likely (although not guaranteed) that an earlier diagnosis and intervention would have occurred. In that respect, it represents a moderate degree of departure from the standard of care set by the Australasian College for Emergency Medicine in its guideline about the supervision of Interns (House Officers). However, this possibly occurred in the context of heavy workload where supervising staff had to prioritise their time and did not have the time to directly assess every patient. In the context of resource limitations, this would meet mild disapproval.

2. The absence of any discharge summaries from the ED visits would meet with mild–moderate disapproval.

Ideally a discharge summary should be generated for all patients after their discharge from ED, incorporating:

- A list of diagnoses
- A summary of relevant investigations
- A summary of treatment given in ED and prescribed at discharge
- Any recommendations for follow-up
- Advice to the patient about when to seek urgent review.

A copy should be sent to the GP and a copy retained by the patient.

This point was commented on by the GP who noted that he had received no correspondence from the 3 visits between [Day 1 and Day 8].

The ED notes had recorded significant renal impairment, advice about the need for follow-up and yet it is difficult to see how this could be conveyed to the GP in the absence of a Discharge Summary.

The absence of a Discharge Summary may not have affected the outcome for this patient but then again, the GP (or an ED doctor viewing it on a return visit) may have spotted the pattern of 3 presentations with back and chest pain and may have been alerted to the possibility of an aortic problem.

Note that on 2 of the 3 ED visits, the patient was discharged by a Cardiology registrar so this is not simply an issue for the Department of Emergency Medicine.

- It should be a policy applicable to all services that discharge patients from ED.

3. On two of the final four visits there appear to have been significant delays before an ED doctor assessed the patient: on one occasion, 130 minutes after arrival despite being given a triage category of 3 (should be seen within 30 minutes) and on the other occasion she was seen 70 minutes after arrival despite a triage category of 2 (should be seen within 10 minutes). This may reflect issues with the electronic system and these sorts of delays are not uncommon at peak load in busy metropolitan EDs in New Zealand.

- The delays suggest that there may be excessive workloads in this ED and they provide important context for the limited ability of supervising doctors to fully supervise their junior staff.
- It is difficult to assign a degree of concern because there are so many possible factors as to why the delay occurred: possibilities include heavy workload, insufficient staff, clerical delays in registering the patient, time taken for appropriate initial assessment by nursing staff, communication issues (notifying the doctors in a timely manner that a patient is ready to be seen) or perhaps that the doctor only 'signed on' for the patient after completing their assessment rather than at the beginning of their assessment.

2. Care provided in ED on [Day 1]

The patient appears to have indicated that her complaint of thoracic intra-scapular back pain was similar to the symptoms of her previous coronary heart disease so she was appropriately referred to a Cardiology registrar who made an assessment and discharged the patient.

The ED Senior House officer made detailed notes regarding a set of symptoms that might have raised concerns with the supervising Emergency Medicine doctor; a doctor is named (I cannot determine whether it was a registrar or Senior Medical Officer).[8]

- The failure to consider thoracic aortic pathology by the supervising Emergency Medicine doctor would meet with mild disapproval — but the supervisor may have justifiably felt that advising a referral to the cardiology service was an

[8] Commissioner's note: the case was discussed by senior house officer Dr C with ED registrar Dr D.

appropriate fulfilment of their responsibility — i.e. that the patient would be assessed by a relatively senior doctor (at registrar level) who could in turn discuss it with their own consultant if necessary.

- I cannot comment on the standard expected of a Cardiology registrar but their failure to generate a discharge summary from the ED would meet with moderate disapproval in light of their recommendations for the GP to follow-up.

Note that the decision to discharge the patient was made by the Cardiology service and not by the Department of Emergency Medicine.

3. Care provided in ED on [Day 7]

- A Triage Category 3 patient (who should ideally be seen by a doctor within 30 minutes of arrival) had their first documented assessment by an ED doctor 130 minutes after arrival. This is suboptimal and may reflect workload in the department.

The patient was assessed by an ED House Surgeon who documented a very good assessment and clearly described a set of symptoms that (in hindsight) are consistent with pathology of the thoracic aorta. She came tantalisingly close to considering the diagnosis when she raised the possibility of an Aneurysm of the Abdominal Aorta (AAA) and seems to have had raised a question about the profile of the aorta on the chest X-ray.

The case was apparently discussed with a supervising doctor (I cannot determine whether it was a registrar or Senior Medical Officer)[9] who (in retrospect) correctly dismissed the possibility of an AAA but seems to have supported the decision to discharge an elderly patient with unexplained thoracic back pain, worsening hypertension and renal impairment (as listed by the House Surgeon).

- In view of the detailed assessment (including symptoms of worsening unexplained thoracic back pain in a high-risk patient) that was initially made by the House Surgeon, the failure to consider thoracic aortic pathology by the supervising Emergency Medicine doctor would meet with mild disapproval. Ideally the supervisor would have personally examined the patient and written some notes when the possibility of AAA was raised and/or would have been alerted by the constellation of symptoms, risk factors, return visit and absence of a clear alternative diagnosis.

It is possible that there were mitigating factors regarding workload. The 130-minute delay to be seen by a doctor is suggestive of a heavy workload. I must

[9] Commissioner's note: the case was discussed by house officer Dr F with ED registrar Dr G.

emphasise that I have no knowledge one way or the other as to whether the supervisor examined the patient and what was said when the case was discussed.

- The absence of a discharge summary from ED would meet with mild disapproval.

4. Care provided in ED on [Day 8]
The patient appears to have presented with a variation of the previous symptoms, with more emphasis on chest pain and less emphasis on the back pain.

- A Triage Category 2 patient (who should ideally be seen by a doctor within 10 minutes of arrival) had their first documented assessment by an ED doctor 70 minutes after arrival. This is suboptimal but may reflect workload in the department.

Again, there is a good assessment documented by the ED House Surgeon.

The case was again discussed with a supervising ED doctor (I cannot determine whether it was a registrar or Senior Medical Officer).[10]

At this point, the ED policy that returning patients should be reviewed by a senior ED doctor should have come into effect. It is unclear whether the patient was seen by the supervising doctor but they may have felt that their responsibility was covered by advising referral to the Cardiology service.

It is more reasonable that thoracic aortic pathology was not considered because of the predominant complaint of chest pain.

- Ideally the patient would have been assessed directly by the supervising doctor who would have had the opportunity to spot the red flags that have been described previously. The guideline is not specific about the extent of review. Thus another opportunity was lost for expert assessment and we can only speculate whether this would have led to concerns about the thoracic aorta. However, the case was discussed and a reasonable plan was made.

- The decision to refer to Cardiology was reasonable.

The difficulties in the subsequent consultation by the Cardiology registrar have been outlined in separate correspondence and relate to a speciality service outside Emergency Medicine.

- The lack of a discharge summary from the Cardiology service would meet with mild disapproval in view of their specific suggestions for GP follow-up.

[10] Commissioner's note: the case was discussed by house officer Dr H with ED consultant Dr I.

Note that the decision to discharge the patient was made by the Cardiology service and not by the Department of Emergency Medicine.

5. Care provided in ED on [Day 10]
The patient was referred by the GP who outlined his concerns about a gastrointestinal problem. In ED, the patient reported that chest pain was her main problem.

Her triage category was 3 (should be seen by a doctor within 30 minutes). She was seen by an ED specialist within 50 minutes of arrival.

The initial focus was on chest pain and vomiting and there was little mention of back pain.

There is evidence that thoracic aortic pathology was considered: blood pressures were recorded in both arms (a test that specifically assesses the thoracic aorta), a request was made to review the 'report on the angiogram on the aortic root' (the angiogram report commented on the tortuosity of the aorta but did not mention an aneurysm).

In his notes written retrospectively (presumably because he had to first attend to the collapsed patient), the ED specialist felt that he needed to rule out thoracic aortic dissection, especially in the light of the Chest X-ray report (on films taken 3 days earlier) that suggested a possible thoracic aortic aneurysm and that suggested a CT scan might be indicated.

An urgent CT was requested at 1400h but the best that the radiology department could offer was 'very busy, will aim to do around 1600h'.

Appropriate interventions were started in the interim: pain relief and treatment to reduce the elevated blood pressure.

The patient collapsed and died while waiting for the CT.

Even if [Mrs A] had the CT an hour or two earlier, by this stage it is unlikely that she would have survived to reach surgery.

- The care provided in ED at this visit was of a good standard.

6. Should further investigations have been performed on [Day 1, Day 7 and Day 8]?
With the aid of hindsight, a Computerised Tomography (CT) scan would have been performed. Diagnosis of Thoracic Aortic Aneurysm and Dissection is confirmed in approximately 95% of cases in hospital with a CT scan performed in the radiology department.

The decision to perform CT scans is not a simple one: it exposes the patient to a high dose of radiation, requires expert radiographers and there is limited access (against high demand) to CT scans in some hospitals in New Zealand. This last point was demonstrated when the ED specialist requested a CT scan on the visit of [Day 10] and was reportedly advised that there would be a 2 hour delay before the scan could be started because of radiology workload. Furthermore, the optimal CT test requires an injection of intravenous contrast dye that can cause kidney damage so there is sometimes reluctance to use contrast dye if the patient already has underlying kidney damage (as this patient had) — this may have limited the willingness to perform a full CT scan.

- A CT scan at any of these 3 ED visits could have made the diagnosis in time to consider potentially life-saving surgery. However, the underlying issue here is that the possibility of Thoracic Aortic Aneurysm was not considered in the differential diagnosis at any of the visits, so CT was not contemplated.

7. Decisions made on [Day 1, Day 7 and Day 8] regarding the patient's blood pressure and renal dysfunction

At the visit on [Day 1], the clinicians were already aware of the history of hypertension — from the recent admission for cardiac intervention. It seems that they were also aware of her reduced renal function: it was noted that her medication had already been altered (by stopping the drug Quinapril) with this in mind ('now withheld due to renal failure').

The issue directly relevant to the patient's outcome was that they both constituted risk factors and markers for arteriosclerotic artery disease — i.e. that they might have acted as 'red flags' to consider the diagnosis of Thoracic Aortic disease.

- Appropriate advice was given by the cardiology service for the GP to monitor the renal function although this should have been conveyed to the GP via a Discharge Summary.

It is a difficult decision for ED staff to initiate more active treatment for elevated blood pressure. Patients often develop a transient rise in blood pressure as a response to pain and/or the stress of attending an ED so elevated blood pressure in this setting is hard to interpret. ED staff are even more wary of increasing drug therapy for elevated blood pressure if there is associated renal impairment (in the short term, the blood flow to the kidneys can be critically decreased) and there is a risk of patients feeling dizzy or fainting if their blood pressure drops further once their condition improves and they leave the stressful environment of a busy ED.

Ideally the patient should be advised to see their GP to confirm whether it is consistently high and adjust therapy.

Blood pressure control at this stage would not have significantly altered the underlying pathology of a dilated, severely atherosclerotic thoracic aorta (described at autopsy) that had probably been developing over decades. Reducing blood pressure may have altered the rate at which blood leaked from the aorta but not the onset of the leak — although I cannot claim expertise on this point.

- The Cardiology service is expert in advising on blood pressure management and this service discharged the patient on 2 of the 3 ED visits without recommending alteration in blood pressure therapy.

8. Delays reporting the Chest X-ray of [Day 7]
A Chest X-ray (CXR) is usually checked in patients with chest pain but its utility in the diagnosis of Thoracic Aortic Aneurysm is equivocal. It may increase the suspicion of an aortic dissection but does not itself confirm the diagnosis and a normal CXR does not exclude the diagnosis.

The Australasian Emergency Medicine textbook chapter on Thoracic Aortic Aneurysm / Dissection notes that:

- Approximately 80% of patients (with aneurysm or dissection) will have some sort of abnormality on the chest X-ray. Several possible abnormalities are possible including:

    - Widening of the superior mediastinum (52–75% of cases)
    - Localised prominence along the aortic contour (38%)
    - Pleural effusion, usually on the left side (15–20%).

The image of one Chest X-ray was available for me to view, dated [Day 7]. I have not seen any images of the patient's Chest X-rays before that date so I cannot compare any changes. I do not think that this is a normal Chest X-ray.

My understanding is that it is abnormal to have an effusion in the left costo-phrenic angle. Furthermore, the aortic contour in this case is beyond the normal range of contours on Chest X-rays that I see several times a day on my clinical shifts.

A radiology report of the Chest X-ray of [Day 1] noted that there was no abnormality (including in 'the pleural spaces') on that date, so I presume that the blunting of the costo-phrenic angle (the lower corner of the lung against the diaphragm) that is apparent on the film of [Day 7] is a new development and makes me wonder whether this represented some minor bleeding from the aneurysm.

My impression that the mediastinal contour was abnormal was supported by the radiology report of the images taken on [Day 7] which described 'Tortuous aorta. Suggestion of fusiform aneurysm of the descending thoracic aorta.' On a background of 'thoracic back pain for weeks, nil trauma … smoker', it seems that

the radiologist is strongly considering a thoracic aortic aneurysm and then suggests that 'CT scan may be indicated.'

There are 2 areas of concern:

1. The discordant Radiology reports

One report suggests that the CXR is entirely normal, a later film is reported as having no change but describes a possible fusiform aneurysm and neither report comments on what appears to me to be another relevant abnormality: evidence of blood or fluid in the left costophrenic angle. Indeed, the abnormal costophrenic angle was noted by the ED House Surgeon in her interpretation of the CXR.

- I view this discrepancy between radiologists and the failure to mention the fluid in the costophrenic angle with some puzzlement. Ultimately it is an issue of radiological expertise and/or it may reflect that the abnormalities were borderline. Perhaps an independent radiological review of this point is needed.

2. Delay in reporting X-rays

The Chest X-ray taken at 2350h on [Day 7] was not read by the radiologist until 0910h on [Day 10] (3 days later): a delay of two and a half days.

ED doctors must make their own interim interpretations of X-rays in most instances that they order them, over a 24/7 time frame without the benefit of a radiology report until after the patient has left the department. 1–5% of these interim interpretations will miss a significant abnormality and this reinforces the importance of timely expert radiology reports.

If this interpretation had been made within 24 hours of the actual Chest X-ray being taken and if it had been conveyed via an alert to a senior ED doctor, it is quite likely that they would have reviewed the clinical notes and quite possible that they would have recalled the patient for a CT scan in time to consider surgery before her fatal collapse: by [Day 8 or Day 9].

Ideally, an expert radiology report should be available within 1 day regardless of whether it is a working day or weekend or public holiday but it is acknowledged that there are resource implications (funding and staffing) for this optimum system.

In their letter regarding radiology services dated 13 July 2007, [two senior clinical staff] (on behalf of CCDHB) state that there is a guideline that 'ED films … be reported by a Radiologist within one working day' and they admit that the 3 day delay fell outside this limit for various reasons.

- Overall, the absence of timely radiological reporting system (within 24 hours, regardless of the day of the week) would meet with moderate disapproval but it

is recognised that there are resource implications. In this case, an opportunity to make an earlier diagnosis and intervention was missed.

9. Delays notifying the ED Consultant of the X-ray Report

I have not seen the detail of any local guidelines about notifying clinical staff of important abnormalities but I can quote from the American College of Radiology (which describes itself thus: '… with more than 30,000 members, is the principal organization of radiologists, radiation oncologists, and clinical medical physicists in the United States') Practice Guideline for Communication: Diagnostic Radiology (2001):

V. COMMUNICATION

A. Direct communication is accomplished in person or by telephone to the referring physician or an appropriate representative. Documentation of direct communication is recommended. In those situations in which the interpreting physician feels that immediate patient treatment is indicated (e.g., tension pneumothorax), the interpreting physician should communicate directly with the referring physician, other healthcare provider, or an appropriate representative. If that individual cannot be reached, the interpreting physician should directly communicate the need for emergent care to the patient or responsible guardian, if possible.

…

C. In those situations in which the interpreting physician feels that the findings do not warrant immediate treatment but constitute significant unexpected findings, the interpreting physician or his/her designee should communicate the findings to the referring physician, other healthcare provider, or an appropriate individual in a manner that reasonably insures receipt of the findings*.*

(Emphasis in bold is mine).

The radiologist clearly was considering the possibility of a potentially dangerous condition but the report seems tentative. The report notes that there was 'no change in appearance since [Day 1]' which is a mitigating factor for the lack of urgency in alerting ED staff. That is to say, I suspect that the radiologist's certainty about the presence of an abnormality was tempered by the fact that a colleague reading a similar film did not feel that there was any abnormality.

- Thus, in the context that the radiologist seems uncertain about the significance of the CXR findings, it is mildly suboptimal that an urgent call to ED was not made.

- Of some concern, in my opinion, is the 'normal' report made of the CXR of [Day 1]: this discrepancy, and the failure to mention the small pleural effusion, remains unexplained.

RELATED ISSUES

Missed diagnosis

Thoracic Aortic Dissection is a term sometimes used in close association with the term 'Thoracic Aortic Aneurysm': the 2 conditions are closely related. They relate to weakening of the wall of the major artery (the aorta) as it feeds out of the heart until it exits from the chest (the thorax) into the abdomen. The thoracic aorta carries large volumes of blood at relatively high pressure. If there is a weakness in the wall of the aorta, blood can leak out of the aorta into the chest or it can force its way between the layers of the aorta wall, stripping the lining and disrupting its flow.

The autopsy report confirms that this patient had a 2.5 cm diameter saccular aneurysm (abnormal widening) of the descending thoracic aorta, complicated by a small tear in the wall and secondary leakage of blood into the chest cavity. Approximately 1/3 of thoracic aortic aneurysms occur in the descending aorta (as opposed to the arch or ascending aorta).

The Australasian textbook of Emergency Medicine has a chapter dedicated to Aortic Dissection (Colman et al). It notes that Aortic Dissection is 'uncommon (5–10 patients per million population per year) … but potentially lethal condition. A high index of suspicion is required due to the broad range of presenting signs and symptoms …'.

It is noted that 'The diagnosis of Aortic Dissection is rarely straight-forward and there is a long list of differential diagnoses.'

One of the standard international textbooks of *Emergency* Medicine also has a chapter dedicated to aortic dissections and aneurysms (Prince et al). It notes that 'a ruptured aneurysm or dissecting aneurysm is a prominent cause of sudden death as well as severe abdominal, chest or back pain.'

The patient in this case had a number of risk factors ('red flags') for Thoracic Aortic Aneurysm.

One textbook (Prince) lists risk factors that include: 'age, smoking, hypertension, hyperlipidaemia …'

The Australasian textbook notes that 'peak incidence is … between the ages of 50–70 years'.

Renal impairment in this context is another indicator of atherosclerotic disease.

The patient had a number of warning symptoms suggesting Thoracic Aortic aneurysm/dissection:

- Persistent chest and back pain, without a clear diagnosis.
- Difficulty swallowing, with nausea and vomiting 48 hours before she died.

Tintinelli's textbook notes that:

- More than 85% of cases of dissection present with 'abrupt and severe pain in the chest or between the scapulae' (*shoulder blades*).
- 'Back pain may indicate involvement of the descending aorta (63%).'
- 'Nausea, vomiting and diaphoresis (*sweating*) are common.'

The Australasian textbook of Adult Emergency Medicine notes that presenting symptoms can be very variable but:

- Pain occurs in 74–95% of cases, classically described as severe, constant, maximal at onset but sometimes variable.
- 'Interscapular pain (pain in the back between the shoulder blades) can occur with involvement of the descending aorta and as distal dissection occurs, pain may migrate to the lower back or abdomen.'
- Other symptoms may include dysphagia (painful difficulty swallowing).

Pain is often distressing. 50–78% of patients have elevated blood pressure (hypertension), especially in Type B dissection: perhaps reflecting underlying hypertension and/or the effect of pain.

In their letter dated 13th July, [two senior clinical staff], responding on behalf of CCDHB quote a paper from the JAMA [Journal of the American Medical Association] that physicians only correctly suspect the diagnosis in 15–43% of presentations of thoracic artery dissection. The fact that 6 different doctors (3 House Surgeons, 2 Cardiology Registrars and the GP) who assessed this patient over the course of a week did not document the possibility of the diagnosis is, in itself, an illustration of the difficulty making the diagnosis. It was particularly difficult in this case because the nature and description of the pain (as described by the various clinical staff) seemed to vary with each visit: in retrospect, probably reflecting the evolving nature of the underlying condition.

Extent of review by ED Registrar or Consultants

A knowledge of the significance and assessment of Aortic Dissection and Aneurysm is part of the core body of knowledge for the speciality of Emergency Medicine. It is reasonable that a House Officer would not consider the diagnosis but the question arises as to whether a trained and experienced Emergency Medicine senior doctor should have considered the diagnosis.

I would expect an Emergency Medicine registrar and certainly a consultant to consider the 'red flags' that would raise the possibility of a thoracic dissection: risk factors of age, long history of smoking, hypertension and known cardiovascular disease in a patient presenting with thoracic back pain that was otherwise unexplained. Indeed, the patient was finally referred for the appropriate test (a CT scan) after seeing an ED consultant.

It is notable that in each of the 3 crucial ED visits prior to the day of her death, the ED House Officers document that they discussed the case with other doctors who were, I presume, more senior colleagues. None of these doctors wrote anything in the notes but they did tender advice. It is not clear whether any of them assessed the patient in person.

In their report on behalf of C&CDHB to the HDC, dated 13th July 2007, the senior clinical staff noted that there is a policy that 'all patients with an unscheduled return to the ED within 72 hours for the same or similar problem are to be seen or reviewed by an ED Registrar or Consultant.' It is unclear as to what extent the ED registrar or consultant ([Dr I]) actually interviewed or examined the patient when the policy applied on the return visit on the [Day 8]. I suspect that if an experienced and trained ED senior doctor had interviewed and examined the patient in detail and reviewed the previous admission notes, they would have been more likely to consider the possibility of a Thoracic Aortic problem — although this is not guaranteed.

It is always a difficult decision for a consultant or registrar, regarding the extent of their supervision of House Surgeons. Should they trust the assessment and report given by these inexperienced doctors and merely give verbal advice — or should they take extra time to interview and examine the patient themselves to more accurately verify the issues? If they see the patient themselves, should they take even more time to write their own supplementary notes to clarify their opinion? This decision is compounded if the department is busy and there are many demands for the attention of the more senior doctors.

The current Australasian College for Emergency Medicine Position Paper on the Role of Interns (house officer equivalents) in the Emergency Department (1999) states, 'The current structure of medical undergraduate training means that, in the vast majority of cases, new graduates have not had sufficient practical exposure and experience to function safely and effectively in an ED … *Where interns are included among the ED medical workforce, the roster profile should be structured so as to allow direct supervision, case by case, by a medical officer in at least the third post-graduate year, at all hours of the day*. There should be capacity for case-by-case supervision of technical skills, interpretation of tests (including X-rays) and decision-making (in relation to both therapy and disposition).' (Italics are mine).

Supervision of junior doctors is not simply a case of rostering a senior doctor to a shift. The supervising doctor must be sufficiently free to review each case seen by house surgeons, to cover the possibility that a junior doctor may be dealing with a case that is more serious than he or she realises. The safety factor is negated if the supervising doctor is so busy with his or her own workload that they cannot be freely and routinely consulted.

- It appears that 3 supervising ED doctors (registrars or consultants) were appropriately asked about this case by the ED House Officers but the possibility of Thoracic Aortic Aneurysm/Dissection was not considered. Doctors [D, I and G] may want to comment on this issue and their reasons for not considering the possibility of Thoracic Aortic Aneurysm/Dissection.
- The ED management may need to consider whether the service is adequately supervising House Surgeons within the parameters outlined by ACEM, including whether there are adequate resources to do so.

Risks associated with Surgery

Indications for vascular surgery include leaking or rupture of the aorta, intractable pain or intractable hypertension or dilatation greater than 5 cm. Thus this patient would have been a potential candidate for surgery.

However, thoracic vascular surgery is a major intervention that is technically very challenging and carries significant risks such as the possibility of '… coagulopathy (clotting problems), the risk of spinal cord ischaemia and resulting paraplegia, renal failure, distal arterial embolisation and infection.' In this case, even if the diagnosis had been made earlier, there is a moderate risk that the patient would either have died peri-operatively or perhaps survived with significant residual disability.

A Cardiothoracic surgeon could comment in more detail if warranted.

REFERENCES

- Beachley MC, Applegate K et al. American College of Radiology Practice Guideline for Communication: Diagnostic Radiology (2001) pp 5–7.
- Prince LA, Johnson GA. Aortic dissection and aneurysms. Chapter 58 (pages 404–9) in Tintinalli JE, Kelen GD, Stapczynski JS. Emergency medicine: a comprehensive study guide (6th edition). 2004. McGraw-Hill, New York.
- Colman M, Hanson D. Aortic Dissection. Chapter 4.10 (pp 242–8) in: Cameron P, Jelinek G et al (eds). Textbook of adult emergency medicine (2nd Ed), 2004. Churchill Livingstone, Edinburgh."

[At this point Dr Clearwater provided a summary of the care provided to [Mrs A], previously set out above.]

Responses to provisional opinion

Capital and Coast DHB

CCDHB stated:

> "CCDHB wishes to acknowledge that it was responsible for the care provided to [Mrs A] and sincerely regrets that its processes did not result in an earlier diagnosis for [Mrs A]. CCDHB extends its apologies to [Mrs A's] family for this."

Review by a senior doctor
CCDHB submitted that, as [Mrs A's] case was discussed with a senior ED clinician on Days 7 and 8, it had complied with its own policy, which was also consistent with practice in emergency departments in New Zealand. CCDHB acknowledged that while it would be ideal for all patients who present to ED to be reviewed in person by a senior ED clinician, this is not achievable.

CCDHB noted that it does not employ first year house officers in ED.

Dr C, who that month was working as a senior house officer in the ED, stated that she found Wellington Hospital ED to be "a very supportive environment for junior doctors".

Response to Dr Clearwater's report
ED Consultant Dr I stated:

> "Dr Clearwater acknowledges that the diagnosis of thoracic aorta dissection or leak is very difficult. However, Dr Clearwater states that there were a number of 'red flags' that pointed to the possibility of vascular pathology and would raise the possibility of a thoracic dissection. The 'red flags' identified by Dr Clearwater are common to many patients presenting to ED, most of whom do not have thoracic aneurysms.
>
> …
>
> On the basis of everything I have seen, and even with the benefit of hindsight, I am not convinced that my decision would have been any different even if I had seen [Mrs A] in person; that is, I would have been likely to refer her for a specialist cardiology assessment."

Radiology reporting
CCDHB stated:

> "CCDHB does not agree with the suggestion made [in the provisional opinion] that it is pointless to achieve compliance with a guideline of review within one day if the result is not promptly reported to the clinicians who ordered the X-ray. As noted, the purpose of ensuring that a radiologist reads the X-ray within a short timeframe is to enable the radiologist to make immediate contact with the ED where it appears that something may have been overlooked. This purpose is achieved by CCDHB's current approach; and this expectation was satisfied in [Mrs A's] case."

CCDHB added that the 24 hour turnaround was an ideal, but is frequently not achieved.

CCDHB submitted reports from external radiologists, Dr Alan List and Professor Terence Doyle. Professor Doyle reviewed Mrs A's chest X-ray of Day 7. He stated in his letter to CCDHB of 5 March 2008:

> "For the [chest X-ray of Day 7] my report would read: 'The descending aorta is dilated and appears 1cm wider in both the frontal and lateral films compared to the films of [Day 1]. The aortic arch also appears wider now than on previous films. The appearance suggests dissection of the aorta. …
>
> Impression: Appearances suggesting dissection of the arch and descending portions of the thoracic aorta'."

Dr List summarised his report (dated 1 April 2008) to state that, in his view, the findings of Mrs A's chest X-ray of Day 7 would not cause most radiologists to "tender such concern as that they should ring the referring clinician".

CCDHB submitted:

> "In summary, and having particular regard to the opinion of Dr List, CCDHB does not consider that there is sufficient evidence on which a finding can be made that the decision not to call the ED doctor by the radiologist on reading the [Day 7] report was below an acceptable standard."

Discharge summaries
CCDHB acknowledged that discharge summaries were not sent on any of Mrs A's presentations to ED. As a result of her presentation on Day 10 (which included a comment in the referral letter from her GP that discharge summaries had not been sent), CCDHB immediately took steps to identify the cause of the malfunction, to identify patients who had not received a discharge summary, and to produce discharge summaries for those affected.

Triage times
CCDHB acknowledged that Mrs A was not seen within the target triage times on Days 7 and 10, owing to the ED being particularly busy. CCDHB advised that it is continually working to improve triage times.

Compliance with "sticky note" system
CCDHB accepted that ED doctors' 60% compliance with the "sticky note" system is unsatisfactory. CCDHB submitted that education, audit, and "follow-up of individual clinicians" is ongoing. It noted that the 1 January to 21 February 2008 compliance had improved to 67%.

Mrs A's family

Ms B, Mrs A's daughter, responded for the family:

> "We know now that Mum was a reasonably high risk patient, but by not diagnosing her condition and thereby giving her a chance at surgery, she was deprived of any chance. …
>
> [A] number of 'red flags' should have alerted hospital staff to the fact that something serious was wrong with Mum. It was distressing to have each visit to the hospital treated as a separate visit and not as a subsequent visit for the same condition, albeit with sometimes slightly different symptoms. Hospital staff should pay more attention to family members' concerns — they know the patient better than anyone else and have been monitoring their condition on at least a daily basis.
>
> I cannot stress enough, the hospital must do more when a patient re-presents, as in Mum's case, to ED four times in total, and three of those visits within a week. It was distressing to us and we were powerless to make them keep her in hospital."

Further expert advice

The responses to the provisional opinion were reviewed by Dr Clearwater. He provided the following further advice:

> "Thank you for asking me to review the response from Capital and Coast DHB and the related documents following the Commissioner's provisional opinion on this case.
>
> I have two alterations to offer regarding points in my advice.
>
> **1. The degree of supervision outlined by the Australasian College for Emergency Medicine in its guideline about the supervision of Interns**

I agree that this guideline relates specifically to doctors who are, in the New Zealand system, in their first House Surgeon year. It is now evident from the staff statements that have been provided that all the House Surgeons were in their second year or later. …

The standard of supervision required for House Surgeons beyond their first House Surgeon year would be more relaxed than that recommended for Interns.

However, I suggest that the supervision was still suboptimal. There are two issues:

A. The need for close supervision does not end after the first House Surgeon year

House Surgeons who work in ED are not systematically studying the specialised discipline of Emergency Medicine (in contrast to registrars who enter a formal systematic learning programme).

The need for supervision beyond the first House Surgeon year is confirmed in the draft of the ACEM guideline on 'Definition of an Emergency Medicine Consultation' (provided by [the clinical director of the emergency department]): 'Clinicians with less than 3 years experience will be expected to consult with a clinician with more than 3 years experience in all cases.' This would have applied to all three House Surgeons in this case.

B. The quality of supervision

There was never any doubt that the House Surgeons appropriately asked their supervisors for advice in all 3 visits to ED between [Day 1 and Day 8] inclusive. In each visit they clearly identified and documented the key complaint of back pain.

The issue is the adequacy of the supervision that was provided.

My main concern was that the supervising staff did not notice the 'red flag' of unexplained thoracic back pain in a patient with atherosclerotic risk factors.

Diagnosis of Thoracic Aortic Dissection is difficult because it sometimes presents only with non-specific chest pain or collapse or peripheral signs but 'thoracic back pain' is rather more specific and should have raised some question about a vascular cause. I emphasise here that cardiac chest pain does not usually radiate to the back. It often radiates to the throat and down one or both arms but not to the thoracic spine.

The various supervisors have not explained how they omitted to consider this possibility.

To repeat the points made in excerpts from two standard textbooks:

Tintinelli's textbook notes that:

- More than 85% of cases of dissection present with 'abrupt and severe pain in the chest or between the scapulae' (*shoulder blades*).
- 'Back pain may indicate involvement of the descending aorta (63%).'

The Australasian textbook of Adult Emergency Medicine notes that:

- 'Interscapular pain (pain in the back between the shoulder blades) can occur with involvement of the descending aorta and as distal dissection occurs, pain may migrate to the lower back or abdomen.'

The nursing and house surgeon notes for all three visits ([Day 1], [Day 7] and [Day 8]) all note that 'back pain' was a predominant complaint.

[Day 1]:

Triage Nurse: '**Back Pain** NT. **Pain across back** … no chest pain'.

ED nurse: '**pain between the shoulder blades** and back of head.'

ED SHO: Pain was 'in band **across the thoracic back** ...'

[Day 7]:

ED Triage: Presenting complaint: '**Back pain NT — thoracic**'

Sudden onset of '**thoracic pain … across back**'

ED House Surgeon:

Presents with '**Thoracic back pain, present for weeks**.'

'cardiology felt unlikely to be cardiac.'

Pain … '**across her back** from armpit to armpit, more on the left.'

[Day 8]:

ED Triage: 'Chest pain: constant pain under L chest **radiating through to back**.'

ED House Surgeon:

'Back and chest pain.'

'**Sharp pain in back** and under left breast, unrelated to breathing.'

Each supervisor outlines that they received a clear history from their House Surgeon but none of them explain why they didn't consider Thoracic Aortic Dissection.

In his response regarding the advice given on [Day 1], the supervising registrar ([Dr D]) does not address the issue at all. I assume that he was told that there was a primary complaint of thoracic back pain. Yet he did not consider any other diagnosis than 'acute coronary syndrome'. If he had read the nursing notes or the House Surgeon notes, it would have been clear that chest pain was not the primary concern.

In his response regarding the consultation on [Day 7], the supervising registrar ([Dr G]) states that he was clearly told that the problem was 'recurrent back pain'.

In his retrospective report, he describes a number of features that seem to have reassured him: the chest X-ray report of [Day 1] was 'within normal limits' and states that 'there was no difference between the left and right upper limb blood pressures and that her pain was not typical of dissection'.

This indicates a very limited knowledge of thoracic aortic dissection, which can present with a wide variety of pain features; a normal mediastinum on chest X-ray and equal blood pressures in each arm do not rule out the diagnosis. He overlooked the significance of a small left pleural effusion on the chest X-ray.

Thus, he overlooked the significance of positive risk factors, predominant complaint of thoracic back pain and a new pleural effusion — based on his concept of a 'typical presentation' of aortic dissection that was more appropriate for a house surgeon but not consistent with the specialised body of knowledge that comprises Emergency Medicine.

In his response regarding the advice given on [Day 8], the supervising specialist ([Dr I]) does address the question but I disagree with his justifications for overlooking the possibility of thoracic aortic pathology.

He states that, 'the 'red flags' … are common to many patients presenting to ED, most of whom do not have thoracic aneurysms'.

Thoracic back pain is an important 'red flag' that does not occur commonly in patients presenting to ED. I reiterate that a predominant complaint of thoracic back pain in a patient with atherosclerotic risk factors should have raised the possibility of thoracic artery pathology. It is not typical of cardiac pain.

- In my opinion, all three supervisors fell at least mildly below the standard of care by failing to consider the possibility of thoracic aortic dissection in a patient with this presentation, having been told of the patient's symptoms by House Surgeons who made good notes.

There has been much comment about whether a supervisor is obliged to personally assess each patient but this is not the key issue and I reiterate that this was not the key point made in my advice.

Reading the response from C&C DHB, I suggest that much emphasis has been placed on the definitions of 'review' and not enough on answering the key question: why did three supervisors not register the significance of the thoracic back pain in this patient?

Supervision is a challenge in ED for the reasons that I listed in my initial advice. However, if supervisors are to perform a minimum of supervision (discussing cases with junior doctors without viewing the notes or the patient) they need to do this with skill and care. A core requirement is to be alert for any 'red flags' described by their House Surgeons. In this case, if they had registered the red flag of thoracic back pain (otherwise unexplained), keeping in mind its potential serious implication, the question of thoracic aortic pathology would have been raised and the opportunity offered to rule it in or out with further assessment or tests.

- Judging from the responses of the supervisors, there seems to be an educational issue: a lack of awareness of the significance of otherwise-unexplained interscapular thoracic back pain in a patient with atherosclerotic risk factors.

Patients with aneurysms and dissections of the thoracic aorta will present to ED each year. I expect that it would be of some comfort for [Mrs A's] family to know that ED staff will have a higher awareness of this possibility in the future. To repeat a quote from the Australasian textbook of Emergency Medicine: Aortic Dissection is an 'uncommon (5–10 patients per million population per year) … but potentially lethal condition. A high index of suspicion is required due to the broad range of presenting signs and symptoms …'

[Dr K] noted in his evidence to the [Coroner] dated 24 July 2007 that the case had been discussed at the ED monthly Mortality & Morbidity meeting and that 'it was emphasised, as a teaching point, that other causes of chest and back pain should be considered, even in a patient with a background of ischaemic disease'.

This is commendable but the lack of acknowledgement of this possibility in the subsequent reports from the three supervisors is of some concern. [Dr I], the consultant (who saw the patient on [Day 8]) stated in March 2008: 'on the basis of everything I have seen, and even with the benefit of hindsight, I am not convinced that my decision would have been any different even if I had seen [Mrs A] in person — that is, I would have been likely to refer her for a specialist cardiology assessment …'

Thus, more education may be needed within the Department.

2. ED Waiting times

I apologise that I was unfamiliar with the format of the electronic format of ED notes and I took the time registered beside the doctor's name as the time that they saw the patient whereas, it was confirmed by C&C DHB, these were in fact the times that the notes were written up. The doctor was registered as seeing the patient before these times.

I had raised this 'clerical' possibility in my original advice in answer to question 1:

- *It is difficult to assign a degree of concern because there are so many possible factors as to why the delay occurred: possibilities include heavy workload, insufficient staff, clerical delays in registering the patient, time taken for appropriate initial assessment by nursing staff, communication issues (notifying the doctors in a timely manner that a patient is ready to be seen) or* ***perhaps that the doctor only 'signed on' for the patient after completing their assessment rather than at the beginning of their assessment****.*

- The concern registered in my advice on question 3 remains: the patient was still seen outside the triage target time on [Day 7]: 70 minutes after being triaged (rather than 130 minutes).

- My response to question 4 would now omit reference to the delay to be seen.

Apart from the delay in seeing the patient on [Day 7], there is now little evidence that workload was an issue or a significant mitigating factor.

I have some comments on a number of other points raised:

The policy of senior review of unscheduled patient return visits to ED within 72 hours

This generated a lot of comment, focused on whether a supervisor should personally examine the patient or whether it is satisfactory to simply discuss the case.

As I have already mentioned, the quality of the supervision is perhaps more important than physically seeing each patient. A supervisor needs to 'filter' each case presented for red flags. If red flags are overlooked then a useful component of indirect supervision is lost.

The formal review policy as outlined by C&CDHB is commendable, for the reasons outlined in the policy document: 'patients who return to the ED are at risk for having undetected or progressing problems and complications and are to be treated seriously and with particular care'.

The wording of the policy (now available to me) is somewhat equivocal (the debate being about the definition of 'review'). I note that the procedure section of the policy states, '*ED doctor seeing patient ensures an ED Registrar or Consultant reviews the patient.*' I would have taken this to mean at least a perusal of the old and current notes if not a physical assessment.

[The ED clinical director] states (in paragraph 17) in relation to this policy that 'it would be counter-productive for a senior clinician to attend every patient under discussion as this would prevent the senior doctor seeing any patients themselves …'. I presume that he was referring to routine attendance of every ED patient. To clarify the point in relation to unscheduled return visits (within 72 hours) — these constitute a very small proportion of ED visits — perhaps one or two per shift (if that). It should not be a resource drain on the service for them to be personally assessed by a senior doctor.

- Supervisors may not be able to personally assess every patient that they discuss with junior doctors but they need a strategy to optimise their supervision. This includes taking relatively more time and effort to consider presentations that relate to higher-risk systems (such as the head, spine and chest). Other tools include reading the notes written by their nursing staff and junior medical staff in selected patients with significant risk factors as this sometimes gives a clearer idea of the predominant concern beyond the verbal summary provided by their junior doctors.

Delays in radiology reporting

[In] its response, C&C DHB states that the chest X-ray taken at 11:50pm on [Day 7] was 'almost certainly' read by the consultant radiologist during working hours on [Day 8]. Nobody seems to be sure of this point, suggesting that no formal record was kept.

However, the typed report 'was available to ED' on [Day 10].

This is a technical point that is potentially misleading. ED medical staff must make an interim interpretation of X-rays in ED at the time that they see the patient and then have only two ways to find out the radiologist's expert interpretation:

- Either a radiologist alerts the ED staff about a relevant abnormality, via a phone call, as soon as the X-ray is viewed; or
- ED staff must await the formal typed report after it has been checked and approved by the radiologist then posted to ED and/or notified electronically.

The system at C&C DHB is not described in detail but typically it would take several more hours for the typed report to be distributed to the appropriate point in ED where, hopefully, there would be a system to check the reports.

For practical purposes, the ED staff are blind to the result of the radiologist report until the formal report arrives in ED. The only exception would be if an ED staff member was particularly concerned and tried to actively track down the report.

Sometimes the reports are electronic instead of printed but it is not clear which system applied. Even electronic reports are not useful until they are systematically reviewed by ED.

[Dr K] saw the patient at 12:02pm on [Day 10] and there is no evidence that the X-ray report was available when he wrote up his initial notes at 12:52pm. His first mention of the report was in his notes regarding a review at [1.45pm]: 'also noted CXR report …'.

Thus, there was effectively a delay of more than 60 hours before ED staff were aware of the X-ray report. This falls significantly outside the range that C&C DHB itself acknowledges is optimum: a 24 hour turnaround.

Thus my points made in Question 8 remain fundamentally unchanged.

- C&C DHB does not seem to acknowledge the limitations of its reporting system, the value of which lies in getting a report to ED staff in a manner timely enough for ED staff to act on any abnormal reports. Having a typed report sitting in a radiology department is of little use. The relevant 'turnaround time' is the time for a report to reach ED and to be reviewed systematically.

Significance of the Chest X-ray (CXR) interpretation

There is evidently a wide range of interpretations regarding the CXR of [Day 7] including markedly different interpretations by two expert radiologists.

A number of clinicians interpreted the mediastinum as being abnormal: [Dr K], [the radiologist who reported the films], and [Professor Doyle].

It is important to point out that I have not indicated that the CXR was in itself diagnostic of an abnormal thoracic aorta. Rather, the CXR report was another supporting piece of evidence that raised the possibility of a thoracic aortic aneurysm or dissection. This was indirectly addressed when Dr Alan List, one of the external radiologists, noted that 'in the circumstances of repeated chest and back pain not accounted for then a CT could be and was considered'.

To reiterate my original advice:

A Chest X-ray (CXR) is usually checked in patients with chest pain but its utility in the diagnosis of Thoracic Aortic Aneurysm is equivocal. It may increase the

suspicion of an aortic dissection but does not itself confirm the diagnosis and a normal CXR does not exclude the diagnosis.

The Australasian Emergency Medicine textbook chapter on Thoracic Aortic Aneurysm / Dissection notes that:

- *Approximately 80% of patients (with aneurysm or dissection) will have some sort of abnormality on the chest X-ray. Several possible abnormalities are possible including:*
  - *Widening of the superior mediastinum (52–75% of cases)*
  - *Localised prominence along the aortic contour (38%)*
  - *Pleural effusion, usually on the left side (15–20%).*

In this case, the Chest X-ray was abnormal in that it had one–two out of three of these abnormalities.

I am still somewhat surprised that a radiologist who interpreted this CXR did not activate a more urgent review, knowing that the indication was listed as 'Thoracic back pain for weeks', that the mediastinum seemed to be abnormal and there was a new pleural effusion (which, in retrospect, was probably leaked blood).

Its significance in this case was that it could have prompted medical staff to consider a diagnosis that was lacking in their considerations up to that point."

Code of Health and Disability Services Consumers' Rights

The following Rights in the Code of Health and Disability Services Consumers' Rights are applicable to this complaint:

RIGHT 4

Right to Services of an Appropriate Standard

(1) Every consumer has the right to have services provided with reasonable care and skill.

…

(5) Every consumer has the right to co-operation among providers to ensure quality and continuity of services.

Opinion: Breach — Capital and Coast District Health Board

Introduction

Mrs A suffered from a rare condition that is notoriously difficult to diagnose — a dissection or leak of a thoracic aortic aneurysm. The fact that a difficult diagnosis is missed does not, in and of itself, constitute negligence. Apart from some delays in being seen in the Emergency Department, Mrs A received good, well documented assessments by ED junior doctors and nurses. However, there are three unsatisfactory aspects of the care Mrs A received over the course of her four ED presentations over ten days: (1) senior ED medical staff missed the "red flag" of unexplained thoracic back pain and did not review her in person when she re-presented; (2) there was a delay in radiology reporting; and (3) no discharge summary was provided following Mrs A's attendances on Days 1, 7 and 8.

Supervision and review by senior ED medical staff

I accept the view of my independent emergency medicine specialist, Dr Garry Clearwater, that making a diagnosis of dissecting thoracic aortic aneurysm is very difficult. However, Dr Clearwater noted that Mrs A had a number of risk factors for a dissecting thoracic aortic aneurysm:

> "I would expect an Emergency Medicine registrar and certainly a consultant to consider the 'red flags' that would raise the possibility of a thoracic dissection: risk factors of age, long history of smoking, hypertension and known cardiovascular disease in a patient presenting with thoracic back pain that was otherwise unexplained."

CCDHB's own policy states that "all patients with an unscheduled return to the ED within 72 hours for the same or similar problem are to be seen or reviewed by an ED Registrar or Consultant". Yet Mrs A was not reviewed in person by an ED registrar or consultant until her fourth and final attendance on Day 10, when she was seen by ED consultant Dr K, who considered the possibility of a dissecting aneurysm and commenced appropriate treatment.

On Mrs A's first attendance on Day 1, her case was discussed with an ED registrar. I note Dr Clearwater's comment that the ED senior house officer on this occasion "made detailed notes regarding a set of symptoms that might have raised concerns with the supervising Emergency Medicine doctor".

On Days 7 and 8, Mrs A re-presented with similar symptoms. Her case was discussed with an ED registrar (on Day 7) and an ED consultant (on Day 8). She was not reviewed in person by a senior ED doctor. I note the point made by Dr I (the ED consultant with whom Mrs A's case was discussed on Day 8) that even if he had reviewed Mrs A in person, he would probably have made the same decision — to refer her to a cardiologist.

In his further advice, Dr Clearwater queried the quality of the consultant supervision of the junior doctors in this case:

> "Supervision is a challenge in ED … However, if supervisors are to perform a minimum of supervision (discussing cases with junior doctors without viewing the notes or the patient) they need to do this with skill and care. A core requirement is to be alert for any 'red flags' described by their House Surgeons. In this case, if they had registered the red flag of thoracic back pain (otherwise unexplained), keeping in mind its potential serious implication, the question of thoracic aortic pathology would have been raised and the opportunity offered to rule it in or out with further assessment or tests."

Dr Clearwater added:

> "… [T]he quality of the supervision is perhaps more important than physically seeing each patient. A supervisor needs to 'filter' each case presented for red flags. If red flags are overlooked then a useful component of indirect supervision is lost.
>
> The formal review policy as outlined by C&CDHB is commendable, for the reasons outlined in the policy document: 'patients who return to the ED are at risk for having undetected or progressing problems and complications and are to be treated seriously and with particular care'.
>
> The wording of the policy (now available to me) is somewhat equivocal (the debate being about the definition of 'review'). I note that the procedure section of the policy states, '*ED doctor seeing patient ensures an ED Registrar or Consultant reviews the patient.*' I would have taken this to mean at least a perusal of the old and current notes if not a physical assessment. …
>
> Supervisors may not be able to personally assess every patient that they discuss with junior doctors but they need a strategy to optimise their supervision. This includes taking relatively more time and effort to consider presentations that relate to higher-risk systems (such as the head, spine and chest). Other tools include reading the notes written by their nursing staff and junior medical staff in selected patients with significant risk factors as this sometimes gives a clearer idea of the predominant concern beyond the verbal summary provided by their junior doctors."

CCDHB submitted that it would not be practical for senior ED medical staff to personally review all patients who re-present within 72 hours. I accept the ED clinical director's point that such individual review by senior clinicians would have resource implications, and is not the practice in other New Zealand emergency departments. However, I note Dr Clearwater's comment that such re-presentations constitute a "very small proportion" of patients, at most one or two patients per shift.

I am left with some doubt about the quality of the senior ED medical staff supervision and review of Mrs A's case when she re-presented on Day 7 and Day 8 with a

complaint of "thoracic back pain in a patient with atherosclerotic risk factors" (as described by Dr Clearwater). Mrs A's pain was not typical of chest pain (as borne out by the cardiology reviews which showed no cardiac problems), and alternative diagnoses should have been considered. As noted in CCDHB's own policy, as a returning patient she needed to be "treated seriously and with particular care". Ideally, she should have been reviewed in person by an ED registrar or consultant who had discussed her situation with the junior doctor and read all the notes.

Radiology reporting
The chest X-ray performed late on the evening of Day 7 was not available to ED clinicians until 9.10am on Day 10, and the result was not telephoned to them, despite the report stating that there was a "suggestion" of an aneurysm.

CCDHB stated that the X-ray was reviewed by a radiologist on Day 8, but not typed and made available until Day 10. CCDHB appears to suggest that it had complied with its previous commitment:

> "In all cases where a patient is discharged from the ED their radiographs are now reviewed by our radiology services within one working day."

However, CCDHB stated in its response to the provisional opinion that a 24-hour turnaround was ideal, but is frequently not achieved. I accept that staff shortages and the intervening public holiday delayed the formal report. However, I note Dr Clearwater's advice that "ideally an expert radiology report should be available within one day regardless of whether it is a working day or weekend or public holiday". Mrs A should not have suffered delays because she had the misfortune to have an X-ray taken just over 24 hours before a public holiday. I also note Dr Clearwater's further advice, that there was effectively "a delay of more than 60 hours before ED staff were aware of the report".

A separate issue is why the radiologist did not telephone his findings on Day 8, when the "suggestion of fusiform aneurysm of the descending aorta" (noting the need for a CT scan) was identified. There is little point in achieving compliance with a guideline of review by radiology services within one day if the result is not promptly *reported* to the clinicians who ordered the X-ray, by telephone if necessary.

CDDHB provided a statement from the radiologist who reported the X-ray explaining that he did not consider there was a need to telephone the results because he did not believe his report differed from that of the ED doctors. CCDHB noted that the condition described by the radiologist (tortuous aorta with suggestion of a fusiform aneurysm) is "a *common* picture for a 73 year old smoker" and did not warrant an immediate CT scan.

CCDHB also provided a report from radiologist Dr Alan List, who stated that the findings of Mrs A's chest X-ray of Day 7 would not cause most radiologists to "tender such concern as that they should ring the referring clinician". In contrast, radiologist

Professor Doyle advised that he would have reported the X-ray of Day 7 as suggesting "dissection of the arch and descending portions of the thoracic aorta".

CCDHB advised that the radiologist's report was not different from the view of the ED physicians on Day 7, and therefore there was no need for the radiologist to contact ED about the report. I am not persuaded by CCDHB's submission. The ED physicians' view of the X-ray (as recorded on the electronic "sticky note") makes no mention of a thoracic aneurysm, whereas (in Dr Clearwater's words) the radiologist in his report was "strongly considering a thoracic aortic aneurysm", and specifically mentions the possibility of such a diagnosis in his report.

Although I accept that the X-ray taken on Day 7 was not of itself diagnostic of the aneurysm, as Dr Clearwater pointed out, it was "another supporting piece of evidence that raised the possibility of a thoracic aortic aneurysm or dissection". Dr Clearwater added that he was still "somewhat surprised" that the radiologist did not telephone his report, in the context of Mrs A's presentations. His final point of advice is worthy of note:

> "[The X-ray report's] significance in this case was that it could have prompted medical staff to consider a diagnosis that was lacking in their considerations up to that point."

It is sobering to note that the possibility of an aneurysm had been identified *prior* to Mrs A's penultimate attendance at ED on the evening of Day 8, but it was not reported to ED clinicians until the morning of Day 10.

Discharge summaries

Despite three attendances, and recommendations made by hospital medical staff for Mrs A's GP, no discharge summary was provided following Mrs A's three attendances on Days 1, 7 and 8. These summaries may not have affected the outcome, but Mrs A's GP may have recognised the pattern of three admissions with back and chest pain. There was also additional information (including new renal impairment and a recommendation of a physiotherapy referral) that should have been communicated to Mrs A's GP via a discharge summary.

CCDHB advised that this was a systems error that was picked up as a result of Mrs A's presentation on Day 10, and that the matter was promptly rectified. This is reassuring. Nevertheless, Mrs A was discharged three times from ED without a discharge summary being given to her or forwarded to her GP. It went unnoticed by staff that Mrs A was not given a discharge summary when she left the department.[11]

[11] CCDHB subsequently advised that, following previous advice from the Coroner, it instigated a system whereby ED discharge summaries are generated automatically and sent by facsimile to known GPs out of hours. Hard copies would only be given to patients when there is no GP listed or if the patient is being discharged to another health care facility. CCDHB accepts that an IT failure

This is a salutary reminder to clinical staff of the need to be alert to whether a system is functioning properly.

Summary
Although I acknowledge that, in many respects, Mrs A received good care from the staff of Wellington Hospital ED, several aspects of her care were unsatisfactory.

There is a question mark in my mind about the quality of the ED senior medical staff supervision and review, particularly since "red flags" were missed and Mrs A was not reviewed in person by an ED specialist when she re-presented a second and third time. Furthermore, the chest X-ray of Day 7 was not available to ED clinicians within a working day of being taken, and the radiologist did not telephone ED with the result of the X-ray. I also note that Mrs A was not seen within the recommended triage time on two of the four ED attendances — although this is a common problem in many emergency departments for triage category 2 and category 3 patients. Finally, due to a systems error a discharge summary was not provided following three ED attendances.

When Mrs A was eventually reviewed by an ED consultant (Dr K) on Day 10, he made the correct diagnosis of a thoracic aortic aneurysm, and commenced appropriate treatment. I also note that Dr K was influenced in his management by the report of the Day 7 X-ray, which stated that there was a "suggestion" of an aneurysm. Despite CCDHB's subsequent statements that this X-ray report was no different from the earlier review by ED staff, it undoubtedly provided Dr K with the prompt to reconsider the diagnosis. This is precisely what Dr Clearwater advised would have been the benefit of ED receiving the report at an earlier stage.

Overall, I consider that the care provided to Mrs A over the ten days was somewhat below the expected standard for a New Zealand emergency department. The individual failures, on their own, may not have warranted a finding that the Code of Health and Disability Services Consumers' Rights was breached. However, their cumulative effect was to result in suboptimal care. In these circumstances, CCDHB breached Right 4(1) of the Code by failing to provide care of an appropriate standard. CCDHB also breached Right 4(5) of the Code by failing to ensure co-operation amongst its clinical staff and services, and between secondary and primary care, to ensure quality and continuity of care.

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prevented Mrs A's GP receiving the discharge summaries and that this was not known to clinical staff at the time.

Recommendations

I recommend that Capital and Coast District Health Board:

- Apologise to Ms B for its breaches of the Code.

- Take steps to improve the education of ED staff by ensuring the availability of current Emergency Medicine textbooks and by educational tutorials directed at recognising the signs and symptoms of thoracic aneurysm, and confirm to HDC by **31 August 2008** that it has done so.

Follow-up actions

- A copy of this report will be sent to the Coroner.

- A copy of this report, with details identifying the parties removed, but naming Capital and Coast DHB and Wellington Hospital, will be sent to the Minister of Health, the Director-General of Health, the Quality Improvement Committee, the Australasian College of Emergency Medicine, Quality Health New Zealand, and all district health boards, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Names have been removed (except Capital and Coast DHB/Wellington Hospital) to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's actual name.