

**Northland District Health Board
Locum Medical Registrar, Dr E**

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

Case 09HDC00865



Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Overview

In November 2008 Mrs A (aged 75 years) presented to an accident and medical clinic in Whangarei complaining of two episodes of shortness of breath and chest pain. She was also noted to have low oxygen saturation (83%).¹ It was suspected that Mrs A had pneumonia and she was transferred by ambulance to Whangarei Hospital for further assessment. Her oxygen saturations were again noted by the ambulance crew to be low (83%). Mrs A was triaged in the Emergency Department at Whangarei Hospital where blood tests, an X-ray and an electrocardiogram (ECG) were ordered. She was also put on a monitor to take automatic readings of her pulse, oxygen saturation levels and blood pressure.

Mrs A was seen by a locum medical registrar, Dr E, at 12.30pm. After reviewing the clinical notes, taking a history, examining Mrs A and reviewing her chest X-ray, ECG and partial blood test results, Dr E was unable to ascertain a cause for her symptoms. He wrote a discharge summary for Mrs A at 1.38pm (less than two hours after her admission), with a diagnosis of panic attack, and left the Emergency Department to attend to duties on other wards.

Mrs A left Whangarei Hospital at 2.02pm and returned home. Shortly afterwards she stopped breathing. Attempts to resuscitate her by a family member and ambulance crew were unsuccessful and she died at approximately 5.19pm that evening. A post-mortem was inconclusive as to Mrs A's cause of death but it was most likely coronary heart disease.

Unknown to Dr E at the time of Mrs A's discharge, her full blood test results had become available at 1.15pm, and showed an abnormal troponin² level; and at 1.30pm the automated monitor had recorded a significantly low oxygen saturation level (80%). Dr E was not aware of either of these abnormal results when discharging Mrs A.

Complaint and investigation

On 9 February 2009 the Health and Disability Commissioner (HDC) received a complaint from Mr B and Mrs C about the services provided by Northland DHB to their mother, Mrs A, in November 2008. The following issues were identified for investigation:

- *The appropriateness of the care provided by Northland DHB to Mrs A.*
- *The appropriateness of the care provided by medical registrar Dr E to Mrs A.*

¹ Oxygen saturation levels should be greater than 95%.

² Troponin is a test used to indicate whether a heart attack may have occurred.

The parties involved in this case were:

Mrs A	Consumer
Mr B	Complainant/Consumer's son
Mrs C	Complainant/Consumer's daughter
Northland DHB	Provider
Dr E	Provider/Locum medical registrar
Ms D	Provider/Emergency Department nurse
Ms F	Provider/Triage nurse
A&M clinic	Provider/Accident and Medical Clinic
Dr G	Provider/Accident and Medical doctor
St John Ambulance	Provider/Ambulance service
Mr H	Provider/Ambulance officer

Also mentioned in this report:

Dr I	Clinical Director
------	-------------------

The following information was reviewed:

- Complaint from Mr B and Mrs C
- Response to complaint from Northland DHB
- Response to complaint from Dr E
- Response to complaint from Ms D
- Mrs A's clinical records from Northland DHB, the A&M clinic and St John ambulance
- Mrs A's post-mortem report

Independent expert advice was obtained from Dr Garry Clearwater (emergency medicine specialist) and Dr David Spriggs (physician) and is attached as **Appendices A and B**.

Information gathered during investigation

The accident and medical clinic, Whangarei

Mrs A presented at an accident & medical clinic (A&M clinic) in Whangarei at 10.54am. The triage notes from her initial assessment describe Mrs A as suffering from "progressive shortness of breath which started yesterday" and "some chest tightness". She was noted to have had a rapid heart rate on arrival (110 beats per minute (bpm))³ and low oxygen saturation levels (83%). She was put on an oxygen machine and seen by Dr G who recorded Mrs A's complaint as "increasing [shortness of breath] and marked dyspnea".⁴ Dr G recorded Mrs A's pulse as 86 bpm and noted

³ The average heart rate for a woman is 70-80 bpm at rest.

⁴ Difficulty in breathing.

she had high blood pressure (180/120 mmHg).⁵ His provisional diagnosis was pneumonia and the case was discussed by phone with the medical registrar at Whangarei Hospital. It was decided Mrs A should be transferred to Whangarei Hospital by ambulance for further review.

Dr G wrote a letter of referral, noting Mrs A's symptoms of "progressively worsening dyspnea" that had started the previous day, "acutely short of breath on waking", low oxygen saturation levels and high blood pressure. The letter did not mention Mrs A's complaint of chest tightness.

Transfer to hospital

The records from St John Ambulance note the following history for Mrs A:

"... cough/felt like [she] inhaled biscuit yesterday afternoon, [she] felt a little [short of breath], but slept OK. Today ... acutely [short of breath] ++ when walking and saw [A&M clinic] → [ambulance] called. On presentation to [A&M clinic] slight chest tightness ..."

Ambulance officer, Mr H, advised HDC that Mrs A was taken off the oxygen machine at the A&M clinic to transfer her to the ambulance. He noted that she became acutely short of breath and her oxygen levels decreased to 83%. Mr H advised that this was "significant" for the period of time she was off oxygen for (two minutes). Once Mrs A was put back on oxygen in the ambulance her oxygen levels improved "rapidly" to 99%. An ECG was taken, and oral aspirin was given. The reason for the aspirin was not recorded on the ambulance note but Mr H advised HDC that he had administered it because Mrs A "had experienced chest pain that sounded cardiac in nature".

According to the ambulance report, Mrs A arrived at Whangarei Hospital at 11.33am. Mr H advised HDC:

"We handed over to a staff nurse, where I highlighted the episode of rapid oxygen desaturation that we had experienced upon exiting the medical centre and the ensuing shortness of breath and how quickly it was resolved."

Emergency Department

The triage notes from Whangarei Hospital's Emergency Department record Mrs A's arrival time as 11.43am.⁶ Triage nurse Ms F recorded Mrs A's history of mild shortness of breath the day preceding admission, which was eased by rest. She made no reference to Mrs A's period of oxygen desaturation on transfer to the ambulance, as relayed to her by Mr H.

⁵120/80 mmHg is considered normal; high blood pressure is when the systolic number is greater than 140 and/or the diastolic number is greater than 95.

⁶ This time is likely to be incorrect. Both the ambulance report and the Chief Medical Advisor at Northland DHB note Mrs A arrived at Whangarei Hospital at 11.33am, and the first reading from an automated monitor attached to Mrs A was taken at 11.42am.

Mrs A's blood pressure remained high (186/124 mmHg), as did her pulse (99 bpm) and her oxygen saturation is recorded as 92% on room air at 11.43am. Ms F ordered a chest X-ray, and noted that Mrs A appeared comfortable, her pain score was zero, and she had been given aspirin by the ambulance crew. Mrs A's identity stickers incorrectly recorded her surname by omitting one letter.

ED nurse Ms D set up Mrs A on a machine that takes automatic recordings of vital signs (pulse, blood pressure and oxygen saturation levels) on a periodic basis. Northland DHB advised HDC that the readings taken from the machine are relayed onto a screen above the patient's bed and are stored in a central monitoring system that is available for all staff to view at the central nurses' station.

Between 11.42am and 1.30pm the machine recorded 14 oxygen saturation levels: 90% (11.42am); 94% (11.50am); 96% (12.00pm); 91-92% (12.18pm–1.01pm); 80% (1.30pm).

At 12.19pm Ms D recorded Mrs A's oxygen saturation as 93% in the nursing progress notes. Ms D also inserted an intravenous line and ordered blood tests (full blood count, urea and electrolytes and troponin). However, she omitted to record in Mrs A's clinical notes that troponin had been ordered.

Review by Dr E

Mrs A was reviewed by locum medical registrar Dr E at around 12.30pm (he had previously spoken with Dr G on the telephone regarding Mrs A). Dr E advised HDC that he reviewed Mrs A's notes which contained the GP's referral letter (from Dr G) and the ED notes. They did not contain the ambulance report. Dr E's notes record that Mrs A was referred by a GP for investigation of shortness of breath and low oxygen saturation levels (83% on room air). He noted that the first episode of shortness of breath "lasted < 1 minute and occurred with coughing", and that the second episode of shortness of breath occurred "when going walking, panic[k]ed and felt like [she] was going to pass out". Dr E further noted that the oxygen saturation recording of 83% at the GP's was done on a "cold hand"⁷ and he therefore thought this recording was likely to be an error. Dr E also elicited that Mrs A had been treated for high blood pressure. The medical notes do not record any enquiry regarding chest pain, chest tightness or any history of heart disease.

Dr E's examination revealed Mrs A was suffering from hypertension⁸ on admission (which he put down to stress). Her blood pressure remained elevated but had reduced to 157/107 mmHg when Dr E examined her and her pulse was recorded as 88 bpm. Dr E advised that Mrs A's JVP⁹ was not elevated and there were no signs of peripheral oedema.¹⁰ Her calves appeared symmetrical in size and there was no tenderness on

⁷ Dr E advised HDC that on examining Mrs A he found her to have cold hands. He also noted that the nurse in ED had placed the oxygen saturation probe on Mrs A's ear and that this would sometimes be done if oxygen readings were difficult to obtain from a monitor placed on the patient's finger.

⁸ Mrs A's blood pressure on admission was 186/124 mmHg.

⁹ Jugular venous pressure. Doctors can estimate the blood pressure in the jugular vein by observing it closely. An elevated JVP can indicate right sided heart failure.

¹⁰ Accumulation of fluid in the tissue of the ankles and legs. This can indicate heart failure.

examination. Cardiovascular and abdominal examinations were normal, as was her breathing (there was good air entry bilaterally and no wheeze). Mrs A's oxygen saturation levels were recorded as 95%; however, it appears to be written as 92% and then altered to 95% (the change is not initialled). Dr E explained this alteration to HDC:

“O2 saturations had remained at 95% with occasional readings of 96%. I had recorded 95% on the patient notes as this was the last reading that I saw on the monitor before I started to write up the notes. I had initially written 92% as was recorded on the triage observation but changed this to my own observation of 95%. I did not sign this alteration as it had been changed immediately.”

Dr E explained to HDC that he did not request a troponin blood test as Mrs A did not report any chest pain and, as the episode of shortness of breath had lasted for about five minutes, he “was not suspicious of a cardiac source for the shortness of breath”. Dr E noted there were no signs of pneumonia on her chest X-ray and her ECG did not show any signs of cardiac disease. As he could not identify any cause for her symptoms, his impression was “panic attack causing [shortness of breath]”.

Blood test results

Dr E started to write up his findings at about 1pm, and at the same time he checked Mrs A's blood test results on line.¹¹ While doing so, he received “calls from the wards to review patients, including one from [coronary care unit]”. Dr E advised HDC:

“I quickly noted the blood results that had come up on screen and noted that apart from CRP,¹² which was 11 and mildly elevated, all other reported results were normal. I printed off the lab results to save myself time from writing the results at the end (which is my usual practice) and did not notice that a troponin was pending on the results. If I had noticed this I would not have discharged [Mrs A] until it had come back.”

Dr E advised that this departure from his usual practice, of writing up the patient's blood test results in their notes, contributed to his failure to notice the pending result.

It is not possible to tell from the printout of Mrs A's blood test results when they became available, but the Chief Medical Advisor at Northland DHB advised HDC that the results became available at 1.11pm.

The printout of blood test results (which was initialled by Dr E) listed all Mrs A's results except troponin, which was listed as “pending” (as it takes longer to process). The results were headed “Partial Results” and these words were repeated in the sub-header of the results.

¹¹ Patient test results are available to medical and nursing staff electronically in the ED at Whangarei Hospital.

¹² C-reactive protein. An elevated CRP result indicates infection or inflammation.

Elevated troponin result

A finalised lab report was subsequently generated showing an elevated troponin test (0.10 ug/L compared to a normal range of 0.00-0.03 ug/L). Again, it is not possible to determine from the report when it became available, however the Chief Medical Advisor advised that it became available electronically at 1.15pm. Dr E was not contacted about the elevated troponin result and he did not follow up the result as he was unaware results were pending.

Last vital signs reading

At 1.30pm the machine taking automatic recordings of Mrs A's vital signs was switched off. (It is not known who switched the machine off.) The last recording at 1.30pm showed a very low oxygen saturation of 80% and rapid pulse of 102 bpm.

Discharge

After reviewing the partial blood test results (but not the finalised lab report showing elevated troponin) Dr E advised Mrs A he could not identify a cause for her symptoms, but they were possibly explained by a panic attack, and she should follow up with her GP as needed. He then "quickly typed a very brief discharge summary" in the doctors' office in ED and placed this in Mrs A's notes before attending to other patients on the wards. Dr E's discharge summary was printed out at 1.38pm and contained the following information:

Diagnoses:

Primary: [b]rief period of SOB – likely panic attack

Secondary: [hypertension]

Clinical information

GP referral with SOB with likely panic attack.

[Oxygen] stats 95% on [room air]

Procedures/investigations

Chest X-ray – normal

ECG – normal

Recommendations

GP follow up as required"

At the time of typing the discharge summary, Dr E was not aware of the low oxygen saturation reading from the automated monitor at 1.30pm. No one advised him of the low reading, and the printout containing the reading was not added to Mrs A's notes until after he had left ED. Dr E advised HDC that, had he been notified, he would have "reviewed [Mrs A] and more than likely would have decided to run further tests with a view towards admission".

Ms D was not aware of the low oxygen saturation reading until some time after Mrs A's discharge. This is because, while readings are printed out when the monitor is turned off, they are not collected until after the paper work is completed. Ms D would not therefore have seen the printout from the automated monitor until after Mrs A had

been discharged, and it would not have been added to the notes until after Mrs A had already left ED.

Ms D provided HDC with some additional information regarding automated monitoring. She advised that if the readings from the monitor fall below or rise above a pre-programmed range, an alarm will sound; and that if a probe is not attached to the patient correctly, or if the probe is being removed by the patient as the monitor is taking a reading, it can result in a false reading being recorded.

Ms D can not recall if she switched off the monitor, or if this was done by someone else. However, she notes that the low oxygen saturation reading was recorded at 1.30pm, which was the same time the monitor was switched off. Ms D believes it is therefore likely that Mrs A was removing the probe at this time, in preparation for discharge, and the person switching off the machine would have attributed the low reading to the fact the probe was being removed.

Ms D recorded Mrs A's discharge in the nursing progress notes at 2.02pm:

“[Patient] given [discharge paper]. IV luer removed. Nil further concerns – circulation good. Warm peripherals. [Nil] shortness of breath. [Nil] pain.”

Family's account

Mrs A's family recall that their mother questioned the doctor twice about his diagnosis of panic attack. They also advised that at the time of discharge, their mother was in a very weak state; she was not able to sign the discharge form and required a wheelchair to assist her to the car.

After discharge

Mrs A returned home and lay down. Shortly afterwards she stopped breathing and a family member performed CPR on her. Mrs A woke up, vomited, and soon afterwards stopped breathing again. An ambulance was dispatched to Mrs A's home at 4.39pm and arrived at 4.49pm. The ambulance report recorded that CPR was continued unsuccessfully until 5.19pm.

Later review of troponin result

Mrs A's troponin result was not reviewed by anyone at Whangarei Hospital until 8.06pm when the Emergency Department consultant became aware that Mrs A had died. An addendum to the clinical notes made by Dr E at 8.45pm states:

“As patient denied chest pain and no calf tenderness on exam [troponin T] was not requested. However this had been done and was found to be 0.10.”

Post-mortem

A post-mortem was performed the next day. The “most likely cause of death” was attributed to coronary heart disease, subject to the toxicology results. The toxicology results showed no abnormalities.

2 December 2008 - Meeting with Clinical Director

On 2 December 2008, Dr I, Clinical Director at Whangarei Hospital, met with Mrs A’s family. The family recall Dr I informing them of the troponin result and that it was not received until after Mrs A’s death; that the diagnosis of panic attack was incorrect; that Mrs A should not have been discharged from hospital until all results had been reviewed; and that Mrs A had a treatable condition and there may have been a different outcome if she had been kept in hospital.

Letter from Dr I to the family

A letter from Dr I was sent to the family a few weeks later, to “help clarify some of the points ... discussed at [the meeting]”.

The letter states that Mrs A was:

“sent from [the A&M clinic] to Whangarei Hospital by ambulance mainly because her oxygen levels were noted to be very low. These levels had returned to normal by the time she arrived at Whangarei Hospital. It was the assessment of the doctor at the time ... that the low recording was probably an artificial one. Unfortunately none of the information including the post-mortem result has given us a clear understanding as to why the oxygen levels had been like this at [the A&M clinic].”

Dr I admits that the troponin test was “mildly but definitely abnormal” and states:

“[I]f the result of this test had been known prior to [Mrs A] leaving hospital, then it is unlikely that discharge would have occurred ... It was the clinical judgement of the doctor ... that [Mrs A’s] features were not suggestive of a heart attack and therefore he did not feel that this blood test was actually required.”

Dr I then reiterates the pathologist’s opinion that, while Mrs A most likely died from a heart attack, there “was not actually definite evidence of this”. Given Mrs A’s atypical symptoms and the “unhelpful post-mortem”, the DHB is “left uncertain as to the cause of [Mrs A’s] death, the meaning of the symptoms which led to her presentation ... and what we should do differently to prevent a similar death in the future”.

Relevant changes

The DHB acknowledged (in Dr I’s letter of 12 December) that the case highlighted some areas it could improve on, and provided the following advice on the relevant changes it had made since these events:

1. A teaching session on diagnosis and management of panic attacks, and their differential diagnoses, has been included in the RMO training

programme. This is being taught in conjunction with a teaching session on assessment of shortness of breath in the Emergency Department.

2. It is reinforcing to junior doctors the importance of treating those people who have required transport to hospital by ambulance with “utmost seriousness” even if their symptoms do not point to a clear, serious illness.
3. New triage documentation for ED staff has been developed, including a checklist for nurses to record investigations ordered and a checklist for doctors to confirm that they have viewed the results.

The DHB initially advised HDC that it had implemented two new procedures in regard to processing of troponin results. The first new procedure required the laboratory staff to alert the Emergency Department by phone whenever there was an abnormal “ED-requested” troponin result. The second new procedure required the laboratory to delay issuing any urgent biochemistry results until every biochemistry investigation requested was available. The Chief Medical Advisor advised:

“This forces the clinician to pause until all results are available (except for emergencies when the initial results can be requested by telephone) and ensures that pending results are not overlooked ...”

The DHB subsequently advised that these two initiatives had been discontinued. With regard to the telephone alert of abnormal troponin results, the DHB found that the extra demand on laboratory staff time “caused laboratory turn around time to drop significantly, so that only 30% of troponin results were out within an hour”. All troponin results are now released automatically by the laboratory software, which means that over 60% of results meet the one hour target.

In relation to delaying the issue of results until all results are available, the DHB advised:

“... [T]he laboratory’s auto-release software now releases results by analyte group — so, for instance, liver function tests as a group may be released immediately ... rather than waiting for a troponin which takes longer to analyse, but other cardiac enzyme results would not be released until the troponin was available.”

Dr E

Dr E graduated from an overseas university in 2003. He worked for one year as an intern in his home country. He then spent two years as a house officer and senior house officer in various departments¹³ at a New Zealand hospital, followed by 15 months as a senior house officer at another New Zealand hospital.¹⁴

At the time of this incident, Dr E was in his sixth week as a locum medical registrar at Whangarei Hospital (his first position at registrar level). It was his first weekend on

¹³ Obstetrics & gynaecology, orthopaedics, paediatrics, cardiology and general medicine.

¹⁴ Working in obstetrics & gynaecology and general medicine.

call as a general medical registrar. He was the sole medical registrar on duty and was rostered to work in ED as the admitting registrar. He had worked the preceding six days, including a 15 hour shift the day prior to Mrs A's admission. He was due to work a 15 hour shift that day, and was rostered to work the next five days before having two days off.

In response to Dr Spriggs' initial advice, Dr E acknowledged that his diagnosis of panic attack was unusual in a woman of Mrs A's age. He advised HDC that he had considered, and ruled out, other possible causes before reaching this diagnosis. For instance, he did not think a cardiac cause for her symptoms was likely given the lack of other supporting symptoms (no reported chest pain and the episode of shortness of breath lasting for five minutes). He had also considered a possible pulmonary embolism¹⁵ but "with no clinical signs of DVT,¹⁶ lack of pleuritic sounding chest pain,¹⁷ or any reported chest pain" he also thought this to be unlikely, especially when Mrs A's oxygen saturations had been 95% on examination.

Dr E explained why he did not believe Mrs A was suffering from hypoxia, despite the clear documentation suggesting otherwise. First, he thought (although he was not sure) that the oxygen saturation taken at the A&M clinic was done on a cold hand, and therefore was unlikely to be accurate. Secondly, he was unaware of the low oxygen saturation noted by the ambulance crew as the ambulance transfer note "was not on the file". Thirdly, while not commenting on the oxygen saturation record in the triage notes of 92% at 11.43am, Dr E did comment on the observation of 93% made at 12.19pm:

"This recording would have been in the notes at the time, but I relied on my own observation of the oxygen saturation levels when making my assessment of the patient."

Lastly, with regard to the discrepancy between the printout of recordings from the automatic monitor (recording 10 mildly low oxygen saturations between 12.18pm and 1.01pm and one significantly low saturation at 1.30pm) and his own observations, Dr E explained:

"The oxygen saturations which I have recorded in the notes were observations which I had made while seeing [Mrs A]. The recordings which I had noted in my history and examination finding were being displayed on the monitor at the patient's bedside and I would have made these observations at a time between 12.30[pm] and [1pm].

...

¹⁵ A blood clot in the lung. Symptoms include difficulty breathing, chest pain on inspiration, and palpitations.

¹⁶ Deep vein thrombosis – the formation of blood clots in major veins. The most serious complication of a DVT is that the clot could dislodge and travel to the lungs (a pulmonary embolism).

¹⁷ The "pleura" is the thin covering that protects and cushions the lungs. A squeaky rubbing sound may be heard if it is inflamed and may indicate a lung infection, or less commonly lung cancer, pulmonary embolism or rheumatoid arthritis.

I note that on the printout of the 8 hour tabular trend that the final reading at [1.30pm] indicated that [Mrs A's] [oxygen] saturation was 80%. These were not in the patient's notes at that time and I had not been notified of these readings prior to her discharge ...”

Dr E advised HDC that he did not consider it necessary to call his supervising consultant, Dr I, to discuss Mrs A's case as she had recovered from her episode of shortness of breath, her oxygen saturations were 95%, and she was feeling better at the time he last saw her.

Dr E also advised that, at the time he saw Mrs A, he was very busy with other work. He received a number of phone calls from the wards and the Coronary Care Unit (CCU) while writing up her notes and reviewing her blood test results. He accepts that he did not notice the pending troponin result; but had he done so, he would have waited for this result before making a decision about whether to discharge Mrs A.

Dr E acknowledges that, if he had had “a higher level of suspicion and been more thorough when reviewing the blood results”, the outcome may have been different. He commented further:

“On reflection I believe that as this was my first weekend working as a medical registrar, my busy workload, being relatively new to the hospital and the stress of having some very sick patients who were in need of close medical supervision all contributed to how I acted on [that day]. But ultimately I entirely accept that being busy is not an excuse and I should have had a higher index of suspicion to other potentially serious causes for [Mrs A's] symptoms.”

Dr E advised HDC that since these events he has reviewed how he deals with patients presenting with unexplained shortness of breath:

“[I] now undertake to investigate more thoroughly anyone presenting with such symptoms as to possible causes regardless of duration of the symptoms. I feel that [Mrs A's] case highlights even apparently normal initial investigations are not sufficient to exclude a more sinister underlying cause. I now routinely take troponin on patients presenting with shortness of breath (even without complaint of chest pain) where no other cause for the shortness of breath can be identified, and perform serial monitoring of troponin. I record all admission blood results in the patient's notes by transcribing them by hand to ensure I don't over look any abnormal results or any outstanding results. This had been part of my normal practice but on this occasion in an effort to be more efficient with my time usage I had deviated from my normal practice with disastrous consequences. I also allow more time to reassess patients and perform serial monitoring of both bloods and observations as both of these would have alerted me to [Mrs A's] deteriorating condition prior to her discharge. I also try to allow more time to seek senior advice with regards to patient's management and don't see a heavy workload as a sufficient excuse not to ask for advice ...”

Dr E also offered the following apology to Mrs A's family:

“I would like to take this opportunity to offer my sincere apology to the family of [Mrs A] for what has happened. I cannot imagine the stress and suffering that the unexpected death of their wife and mother has caused them. I keep going back over that day in my mind and wish there was some way I could [have] altered the eventual outcome. I wish I had noticed the troponin test was pending and would have waited for a result to come back before making a decision as to what to do. I have looked thoroughly at my practice on that day and feel that I have improved on certain areas that were in need of change.”

Support available

Dr I was the general medicine consultant on call that weekend. Dr I came into Whangarei Hospital that morning to assess the patients who had been admitted in the preceding 24 hours. Dr I left the hospital after the ward round but was able to be contacted by telephone for advice and support and could attend the hospital if required.

Northland DHB advised HDC that, while Dr I does not recall giving Dr E specific advice to contact him before discharging patients,

“it is a general expectation that registrars will have a low threshold for contacting consultants for advice, and consultants at NDHB make themselves readily available for this. Nonetheless, registrars at NHDB are allowed to discharge patients home without prior consultant approval or advice if they feel confident to do so. We would be open to considering introduction of a rule that registrars should discuss all cases with consultants prior to discharge. However this would be a significant culture change, it would add to the time taken to discharge patients and to the workload of both consultants and registrars, and it would probably be an inappropriate and unnecessary expectation for senior registrars.”

Northland DHB also advised HDC that Dr E had immediate access to an ED consultant for urgent help if required.

With regard to the broader support systems, Dr E advised HDC that the registrars were “regularly asked to cover gaps in the roster” as it had only 8 registrars (out of a usual complement of 11); and that while regular training was provided to permanent RMOs on Wednesday lunchtimes, Dr E was not permitted to attend these sessions as he was a locum and therefore required to cover staff attending the training session.

Opinion: Breach — Dr E

Diagnosis

Dr E's primary diagnosis was “[shortness of breath] with likely panic attack”. My physician advisor, Dr Spriggs, considered this an unusual diagnosis in the

circumstances. Mrs A was 75 years old, had no history of panic attacks and was suffering from hypoxia.¹⁸ Dr Spriggs advised that it would be unusual for a 75-year-old to be suffering from a panic attack if she had no history of such attacks; he also advised that panic attacks are “not consistent” with hypoxia.¹⁹

As noted earlier, Dr E accepts that “panic attack” was an unusual diagnosis for a woman of Mrs A’s age; however, he did not think Mrs A was suffering from hypoxia.

Dr E says that he was only aware of one significantly low saturation reading (the reading taken at the A&M clinic) but he believed this was inaccurate as it was done on a “cold hand”. He had not seen the ambulance transfer note that recorded a second significantly low oxygen saturation as it had not been in Mrs A’s notes. Also, he did not view the printout from the automated monitor recording a significantly low oxygen saturation of 80% at 1.30pm, and was not notified by anyone in ED of this abnormal reading.

Northland DHB has not commented on the missing ambulance report, but it has advised HDC (in regard to another point) that if “relevant recordings or observations are not in the file, the medical staff are expected to ask for them”. I note the advice from my emergency medicine specialist, Dr Clearwater, that ambulance reports are valuable sources of supplementary information that “should be routinely available in the medical notes”. I discuss this below in relation to Northland DHB.

Quite apart from any DHB systems failure, it may have been reasonable for Dr E to ask for the ambulance transfer report, as there was information on Mrs A’s file to alert him to the fact that she had arrived by ambulance.²⁰ Dr Clearwater has suggested that the DHB include as part of orientation “at least a brief reference” to the value of ambulance reports as part of the initial medical assessment.

With regard to the abnormal oxygen saturation reading taken from the automated monitor at 1.30pm, it is clear that Dr E was reliant on ED nursing staff to alert him to any abnormal readings from the machine after he had finished assessing Mrs A.

As Dr Spriggs notes, there is no evidence that Dr E had any further contact with Mrs A after accessing her laboratory results between 1.11pm and 1.15pm. It is likely that Dr E was typing up Mrs A’s discharge summary at the time of the abnormal reading at 1.30pm (the discharge summary was printed at 1.38pm), and immediately thereafter he was called away to assess patients in other wards.

Dr Spriggs advised:

“It would not be reasonable to expect a busy registrar to scan the monitors on all his patients just in case there was a new abnormality. It would be usual for the nurse caring for the patient to identify any major changes in the patient’s

¹⁸ Deprivation of adequate oxygen supply to the body, identified by low oxygen saturation levels.

¹⁹ Patients suffering from shortness of breath due to a panic attack will often hyperventilate, which in turn will usually lead to high, rather than low, oxygen saturation levels on air.

²⁰ The triage nurse had recorded “Given aspirin by ambulance crew” in Mrs A’s triage notes.

condition, be it on monitoring or on clinical grounds ... The nurse would then let the doctor know of such a change.”

The Chief Medical Advisor at Northland DHB concurred with Dr Spriggs, stating:

“... [I]t would have been necessary for nursing staff to call [Dr E] if they had detected any deterioration after his assessment and before [Mrs A’s] actual departure.”

I do not therefore consider it reasonable to expect Dr E to have noticed the abnormal reading at 1.30pm. This was the responsibility of nursing staff (discussed below).

With regard to the mildly low recordings noted by Ms D, Dr E admits that he was aware of these. However, he preferred to assess Mrs A based on his own observations of her saturation levels. He advised HDC that between 12.30pm and 1pm he observed that Mrs A’s oxygen saturations “remained at 95% with occasional readings of 96%”. I note that Dr E’s observations are at odds with the printout of automated recordings for the same time period, which shows Mrs A had consistently mildly low oxygen saturations. In fact, Dr E had initially documented a mildly low oxygen saturation of 92%. This was later changed to 95%. It is not clear when this was changed, and the change was not initialled. Dr E advised HDC that he initially documented 92% as this was the figure in the triage documentation, however he later amended this to 95% as it was the last reading he viewed on the monitor. He advised that he did not sign the alteration as it was changed “immediately”.²¹

Neither Dr E nor Northland DHB has provided an explanation for the discrepancy between the readings on the printout and Dr E’s observations for the same time period. However, I do not consider it is necessary to reach a determination on this point. Regardless of whether Mrs A’s oxygen saturation levels were mildly low between 12.30pm and 1pm, there was already information available to Dr E indicating that Mrs A had suffered hypoxia,²² and that a “panic attack” was therefore unlikely to explain her breathlessness.

In my view, Dr E did not exercise reasonable care and skill in concluding that Mrs A was simply suffering from a panic attack, without ruling out other, more serious differential diagnoses. The diagnosis of panic attack is one of exclusion and Dr E does not appear to have appreciated that short severe attacks of shortness of breath in this age-group are much more likely to be a cardiac symptom, and to have taken sufficient steps to rule out this possibility.

Failure to review full blood test results

When Dr E reviewed Mrs A’s initial laboratory results online some time between 1.11pm and 1.15pm, he believed he was viewing her full results, which he found to be

²¹ Dr Clearwater advised that, ideally, notes should not be amended retrospectively. If they are, the changes should be countersigned.

²² The significantly low reading taken from the A&M clinic and the two mildly low readings recorded by Ms F at 11.43am and Ms D at 12.19pm.

“essentially normal”. He did not notice that the results were headed “Partial results” or that the troponin result was listed as “pending”.

Mrs A’s full blood test results, which included an abnormal troponin result, became available at 1.15pm. However, Dr E was not aware of this result until that evening when he was told about her death.

Dr E had not requested the troponin test. This had been requested by Ms D as part of the initial investigations in ED.²³ However she failed to document this in Mrs A’s notes. Dr Clearwater advised that this failure to document was minor, and that Dr E, who had a “clear indication that the result was pending”, had primary responsibility for checking the result. Dr Spriggs confirmed this advice, and further noted that Dr E’s failure to review the complete set of test results “almost certainly meant that Mrs A was discharged prematurely”.

Dr E advised HDC that at the time of reviewing the results he was very busy. He was interrupted by phone calls to review patients on other wards and, after quickly viewing the results on the computer screen he printed them, instead of following his usual practice of writing up the results at the end. Dr E believes it was this departure from usual practice that resulted in him missing the pending troponin result.

While it was clearly inadequate to miss the pending troponin result, Dr Spriggs advised that, as Dr E was acting as a busy, junior registrar, his peers would consider this oversight with mild disapproval.

Decision to discharge

Even accepting that Dr E did not consider Mrs A had suffered hypoxia and was unaware of the abnormal troponin result, Dr Clearwater is critical of Dr E’s decision to discharge Mrs A when he did.

He points out that Mrs A, a 75-year-old woman with no history of panic attacks, had suffered two unusual episodes of breathlessness. Dr Clearwater advised that unexplained shortness of breath can have “a number of serious causes, including cardiac ischaemia with mild heart failure, an arrhythmia, a pulmonary embolus or gastrointestinal bleeding (to name a few)”.

Dr Clearwater further advised that any of these conditions may produce normal blood tests; and that patients, especially older patients, can have significant myocardial ischaemia without any chest pain or tightness and it can occur with a normal troponin test. Therefore, in Dr Clearwater’s opinion, the crucial issue was Dr E’s decision to discharge Mrs A less than two hours after admission, preventing further observation and investigations to rule out more serious causes for her unexplained shortness of breath.

²³ Dr Clearwater advised that in many EDs it is considered more efficient for nursing staff to take blood tests as soon as possible, rather than adding further delay waiting for a doctor to assess the patient. He advised that it was reasonable for Ms D to request a troponin test in light of Mrs A’s symptoms.

Insufficient consideration to myocardial ischaemia?

Dr Clearwater notes there is no recorded enquiry in Mrs A's notes regarding chest pain, chest tightness or history of heart disease. Ms F had recorded "given aspirin by ambulance crew" in the triage notes and this information was available to Dr E at the time he assessed Mrs A.

However, Dr Clearwater also points out that those who assessed Mrs A prior to Dr E omitted vital information from the notes that could have prompted him to consider more carefully the possibility of myocardial ischaemia.

First, Dr Clearwater notes that the referral letter from Dr G to Whangarei Hospital "did not mention any chest pain or tightness although these were recorded on the clinic notes".

Second, there is no recorded enquiry by Ms F about chest pain, chest tightness, or history of heart disease, despite two important cues in the ambulance report. It contains the words, "on presentation to [the A&M clinic] slight chest tightness", and it records that aspirin was administered to Mrs A during the ambulance transfer. Dr Clearwater notes that had Ms F mentioned in the triage documentation whether Mrs A had chest pain or chest tightness, this could have alerted Dr E to consider myocardial ischaemia more carefully (especially in these circumstances, when the ambulance report was not available for Dr E to review).

Dr Clearwater does acknowledge, however, that the primary clinical concern (of Dr G and St John Ambulance) was shortness of breath. He therefore "would expect the triage process to be influenced by the referral letter".

Adequacy of changes

Dr Clearwater believes that the changes made by Dr E to his practice since these events are "commendable", and Dr Spriggs comments that Dr E "has clearly learnt from this error".

Mitigating factors

Dr Clearwater advised that, from an ED perspective, Dr E was working under "arduous conditions that potentially increased the risk of tiredness and errors". It is not acceptable or safe for a junior registrar to work 15 hour shifts in an emergency service. Dr E had worked a 15 hour shift the previous day and came to ED that morning expecting to work 15 hours as admitting registrar.

Dr Clearwater further notes that Dr E was employed by Northland DHB as a locum at registrar level; however, his only previous experience was as a house officer and senior house officer. Ideally, locums would be employed on the basis of having worked previously in that role, with relevant experience and skill.

Dr Spriggs notes that while Dr E was adequately experienced for the role of medical registrar, he was a very junior registrar doing his first weekend on call. Accordingly, he required a higher level of support than he received from senior colleagues. While there was a general expectation registrars would call the "on call consultant" if they

were worried, Dr E was not advised to keep his senior colleagues informed. I endorse Dr Spriggs' following comment:

“There remains a culture in New Zealand of junior doctors not wanting to ‘bother the boss’. It is important that DHBs and individual consultants encourage junior doctors to consult widely before making discharge and other critical decisions.”

Dr Spriggs believes that it would have been appropriate for Northland DHB to insist that new locum registrars working in ED make either the ED senior medical officer or consultant physician aware of all patients before discharge. Dr Clearwater agrees with this, and notes that at his workplace, all new staff, “particularly those who are starting out as locums or in new registrar roles” are, for a defined period (depending on their skill and experience), advised to discuss all cases for discharge with an experienced colleague or supervisor before finalising the decision. Dr Clearwater does not believe this would “add too much of a burden” to senior staff, as such consultation would “not [be] necessary for admitted patients” (who are “automatically reviewed”). It would only be necessary for the “fairly small” number of cases where the patient is not admitted to hospital and is discharged directly from ED.

Dr Spriggs also notes that Dr E's orientation was “of a geographic nature only” and he was excluded from the regular training sessions for registrars on the basis that he was a locum, yet he was working full time at the DHB from 25 September 2008 to 22 February 2009. As Dr Clearwater notes, Dr E “carried the responsibility of a registrar without the full range of training available to permanent employees”.

Dr Spriggs believes that the orientation, education, supervision and support provided to Dr E by Northland DHB fell below an appropriate standard.

Conclusion

Dr E's diagnosis of “panic attack” was inappropriate in light of Mrs A's history and symptoms. He failed to place any significance on the hypoxia recorded at the A&M clinic and in the triage notes; and he was not alert to the second episode of hypoxia in the ambulance, although he would have been aware if he had requested a copy of the ambulance report.

Furthermore, Dr E did not notice that a troponin result was pending. Had he done so, he would have awaited the result (which became available only a few minutes after the initial results) before making a decision whether to discharge Mrs A. Once the abnormal troponin result became available, Dr E would almost certainly have been alerted to the possibility of a more serious cause for Mrs A's breathlessness, and kept her in hospital for further investigation.

Even if the troponin test had come back normal (or one had not been requested in the first place), Dr E's decision to discharge Mrs A when he did was inappropriate. There were a number of potentially serious causes for her episodes of breathlessness (which would not have caused abnormal blood test results), which had yet to be investigated and ruled out.

At the time of these omissions, Dr E was working under difficult conditions. He was very busy, quite junior, and poorly oriented for the position, and did not have the formal training opportunities that were available to permanent registrars. However, while DHBs have a responsibility to ensure they have adequate policies in place to minimise human errors, and provide junior doctors with reasonable working conditions, individuals must also take responsibility for their own actions and omissions. As noted in case 08HDC04311:

“Junior doctors who accept responsibility for the care of patients ... should expect to have their actions scrutinised when their patient’s care is compromised. Being held accountable for one’s actions is the flipside of the privilege of registration as a health professional and of accepting responsibility for the care of patients. Accountability goes with the territory. It must be applied fairly, taking into account the context in which the health professional was working (including any ‘system factors’).”

I made a similar point in case 07HDC14539 (which concerned a junior doctor who failed to diagnose a very rare spinal condition), where I noted:

“Junior doctors have a high level of responsibility in the ED. They should ensure they are familiar with any relevant guidelines, not hesitate to seek senior review, and delay the patient’s discharge until appropriate investigations have been undertaken.”

Although senior colleagues were available to provide advice, Dr E did not consult anyone. Nor had he taken any steps to alert management to the pressures he was facing. If junior doctors feel they are unable to practise safely in the conditions they are working in, they need to voice their concerns and seek help.

To his credit, Dr E has accepted responsibility for his mistakes, which have clearly had a profound impact on him, and has offered an apology to Mrs A’s family. Nonetheless, I conclude that, by his omissions, Dr E breached Right 4(1) of the Code of Health and Disability Services Consumers’ Rights (the Code).²⁴

Opinion: Breach – Northland DHB

Introduction

It is to Northland DHB’s credit that Dr I promptly and openly disclosed to the family (at a meeting on 2 December 2008) that Mrs A had been discharged prematurely and that her condition had been misdiagnosed. I commend the DHB on putting open disclosure into practice in this way. It is the right thing to do. The DHB has also made a number of changes to fix deficiencies identified in this case.

²⁴ Right 4(1) states: “Every consumer has the right to have services provided with reasonable care and skill.”

However, open disclosure and remedial steps do not necessarily preclude the need for further inquiry by an independent reviewer, as has occurred in the HDC investigation reported herein.

Orientation/training/support/supervision

In my opinion the orientation and training offered to Dr E was inadequate. Locum junior doctors (even relatively experienced registrars such as Dr E) need to be carefully selected and orientated for locum positions in public hospitals. In my view, prospective locums should be formally interviewed by clinicians from the service they will be working for. (It appears that Dr E was not interviewed by anyone at Northland DHB prior to his appointment.) Once they take up an appointment, locums should receive a formal orientation to the new position and services, and there should be regular meetings between the locum and his or her supervisor.

Orientation for Dr E was “of a geographic nature only” and he was excluded from the regular training sessions for registrars on the basis that he was a locum, even though he worked full time at Northland DHB from 25 September 2008 to 22 February 2009. As Dr Clearwater noted, Dr E “carried the responsibility of a registrar without the full range of training available to permanent employees”.

The level of support and supervision for Dr E was also inadequate. He was working long hours as a locum at registrar level (his only previous experience being at house officer level). Dr Clearwater described this as “arduous conditions that potentially increased the risk of tiredness and errors”. Northland DHB should have been aware of the risk factors (no previous registrar experience, new to the hospital, first weekend on call, etc) and taken appropriate steps to support Dr E. In particular, the DHB should have insisted that Dr E discuss all cases for discharge with an experienced colleague or supervisor before finalising the decision.

I note Dr Spriggs’ view that the orientation, education, support and supervision provided to Dr E by Northland DHB fell below an appropriate standard to a moderate degree.

These are significant failings, which played a part in Mrs A’s premature discharge. Had Dr E been better supported, and advised to consult a senior colleague prior to discharging patients from ED, it is likely the pending troponin result and the “unusual diagnosis” would have been noticed, and steps taken to rule out other, more serious causes for Mrs A’s symptoms.

As noted earlier, Northland DHB advised HDC that it would be open to considering the introduction of a new rule whereby registrars are required to discuss all cases with consultants prior to discharge. To apply this requirement to all registrars, regardless of their skill and experience, may exceed what is required. I am attracted to Dr Clearwater’s suggestion that all new ED staff (especially new locums or registrars), for a set period (depending on the individuals’ experience and skill), be required to discuss all cases for discharge with an experienced colleague before finalising the decision. This requirement would apply only to those cases where the patient is being discharged directly from ED, not where the patient has been admitted.

Northland DHB has also advised HDC that since these events it has included a teaching session about panic attacks in the RMO training programme. Although this teaching session could be useful if it cautions doctors about making the diagnosis of “panic attack” lightly, Dr Clearwater advised:

“ ... [I]t would be more important to emphasise teaching and guidelines regarding assessment of patients with acute shortness of breath in general. A guideline could point out that many patients with myocardial ischaemia will not have classic complaints of chest pain and a high proportion may have atypical symptoms such as dizziness, weakness, nausea or shortness of breath — and that is more likely to be the case in higher-risk patients such as diabetics or older people.”

In response to Dr Clearwater’s comments, the DHB advised that “the additional training on diagnosis of panic disorder is being provided in conjunction with a teaching session on assessment of shortness of breath in the Emergency Department”.

Dr Spriggs also noted that RMO teaching sessions are usually aimed at house officers (Dr E was a registrar) and that Northland DHB should therefore “assure the Commissioner that Medical Registrars will receive this teaching on an ongoing basis”.

Northland DHB responded that it had chosen to provide the teaching session on shortness of breath and panic disorders to house officers, “as it is relevant to all specialities and needs to be in place before doctors reach medical registrar level”. However, I endorse Dr Spriggs’ observation that “it can not be assumed that new doctors arriving in Northland have had such teaching in their previous employment”.

Transfer of information from automated monitor

On arrival in ED Mrs A was put on a monitor that took automated readings of her pulse, blood pressure and oxygen saturation levels. The DHB advised that the readings were displayed on a 17 inch screen above Mrs A’s bed, and that the data collected from the monitor is stored at the central nurses’ station.

The printout from the monitor shows that at 1.30pm Mrs A had significantly decreased oxygen saturations (80%) and was relatively tachycardic (102 beats per minute). Yet nothing was done in response to this and Mrs A was discharged at 2.02pm.

As noted earlier, it was not reasonable to expect Dr E to notice the abnormal readings at 1.30pm. He was probably typing up Mrs A’s discharge summary at this point, and was then called away to assess patients in other wards. As Dr Spriggs advised, and the DHB accepts, it was the ED nurse’s responsibility to notice this abnormal reading and alert Dr E to Mrs A’s physiological instability.

However, Ms D was not aware of these abnormal readings until some time after Mrs A had been discharged — when the printout was collected. Dr Clearwater was critical of the process:

“It seems to be ineffective practice to print off ‘trend reports’ and to have nurses file them in the notes without routinely being seen by a doctor, after the decision has been made to discharge the patient.”

Dr Spriggs did not consider it unreasonable for the printout to be viewed after the patient was discharged, “provided that the nurse examines the monitor before the discharge”. (In this case it is not known who saw the monitor prior to Mrs A’s discharge.)

As noted by Ms D, ED staff probably were alerted to the low oxygen saturation level at the time it was recorded, but dismissed it as inaccurate (due to the probe being removed as the monitor was switched off). However, as Dr Spriggs points out, while it is possible the reading was inaccurate, “it is also possible that the hypoxia detected was indeed a true reading and that reading was inappropriately dismissed”. He also notes:

“The nurse has the responsibility to act on significant abnormal monitoring results. If she feels they are [artificial], the monitoring should be repeated or a clear explanation of the decision to ignore the monitoring results needs to be given.”

Overall, Dr Spriggs described the systems for alerting staff to abnormal readings from the automated monitor as inadequate and contributory to the premature discharge:

“The standard of care provided by Northland DHB to [Mrs A] on [...] was in my view below the standard that could reasonably be expected ... In particular the failure to notice the fall in oxygen saturation at [1.30pm] and respond appropriately, significantly contributed to the inappropriate discharge of [Mrs A] ... I am not certain that the DHB has recognised the process errors around this and there is no indication that they have put in place any protection for subsequent patients from a similar oversight.”

Laboratory reporting systems

Dr E was not alerted to Mrs A’s abnormal troponin result until later that night, after he had received the news that Mrs A had died. As discussed earlier, Dr E was a very busy, junior registrar. Northland DHB accepts that his failure to see the pending troponin result was a “perceptual error, attributable to human factors, for which system barriers are the appropriate response”.

It is clear that Northland DHB’s “system barriers” for preventing or minimising the risk of doctors’ missing test results were inadequate. Northland DHB has acknowledged this:

“NDHB is endeavouring to put in place systems which reduce as far as possible the risks of test results being missed. While we acknowledge that individual clinicians have responsibility for following up test results, in an environment which is increasingly busy and which places increasing pressure on clinicians to make decisions rapidly about a large number of patients,

conditions and test results, systems must be used to minimise the risk of mistakes. We acknowledge that our systems at the time this occurred were not adequate and we will continue to review these systems in the light of ongoing experience to make them as optimal as we can.”

The changes made by Northland DHB since these events have been noted earlier. Both Dr Clearwater and Dr Spriggs agree with the DHB’s decision to discontinue the system of delaying blood test results until all results are available, as such a delay could add more risk overall.

However, Dr Clearwater is not supportive of the decision to discontinue telephone alerts to ED whenever there is an abnormal troponin result for ED. He believes the telephone alert was “preferable” and that it would have been “useful”. He added:

“Ideally the lab should have a set of criteria for alerting ED by phone for a range of abnormalities that are critically important ...”

As noted earlier, Ms D’s omission to record that a troponin test had been ordered may have contributed to Dr E’s failure to note that it had been ordered, and his subsequent failure to follow this up. In response, the DHB advised that it has introduced new triage documentation for ED staff, including a check list for nurses to record investigations ordered and a checklist for doctors to confirm that they have viewed the results.

Dr Clearwater recommends that the new documentation also include an option to record (by way of a tick box) that basic tests have been ordered and then extra boxes to tick for critical discretionary tests (eg, troponin, pregnancy test, Group & Hold, D-dimer and coagulation screen).

Dr Clearwater also noted:

“While it is good to record what tests have been sent, I personally doubt that all (or indeed most) doctors will tick the boxes when they have reviewed each result. In the case of this patient, the proposed form does not add anything to the system that was in place when [Mrs A] was seen. The laboratory generated a full record of what tests had been ordered and clearly showed that a troponin test had been requested and the result was awaited — this was signed by [Dr E].”

Dr Clearwater suggested that the DHB include, as part of its orientation programme, a specific topic on following up laboratory results.

Ambulance report

Dr E advised HDC that Mrs A’s ambulance report was not on her file at the time he reviewed her. Ambulance reports are valuable sources of information and should be available to staff as part of the initial medical assessment. Dr Clearwater believes that the ambulance report “could have prompted [Dr E] to consider the possibility of myocardial ischaemia more carefully”, as it mentioned the symptom of “slight chest

tightness” on presentation to the A&M clinic and the administration of aspirin during the ambulance transfer.

Conclusion

Many factors contributed to the misdiagnosis and premature discharge of Mrs A. Dr E did not receive adequate orientation, training, support and supervision. Northland DHB is also responsible for the systemic factors that contributed to Mrs A’s misdiagnosis and premature discharge. It did not have adequate systems in place to check the accuracy of, and alert doctors in a timely manner to, abnormal results from automated monitoring; there were insufficient barriers to minimise the risk of busy doctors missing pending blood test results; and there were inadequate systems to ensure that all relevant notes were included in the patient’s file at the time of initial assessment.

In these circumstances, Northland DHB breached its duty of care and Right 4(1) of the Code.

Other comment

St John Ambulance

Dr Clearwater commented on the failure by St John Ambulance officer, Mr H, to document the reason for administering the aspirin to Mrs A (“chest pain that sounded cardiac in nature”). Dr Clearwater advised that St John Ambulance should remind crews to document any history of chest pain or chest tightness in their reports.

The St John Ambulance Chief Executive responded that it is normal practice for their crews to document their action taken and care given, and he regrets “that it was not completely done in this case”. He advised HDC that they always remind their crews of this important part of the process and will do so again through their regular bulletin.

Northland DHB

Dr Clearwater also identified some other issues with the potential to cause problems in the future.

First, Dr Clearwater noted that Northland DHB’s records spell Mrs A’s surname incorrectly, despite the correct name being recorded by Dr G and St John Ambulance:

“This is a basic error that can sometimes have significant consequences (particularly access to old medical records). It is standard practice for ED staff to confirm the details with the patient when applying the obligatory wrist tag soon after admission and this error should have been detected then.”

Secondly, Dr Clearwater noted some minor documentation system issues relating to ancillary services at Northland DHB, namely that the initial laboratory report was untimed and the formal radiology report was not dated or timed.

Recommendations

I recommend that Northland DHB:

- Review its policies regarding orientation, training, support, and supervision of junior doctors and report back to HDC by **30 April 2010** on the outcome of the reviews. In particular, I recommend the DHB:
 - a) ensure that all prospective locums are formally interviewed by clinicians from the service they will be working for;
 - b) ensure locums regularly meet with their supervisors after they take up an appointment;
 - c) implement a policy requiring that, for a defined period of time (depending on each individual's level of experience and skill, but for a minimum of one month), new locums and registrars working in ED discuss all cases for acute discharge with an experienced colleague or supervisor before finalising the decision;
 - d) include, as part of orientation,
 - reference to the value of ambulance reports as part of the initial medical assessment;
 - an outline of the system of "partial" and "final" lab reports, with emphasis on the importance of reviewing the complete set of reports before making a final decision;
 - the organisational expectations regarding review of laboratory results and sign-off; and
 - information about trend reports from automated monitoring (ie, that they are available and should ideally be viewed before finalising a decision about patient care);
 - e) allow locums, who will be working at the DHB full time for more than three months, the option to attend teaching sessions.
- Advise HDC by **30 April 2010** what steps it has taken to:
 - a) improve the working conditions for registrars at the DHB, including the steps it has taken to increase the number of registrars employed;

- b) ensure abnormal results from automated monitoring are checked for accuracy;
 - c) ensure doctors are alerted to abnormal results from automated monitoring; and
 - d) ensure ambulance reports are in the patient's notes at the time of initial medical assessment.
-

Follow-up actions

- A copy of the final report will be sent to Medical Council of New Zealand and St John Ambulance.
- A copy of the final report with details identifying the parties removed, except the experts who advised on this case and the names of Northland DHB and Whangarei Hospital, will be sent to all DHBs, the Resident Doctors Association, Health Workforce New Zealand, the Quality Improvement Committee, the Accident and Medical Practitioners Association, and the Royal Australasian College of Physicians, and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A — Expert advice from physician Dr David Spriggs

Initial advice

The following initial advice was obtained from general medicine expert Dr David Spriggs:

“I, David Arthur Spriggs, have been asked to provide an opinion to the Commissioner on Case No: 09/00865. I have read and agree to follow the Commissioners’ guidelines for independent advisors.

My medical qualifications are, MBChB (Manchester University, 1980), MRCP(U.K.) 1983, FRACP (1993), MD (Newcastle University, 1993). I am a fully trained General Physician and Geriatrician receiving my Certificate of Completion of Medical Training in the U.K. in 1992. I am currently practising as a General Physician and Geriatrician at Auckland District Health Board and also hold the post of Clinical Director in General Medicine there. I hold current Vocational registration with the New Zealand Medical Council No: 18739.

I have been asked to review the case of [Mrs A]; in particular, my instructions are to:

1. Comment generally on the standard of care that Northland DHB’s General Medicine Department provided.
2. Comment on:
 - (a) The adequacy of the overall assessment of [Mrs A].
 - (b) The adequacy of documentation and communication.
 - (c) The appropriateness of changes made by Northland DHB as a result of these events.
3. Review any aspects of the care provided I consider warrant additional comment.
4. Comment on whether [Dr E] gave sufficient consideration to alternative diagnoses.

I have been provided with:

Summary of events compiled by the Health & Disability Commissioner

Copy of the referral note from [the A&M clinic] dated [November]

St John Ambulance Patient Report Forms dated [November] – Job No: 0471 and 0779

Clinical notes starting at the time of arrival 1143 hrs to discharge time 1402, this includes one ECG, monitoring reports, copies of biochemical reports and haematology, Discharge Summary and [X]-ray report

Autopsy Report by Dr Oosthuysen and a Toxicology Report from ESR

Letter by [Dr I] dated 12.12.08

Departmental M&M Report dated 26.11.08

Letter of complaint from [Mr B] to the Health & Disability Commissioner dated 03.02.09

Report from the Paramedic, [Mr H] dated 25.03.09

Letter to the Health & Disability Commissioner from [the Chief Medical Advisor] dated 31.03.09.

[At this point in his report Dr Spriggs sets out the facts of the case. This detail has been omitted for purposes of brevity.]

Opinion:

1. The standard of care provided by Northland DHB's General Medical Department to [Mrs A] [in November] was, in my view, below the standard that could reasonably be expected for the following reasons: a) The diagnosis of 'panic attack' is unusual in a 75 year old without a previous history of such attacks, there was clear documented evidence of low oxygen saturation at [the A&M clinic], in the ambulance and subsequently prior to discharge at Whangarei Hospital. Panic attacks do not cause hypoxia. b) The failure to review the complete battery of blood tests almost certainly meant that [Mrs A] was discharged prematurely. Even if [Dr E] had not ordered the test himself, the missing troponin result was clearly identified to him electronically and became available only a few minutes later, certainly more than $\frac{3}{4}$ of an hour before [Mrs A] was discharged. It is a common and safe practice that bloods get taken "routinely" on admission to emergency departments by admitting nurses. It remains the responsibility of the medical staff to review the results. c) The low oxygen saturation and relative tachycardia found by routine monitoring at Whangarei at 1330 hours should have alerted the nursing staff to the physiological instability of [Mrs A] and further medical assessment should have been requested. I believe that this standard of care would be judged with moderate disapproval by other medical departments. The medical decisions clearly rest with General Medicine. The nurses are more likely to be working within the Emergency Department and their conduct may be beyond the responsibility of General Medicine. If this is the case, the Emergency Department needs to review its processes.
2. (a) The history taking, physical examination, monitoring and test ordering for [Mrs A] is satisfactory. The failure to consider other diagnoses apart from 'panic attack' in the presence of documented hypoxia in a lady of 75

years is inadequate and the failure to review all the test results and notice further hypoxia in hospital meant that the interpretation of these results falls well below an adequate standard.

(b) The quality of documentation is good. There has been a meeting with the family in which there was full disclosure and, although there is a differing record of the details of the discussion between the family and [Dr I], I believe the quality of communication is good.

(c) The proposed changes to systems at Northland Hospital are a clear attempt to prevent this tragedy happening again. I do not believe that the time lag from drawing the bloods at 1220 hrs and the blood results becoming available at 1315 hrs is the cause of this tragedy and it would seem counter intuitive to make things safer by delaying the publication of urgent results. RMO education sessions run by Intern Supervisors are usually aimed at House officers. The doctor responsible in this case is the Registrar and Northland DHB needs to assure the Commissioner that Medical Registrars will receive this teaching on an ongoing basis. The DHB should also assure the Commissioner that [Dr E] was appropriately trained, orientated and supervised for his role as Medical Registrar.

3. My additional comments are with regard to:

(a) Training supervision of [Dr E]. It is not clear what his previous experience had been, nor the orientation/training for the post of Acute Medical Registrar, nor the level of supervision he received.

(b) The response to the abnormal monitoring results at 1330 hrs is clearly inadequate. It seems that these results were missed and there seems to be no explanation for this nor any attempt to prevent this happening again. This requires that the nursing staff take notice of such monitoring results and are empowered to delay discharge while requesting further medical review.

(c) The record by the nursing staff of [Mrs A's] wellbeing on discharge contrasts markedly with the account of her disability given by the family.

4. I believe that [Dr E] did not give sufficient consideration to alternative diagnoses. He attributed the initial low oxygen saturation to 'cold hands' despite this test being repeated in the ambulance. He came to a diagnosis that was not consistent with this hypoxia and a diagnosis that is unusual de novo in the elderly. He also failed to review the troponin result, but certainly should have seen that the troponin result was pending when he reviewed the other results on the computer screen. I do not believe that the failure of the nurse to state that she had requested a troponin result in itself contributed her to this oversight. Without more information on the level of training, experience and supervision of [Dr E], it is difficult to be definite as to the degree of disapproval that his conduct would receive from peers. However, assuming that he is a very junior, very busy, under supervised

Medical Registrar, I believe his peers would consider this oversight with mild disapproval. If he was better supported and at a further stage of his training the degree of disapproval would increase.”

Further advice

After reviewing further information from Northland DHB and [Dr E’s] response, Dr Spriggs provided the following further expert advice:

“I have been asked for further comment on the case of [Mrs A] in addition to my letter from May 19th, 2009. In addition to the documents viewed on that occasion, I have been provided with notification of investigation letter to [Dr E] dated 9th June, 2009, response from [Dr E] dated 9th July 2009, request for further clarification from the HDC to [Dr E] on 28th July 2009, response from [Dr E] on 13th August 2009, letter to [the] Chief Executive Officer at Northland District Health Board requesting further information on 9th July 2009, response from [the] Chief Medical Advisor Northland District Health Board, 23rd of June email request from [HDC investigator] to [the Chief Medical Advisor] dated 14th July for further clarification, response from [the Chief Medical Advisor] dated 17th July, email from [HDC investigator] to [the Chief Medical Advisor] dated 22nd July requesting further information, responses from [the Chief Medical Advisor] on 28th July and from [the ED Nurse Manager] on 27th July 2009, I also have the Medical Staff Orientation Booklet from Northland District Health Board.

I have been asked to comment on the following:

1. Whether my initial advice is altered in any way in the light of further information provided and if so how it is altered?
2. On the standard of care that [Dr E] provided [Mrs A] [in] November 2008 in the light of further information provided?
3. On the adequacy of the orientation and training provided to [Dr E] by Northland District Health Board and in relation to his position of Medical Registrar as at the [time of Mrs A’s death]?
4. On the adequacy of the support and supervision provided to [Dr E] by Northland District Health Board?
5. Anything in the further information provided that you consider warrants additional comment?

[At this point in his report, Dr Spriggs details the further information he has been provided with. This has been omitted for the purposes of brevity.]

It seems that [Dr E] would have had access to the hospital results between 1311 and 1315 hours and there is no evidence that [Dr E] had any further contact with [Mrs A] after this. Even if the tabular trend report had been available up until 1315 hrs and [Dr E] had seen it, this would not have identified the subsequent drop in oxygen saturation. Indeed it seems that having finished the discharge papers of [Mrs A], [Dr E] was called to see a patient in the Coronary Care Unit. [The ED Nurse Manager] states that the ‘continuous monitoring of the patient’s vital signs is very clear during all interactions with the patients’ and that the nurse ‘was confident the doctor

knew the patient's vital signs at all stages throughout the patient's stay from 1143 to 1402 hrs'. It is not clear how this is achieved. [Dr E] was probably writing the discharge papers at the time of the abnormal oxygen saturation. It would not be reasonable to expect a busy registrar to scan the monitors on all his patients just in case there was a new abnormality. It would be usual for the nurse caring for the patient to identify any major changes in the patient's condition be it on monitoring or on clinical grounds. Many monitors have alarm systems that would alert the nurse to an oxygen saturation of 80%. I am not aware if this was the case here. The nurse would then let the doctor know of such a change. It seems that there was and is no clear mechanism for such information to be transferred to a doctor who may already have left the Emergency Department by the time the abnormality was noticed.

It is not clear what instructions were given to [Dr E] about seeking senior advice. It is clear that [Dr I] had been in the hospital doing a post acute round and that there was a general expectation that registrars should call the 'on call consultant' if they are worried. I am uncertain whether there was any specific advice or support for [Dr E] who was doing his first weekend on call as a very junior registrar. I note that on site there was an Emergency Department Consultant Physician, who presumably was also available for advice about patients in the Emergency Department. He/she was in no way consulted either by the nurses or by [Dr E] about [Mrs A]. It would not be unusual to expect a junior registrar to consult a senior colleague before discharging a patient that he has assessed in the Emergency Department.

I note that in the letter from [the Chief Medical Advisor] of 23.06.09 she states that 'additional training on diagnosis of panic disorder is being provided ... we have chosen to provide to this to house officers as it is relevant to all specialties and needs to be in place before doctors reach medical registrar level'. It cannot be assumed that new doctors arriving in Northland have had such teaching in their previous employment.

Opinion:

1. My initial advice to the Commissioner needs some modification in the light of the above information. The standard of care provided by Northland DHB to [Mrs A] [in] November 2008 was in my view below the standard that could reasonably be expected. In particular, the communication and information flow from the electronic monitoring system to the nurse and then the doctor is inadequate. In particular the failure to notice the fall in oxygen saturation at 1330 hrs and respond appropriately significantly contributed to the inappropriate discharge of [Mrs A]. If the nursing staff saw the abnormal monitoring results they should have been empowered to delay the discharge. However it seems that the nurses assumed that the medical staff had continuous access to the monitoring and therefore it was not their responsibility to act on such abnormal results. I am not certain that the DHB has recognised the process errors around this and there is no indication that they have put in place any protection for subsequent patients from a similar oversight. I do not think that this error is the sole

responsibility of General Medicine at Whangarei, but is more likely to reflect the process errors in the Emergency Department.

2. [Dr E] was acting as a busy junior registrar. He acknowledges that he did not see the pending troponin result and that his diagnosis of panic attack was inappropriate. He has clearly learnt from this error and I believe that his peers would consider this oversight with mild disapproval.
3. [Dr E] was adequately experienced to take on the role of medical registrar. His orientation was of a geographic nature only and there is no suggestion that he got specific advice about contacting SMOs if he was concerned or before discharging patients. He was excluded from the regular training sessions for registrars on the basis that he was a locum. He was, however, apparently working fulltime at the DHB from 22nd September 2008 to 22nd February 2009. I note that he will be returning in August 2009 to do further medical work as a medical registrar. I believe that this level of orientation and ongoing training is inadequate. While acknowledging that there is significant disquiet over the role of locums in our hospitals in New Zealand, it remains essential that such doctors are adequately oriented and trained.
4. There is very little information available on the level of support and supervision for [Dr E], neither [Dr I] (Consultant Physician) nor the Emergency Physician were consulted about [Mrs A] and I am not aware of any instructions to [Dr E] about such consultations. It is clearly important to emphasize to junior registrars that they must keep their senior colleagues informed and it would be appropriate to insist that either the ED SMO or the Consultant Physician is made aware of all patients before discharge by such a junior doctor. There remains a culture in New Zealand of junior doctors not wanting to ‘bother the boss’. It is important that DHBs and individual consultants encourage junior doctors to consult widely before making discharge and other critical decisions.
5. I feel that the failure of Northland DHB to orientate, educate, supervise and support [Dr E] falls below an appropriate standard. I think most medical services would consider this departure form of moderate severity.”

Automated monitoring

In response to further questions from HDC, Dr Spriggs provided the following advice regarding the systems for automated monitoring:

“ ... I also note that the print out is done after the patient is discharged which is not unreasonable provided that the nurse examines the monitor before the discharge.”

...

“Nurse [Ms D] explains that the low oxygen saturation reading may have been on the basis that [Mrs A] had the oximeter removed just before the recording was taken as part of the discharge process. This allowed an abnormal reading

(80%) to be recorded and printed. This also may explain why “someone” went to the alarm and turned it off and presumably neither noticed nor took any action on the low reading.

While this explanation may be correct it is also possible that the hypoxia detected was indeed a true reading and that reading was inappropriately dismissed.

I feel that there is a need to ensure that nursing staff are expected to look at those patients being monitored even after the doctor has decided that they can be discharged. The Nurse has the responsibility to act on significant abnormal monitoring results. If she feels they are atefactual, the monitoring should be repeated or a clear explanation of the decision to ignore the monitoring results needs to be given.”

Appendix B — Expert advice from emergency medicine specialist Dr Garry Clearwater

Initial advice

The following initial advice was obtained from emergency department expert 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 MBChB 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. I was Clinical Director of the Emergency Medicine service between 2000 and 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, Registrars in training and Senior House Officers.

I have been asked to review the case of [Mrs A] as part of the Commissioner’s investigation into the appropriateness of the care provided by Northland District Health Board to [Mrs A] [in] November 2008 prior to her death at home later that day.

I have reviewed the following documents:

- A formal letter of complaint written by [Mr B] (son) and [Mrs C] (daughter) on behalf of [the family]: dated 03 February 2009 (#0001-0002).
- A laboratory report dated 08 December 2008 and elsewhere [...] November 2008, including biochemistry report on [Mrs A] from [...] November 2008 and subsequent commentary, apparently addressed to [a medical surgery] (#0003-0004).
- Letter from [the A&M clinic], dated 16 March 2009, including the clinical record of [Mrs A’s] consultation [in] November 2008 at the [A&M clinic] in Whangarei and the referral letter to Whangarei Hospital (#0005- 0007).
- A letter dated 25 March 2009 outlining events as witnessed by Mr H, the ambulance Advanced Paramedic who transported [Mrs A] to hospital [in] November 2008 (#0008-0009).
- The St John Ambulance Patient Report Form recording the transport of [Mrs A] to hospital [in] November 2008 (#0010).
- The St John Ambulance Patient Report Form recording the attempted resuscitation of [Mrs A] after discharge from hospital [in] November 2008 (#0011).
- A letter dated 31 March 2009 from the Chief Medical Advisor of Northland DHB responding to the questions posed by the HDC office (#0012-0015)
- Clinical records of [Mrs A’s] assessment in ED [in] November 2008 including nursing and medical notes, ECG, recordings, finalised lab report

and interim lab report, and discharge summary to the GP as well as a record of a meeting with the family on 02 December 2008 (#0016-0032).

- note that all the hospital medical records list the surname as [...] rather than the correct name (used by the family) [...].

- The autopsy report dated [...] November 2008 (#0033-0034).
- The undated radiologist report on the chest x-ray performed on [Mrs A] [in] November 2008 (a hand-written note records that it was printed [later in] November 2008) (#0038).
- E-mail correspondence between clinicians [in] November 2008 (#0036).
- A letter dated 12 December 2008 from [Dr I], physician, to [a family member] regarding the issues raised at the family meeting on 02 December 2008 (#0037-0038).
- A Morbidity & Mortality (M&M) report from the Department of Medicine dated 26 November 2008 (#0039).
- A toxicology report dated 18 November 2008 regarding the post-mortem on [Mrs A] (#0045-0046).

I have limited or no information regarding the following:

- A response from any of the medical or nursing staff involved in the care of [Mrs A].
- Information about the experience, training and supervision of the medical registrar who assessed and discharged [Mrs A] from hospital.
- Information about ED and/or laboratory protocols or guidelines regarding blood test requests by nurses and follow-up of critically abnormal blood tests.

Note that the doctor who assessed and discharged [Mrs A] was a Medical Registrar under the supervision of the Department of Medicine. No medical staff from the Department of Emergency Medicine were involved in this episode of care.

[At this point in his report, Dr Clearwater sets out the facts of the case. This detail has been omitted for purposes of brevity.]

Questions raised by the Commissioner.

1. The general standard of care that Northland DHB's emergency department provided to [Mrs A] [in] November 2008.

There were two components of care:

The general system of care seems to have been of a good standard. Documentation was good and investigations were performed promptly (recordings, blood tests, ECG and chest X-ray).

There were some minor points of concern:

-
- [Mrs A's] surname was entered incorrectly in the clerical system despite the correct name being recorded by the referring doctor and the ambulance. This is a basic error that can sometimes have significant consequences (particularly access to old medical records). It is standard practice for ED staff to confirm the details with the patient when applying the obligatory wrist tag soon after admission and this error should have been detected then.
 - There are some minor documentation system issues relating to ancillary services: the initial lab report was untimed and the formal radiology report was not dated or timed (i.e. unable to determine when it was reported).

The care provided by the Medical Registrar is being addressed separately.

2. Particular issues:

- (a) The adequacy of ED documentation on handover of [Mrs A] from ambulance staff.

Overall, this was of a good standard apart from one crucial point: there is no mention on the ED nursing documentation regarding whether or not [Mrs A] had chest tightness or chest pain.

The ambulance paramedic recorded that [Mrs A] had 'on presentation to [the A&M clinic] slight chest tightness'. Apart from that brief reference, all other symptoms on record relate to shortness of breath.

However, in the [ambulance paramedic's] retrospective letter he states that he administered aspirin 'as this patient had experienced chest pain that sounded cardiac in nature'. I am not sure whether he refers to the symptoms prior to attending the A&M clinic or whether [Mrs A] had more symptoms in the ambulance. He does not say whether he mentioned this concern to the ED triage nurse.

Aspirin would only be given if there was concern about possible cardiac pain so this could have acted as a cue to ED staff.

The handover sheet from the ambulance records chest tightness and the administration of aspirin so there were two important cues regarding possible cardiac pain that could have alerted triage staff and (subsequently) the doctor.

However, the primary clinical concern (by the referring doctor and ambulance) was shortness of breath. I would expect the triage process to be influenced by the referral letter.

- (b) The management and assessment of [Mrs A] by ED staff on her arrival at Whangarei Hospital.**

Nursing documentation and initiation of investigations was of a good standard apart from the lack of reference to chest pain or tightness (discussed above).

Recordings were taken promptly and were repeated regularly. Appropriate tests were ordered promptly, including ECG, chest X-ray and blood tests.

- **The only concern is a minor issue: the request for a troponin level was not recorded.**

It was reasonable for ED nursing staff to request a troponin level as part of the initial investigations, in light of the symptoms of unexplained breathlessness, some chest tightness and the concerns described by the ambulance paramedic that prompted him to administer aspirin en route to the hospital. In many EDs, it is considered more efficient for nursing staff to take blood tests as soon as possible, rather than adding further delay waiting for a doctor to assess the patient and then order the tests.

There should be agreed guidelines to assist nursing staff as to what tests are to be ordered and how these should be documented. These may exist already but I was not presented with any guideline.

When the interim lab report was signed, the doctor who assessed [Mrs A] had all the appropriate information available or underway at the time of assessment.

(c) The laboratory reporting systems in place at Northland DHB at the time of these events.

Overall, these seem to have been of a good standard. I am unable to determine the exact time that the preliminary lab results were sent to ED.

The blood tests were sent to the lab at approximately 1217h and all results except troponin were signed off by the doctor before the patient discharge letter was completed at 1338h. This indicates that they were available in ED within an hour and a half which is a very good response time (better than the two hospitals where I work, for example).

The only lab result not available was the troponin test but the lab printout is clearly headed "Partial results" and clearly notes that the troponin test result was "pending".

Thus the doctor who signed this report had a clear indication that a troponin test had been requested and the result was awaited.

Regarding delayed detection of the eventual positive troponin result, this is primarily the responsibility of the assessing doctor who had a clear indication that the result was pending. Furthermore, according to the Chief Medical Officer (#0014), the elevated result was available at 1315h, 20-40 minutes before [Mrs A] was discharged from ED. **Thus, it seems that the discharging doctor did not check the abnormal result even though it was available prior to discharge.**

The doctor may not have agreed with the need to send a troponin test in this case but he had evidence that the test was pending and had primary responsibility to check the result. It seems that he did not do so, even when the updated test was available before he discharged his patient.

There is the issue that the abnormal result remained unchecked after it was issued. Some abnormal lab results are too critical to wait for clinical staff to check them at an indeterminate time. Examples include extremes of potassium or haemoglobin levels. Such results should be phoned urgently to the department or clinician who ordered the test.

- **The laboratory should phone through selected critically abnormal lab results. The criteria for notifying the referring doctor varies between hospitals. There should be a guideline, agreed between the laboratory and clinicians, regarding this notification, including whether this should include troponin levels.**

(d) Adequacy of changes made by Northland DHB.

Overall, I do not think that Northland DHB had much need to change its systems, based on this case. The key problem seems to be the decision to discharge a patient within 2 hours of arrival in ED with the particular symptoms.

The letter from the Chief Medical Advisor dated 31 March 2009 lists ‘relevant changes’ made since the incident (paragraph 10, Pg 0014):

- i. A teaching session about panic attacks was included in the RMO training programme.
 - This should be useful if it cautions doctors about making this diagnosis lightly.
 - However, it would be more important to emphasise teaching and guidelines regarding assessment of patients with acute shortness of breath in general. A guideline could point out that many patients with myocardial ischaemia will not have classic complaints of chest pain and a high proportion may have atypical symptoms such as dizziness, weakness, nausea or shortness of breath — and that this is more likely to be the case in higher-risk patients such as diabetics or older people.
 - Related points were covered in the letter by [Dr I] in his letter dated 12 December 2008, Page #0038: ‘junior doctors are being asked to review the results of all tests ... before sending any patient home’ and ‘we are reinforcing the importance of treating with the utmost seriousness all people who have required transport to hospital by ambulance, even if their symptoms do not point to a clear serious illness’.

- ii. New triage documentation has ‘a check list for nurses to record investigations ordered and ... for doctors to confirm that they have viewed the results’.
 - The current tick box system seems to be incomplete. **I suggest that there should be an option to record (via a tick box) that basic tests (standard biochemistry and full blood count) have been ordered and then extra boxes to tick for critical discretionary tests: in our EDs these options include troponin, pregnancy test, Group & Hold, D-dimer and coagulation screen. The alternative is to have a free text space.**
 - While it is good to record what tests have been sent, I personally doubt that all (or indeed most) doctors will tick the boxes when they have reviewed each result. In the case of this patient, the proposed form does not add anything to the system that was in place when [Mrs A] was seen. The laboratory generated a full record of what tests had been ordered and clearly showed that a troponin test had been requested and the result was awaited – this was signed by the discharging doctor.
- iii. The lab now delays issuing any urgent biochemistry result until all components are available and they are sent as a batch.
 - This change will presumably add delays to the standard biochemistry reporting, while waiting for more complex results to accumulate. **The delay could add more risk overall.**
- iv. The lab alerts ED by phone whenever there is an abnormal troponin result for ED.
 - **This will be useful.**
 - Ideally the lab should have a set of criteria for alerting ED by phone for a range of abnormalities that are critically important, including standard biochemistry results (e.g. serum potassium less than 2.8 or greater than 6 mmol/L) – as discussed above (2b). An elevated troponin would presumably be added to that list.
- v. The lab will process troponin results faster.
 - **This will be useful.**

Comments about other aspects of care provided.

The key issue in this case seems to be the assessment of the patient and the decision to discharge her in less than two hours with mildly reduced oxygen saturation levels.

Overall, I do not think that the ED or laboratory systems contributed adversely to the discharge decision, especially as the doctor states that he did not want a troponin test.

I suggest that the lab report of an elevated troponin level is a side issue. This 75 year old woman had one or more unusual episodes of breathlessness that could have had a number of serious causes, including cardiac ischaemia with

mild heart failure, an arrhythmia, a pulmonary embolus or gastrointestinal bleeding (to name a few). All of these could have had normal standard blood tests. A low oxygen saturation was documented by the clinic and the ambulance. While in hospital, there were at least 10 recordings of low oxygen saturations (92%). This contrasts with the discharge letter that recorded the oxygen saturations as being 95% and I note that the medical note has an unsigned alteration (saturation 92% changed to 95%).

A diagnosis of primary anxiety and hyperventilation was less likely to explain the low saturations (patients with primary hyperventilation tend to have high oxygen saturations on air).

Patients can have significant myocardial ischaemia without any chest pain or tightness, especially older patients. Furthermore, significant ischaemia can occur with a normal troponin level, as occurs with unstable angina. Thus, it was quite possible that this patient could have had a normal troponin level and still had the same risks and clinical outcome.

Thus the decision by the medical registrar to discharge the patient when he did is the crucial issue. This will be reviewed separately.”

Further advice

After reviewing further information from Northland DHB and [Dr E’s] response, Dr Clearwater provided the following further expert advice:

“Thank you for asking me to review additional material relating to this case since my initial report in May 2009:

- Notification of investigation letter to [Dr E] dated 09 June 2009.
- Response from [Dr E] dated 09 July 2009.
- Letter to [Dr E] dated 28 July 2009, requesting further information.
- [Dr E’s] response dated 13 August 2009.
- Letter to Northland DHB dated 09 June 2009 requesting further information
- The response from Northland DHB dated 23 June 2009
- Email to Northland DHB dated 14 July 2009 and its response dated 17 July 2009.
- Email to Northland DHB dated 22 July 2009 and its response dated 28 July 2009.
- Copy of Northland DHB orientation booklet for medical staff.

I have not seen the report by the expert advisor Dr David Spriggs.

[Dr E’s] background

[Dr E] listed his medical experience since graduation [overseas] in 2003. This included 2 years as a house officer and 15 months as a senior house officer in New Zealand hospitals before starting as a locum medical registrar at Whangarei Hospital on 25 September 2008, approximately 6 weeks before his interaction with [Mrs A] ([in] November 2008.)

In total, his experience in general medicine and cardiology included 6 months as a house officer, 6 months as a senior house officer and 6 weeks as a locum registrar.

[Dr E's] assessment of [Mrs A].

In his detailed description of the assessment, he explains that he altered the figure for oxygen saturation level in his notes based on his own observation at the bedside. Ideally, notes should not be amended retrospectively and without countersigning the changes.

[Dr E] describes the changes that he has made to his practice since these events. They are all commendable and include:

- A greater awareness of the potentially serious significance of unexplained shortness of breath.
- Careful attention to reviewing all laboratory results.
- A lower threshold for seeking senior advice regarding patient management.
- A lower threshold for observing patients for a longer period of time before discharging them.

The orientation booklet for medical staff (#00071-138) comprises 68 pages of assorted information. It is a difficult balancing act to incorporate relevant information about a large range of topics in an orientation document while keeping its size manageable and readable. I could not find any information about:

- Laboratory services, reviewing results and signing off results;
- Reviewing “trend” reports for pulse, blood pressure and oxygen saturation.
- Reviewing ambulance reports.

ADDITIONAL COMMENTS

WORKLOAD

It seems evident that [Dr E] was working under a lot of pressure as a new locum medical registrar. While this role relates primarily to another service (General Medicine), from an Emergency Medicine perspective he was working under arduous conditions that potentially increased the risk of tiredness and errors:

- We would not accept that it is safe for a junior registrar to work 15 hour shifts in an emergency service: especially without compensatory time off during the week when working full weekend shifts. [Dr E] reports that he had already worked a 15-hour shift the previous day (Saturday) and came to ED directly from his post-admission ward round on Sunday morning and expected to work 15 hours as admitting registrar that day.

-
- [Dr E] describes (# 00052) being one of 8 registrars coping with a roster shortfall of 2-3 registrars. They were ‘regularly asked to cover gaps in the roster’.
 - While reviewing the lab results, he describes being interrupted by phone calls to assess other patients and ‘did not notice that a troponin was pending on the results’.

ED SYSTEMS

There may be room for improvement in some ED systems:

A. Trend reports for automated vital sign recordings.

It seems to be ineffective practice to print off ‘trend reports’ and to have nurses file them in the notes without routinely being seen by a doctor, after the decision has been made to discharge the patient. The abnormal oxygen saturation levels and ‘relative tachycardia’ that were recorded as part of the routine monitoring in ED were not reported to the medical registrar by nursing staff in this case ‘because they expected that the medical registrar ... would respond appropriately’ (#00064).

[Dr E] states that he was unaware of the regular recordings of low oxygen saturation levels that were printed and filed without being reviewed.

Options for improving this system:

- Orientation information that such trend reports are available and that they should ideally be viewed before finalising a decision about patient disposition;
- Perhaps having a doctor sign off the trend reports before filing them.

B. Availability of ambulance reports.

[Dr E] did not review the ambulance report or note the administration of aspirin by the ambulance crew: ‘I did not see the ambulance letter until later that night’ (#00056). This report could have prompted [Dr E] to consider the possibility of myocardial ischemia more carefully (the ambulance crew administered aspirin on the basis of the patient’s symptoms of chest tightness but did not document this symptom).

- Ambulance reports are valuable sources of supplementary information that should be routinely available in the medical notes as part of the initial medical assessment.
- Orientation could include at least a brief reference to this valuable resource.
- Ideally, all drugs administered before ED admission (by the referring doctor and/or ambulance crew) should be documented clearly on the ED record at entry.
- The ambulance service probably needs to remind its crews to document any history of chest pain or tightness in their reports (in this case, the ambulance crew omitted to document this vital symptom in their report, even though it was significant enough to prompt the administration of aspirin).

LABORATORY REPORTS

There is no evidence of formal orientation regarding review and sign-off of laboratory results although I expect that there would be on-site informal learning.

- There have been previous HDC reports relating to pitfalls in following up laboratory reports so this issue could warrant a specific topic in the orientation document.
- Orientation could outline the system of staggered lab reports (sent as they become available rather than batched into a single finalised reports) and emphasise the importance of reviewing the complete set of reports before making a final disposition decision.
- The letter from the Chief Medical Advisor, dated 17 July 2009 (#00067) describes the organisational expectations regarding review and sign-off — perhaps these could be included in the orientation document.

There is some minor discrepancy between two descriptions of notification of elevated troponin results. The Chief Medical Advisor stated (23 June 2009 (#00063)) that elevated troponin results were previously notified to medical staff by the laboratory staff until this system was discontinued on the basis that the extra demand for staffing time had an adverse effect on overall laboratory reporting turn-around times.

However, an original document from the DHB (#00014, 31st March 2009) stated, “the laboratory also now alerts ED by phone whenever there is an abnormal ED-requested troponin result”. As noted in my original report, this latter system is preferable but perhaps the system needs to be clarified.

SUPERVISION

I hesitate to comment on the supervision arrangements of another service and I am acutely aware of the difficulties and pressures to maintain staffing of acute services while keeping the workload manageable for supervising consultants.

[Dr E] was employed as a medical registrar locum having never before worked as a registrar. Ideally, locums would be employed on the basis of having worked previously in that role and would have relevant experience and skill. [Dr E’s] only previous experience was as a house officer and senior house officer. He notes (#00052) that his locum status precluded his attending weekly registrar training sessions (that were compulsory for permanent staff), so he was not getting formal training — ie he carried the responsibility of a registrar without the full range of training available to permanent employees.

[Dr E] had not discussed the case with his consultant before discharging [Mrs A]. He had not considered more serious causes for the episodes of shortness of breath.

Following on from that point, I recommend a risk management system that we use in ED for new staff, particularly those who are starting out as locums or in new registrar roles: for a defined period (depending on their skills and experience), the doctor is advised to discuss all cases for discharge with an

experienced colleague or supervisor before finalising the decision. This is not necessary for admitted patients who are automatically reviewed. I suspect that the number of cases discharged acutely by medical registrars would be fairly small so this would hopefully not add too much of a burden to the supervising consultant.

However, I defer to the judgement of General Medicine specialists who have a better appreciation of their system.”