General Practitioner, Dr C

House Officer, Dr D

Canterbury District Health Board

A Report by the

Health and Disability Commissioner

(Case 07HDC14539)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Parties involved

Mr A	Consumer (deceased)
Ms A	Complainant/Consumer's partner
Mrs B	Complainant/Consumer's mother
Mr B	Complainant/Consumer's father
Dr C	Provider/General Practitioner
Dr D	Provider/ED second-year house officer
Dr E	ED consultant
Ms F	ED registered nurse
Ms H	ED registered nurse
Ms G	ED registered nurse
Mr I	Physiotherapist
Ms J	Physiotherapist
Mr K	Physiotherapist
Dr L	ED registrar

Complaint

On 17 August 2007 the Health and Disability Commissioner (HDC) received a complaint from Mrs B about the services provided to her son, Mr A, by Dr C and Christchurch Hospital Emergency Department. (On 29 August a complaint about the same events was received from [Mr A's] father, Mr B.) The following issues were identified for investigation:

The appropriateness of the care provided to Mr A by Dr C from 11 to 13 April 2007.

The appropriateness of the care provided to Mr A by Dr D on 13 April 2007.

The appropriateness of the care provided to Mr A by Canterbury District Health Board on 13 April 2007, and the adequacy of the communication with him and his family.

An investigation was commenced on 26 October 2007.

Information reviewed

Information was received from:

- Ms A
- Dr C
- Mr I
- Mrs B
- Mr A
- Dr D
- Dr E
- Clinical Director, Christchurch Hospital ED
- RN Ms F

Mr A's clinical records were obtained from Dr C, Mr I and Canterbury District Health Board (CDHB). CDHB also provided a copy of the July 2007 report of the independent review conducted into the circumstances of the death of Mr A, and copies of relevant CDHB policies and procedures. The New Zealand Police and ACC also provided documentation relating to this case. All information gathered was provided to the independent experts and reviewed during the course of this investigation.

Independent expert advice was obtained from general practitioner Dr Tony Birch and emergency medicine specialist Dr Garry Clearwater.

Overview

Mr A, aged 25 years, presented to a physiotherapy clinic on the afternoon of 5 April 2007 with back pain following an injury sustained at 1pm that day while he was working with sheep on a farm. Over the next eight days Mr A's back pain increased despite treatment provided by the physiotherapy clinic and his general practitioner, Dr C.

On 13 April, Mr A returned to the physiotherapy clinic in severe pain. Mr I telephoned Dr C because he was concerned about Mr A's condition. Dr C saw Mr A and prescribed him alternative pain relief and an anti-nausea drug, and advised that if he did not respond he would have to go to the hospital for better pain relief. Shortly after this Mr A, his partner, and his mother went to Christchurch Hospital Emergency Department (ED) as he remained in severe pain.

Mr A arrived at 3.50pm. He was assessed by a senior ED nurse, Ms F, who gave him medication for pain and nausea at 4.30pm. At 5.25pm he was reviewed by second-year house officer Dr D. Dr D discussed pain relief options with emergency medicine

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

consultant Dr E. She then prescribed Mr A 10mg of intramuscular morphine, which was administered at 6pm. At 6.30pm a junior nurse reviewed Mr A and was asked to assess his level of mobilisation. Dr D then advised Mr A about regular pain relief and told him to return to ED if there were any further concerns. Mr A left the ED after three hours. Sadly, his condition deteriorated overnight and he died at home less than 12 hours later.

What happened in this case is well summarised by my emergency medicine advisor, Dr Garry Clearwater:

> "[Mr A] presented with a rare condition (epidural abscess), in an atypical manner (no risk factors for infection, no recorded fever). He was managed by a relatively inexperienced junior doctor in a chaotic busy department. In a setting of reasonable workload and on-site active supervision, I expect that the atypical features of [Mr A's] case would have been more readily detected."

This report identifies a number of gaps and deficiencies in the ED care provided to Mr A, and attributes responsibility for the failings to CDHB. CDHB accepts that it failed to fulfil the duty of care it owed to Mr A and is making the necessary and appropriate changes following these events. I commend Canterbury DHB for the considerable efforts made to implement the recommendations from the July 2007 independent review.

This case highlights the threat that overcrowding poses to patient safety.[1] The shortcomings in this case are not confined to Canterbury DHB, and should be viewed in the context of the national and international problem of overcrowding in emergency departments.[2] It will take a concerted national effort to tackle these problems. Even in well resourced emergency departments patients with rare infectious disorders may not have their condition detected, but it may be some comfort to families to know that every reasonable precaution was taken.

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[1] Hospital crowding: a threat to patient safety. MJA editorial 184 (5) 6 March 2006.

[2] Sprivulis, P. et al. The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments. MJA editorial 184 (5) 6 March 2006.

Information gathered during investigation

Physiotherapy and general practitioner care

5 and 10 April — physiotherapy
Mr A had consulted physiotherapist Mr I at the physiotherapy clinic periodically for six years for rugby injuries, but was generally in excellent health.

At 5.40pm on Thursday 5 April 2007, Mr A was seen at the clinic by physiotherapist Ms J. He told her that at 1pm that day he had been hit in the back by a sheep while he was holding a heavy container of sheep-dip over his head. Mr A filled out an ACC claim form. Ms J noted that Mr A did not have a previous history of lower back pain. She performed a physical examination and recorded her impression that he was suffering an acute facet and disc sprain at the level of his 5th lumbar vertebra and was a "3" for severity and irritability, which is the highest rating. Ms J did not test Mr A's neurological and neural tension. She recorded her treatment plan, which included heat and relative rest. (Ms J finished work at the clinic that day. She was not interviewed as she left New Zealand shortly after these events.)

At 6.40pm on Tuesday 10 April, Mr A returned to the physiotherapy clinic, where he was seen by physiotherapist Mr K. Mr K noted, "[Mr A] has been worse over the weekend hasn't been able to do extensions too sore." Mr K assessed Mr A after he performed the exercise regime prescribed by Ms J. Mr K noted that Mr A could only bend to touch his knees before pain stopped him from bending further. When asked to do straight leg raising while lying on his back, his ability to lift his left leg was reduced and painful. Mr K agreed with Ms J's assessment of the cause of Mr A's pain and taught him another exercise to do at home.

11 April — Dr C
At 6pm on 11 April, Mr A, accompanied by his partner, Ms A, consulted medical practitioner Dr C about his ongoing back pain. Dr C had known Mr A since he was a boy, but had not been required to see him often. Dr C recorded the history of Mr A's back pain, and that he had received physiotherapy and was taking the anti-inflammatory Voltaren 75mg twice daily. (Mr A had been prescribed the Voltaren by Dr C for an earlier neck injury.) Dr C noted that Mr A was sweating and breathing quickly but was able to get onto the examination couch unaided. His temperature and pulse rate were relatively normal, at 36°C and 84 beats per minute (bpm) respectively. Mr A's blood pressure was slightly elevated at 145/90mmHg. (A normal blood pressure for a young adult is 120/70mmHg.)

Dr C recalls that he asked Mr A if he had had any recent illness. Mr A replied that he had had influenza a month earlier, but had had no cough or viral symptoms at that time. Dr C found that Mr A's chest was clear and his abdomen soft, but he had difficulty flexing his left hip beyond 30 degrees. Dr C considered that Mr A was in

severe pain. Dr C recorded his assessment of Mr A's condition, and he prescribed him painkillers (Tramadol and Codalgin (paracetamol with codeine)) and more Voltaren.

13 April — physiotherapy
Mr A returned to the physiotherapy clinic at 11.40am on Friday 13 April. Mr A advised Mr K that he had been to see Dr C on 11 April because his pain was severe. The medication Dr C prescribed was not helping. His pain had increased over the previous two days and was radiating down into his calves and was worse in his left leg. Mr K noted that Mr A had no problems with his bowel or bladder. However, she was concerned and asked Mr I to see Mr A.

Mr I recalls that when he saw Mr A he was lying on the examination couch on his stomach and had a bucket in front of him because he felt he wanted to be sick. Ms A was also in the room. Mr I noted that Mr A reported that his legs were starting to go numb. He was in severe pain and unable to find a comfortable position. He was too sore to be touched in the lower back area.

Mr I said, "In our profession we have the phrase 'Red Flags'. [Mr A] was exhibiting red flag symptoms, ie. unrelenting pain, not responding to treatment, his condition worsening. I said to [Ms A] that [Mr A] needed to go to hospital for further testing, scans or assessment."

Mr I recalls discussing with Ms A options for transporting Mr A to hospital and suggested that she call for an ambulance. Mr I telephoned Dr C to discuss his concerns. He told Dr C that his staff had been treating Mr A for a disc injury. He advised Dr C, when he enquired, that Mr A was not exhibiting any signs of fever. Dr C advised Mr I to send Mr A to the medical centre.

Mr I watched Mr A get off the couch. He was in a lot of pain and walked with his legs straddled and slightly bent. His breathing was very shallow. Mr I said, "He appeared to be breathing only with the top half of his lungs. I offered him crutches and he said he was fine." Mr A and Ms A left the clinic at about midday.

13 April — Dr C
When Mr A and Ms A walked into the medical centre waiting room on 13 April, Dr C took him into the consulting room without delay. Mr A was walking with great difficulty and breathing heavily with each step. He was sweating and pale and told Dr C that he felt he might be sick at any minute. Dr C asked Mr A to lie down on the examination couch and asked him again about signs of fever, cough and any bowel and bladder problems. Mr A told Dr C that the pain was getting worse because it was radiating into his buttocks at times. He denied any pins and needles or weakness in his legs.

Dr C checked Mr A's upper abdominal area and the lymph glands in his groin and neck. Dr C also checked Mr A's reflexes, which were all present, and asked him if he had any numbness in his crotch, which Mr A denied. Mr A's temperature was 36.8°C

and his blood pressure was 130/90mmHg. Dr C considered that Mr A's nausea might have been caused by too much analgesia and anti-inflammatory medication. He gave him an intramuscular injection of Maxolon to settle the nausea and asked the nurse to lie him down in an adjoining room.

Dr C checked Mr A 15 minutes later, and Mr A reported that he felt better after vomiting. Ms A questioned Dr C about intramuscular pain relief for Mr A. Dr C replied that although Mr A was feeling better now, he was still concerned about his nausea. Dr C advised that if Mr A did not respond to the oral pain relief he would have to go to hospital for better pain relief and observation.

Dr C checked Mr A again ten minutes later. He advised him to stop taking the Tramadol and Voltaren because he believed this was causing the nausea. Dr C told Ms A that if Mr A showed any sign of infection or neurological signs over the next few hours, they should call him and he would make further arrangements. Dr C advised Mr A to return to see him again on Monday. Dr C recorded the details of the consultation.

Ms A called Mrs B to update her about her son's condition. They decided to take him to Christchurch Hospital by car.

Retrospective records
Between 17 and 24 April 2007, Dr C reviewed his record of Mr A's consultations on four separate occasions, adding further information about his neurological assessments. Dr C clearly identified the additional information he added and that the additional notes were retrospective. These retrospective notes clarified the circumstances of the accident that caused the injury, the medication Mr A was taking, additional information about Dr C's neurological assessment and Mr A's physiotherapy treatment.

Emergency Department care

Background
The total capacity of Christchurch Hospital's Emergency Department (ED) at the time was 39 patient spaces. The ED is divided into three areas: the ambulatory or front area of the department; the work-up area for patients who require more intensive investigation, assessment and treatment; and the resuscitation and monitoring area.

Canterbury DHB advised that each area in ED should have doctors of different levels of experience working every shift. Ideally, the medical staffing level is six per shift to allow for two doctors in each of the three areas. There is usually one emergency medicine specialist working, but sometimes two specialists work in ED. When there are two specialists on duty, they divide the department with one specialist taking responsibility for the patients in the monitored and resuscitation areas. However, if the resuscitation area becomes busy the second consultant will be called to help there.

The specialists take an overview and should be available to review cases with junior medical staff. However, due to the volume of patients and the high level of intervention required for some of these patients, the consultant is often required to assume a primary patient workload.

Christchurch Hospital tries to have a registrar in each area to take on a primary patient workload and provide back-up for any house officer working in the department. Frequently, when the workload goes up in one area, the doctors move to the area of higher need until the workload eases.

New medical staff are orientated to the ED with written information and an orientation programme, which takes place over two mornings and includes computer training and presentations from the Clinical Director and other consultant staff, senior nursing staff, and allied health staff. The written information given to new medical staff includes:

- an introductory letter (emphasising team work and asking for advice on patients)
- the Emergency Department Core Ideology
- Emergency Department Analgesic Guidelines
- Canterbury DHB Guidelines for Common Medical Conditions
- copy of the Department of Emergency Medicine Guidelines (the "Black Book"[3]).

When Mr A arrived in ED at 3.50pm on Friday 13 April, there were 32 patients present in ED (total capacity being 39 patients). A further 19 patients arrived over the next hour and a half.[4] The ED was extremely busy and there was a high acuity of patients.

There were three registrars and two senior house officers on duty for the 2pm to midnight shift, and four more junior doctors worked until 6pm. There were two emergency medicine consultants working that evening, with the consultant handover taking place between 4pm and 4.15pm.[5] Two nurses had been replaced by "casual pool nurses".[6]

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[3] The ED "Black Book" includes a section on "Acute Back Problems". The section states that although back pain is often not serious or life-threatening, certain "red flag" symptoms signal potentially serious conditions. The red flags outlined include: features of cauda equina syndrome (especially urinary retention, bilateral neurological symptoms and signs, saddle anaesthesia); intravenous drug use; severe, unremitting night-time pain; and pain that gets worse when the patient is lying down.

[4] The capacity of ED was exceeded 18% of the time between 28 April and 31 May 2007 (and nearly 50% of the time over the peak hours of 1pm to 8pm).

[5] Medical handover is a process whereby the care of patients is handed over from the doctors going off duty at the end of their shift to the doctors coming on duty.

[6] "Casual pool" refers to nurses who are available to work casual shifts to cover a shortage of DHB nurses.

The staff involved in Mr A's care were assigned as follows:

Triage	*Ambulatory*	*Resus/Monitoring*
Receptionist	RN Ms H	Dr E, ED consultant
RN Ms G	RN	
RN Ms F	Dr L, ED registrar	
	Dr D, ED house officer	
	ED consultant	

There were other staff on duty but they were not directly involved in the care of Mr A.

Triage — RN Ms G
The role of the triage nurse is to facilitate the flow of patients through the ED system. The triage nurse assesses the patients on arrival to determine the urgency of their problem and arrange appropriate health care in a timely, organised manner.

When Mr A arrived at ED at 3.50pm, registered nurse Dr G was behind the triage desk with registered nurse Ms F. (RN Ms G had been working in ED for 4½ years; RN Ms F had been working in ED for eight years.)

Ms A stated that, when they arrived, Mr A was struggling to walk and groaning with every step. His breathing was laboured. There were a number of people already in the waiting room when Mrs B, Ms A and Mr A approached the admitting/triage desk.

While Mrs B was answering the admitting clerk's questions, Ms A asked RN Ms G if Mr A could go through the doors into the ED to lie down. Ms A told RN Ms G that Mr A had a slipped disk and needed a bed to lie on. She explained that Mr A was in a lot of pain from the car journey to Christchurch. RN Ms G told her that they would have to wait.

Ms A recalls that RN Ms G's attitude was "very abrupt and uncaring". Mrs B stated that they were informed "in a very short manner that [Mr A] would have to either sit or stand".

RN Ms G recalls that she explained to Mr A that RN Ms F would find somewhere for him to lie down and that he would be seen as soon as possible. RN Ms G said that Ms A was "angry because she was distressed". RN Ms G instructed Mr A to try to get comfortable, to slow his breathing and to calm down while he was waiting to be seen. She noted, however, that he was unable to do this as he was "too agitated". RN Ms G stated that most people who walk into the ED with back pain are assigned a code of

"4", which means they wait up to 60 minutes to see a doctor.[7] However, Mr A was assigned a code of "3" (30-minute wait time) because he was obviously in severe pain.

Mrs B stated that Ms G's description of Ms A's and her behaviour was an indicator of how they viewed the seriousness of her son's "incapacity and distress". Mrs B feels that RN Ms G overlooked Mr A, who was clearly in a state of pain that was beyond being endured.

Nursing care: RN Ms F

While Mr A was being booked in, RN Ms F went to look for a trolley for him. She thought that because of Mr A's obvious stress and pain, he would be better off in the work-up area of ED where the atmosphere is more relaxed. As RN Ms F passed through the work-up area to get a trolley from storage, she saw that the work-up area was full.

Within five minutes, RN Ms F returned with a trolley. RN Ms F said, "I watched him get up on the trolley and my only thought at that point was that he got onto the trolley relatively well." She anticipated that he would lock up and struggle to get on to the trolley. She took Mr A into the ED ambulatory area.

Mr A remained distressed after lying down. He was intermittently groaning and swearing. RN Ms F tried to get him to slow down his breathing by taking deep breaths. She explained that she wanted to assess whether his condition was a straightforward mechanical back pain or was more serious. RN Ms F stated that she considered such conditions as renal colic and cauda equina,[8] but she was restricted in performing an adequate examination because they were in a public space. She asked Mr A about the medications he had taken and documented his response because she wanted him to have some analgesia.

RN Ms F took Mr A's blood pressure and said she would talk to the doctor about getting some stronger pain relief. Ms A recalls that RN Ms F did not appear alarmed about Mr A and was "just treating it as back pain. She was quite casual about the whole thing."

RN Ms F recorded (at 4pm) that Mr A's temperature was 36.2°C, his pulse 110bpm and his blood pressure 139/85mmHg. His respiration rate was high, 40 breaths per minute. (Normal adult respirations are between 12 and 18 per minute.) RN Ms F spoke to the ambulatory area registrar, Dr L, about Mr A. Dr L wrote a prescription for oral analgesia including some diazepam to relieve muscle spasm, an antiemetic, and

[7] Christchurch ED uses the Australasian College of Emergency Medicine Triage Scale, with a numerical system (1–5) to indicate the relative waiting time recommended before the patient is seen by a doctor.

[8] Cauda equina syndrome refers to compression of the lumbar, sacral and coccygeal spinal nerves, characterised by impairment of perineal sensation, anal tone and sensation, bladder distention and urinary retention.

Losec to control gastric discomfort and nausea. RN Ms F gave Mr A this medication at 4.30pm before returning to her triage duties at the front desk. Mrs B got a glass of water and administered the medication to Mr A.

RN Ms F stated that she stayed with Mr A for two reasons. She said:

> "One was the stress of the situation and the family. I wanted to be able to diffuse that which is difficult to do. … I was also concerned about the level of stress given that the actual presentation of him which appeared at that time to be mechanical back pain was at odds with the partner and mother — it was at odds with the presentation."

About 10–15 minutes later, RN Ms F was again in the ambulatory area and saw Mr A walking, assisted by Ms A. She asked him if he was feeling better. He said that he was no better but wanted to go to the toilet. RN Ms F asked him to provide a urine sample and told him that the sample pots were kept in the toilet. This was the last time RN Ms F saw Mr A.

Ms A recalls that when she accompanied Mr A to the toilet, he tried for about ten minutes to pass urine but was unable to do so. When they left the toilet she passed the sample pot to a nurse and said that Mr A had been unable to provide a sample. The unidentified nurse told Ms A not to worry. CDHB advised that this person might have been a ward assistant or a volunteer.

Nursing care — RN Ms H

Newly graduated nurse Ms H had been assigned to work in the ambulatory area of the ED for the evening shift on 13 April (12.30pm–11pm). She was supervised by her preceptor, a senior nurse. The first time RN Ms H saw Mr A he was walking to the toilet with Ms A. RN Ms H recalls that his movements were guarded, stiff and slow. She saw him return and get back onto the trolley. Mrs B recalls that by the time Mr A returned a room was available for him.

At 4.45pm RN Ms H took Mr A's recordings, noting that his respiration rate, temperature and blood pressure remained essentially the same as recorded at 4pm, but his pulse rate had increased to 116bpm. She noted that his pain score at that time was 9 out of 10.

RN Ms H recorded on the "Emergency Nursing Documentation" page of Mr A's records, "1645 Pt walked to toilet + A[assessment] to AB [ambulatory]. Family present. Still reports max pain but await PO [per oral] analgesia effect."

Ms A stated that while they were waiting for the doctor, Mr A was groaning in pain. He had pain down both legs, but the pain was worse in his left leg. He described it as like having played a hard game of rugby. His muscles were sore. He also had pain in his buttock and was complaining about feeling cold.

Medical assessment — Dr D

Dr D was a second-year house officer working at Christchurch Hospital Emergency Department (ED) on 13 April 2007. Dr D saw Mr A at 5.25pm when his name came up on the computer screen as next to be seen. At that time, he had been waiting one hour and 35 minutes.[9]

Dr D recalls that Mr A gave a clear history. He told Dr D that the analgesic combination that he had been given by Dr C the preceding week had not been effective in controlling his pain and had been changed that day. She took a thorough history of the pain relief Mr A had been taking because she knew he had been very sore and she wanted to make sure that he had not had dangerous amounts of paracetamol.

Dr D recalls that Mr A reported good general health and his only concern was his sore back, and left buttock and posterior thigh pain. It is common for acute back pain to radiate down the buttocks and thighs, so this did not cause her to be concerned and appeared to support a diagnosis of musculoskeletal back pain. Mrs B recalls that Mr A clearly stated that his legs were sore and he had feelings of numbness.

Dr D recalls that, on examination, Mr A did not look physically unwell. She said that Mr A "was not pale, cyanosed or sweaty. He was not vomiting, coughing or displaying any systemic signs." Mrs B recalls that Mr A was "as white as a sheet and clearly at the end of his endurance threshold with the pain".

Dr D found it "a little difficult" to examine Mr A because he did not seem to be able to relax fully. She said that when a person is in pain and/or anxious, it is sometimes hard to elicit the reflexes. She understood that Mr A had been lying down for periods to relieve his pain. This can exacerbate musculoskeletal pain because the patient stiffens up and then the pain becomes worse when they do try to start moving. It is difficult to break the cycle.

When Dr D examined Mr A, she found he was in genuine pain, but he was able to move his knees, ankles and toes normally. She said that his motor examination was normal except for a possible absent knee jerk on the left. However, she was not convinced that the reflex jerk on Mr A's left knee was actually absent, as the examination was complicated by Mr A not being able to relax.

Dr D said that she "probably" examined Mr A's abdomen and chest, because it is something that she normally does. She recalls moving the bed out from the wall of the cubicle so that she could perform her examination from the right side as she had been taught. Dr D recalls that he did not have any tenderness over his kidneys to lead her to

[9] Dr D was assigned to work in the ambulatory area with an emergency physician and registrar Dr L. However, Dr L had been called out of the area to work in another area.

suspect a urinary tract infection. She did not document these examinations. She recalls that she palpated his bladder and clinically ruled out urinary retention.

In relation to her assessment of Mr A's vital signs, Dr D advised:

> "It is my practice to take the pulse of my patients myself. It is part of my examination and gives me confidence in my findings and diagnoses. When I took [Mr A's] pulse, it was in the mid 80s and his respirations were less than 20 per minute and he was speaking in full sentences. I can clearly recall these rates because they were within normal limits and I had previously noted the nurse's abnormal recordings. It is important for patients to not remain persistently tachycardic and I was happy that he was more comfortable since the analgesia had taken some effect."

Mrs B clearly recalls that until Mr A had the morphine, his breathing was rapid, and remained at the same or similar level to that when he arrived. Ms A recalls that Dr D told Mr A to roll over, but he was too sore to lie on his side for more than one to two minutes. Ms A stated, "She poked around his back and asked him specifically where it was that he was sore." She recalls that when Dr D tested Mr A's reflexes, she seemed concerned that he had not had any relief from the tablets and said that the next step was to give him morphine. Dr D said that if they gave him the morphine intravenously he would have to be admitted. She said she would talk to her "boss" and went away.

Supervision — Dr E

Dr D decided to discuss Mr A with consultant Dr E, who was in the resuscitation area of ED, because she did not know where the other ED consultant (who was responsible for supervising the ambulatory area) was at that time.[10]

Dr E was writing up notes when Dr D asked him for advice about Mr A. Dr D said that she briefed Dr E about Mr A's history and condition and asked for his advice on pain relief. Dr D stated that if she had been at all concerned about Mr A's condition she would have asked Dr E to see him.

Dr E recalls that Dr D's description of Mr A was "very consistent" with a musculoskeletal type of back pain. He suggested that she try something stronger than the simple pain relief Mr A had been given earlier in the evening. There are a variety of stronger medications that can be used in these situations, and on this occasion he suggested some opiates (to be administered parenterally or as a suppository). Following discussion with Dr E, Dr D prescribed Mr A 10mg of intramuscular morphine.

[10] Canterbury DHB advised that the other ED consultant was working in another area for a period when Dr E took a patient upstairs for scanning.

Analgesic guidelines
Advice on the administration of opiates in ED is included in the Emergency Department Analgesic Guidelines, in nursing manuals, and in Canterbury DHB's Guidelines for Common Medical Conditions.

The Emergency Department Analgesic Guidelines include a section on morphine stating: "In the treatment of severe pain in the ED, intravenous aliquots of morphine is the preferred form of analgesia. … Intramuscular administration has delayed onset and variable absorption in abnormal physiological states and is not recommended." Consultant emergency physician Dr Scott Pearson advised that the intramuscular route of administration is unusual and is generally discouraged.

Canterbury DHB Guidelines for Common Medical Conditions include a section on "Pain Management" with dosage and observation guidelines for opioid administration (page 192). The guidelines for IM morphine state a dose for adults of 0.15mg/kg 3–6 hourly, with observations at least one hour after each dose. Pulse, respirations, sedation score and pain score are the recommended minimum observations.

Morphine administration and mobilisation — RN Ms H
RN Ms H recorded that she gave the morphine at 6pm. At 6.30pm RN Ms H recorded, "IM morphine taking effect. ↓ pain in legs — absent in back." She stated that she took another set of vital recordings at this time, but did not document these on the "MR2B" because she could not find it. She recalls that his respiratory rate had decreased to between 20–28 per minute and his "O2 sats" were 94–95% but rose to 98–99% when she asked him to take a few deep breaths, as he had been lying on his back.

A short time later, RN Ms H asked Dr D about her plan for Mr A. Dr D was busy with another patient and asked RN Ms H to get Mr A up to see how well he was mobilising.

RN Ms H stated that after she spoke to Dr D she went back to Mr A and explained that she was going to get him up to see if he could walk. She recalls that he sat up independently and walked with her supervision approximately 20 to 30 metres. She said, "His gait was initially stiff, but he walked safely with his family and I with him. He again mentioned the feeling of aching and sore leg muscles. By the end of the walk his gait had improved moderately and he lay down again on the trolley."

Dr D recalls that RN Ms H returned and said that Mr A was feeling much more comfortable and was mobilising well. The pain in his buttocks and back had gone, but he still had pain in his legs.

Ms A stated that after Mr A had the morphine injections he began to relax and doze off. She recalls that after a while one of the nurses came into the cubicle to check on him. The nurse took Mr A for a walk, but he was having trouble moving. The nurse told him to lie down for another half hour and then she would try him walking again.

When the nurse came back he was worse. She had to support him to stand upright. He was shuffling and could not lift his feet, but slid his feet forward.

Ms A said that the doctor must have seen how he was walking as the nurse took him past the nurses' station where the doctors and nurses were standing. When the nurse and Mr A came back to the cubicle, she said that he could have another lie down and go home when he was ready.

Discharge
Dr D went to see Mr A at this point. Mrs B asked what they should do if her son's pain remained uncontrolled. Dr D recalls that she "reiterated" that he needed to take regular and adequate analgesia and that if things did not settle or if they had any concerns then he needed to come back to ED. She recalls that Mr A and his family appeared happy with the plan and that he walked out of the department unaided.

Mrs B stated that she was "far from happy" about leaving the ED with her son "in the state he was in". She recalls speaking to Dr D about this and commented that if he did not improve, it was over an hour's drive for them to return to the hospital. Dr D assured her that Mr A would go home and sleep. Mrs B said that that was all her son wanted to do as he had not been able to sleep for a week. She also recalls a discussion about the possibility of inadvertently overdosing on painkillers in trying to manage the pain.

Dr D was of the opinion that Mr A was "young, fit and healthy and that all the indicators were that he should be able to go home". She believed that he was suffering from a mechanical back injury and by giving him some intramuscular morphine, he would be comfortable enough to start moving about. His presentation fitted with his history of injury and irregular (inadequate) pain relief. She had no concerns about her diagnosis.

She was not concerned about Mr A, as she had not identified any "red flags". Dr D has a "mental checklist, which verifies the procedures and questions that must be covered in order to be more satisfied that there is nothing more serious going on". Her mental checklist for Mr A's back pain included "numbness or weakness of the lower limbs, saddle parasthesia or numbness or alteration in bowel or bladder habit (especially urinary retention)". Dr D considered that the only finding that was a cause for concern was Mr A's complaint about his bowels slowing, but this could be explained by the medication he had been taking. She advised Mr A about the need for regular and adequate analgesia and that he should come back if they had any concerns.

Ms A said that Mr A wanted to go home. On their way out of ED, they passed the nurses' station and Dr D gave Mr A some pills in a brown envelope. Dr D has no recollection of giving Mr A any medication to take home. Strips of the medications ibuprofen 200mg and Tramadol 50mg were found at Mr A's home by Police after his death. However, it is possible that this medication was part of the prescription previously provided by Dr C and documented in his notes. Dr D said that medications

are often given to ED patients to take home. It is usual to give them enough medication to get them through the night. She often gives patients ibuprofen and paracetamol to take home, but it is unlikely that she gave Mr A Tramadol as it is a controlled drug and would have to be checked and signed out by two nurses.

CDHB subsequently advised that the only brown envelopes in ED are internal mail envelopes, and there is no record of any ibruprofen or Tramadol being prescribed at this time.

The time that Mr A, his mother and Ms A left ED was not recorded on the medical record, but video footage of the family leaving the department recorded the time as 7.10pm.

CDHB advised that, except in cases referred for admission by a GP (which must be reviewed by a registrar or consultant before discharge), patients discharged from ED are not required to be discussed with a consultant. There are 25 patient advice sheets about specific conditions, which staff can give to patients at the time of discharge. However, there is no advice sheet for back pain.

Documentation
Dr D explained that her notes of her assessment of Mr A were written in retrospect. She said, "At a guess [I wrote them] up to two hours later. This is not my common practice, but as I was the only doctor in the front I was getting asked to do things from several of the nursing staff and I had not time to write my notes sooner." Dr D recalls that she eventually had a pile of about five patient files that she needed to write up quickly. Mrs B believes the delay in writing up the notes has resulted in misinformation.

Dr D's notes record Mr A's presenting complaint as "acute lower back pain", with a history of twisting his back eight days ago and "much worse" since Wednesday. She noted that his pain was not settling but that pain relief may not have been taken regularly. Dr D stated that she ruled out urinary retention clinically and documented that in her notes. She noted that he had no bladder symptoms and his bowels were slow secondary to analgesia.

Dr D recorded that, on examination, Mr A was "obviously uncomfortable". His temperature was recorded as 36.1°C. She noted that his tone and sensation was normal, but "power" was decreased secondary to pain. Dr D recorded that Mr A's gait was "markedly abnormal", probably due to anxiety. Her impression was that he had musculoskeletal back pain with "ongoing, severe pain" and decreased mobilisation.

Dr D recorded her plan for Mr A as regular analgesia (codeine, ibuprofen and paracetamol) for one to two days.

Dr D's advice on discharge was for Mr A to return to the hospital if his pain did not settle with regular analgesia. She advised him to return to his GP the following week.

Deterioration
Mr A dozed most of the way home. Mrs B dropped Ms A and Mr A off at their house. Ms A helped Mr A get into bed. He slept for about an hour, but that was all the sleep they had that night. He was moaning with pain and told Ms A that he was cold. She tried to rub his legs to warm him up, but he couldn't stand her touching his legs. He tried to go to the toilet several times during the night, but was unable to pass urine. Ms A had to support him because he couldn't balance or take any weight on his legs. Ms A wanted to take Mr A back to the hospital, but he refused.

At about 6am Mr A told Ms A that he was hot and couldn't feel his legs. She said that he had stopped moaning and was very quiet. Ms A decided to ring for an ambulance. Not long after she made the call, she realised that Mr A had stopped breathing. Ms A started CPR but said she knew that he was dead.

Post-mortem report
The Coroner-authorised Autopsy Report dated 1 May 2007 concluded that Mr A's death was due to overwhelming sepsis with bacterial septicaemia (*Staphylococcus aureus*) complicating spinal epidural abscess.

Subsequent events

Independent review
After Mr A's death, Canterbury District Health Board commissioned an independent review into his death. The reviewers were Counties Manukau DHB Acute Care Service Manager Dot McKeen, Capital & Coast DHB Emergency Medicine Clinical Leader Dr Peter Freeman, and Christchurch Bayley's Realty Group Chief Executive Mr Scott McCrea. The family provided input into the terms of reference and composition of the review panel.

On 3 July 2007, Ms McKeen, Dr Freeman and Mr McCrea issued their report. The report identified the following key issues for Canterbury DHB to address:

- physical environment in ED waiting room, triage and reception
- front house skills for triage nurses and receptionists
- Australasian College of Emergency Medicine triage target compliance — particularly with triage 2 and 3
- departmental capacity and design
- patient tracking systems
- junior staff supervision and support
- medical handover
- analgesia policy
- clinical documentation
- discharge process, discharge summary and link to primary care.

The report concluded:

> "Individuals such as [Mr A] should expect to receive timely and expert care when attending an Emergency Department. The review panel is of the view that [Mr A] would probably have received similar care in any major ED in the country and that on the evidence presented — the nursing and medical staff did the best they could in offering care to an acceptable standard. What [Mr A] deserved was more timely care, more expert care and a period of observation which may have allowed the true nature of his serious illness to become apparent — this time factor is compromised in many of our Emergency Departments due to inadequate numbers of experienced clinical staff and overwhelming numbers of patients seeking care."

ACC

On 17 September 2007, ACC advised the estate of Mr A that the treatment injury claim had been declined on the basis of advice of independent emergency medicine specialist Dr Andrew Swain. Dr Swain concluded:

> "I do not consider that a reasonably competent Emergency Department doctor would have been in a position to diagnose severe infection or an epidural abscess on 13 [April] 2007."

Improvements to ED

On 21 September 2007 Canterbury DHB Chief Medical Officer (CMO) advised that the Board believes that the review "comprehensively assessed the clinical treatment of [Mr A], together with the wider systems and processes relating to the Emergency Department at Christchurch Hospital".

The CMO advised that a number of the recommendations made in the independent review had been addressed, including:

- the waiting room has been changed so that the environment is more pleasant;
- there is clear access to the triage nurse;
- there is now room for two triage nurses to work together thus reducing waiting times;
- visibility has been improved so that the triage nurses can see the incoming and waiting patients;
- the business plan for additional emergency medicine consultants has been approved which will provide a greater skill mix in the department;
- additional nursing staff have been employed;
- capital for the expansion of the Emergency Department has been approved;
- processes have been reviewed to improve assessment times for ambulatory patients; and
- inservice education has been provided for doctors on the assessment of patients with back pain.

The CMO advised that the Canterbury DHB *Improving the Patient Journey* programme will continue to be a major focus of improvement, focusing on patients and their needs. Project RED (Rejunvenating the Emergency Department) was launched in May 2007 and concentrates on people, processes and plant/space. It is a clinician-led and management-supported project to concentrate efforts and progress some longstanding ED issues.

Responses to provisional report

In response to my provisional report, Canterbury DHB accepted that it had been found in breach of the Code in relation to inadequate resourcing, inappropriate supervision, a lack of guidance for ED staff, and an inadequate discharge process. Canterbury DHB noted that the difficulties encountered by Christchurch Hospital's Emergency Department are not unique:

> "It is important that such difficulties are not viewed in isolation from the rest of the hospital. Where there are problems in patient flow in the hospital, this directly impacts on the ED … Improvements to ED are difficult if there is not a concurrent improvement in the way patients are transferred to other parts of the hospital."

Canterbury DHB also stated:

> "CDHB wishes to acknowledge that we are responsible for the care we provide to patients and we are sincerely sorry that our processes did not result in [Mr A's] condition being diagnosed. CDHB again extends its apologies to [Mr A's] family for this."

Dr D stated in response to my provisional report:

> "I will remember [Mr A] for the rest of my life, and this tragedy has and will continue to impact on my care and documentation. I would like the family to know I gave their son and partner the best of my skills and knowledge. As they do, I find it difficult to explain or understand why this should happen to him. I extend my sympathies to his family and loved ones …"

Report on state of ED services in New Zealand

In November 2008 the Working Group[11] for Achieving Quality in Emergency Departments published a draft report to the Minister of Health on the state of ED

[11] The Working Group was established following a workshop on ED quality held in May 2008, attended by about 70 sector representatives, mainly ED clinicians and managers, and co-sponsored by Counties Manukau DHB and the Ministry of Health.

services in New Zealand and made a number of recommendations for action.[12] The main focus of the report relates to:

- overcrowded EDs
- patients who have to be treated or housed in informal spaces
- long patient stays in ED
- long patient waits for treatment or analgesia.

It is clear that the solutions to ED problems require whole-of-system and whole-of-hospital responses. I commend the steps being taken to tackle these problems at a national level, with the active engagement of ED clinicians and sector leaders in DHBs, supported by the Ministry of Health. Implementation of the Working Group's sensible, evidence-based recommendations will be a key step to improve the quality of care in New Zealand emergency departments.

Independent advice to Commissioner

The independent expert advice provided by general practitioner Dr Tony Birch, and emergency medicine specialist Dr Garry Clearwater, is attached as Appendices 1 and 2 respectively.

Emergency medicine specialist Dr Clearwater was asked to review the parties' responses to my provisional report in relation to the emergency department care. Dr Clearwater's comments are attached as Appendix 3.

[12] Recommendations to Improve Quality and the Measure of Quality in New Zealand Emergency Departments, November 2008.

Code of Health and Disability Services Consumers' Rights

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

RIGHT 4

Right to Services of an Appropriate Standard

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

Other relevant standards

Cole's Medical Practice in New Zealand 2007 (Medical Council of New Zealand, October 2006):[13]

> "An important part of a good doctor–patient relationship is the keeping of a proper medical record. It is a tool for management, for communicating with other doctors and health professionals, and has become the primary tool for continuity of care in many practices, as well as in hospitals. To fulfil these tasks, the record must be comprehensive and accurate."

Commissioner's Opinion

Opinion: Breach — Canterbury District Health Board

Several systemic problems at Christchurch Hospital ED on the evening of 13 April 2007 affected the care Mr A received. The heavy workload ED staff faced that evening impacted adversely on their standard of assessment, communication and documentation. A district health board has a duty to provide an emergency department that has sufficient staff and adequate systems to withstand fluctuating demands. I consider that Canterbury DHB did not provide Mr A with an appropriate standard of care as a result of the deficiencies in its systems identified below.

[13] Page 95.

Resourcing
When Mr A arrived at the Emergency Department, the staffing levels were considered to be normal. However, the department was overcrowded with a high acuity of patients. This delayed Mr A being seen and resulted in Dr D working alone in the ambulatory area.

Overcrowding in ED is not a recent issue for Christchurch Hospital. It was highlighted as a problem in Commissioner Robyn Stent's *Report on Canterbury Health Limited* (1998), and in the *External Review of Emergency Department Christchurch Hospital* carried out by Dr Peter Brennan and Associate Professor Marcus Kennedy in 2004. In response to these reports, staffing levels were increased and initiatives undertaken to improve the ED models of care and patient flow through ED. However, it is clear that in April 2007 Christchurch Hospital still did not have sufficient bed space to accommodate the number of patients presenting to ED or an adequate level of senior supervision to ensure that patients received an appropriate standard of care.

I am concerned that, despite various reports over the past decade highlighting areas for improving the ED, insufficient remedial action appears to have been taken until recently. Recent improvements include the capacity and design of the ED, more efficient processes for moving patients through ED, and staffing increases.

This case highlights the threat overcrowding poses to patient safety. When departments are crowded, patients wait longer to be seen and treated by medical staff. The nursing resource is spread more thinly and nursing observations occur less frequently than desired. Medical staff are rushed, and decisions, assessments and medical interventions may be rushed or truncated as a result.[14]

Where there is a shortage of resources (whether in staff numbers, bed space, or access to further tests or services), it is inevitable that staff will be forced to make difficult decisions about which patients should be able to access resources. Inadequate access to observation beds inevitably leads to pressure to discharge patients earlier than is optimal. An observation area is a valuable option to confirm that a patient's condition has stabilised or is improving and that treatment is adequate for discharge.

While I am pleased to note that action is now being taken to address these resourcing issues (via Project RED), in my view the lack of beds and highly skilled staff in Christchurch Hospital ED on 13 April 2007 contributed to the deficiencies in the care Mr A received.

Supervision
Canterbury DHB was responsible for providing proper supervision to junior staff, and ensuring that staff had adequate back-up and support. A key issue in this case is the

[14] Ardagh, M., & Richardson, S. (2004). Emergency department overcrowding — can we fix it? NZMJ, 117 (1189).

amount of supervision that was required. I acknowledge that Dr D was a highly regarded house officer and that there was a relatively high number of senior medical staff on duty. Dr D discussed Mr A with a specialist, who would have reviewed him if that was required. Nonetheless, there is a question mark in my mind about the adequacy of the supervision and support, particularly since significant clinical findings were misinterpreted and Mr A was not reviewed after morphine had been administered.

As noted by my emergency medicine specialist, Dr Clearwater, "It is remarkable that the system allowed a junior doctor to make these findings without activating more intensive review." Junior medical staff are relatively inexperienced in clinical work and must base their management on what they have learnt at medical school. There is a gradual increase in clinical autonomy, but a second-year house officer, such as Dr D in April 2007, is still very inexperienced.

The ED is one of the few areas of a hospital where a substantial proportion of the patients may be assessed and discharged by a junior doctor without senior review. The role of the house surgeon in the ED is high risk when there is a lack of proactive supervision. Regrettably, there are many instances of junior doctors having to explain why they did not recognise the early signs of a significant illness.[15]

As noted by Dr Clearwater, resource constraints in many EDs require supervisors to use a limited passive/reactive form of supervision, where only selected cases are reviewed. This relies on the junior doctor recognising that there is an issue that requires advice. If the supervisor is too busy to fully review the case, then he or she must focus on a key issue and trust that the junior doctor has made an adequate assessment and conveyed all the relevant information. When the supervisors are busy managing their own work load, there is a natural reluctance on the part of the junior doctor to interrupt with a request to review another patient.

I accept that it would be impracticable for an emergency medicine specialist to personally review every patient in ED. However, the district health board is responsible for ensuring there is the capacity in the ED for senior doctors to provide effective supervision to junior staff — a system that optimises the senior doctors' expertise. The ED should have sufficient senior staff on duty to enable them "to 'roam' their areas of responsibility to facilitate early detection of problems and concerns".[16]

The issue of supervision is being addressed by the Australasian College for Emergency Medicine. The 2008 ACEM draft policy on "Components of an

[15] Ardagh, M. (2006). The skills of our New Zealand junior doctors — what are these skills and how do they get them. NZMJ, 119 (1229).

[16] Canterbury DHB's response to the provisional report.

Emergency Medicine Consultation" advises that doctors with less than four years' relevant experience should consult with a doctor of four or more years' relevant experience prior to initiation of a diagnostic and management plan for all patients. The policy also refers to a screening process to assess patients' suitability and safety for discharge. A mandatory component of the screening process is authorisation of discharge by a doctor of four or more years' relevant experience. I note that patients referred to Christchurch Hospital for admission by a GP must be reviewed by a registrar or consultant before discharge.

Developing guidance that all patients must be reviewed by a registrar or consultant before discharge would enhance supervision of junior staff, and provide a further safety check in the system.

The system at CDHB in 2007 allowed patients to be discharged by junior doctors without senior review (except for GP referrals). A junior doctor working in the ambulatory area was supposed to be supervised by an emergency specialist and registrar in the area. The specialist was expected to have an overview of the area, and both would be available to review cases with the junior doctor and provide advice. However, in reality, due to the volume of patients and the high level of intervention required for some patients, the consultant was routinely required to assume a high primary patient workload. This created a barrier to effective supervision.

This case highlights the risks of "reactive" supervision. Dr D was left to run the ambulatory section of the ED for some of the evening and had to decide for herself when to seek a supervisor's advice. She did not recognise the significance of her findings and therefore did not fully convey them to the senior doctor. I share Dr Clearwater's view that this placed Dr D and her patients at risk, especially since the designated consultant for that area was unavailable and the second consultant was very busy. In my opinion, the supervision in place at Christchurch Hospital ED on 13 April 2007 was inadequate and placed patients at risk of junior medical staff making errors due to inexperience.

Guidance for ED staff

There is a growing body of knowledge about the provision of effective guidelines. Guidelines need to be relevant and consistent with good practice, readily accessible, systematically taught and reinforced, and consistently followed, with senior staff leading by example.

I am left in some doubt whether staff involved in Mr A's care were familiar with and supported to follow departmental guidelines on administering morphine. From the records, it appears that no observations were taken after morphine was provided, in contravention of the departmental guidelines. If Mr A had been exhibiting signs of infection or shock, it may well not have been detected. This clearly contravenes hospital guidelines and good practice.

I note Dr Clearwater's criticism of the decision to discharge Mr A under the influence of a narcotic. This practice carries the risk that the patient will be at home when the analgesic effect wears off, leaving the patient the same as they were or even worse off. Ideally, the patient should be kept in the department to assess progress after the drug has worn off.

Discharge policy
Discharge advice is a vital aspect of ED care. Canterbury DHB advised that doctors discharging patients are encouraged to liaise with the patient's GP about follow-up care, and provide patient advice sheets about specific conditions. However, there is no advice sheet for back pain.

Dr Clearwater advised that, ideally, discharge advice should include verbal advice reinforced with written instructions. Discharge instructions should list the significant symptoms that warrant urgent review. Written advice is very useful for patients and their associates, who must assimilate a lot of information at the time of discharge.

As previously discussed, before Mr A left the ED, he and his family were not adequately informed about the significant symptoms that would warrant urgent medical review. Providing patients and families with written advice is very useful because when people are under stress, as the family undoubtedly were, they are unlikely to assimilate a lot of verbal information. An advice sheet could have provided Ms A with information about symptoms that would justify seeking further urgent medical attention. Dr Clearwater also advised that the space on the discharge summary form used at Christchurch Hospital ED to document advice is very small, and may have contributed to the lack of comprehensive advice.

Specific discharge advice is an important aspect of ensuring appropriate care, and Canterbury DHB had an obligation to ensure that the discharge process from ED included such advice. I accept Dr Clearwater's advice that the lack of systemic discharge instructions was a departure from an appropriate standard of care.

Summary
In my opinion, Canterbury DHB failed to provide Mr A with services of an appropriate standard on 13 April 2007 by failing to adequately resource the ED, and failing to ensure appropriate supervision and effective guidance for staff, and an adequate documentation and discharge process. In these circumstances, Canterbury DHB breached Right 4(1) of the Code.

Other comment

Ms A and Mrs B were both upset by what they considered to be an uncaring attitude of the triage nurse, RN Ms G. RN Ms G explained to the Canterbury DHB

commissioned reviewers that she had attempted to calm Mr A, who she could see was in severe pain, by asking him to slow his breathing.

RN Ms F was also concerned about the reaction of Mr A's family to his distress and went outside her assigned role to find a bed for him and arrange medication to control his nausea and pain. She admitted that she found the family's stress difficult to deal with.

The family was naturally frightened and looked to the hospital staff for help. They found RN Ms G's manner "short" and unhelpful. It appears that Ms A and Mrs B were angry and that RN Ms G and RN Ms F had difficulty in responding appropriately to their manner.

Emergency departments are busy, stressful environments and, as Dr D commented, there is frequently "a big drive" to process patients. RN Ms G and RN Ms F were both experienced ED staff, who must have encountered difficult situations before. The triage desk at the entrance to ED is the front door of the hospital. It is disappointing that the family's lasting impression is that the nurses were uncaring and unhelpful, when in fact RN Ms F went out of her way to find a trolley and pain relief for Mr A, and the ED staff were trying to alleviate Mr A's pain and suffering in an efficient manner.

I note that the independent review commissioned by Canterbury DHB in July 2007 stated that, although they had no criticism of the triage nursing and reception staff, all staff would benefit from "front of house skills" training to prepare them for the sometimes difficult interactions that can occur when patients seek help from emergency departments. The DHB has advised that communication skills training for all staff has been undertaken as part of Project RED.

Opinion: No breach — Dr D

Dr D, a second-year house officer, was working in difficult conditions on 13 April 2007. She was assigned to work in the ambulatory area with a specialist and registrar, but ended up working by herself for some of the evening. During this time, she assessed Mr A and concluded he was suffering from mechanical back injury. She consulted a specialist in another area in relation to his management, and provided treatment in accordance with the advice.

Back pain is one of the most common presentations to an ED. Dr Clearwater advised that the challenge for clinicians is to detect the small number of serious underlying diseases in the many cases of back pain they see. Guidelines help filter out risk factors ("red flags") and thereby identify the small proportion of cases that warrant special investigation.

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. The key question in this case is whether Dr D should have recognised any "red flag" symptoms or abnormal findings that indicated Mr A might have a more serious underlying condition.

Epidural abscess is a rare condition that is notoriously difficult to diagnose.[17] Dr D and Canterbury DHB maintain that there were no risk factors or red flags to signal the possibility of an epidural abscess. Dr D says it "was a very difficult diagnosis to make. It probably would not have been made under the most ideal circumstances, even with senior staff. This is supported by Drs Freeman, Swain, and the GP advisor — all senior clinicians." Dr D states that it is extremely unlikely that an uncomplicated back pain patient with a clear history of mechanical cause and with increasing ease of mobility would have been accepted by the orthopaedic team, nor further testing undertaken until the following day or after the weekend.

Nonetheless, Dr Clearwater advised that Dr D's assessment of Mr A was suboptimal in some respects. He comments that Dr D "states some strong ideas about back pain that reflected her inexperience and incomplete knowledge, resulting in a tendency to minimise significant symptoms". This is evident from her notes, where each abnormal finding is explained away. For example, Mr A's decreased power was noted to be secondary to pain, and his abnormal gait secondary to anxiety. Given that Dr D attributed the abnormal neurological results of her examination of Mr A to his pain and anxiety, it was particularly important that she review Mr A once the morphine had taken effect. Dr D also omitted some important assessment facts from her notes (pulse and respiratory rate) and her neurological examination was limited in detail.

Dr Clearwater considers that these deficiencies reflect underlying service issues rather than individual shortcomings. He comments that "if the consultant had time to personally assess the patient and review the neurological exam, it is quite possible that the severity of the patient's condition would have been appreciated and different management advised". Dr Clearwater concludes that it was reasonable for a junior doctor to send a patient like Mr A home, having discussed the case with a specialist and having made a joint plan.

Conclusion

I accept Dr Clearwater's advice that Dr D underestimated some potentially significant findings and then omitted to review those findings after the morphine had taken effect. Regrettably Dr D was too quick to dismiss the vital, albeit subtle, clues that Mr A might have been harbouring a more serious underlying disease. In a busy ED with

[17] It occurs in approximately one in 10,000 hospital admissions.

multiple sick patients and a heavy information load from multiple sources, a junior doctor may fail to appreciate the significance of clinical findings.

It was far from ideal that Dr D's medical notes were written up retrospectively. No doubt the delay reflects the pressure on the ED at the time. Nonetheless, it has left some question about the accuracy of the notes. Mrs B has no doubt "that the delay in writing the notes on [Mr A] by [Dr D] has resulted in misinformation".

Overall, I accept that the care Dr D provided was reasonable for a doctor of her relatively limited experience, working under pressure with suboptimal support. It follows that she did not breach the Code.

Opinion: No breach — Dr C

11 April consultation
When Dr C saw Mr A for the first time in relation to his back injury on 11 April 2007, he had been receiving physiotherapy treatment for about a week: Dr C excluded recent illness such as a respiratory infection, performed a comprehensive physical examination, and documented his impressions and treatment plan for Mr A.

My general practitioner advisor, Dr Birch, considered that Dr C's assessment on 11 April that Mr A was suffering a musculoskeletal injury, and his subsequent management plan, were "entirely adequate".

13 April consultation
When Mr A returned to see Dr C on 13 April, on the advice of senior physiotherapist Mr I, Dr C responded appropriately, and promptly re-examined Mr A. Although there is some discrepancy between the recollection of these events by Mr A's family and Dr C, it appears that Dr C performed another detailed examination of Mr A. His records show that he did not find anything new in relation to Mr A's symptoms. He was concerned that Mr A was still in severe pain and nauseated. Dr C considered that Mr A's nausea, in the absence of any other apparent cause, was the result of over-medication. He gave Mr A an intramuscular injection to control the nausea and advised him to stop taking Tramadol and Voltaren and to seek further advice over the weekend if he developed fever or any neurological signs.

Dr Birch stated that he could not "take any issue with [Dr C's] assessment or examination". Guided by this advice, I am satisfied that the service Dr C provided to Mr A on 11 and 13 April 2007 was reasonable in the circumstances and that he did not breach the Code.

Retrospective records
Dr C reviewed and amended his initial record of the consultations after he learnt Mr A had died. Not documenting the full assessment at the time of a consultation is an extremely common failing in general medical practice. Dr Birch commented that use of computerised clinical record systems do not encourage explicit assessment recording, and noted that Dr C followed up his initial record of his consultations with Mr A by clearly marking that they were retrospective.

The additions were made after Mr A's death. Although it is legitimate to amend clinical records as long as the amendment is clearly annotated as retrospective, and dated and signed, doing so in circumstances such as in this case — where the circumstances of Mr A's death were highly publicised — leaves a practitioner open to criticism that the changes were made for reasons of expediency. I accept that the subsequently recorded information was accurate but I do not share Dr Birch's view that computerised recording can be blamed for less than adequate recording of assessments. I remind Dr C of the importance of thorough, contemporaneous clinical recording.

Recommendations

Canterbury District Health Board
I recommend that Canterbury District Health Board:

- Apologise in writing to Ms A, Mr B and Mrs B for its breaches of the Code. The apology is to be sent to HDC and will be forwarded to Ms A, Mr B and Mrs B.

- Further review Christchurch Hospital's ED systems in light of Dr Clearwater's comments and advise HDC by **31 March 2009** of the actions taken in response.

Australasian College for Emergency Medicine
I recommend that the New Zealand Faculty of ACEM:

- Review the current guidelines for managing back pain in light of the issues raised by this report.

- Consider developing guidelines on ordering tests for CRP and ESR as part of the work-up on any patient with moderate–severe pain, especially if they are on medication that could be suppressing signs of infection.

- Consider its policy on the supervision of junior doctors in ED beyond the first house officer year in light of this report.

Follow-up actions

- A copy of this report will be sent to the Medical Council of New Zealand, ACC, the Christchurch Coroner, the Royal New Zealand College of General Practitioners, and the Australasian College of Emergency Medicine.

- A copy of this report with details identifying the parties removed, except the names of Canterbury District Health Board and Christchurch Hospital, will be sent to the Minister of Health, the Director-General of Health, the Quality Improvement Committee, all district health boards, the New Zealand Nurses Organisation, the New Zealand Medical Association, and the Association of Salaried Medical Specialists, and will be placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix 1

General practitioner Dr Tony Birch provided the following independent advice:

> "Thank you for your letter of 18th March requesting that I provide an opinion to the Commissioner about the services provided by [Dr C] to [Mr A], as detailed in the documents you supplied. I can confirm that I have no personal or professional conflict in this case. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors. I understand also that my report is subject to the Official Information Act and that my advice may be requested and disclosed under that Act and that the Commissioner's policy is to name his advisors where any advice is relied upon in making a decision.
>
> I qualified MB, ChB in 1968 from Victoria University of Manchester, UK. I also hold a Diploma in Obstetrics from the Royal College of Obstetricians (1970) and a Diploma in Health Administration from Massey University (1985). I have been a Member — now Distinguished Fellow — of the Royal New Zealand College of General Practitioners since 1980. Prior to working in New Zealand I worked in an isolated area of Fiji for three years. For 34 years I worked as a rural general practitioner and GP Obstetrician in Rawene, Hokianga. This practice involved on-call work and the care of patients in a small rural hospital.
>
> I have recently (February 2006) retired from this post and am now providing locum services and working as a medical educator for the Northland area of the RNZCGP General Practice Education Programme.
>
> I have read the supporting information supplied by the Commissioner, viz:
>
> - Letter of complaint to the Commissioner from [Mrs B], received 17 August 2007, marked with an 'A'. (Pages 1–19)
> - Letter of complaint to the Commissioner from [Mr B], received 29 August 2007, marked with a 'B'. (Page 20)
> - Notes taken during a telephone conversation with [Ms A] on 12 October 2007, marked with a 'C'. (Pages 21–22)
> - Response to the Commissioner from [Dr C], dated 10 September 2007, marked with a 'D'. (Pages 23–27)
> - Further response from [Dr C] on 2 & 12 October 2007, marked with an 'E'. (Pages 28–34)
> - Response to the Commissioner from physiotherapist [Mr I], dated 11 January 2008, marked with an 'F'. (Pages 35–38)
> - Response to the Commissioner from Canterbury DHB, dated 22 November 2007, marked with a 'G'. (Pages 39–150)

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

- Transcript of an interview conducted with [the Clinical Director] on 13 December 2007, marked with an 'H'. (Pages 151–154)
- Transcript of an interview conducted with [Dr E] on 13 December 2007, marked with an 'I'. (Pages 155–157)
- Transcript of an interview conducted with [Ms F] on 13 December 2007, marked with a 'J'. (Pages 158–163)
- Transcript of an interview conducted with [Dr D] on 13 December 2007, marked with a 'K'. (Pages 164–173)
- Notes taken during an interview with [Ms A] on 14 December 2007, marked with an 'L'. (Pages 175–184)

Report

1. *Please comment generally on the standard of care provided to [Mr A] by [Dr C] on 11 and 13 April 2007.*

Low back pain with sciatica-like symptoms following an accident like that suffered by [Mr A] is 'bread & butter' to general practice. Hardly a week would go by without someone presenting with these symptoms. Most improve in 3–4 days and current practice is to assume that this will happen and provide supportive care with advice and pain relief. This seems to have happened in this case.

The comments attributed to [Dr C] or his nurse regarding childbirth and the sense that [Mr A's] distress was being minimised are commonly part of the practice these days of expecting the problem to get better. An optimistic attitude is warranted in over 90% of cases.

From the notes and from the comments by [Dr C] subsequently, I can find nothing that would deviate from the standard of care provided by most general practitioners.

With no 'red flags' in evidence, [Dr C's] optimistic expectancy of resolution may have been perceived as a lack of sympathy.

2. *Was [Dr C's] examination/assessment and management plan for [Mr A] on 11 April adequate?*

As [Mr A] was already attending a physiotherapist, I find nothing to comment on with respect to the consultation on 11 April. It seems to be an entirely adequate assessment and management, given a presumed diagnosis of musculo-skeletal injury.

3. Was [Dr C's] examination/assessment and management plan for [Mr A] on 13 April adequate in light of the telephone conversation he had with physiotherapist [Mr I]?

There seems to be some discrepancy between what the family believed [Mr I] had said to [Dr C] and [Dr C's] recollection. [Mr I's] notes are not particularly helpful here either. It does appear from his notes, however, that it was [Mr I] who advised the family to take [Mr A] to hospital if he had not improved within an hour after seeing [Dr C].

What is not clear is how well [Dr C] knew [Mr A] and how he would normally react to pain. It appears that he — like many 25 year olds — hardly attended the doctor and was a relative stranger to [Dr C]. It does appear that [Dr C] took [Mr I's] message seriously and re-examined [Mr A]. However, finding nothing new — apart from non-resolution or, perhaps, worsening of the symptoms — he made adjustments to the pain management. I believe that this would have been the actions of most GPs.

Had [Dr C] been aware of [Mr A's] normal reaction to pain, and had he sufficient confidence in [Mr I's] clinical judgement, he may well have tried to expedite admission to hospital. Given most hospitals' policies, however, the probable response from the admitting doctor would have been the same as what, in fact, happened: 'Send the patient to A & E and we'll assess him there.'

4. Should [Dr C] have considered any other assessments or examinations?

As is mentioned in the documentation, [Mr A] died of an extremely rare condition. In 40 years of practice, I have never seen a case; though I have heard of one in an elderly diabetic man in our area. It appears that, by the time symptoms and signs have developed such that a diagnosis can be made, mortality is still very high. I cannot take any issue with [Dr C's] assessment or examination. I just wish that he had actually documented an assessment! (This is an extremely common failing in GPs and is not helped by computer systems which do not encourage making an assessment explicit!)

5. Please comment on [Dr C's] documentation.

[Dr C's] documentation is good. That he made extra notes after the fact is clearly marked and these notes were made soon after the event, while his memory was still clear.

Further comments

I wonder what the complaints policy is in [Dr C's] practice. In a situation like this, in a small town, much of the anger — which is directed at the medical system — may have been defused in a meeting at the practice between the doctor

and the family. With good facilitation, the hurt and pain experienced by both parties may have been expressed and, thus, lessened somewhat. We have done this in our practice. It is not an easy thing to be part of but it allows a sharing of our humanity in a situation where an 'unkind fate' has intervened. …"

Appendix 2

Emergency medicine specialist Dr Garry Clearwater provided the following advice:

> "Thank you for asking me to review this case.
>
> I have read and agreed to follow the Guidelines for Independent Advisors provided by the Office of the Health and 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 two Emergency Departments (EDs) at Waitemata District Health Board and I was Clinical Director of the Emergency Medicine service between 2000 and early 2006. I have previously worked as a GP in a semi-rural practice and as a Medical Officer of Special Scale at Middlemore Hospital ED. Our service employs specialists, Senior Medical Officers and registrars in training as well as locums. We employed Senior House Officers up until 2005.
>
> I have been asked to provide independent expert advice about whether [Dr D] and Canterbury District Health Board provided an appropriate standard of care to [Mr A] during an attendance at the Emergency Department on 13 April 2007.
>
> I have read the following documents:
>
> - Letter of complaint to the Commissioner from [Mrs B], received 17 August 2007, marked with an 'A'. (Pages 1 to 19)
> - Letter of complaint to the Commissioner from [Mr B], received 29 August 2007, marked with a 'B'. (Page 20)
> - Notes taken during a telephone conversation with [Ms A] on 12 October 2007, marked with a 'C'. (Pages 21 & 22)
> - Response to the Commissioner from [Dr C], dated 10 September 2007, marked with a 'D'. (Pages 23 to 26)
> - Further response from [Dr C] on 2 & 12 October 2007, marked with an 'E'. (Pages 28 to 33)
> - Response to the Commissioner from physiotherapist [Mr I], dated 11 January 2008, marked with an 'F'. (Pages 34 to 40)
> - Response to the Commissioner from Canterbury DHB, dated 21 September 2007, marked with a 'G'. (Pages 41 to 151)
> - Response to the Commissioner from Canterbury DHB, dated 22 November 2007, marked with an 'H'. (Pages 152 to 184)
> - Transcript of an interview conducted with [the Clinical Director] on 13 December 2007, marked with an 'I'. (Pages 185 to 193)
> - Transcript of an interview conducted with [Dr E] on 13 December 2007, marked with a 'J'. (Pages 194 to 199)

- Transcript of an interview conducted with [Ms F] on 13 December 2007, marked with a 'K'. (Pages 200 to 211)
- Transcript of an interview conducted with [Dr D] on 13 December 2007, marked with an 'L'. (Pages 212 to 230)
- Notes taken during an interview with [Ms A] on 14 December 2007, marked with an 'M'. (Pages 231 and 232)
- Further information provided by [Dr D] (re attached questions) received 2 April 2008, marked with an 'N'. (Pages 233 to 236)

I was asked to comment generally on the standard of care provided to [Mr A] by [Dr D] and Canterbury DHB on 13 April 2007.

Specific issues were raised:

Re: [Dr D]

I was asked to comment on whether:

1. [Dr D's] assessment of [Mr A] was adequate.
2. Her management plan for [Mr A] was reasonable.
3. [Dr D] should have considered any other assessments or examinations.
4. She should have discussed [Mr A's] condition further with one of the senior Emergency Department medical staff.
5. It was reasonable to discharge [Mr A] from ED on the evening of 13 April 2007.
6. [Dr D's] standard of documentation was adequate.

Re: Canterbury DHB

1. Were there any deficiencies in the management of Christchurch Hospital ED that may have contributed to the death of [Mr A]?
2. If so, what other systems could have been in place at Christchurch Hospital ED to ensure appropriate treatment and care of patients?
3. If, in answering any of the above questions, it was my opinion that [Dr D] and Canterbury DHB did not provide an appropriate standard of care, I was asked to indicate the severity of the departure from that standard.
4. I was also asked whether there were any aspects of the care provided by [Dr D] and Canterbury District Health Board that warranted additional comment.

OUTLINE OF EVENTS

[Mr A] was a fit and active contractor and recreational rugby player aged 25 years. He presented to [a] Physiotherapy Clinic on Thursday 5 April 2007 with back pain which he attributed to forcibly twisting his lower back while dipping

sheep that day. He had felt 'severe pain' and had remained uncomfortable since that time.

He was assessed by a physiotherapist who recorded that he had spasm of his left lower back muscles consistent with a back muscle strain, possibly a left-sided facet joint sprain at the L5 (5th Lumbar vertebra) level and raising the possibility of 'disc involvement' (prolapse of the flexible tissue between the vertebral bodies) and recommended treatment with local heat, rest and a mobilisation regimen.

[Mr A] returned to the physiotherapy clinic on Tuesday 10 April and was reassessed by another physiotherapist who noted that he was worse, too sore to undertake extension (back arching) exercises, had limited spine mobility and she raised the possibility of an intervertebral disc irritation with facet joint irritation between the 4th and 5th vertebrae. She recommended further exercises.

[Mr A's] back did not improve and on Wednesday 11 April 2007 he attended his medical practitioner, [Dr C], for pain relief for his back pain.

His GP noted that [Mr A] had already started taking anti-inflammatory medication (Voltaren — diclofenac 75mg twice daily: a full dose) from a previous prescription for an old neck injury. [Dr C] noted that his patient was in 'severe pain', sweating and mobilising with difficulty. His temperature was recorded at 36 degrees (normal). His GP reports that he asked detailed questions about [Mr A's] background health without any red flags being elicited. He recorded that the back pain was radiating into the left leg, had no symptoms of cauda equina (central spinal cord) impairment and that [Mr A] was very tender at the lower left part of his back (the 'SI' — sacro-iliac area), had painful left hip flexion to 30 degrees (the normal is 80–90 degrees) and a normal neurological exam of the feet. He prescribed pain-killers: Tramadol and Codalgin (paracetamol with codeine) as well as more Voltaren.

On Friday 13 April, [Mr A] returned to the physiotherapy clinic, reporting that his pain-killers were 'not helping much' and that the pain was getting worse in the last few days, now radiating down both legs. He was unable to find any comfortable position, was pale and sweaty and was too distressed to be adequately examined. He was seen by a senior physiotherapist, [Mr I], who was concerned about the possibility of a 'disc derangement' and the severity of pain — he telephoned the GP for an appointment.

His partner took [Mr A] to the GP surgery. He told [Dr C] he had severe back pain, epigastric pain and nausea. He was noted to be 'sweaty and pale'. His temperature was recorded as 36.8 degrees. He was given an intramuscular injection of Maxalon (metoclopramide) to control his nausea which was attributed to a combination of anti-inflammatories and analgesics. [Dr C] prescribed codeine phosphate 30mg four times a day and advised stopping Tramadol and Voltaren.

He also prescribed Omeprazole, a drug to reduce stomach acidity and irritation. He discharged [Mr A] after half an hour with advice to be seen again in three days.

However, a short time after arriving home, [Mr A] was in so much pain that his partner and mother drove him to Christchurch Hospital, arriving at the hospital's Emergency Department (ED) at 3.15pm on 13 April.

[Mr A] was assessed by a triage nurse at 1550h who noted that he had back pain, was sweating, hyperventilating and in severe pain and coded him as Triage category 3 (to be seen by a doctor within 30 minutes), a higher category than usual in view of his severe pain.

A senior registered nurse found a bed for [Mr A]. She noted his vital signs at 1600h (including pulse of 110 per minute and temperature 36.2 degrees). She recorded that he had lower back pain, not relieved by regular pain-killers from his GP and was nauseated after Tramadol. He was 'very distressed' and hyperventilating and had been 'lying flat for long periods each day'.

[Mr A's] 'current medications' were listed as Codcomol (a combination of paracetamol and Codeine) which he had taken four that day, Codeine, Tramadol (both taken that day) and Voltaren SR (slow release diclofenac).

She discussed the case with a registrar, Dr L (who did not actually assess the patient), and dispensed the doctor's prescribed medication at 1630h: paracetamol 1gm, codeine 60mg (for pain), Ibuprofen 400mg (an anti-inflammatory similar to Voltaren), Omeprazole 40mg (to reduce stomach acidity) and diazepam 5mg (a sedative and muscle relaxant).

At 1645h, a newly graduated nurse took over the care of [Mr A], recording his fast pulse rate (116 per minute), high respiratory rate (40 per minute) and a normal temperature. She recorded that he still had 'max pain'. [Mr A] walked to the ED toilet assisted by his partner at around this time. He was asked to pass a urine specimen but was unable to do so.

At 1725h [Mr A] was seen by a second year house officer, [Dr D], who reviewed the nursing notes and examined [Mr A]. She noted that he had twisted his back eight days previously but the pain had become 'much worse' in the last two days. She recorded that his bladder function was normal. He was 'obviously uncomfortable', had a normal temperature, and his neurological examination was unequal: he had reduced leg power (attributed to pain) and an absent left knee reflex but normal sensation. She recorded a 'markedly abnormal' gait. She recorded her diagnosis as musculoskeletal back pain with 'ongoing severe pain and reduced mobilisation'.

In her report, [Dr D] states that she had seen [Mr A] walk unaided before she saw him. She recalled that his pulse was 'in the mid 80s' and she noted that this was memorable because the nurse had recorded a fast pulse rate. However, this was not recorded in the notes that she wrote up approximately two hours later along with several other charts.

[Dr D] discussed [Mr A] with an Emergency Medicine consultant who suggested giving 10mg of intramuscular morphine 'to get [Mr A] up and moving.' [Dr D] discussed her plan with [Mr A] and his family and the nurse administered the morphine at 1800h.

At 1830h the nurse recalls that [Mr A] reported a muscular ache in his legs; his respiration rate had decreased and his back pain had eased. She did not record these observations in [Mr A's] notes. [Dr D] advised the nurse to try [Mr A] walking. [Mr A] was able to walk approximately 20 to 30 metres with assistance.

His partner recalls that [Mr A] had some difficulty walking at this time; he was unable to lift his feet and required considerable assistance. [Dr D] reviewed [Mr A] and talked to him and his family and reiterated the need for regular pain relief (paracetamol, codeine and Ibuprofen) and advised them to return to ED if the pain was not settling with regular analgesia. [Mr A], his partner and his mother left the ED at an unspecified time.

[Mr A] returned home where his condition deteriorated. His partner described him (#00232) being unable to sleep, moaning with pain, having hypersensitive skin (in his legs) and unable to pass urine despite several attempts. His partner stated that she 'wanted (him) to go back to the hospital but he refused'. At 0600h he told her that he was hot and 'couldn't feel his legs' then became quiet and he died at about 0700h on Saturday 14 April 2007.

A post-mortem conducted on 16 April found that he died as a result of overwhelming bacterial sepsis caused by Staphylococcus aureus originating from an untreated spinal epidural abscess.

The findings included:

- Healing abrasions on his knees and forearm.
- Thick extra-dural exudate, mainly posterior to the dura, extending from T10 (10th thoracic vertebral bone, out of 12 vertebrae in the level of the chest) to L3 (the 3rd lumbar vertebra, out of 5 vertebrae in the lower back), maximal at L2 without localised abscess or bone infection.
- Macroscopically normal thoracic and lumbar cord and cauda equina (the thin filaments of nerve that extend beyond the end of the tapered-off spinal cord and provide nerve supply to the bladder and bowel sphincters).
- No evidence of disc prolapse.

BACKGROUND

EPIDURAL ABSCESS

References are given on pages 0012–0014 (the Independent Review) so I will simply summarise some key points:

- Epidural abscess refers to an infection of the area of the spine between the outer layer of the spinal cord (dura) and the bones of the spinal column (vertebrae), usually the posterior aspect.
- In most cases the infection enters the space from a local source such as an infection of the back itself or from surgery or a needle or catheter that has been injected into the space.
- In approximately 1/3 to 1/2 cases, the infection reaches the epidural space via the blood stream from a distant source — before the body's immune system can clear the infection from the blood. This is the likely scenario for [Mr A].
- The organism that most commonly causes this infection is Staphylococcus aureus ('S aureus') — it was identified in [Mr A's] case. Once established in a part of the body, it is a difficult infection to clear because it produces abscesses that secrete fluid and pus that impede the action of the immune system. Antibiotics are often insufficient by themselves to clear the infection unless a surgical procedure has been performed to clear away the pus.
- Epidural abscess is relatively rare: approximately one case in every 10,000 hospital admissions. A typical metropolitan hospital would admit approximately 4–5 cases per year.
- Most patients who develop epidural abscess have one or more identifiable factors that put them at increased risk, eg an impaired immune system, an obvious infection or a spinal abnormality. It is particularly rare for infection to develop in a fit healthy young adult: overall, perhaps one or less cases per year in a metropolitan hospital.
- There is a 'classic' set of symptoms and signs that are typically considered to be features of epidural abscess: pain in the back, fever and nerve impairment. But in reality, it is unusual for all three features to be present (one study found that only 13% of cases had all three features).
- Not surprisingly, it is more common to miss the diagnosis initially. In one study, the average duration of symptoms before presenting to ED was five days and it took a median of two visits to ED before the patient was admitted (the range was 1–8 ED visits before the diagnosis was made).
- Symptoms occur because of compression and irritation of the spinal cord, inflammation and occlusion of the blood vessels around the spinal cord and local inflammation reacting to the infection. The spinal cord function is impaired, producing severe pain, loss of power, impaired sensation and bladder or bowel dysfunction — these can be patchy incomplete changes.

- The most sensitive screening test is a blood test for signs of an active immune reaction to infection: an elevated ESR (Erythrocyte Sedimentation Rate) or CRP (C-Reactive Protein). These tests are elevated in virtually all cases of epidural abscess whereas they would usually be normal in typical back strain — although they may be elevated for many other reasons as well. The tests are readily available within an hour or two at hospital laboratories.
- The diagnostic test that confirms epidural abscess is a Magnetic Resonance Imaging study (MRI): this is a difficult test to arrange, with limited availability because it requires expensive equipment and a lot of expertise to perform and interpret it.
- The mortality of epidural abscess is moderately high: about 20% of cases. 4–22% of patients have irreversible paraplegia and others have residual motor weakness.

To quote from one of the research papers describing a series of these infections (Tang H. Spinal Epidural Abscess — Experience with 46 Patients and Evaluation of Prognostic Factors. Journal of Infection; 45(2): 76–81): 'Spinal epidural abscess is a rare infectious disorder, often with a delayed diagnosis, and associated with significant morbidity and mortality rates.'

EFFECT OF PARACETAMOL AND ANTI-INFLAMMATORY DRUGS

These are common, standard treatments for musculo-skeletal pain.

They are also both used to reduce fever: this 'antipyretic effect' is used commonly in children with fever. If these drugs are used for pain, it is possible for them to mask some signs of infection.

The Non-Steroidal Anti-inflammatory Drugs (NSAIDs) used in this case were diclofenac (Voltaren) and Ibuprofen. There is some debate (which I will not detail here) about whether these drugs may actually impair the body's immune response and thereby give extra advantage to some infections (e.g. Barnham M. Non-steroidal anti-inflammatory drugs: concurrent or causative drugs in serious infection? *Clin Infect Dis.* 1997; 25: 1272–1273).

One research report is particularly interesting in respect to this case, related to severe Staphylococcus aureus infection in young people who had no predisposing factors:

Gonzalez BE, Martinez-Aguilar G, Hulten KG et al. Severe Staphylococcal Sepsis in Adolescents in the Era of Community-Acquired Methicillin-Resistant *Staphylococcus aureus*. Pediatrics 2005; 115(3): 642–648.

'Severe staphylococcal infections in previously healthy adolescents without predisposing risk factors have presented more frequently *at Texas Children's*

Hospital since September 2002. Fourteen adolescents with severe S aureus infections were identified between August 2002 and January 2004.

Of the 14 children, 13 (93%) had bone and joint infections.

A particular clone of Staph aureus was identified in most of these infections.

***Eight children (57%) had experienced some sort of blunt trauma (i.e., fall from bed, stumbled on a carpet), which in some instances heralded the initial site of presentation. The average time between the trauma and the presentation was 7 days**. The average duration of symptoms before admission was 3.5 days (range: 2–7 days).*

Because this clone is also the predominant cause of skin and soft tissue infections in our community, other factors such as host immunity, hormonal factors, and protein expression may be playing a role in the pathogenesis of these severe infections in adolescents.'

In response to this paper, a correspondent wondered how many patients had used Non-steroidal Anti-inflammatory Drugs (NSAIDs) prior to diagnosis. The authors responded:

Gonzalez BE, Martinez-Aguilar G, Hulten KG et al. Nonsteroidal Anti-inflammatory Drugs and Invasive Staphylococcal Infections: The Cart or the Horse? In Reply. Pediatrics 2005; 115(6): 1791

*'Revisiting the charts of the 14 patients described, information regarding the use of NSAIDs was available in 11 of the 14 patients. **8 of these 11 patients received NSAIDs before admission**. Ibuprofen was used most commonly (6 of 8). Other NSAIDs were ketorolac and naproxen. No major differences were identified between those who took NSAIDs and those who did not except for the Pediatric Risk of Mortality score, which was much higher in the NSAID group (mean: 25.1 vs 9.3). **All 3 children who died took NSAIDs.'***

These papers are not widely known. They highlight the fact that there seems to be an increase in Staphylococcus aureus severe infections in otherwise healthy young people, possibly related to a particular clone of that bacterium. Many cases were associated with otherwise-innocuous injuries, took a week to become apparent and had a high mortality rate despite expert care. A majority of patients had used NSAIDs before they were diagnosed — although this could simply reflect the fact that they were so sore that all types of painkillers were being used.

ASSESSMENT OF BACK PAIN

Back pain is one of the most common presentations to Emergency Departments. Two Emergency Medicine textbooks are commonly used in EDs and both address the topic:

An Australasian textbook has a chapter that deals with the problem: Safih, S. Chapter 13.1 Rheumatological emergencies. Section on back pain pages 523–4 in Cameron P, Jelinek G et al(eds). Textbook of adult emergency medicine (2nd ed.), 2004. Churchill Livingstone.

'Back pain is one of the most common presentations encountered in the emergency department. It is often complex to sort out (for reasons that include):

- *An exact anatomical diagnosis is elusive*
- *Pain control is difficult*
- *Patient mobilisation, and hence discharge from the emergency department is difficult …'*

'Vital signs must be taken carefully. An accurate temperature reading is important.'

'Sensation should be carefully tested, especially in the perianal region including anal tone. Saddle anaesthesia and loss of anal and urethral sphincter control occur in cauda equina compression and constitute a surgical emergency. Deep tendon and plantar reflexes, power and gait should be examined.'

'For acute back pain of probable musculo-ligamentous cause no investigation is indicated.'

A standard American textbook has a chapter as well: Della-Giustina D, Coppola M. Thoracic and lumbar pain syndromes. Chapter 282 (pages 1773–79) in Tintinalli JE, Kelen GD, Stapczynski JS (eds). Emergency medicine: a comprehensive study guide (6th ed). 2004, McGraw-Hill.

'The majority of patients that present to the ED with back pain have a nonspecific etiology that has no life-threatening or neurologically impairing concerns. However, due to the high volumes of ED patients with back pain, one can … potentially overlook serious causes for the symptoms.'

'The history should focus on the risk factors for serious disease …'

This chapter outlines 20 risk factors, one of which applied unequivocally in the case of [Mr A] ('positive straight leg raise' — raising the straightened leg which stretches the spinal nerves and their lining, the meninges) and two which probably applied: '*unremitting pain, even when supine (lying flat)*', and '*night pain*' (the

author adding that '*these are worrisome symptoms that are commonly overlooked in the evaluation of patients with back pain*').

It raises concerns about the presence of any neurological symptoms: '*neurological complaints such as paresthesias, numbness, weakness and gait disturbances must be further addressed …'*

It emphasises assessment for possible epidural compression by evaluating for urinary retention or incontinence.

Regarding assessment of vital signs, it states, '*unfortunately the sensitivity of fever is low … (including) 83% for spinal epidural abscess.'*

Examination should include the abdomen and a digital rectal examination as well as a detailed neurological exam.

Blood and radiological tests are only warranted for suspected infection, tumour, fracture or rheumatological causes and are not done routinely.

There is a section about Spinal Infections: '*very serious but uncommon causes of back pain*'. It lists risk factors which relate to immune deficiency and it states that about 50% of cases have pain for greater than three months. Fever is present in only 50% of cases. A blood test for ESR is nearly always elevated. X-rays are expected to be normal for the first few weeks.

There is a widely-disseminated guideline produced by the New Zealand Guidelines Group in 2004 and circulated by ACC, available on-line: New Zealand Acute Low Back Pain Guide www.nzgg.org.nz/guidelines/0072/acc1038_col.pdf

Its key messages (Page 5):

- *Acute low back pain is common. Episodes are nearly always short-lived and reassurance is very helpful.*
- *Investigations in the first 4–6 weeks do not provide clinical benefit unless there are Red Flags present. There are risks associated with unnecessary radiology (X-rays and CT scans).*
- *The evidence for the benefits of activity has strengthened. This means staying or becoming physically active and resuming usual activities, including work, as soon as possible.*
- *Analgesia and manipulation may provide short-term symptom control.*
- *Some clinical interventions may be harmful, especially extended bed rest and use of opiates or diazepam.*
- *Advice on early return to work is helpful.*

'Acute low back pain is common and episodes by definition last less than 3 months. In a few cases there is a serious cause, but generally the pain is non-

specific and precise diagnosis is not possible or necessary. If the pain radiates down the leg, below the knee, there is a greater chance that symptoms are caused by a herniated disc.'

'After an acute episode there may be persistent or fluctuating pain for a few weeks or months. Even severe pain that significantly limits activity at first, tends to improve, although there can be recurring episodes and occasional pain afterwards. Acute low back pain does not cause prolonged loss of function — unlike chronic back pain.'

Thus there is a strong message that most cases will be benign and should settle even if pain is initially severe.

Red Flags help identify potentially serious conditions. They include (page 10):

- *Features of Cauda Equina Syndrome include some or all of: urinary retention, faecal incontinence, widespread neurological symptoms and signs in the lower limb, including gait abnormality, saddle area numbness and a lax anal sphincter. Cauda Equina Syndrome is a medical emergency and requires urgent hospital referral.*
- *Significant trauma*
- *Weight loss*
- *History of cancer*
- *Fever*
- *Intravenous drug use*
- *Steroid use*
- *Patient over 50 years*
- *Severe, unremitting night-time pain*
- *Pain that gets worse when lying down.*

As to investigations and referrals (page 11):

- *Investigations in the first 6 weeks of an acute low back pain episode do not provide clinical benefit, unless there are Red Flags.*
- *A full blood count and ESR should usually be performed only if there are Red Flags. Other tests may be indicated depending on the clinical situation.*
- *Radiological investigations (X-rays and CT scans) carry the risk of potential harm from radiation related effects and should be avoided if not required for diagnosis or management.*

Recommended management options include (page 13):

- *Advice to stay active (including work)*
- *Analgesia using paracetamol and non-steroidal anti-inflammatory drugs*
- *Manipulation — in the first 4–6 weeks only*

- *Advise patients to 'stay active' and continue their usual activities*
- *Provide them with an explanation and reassurance, rather than a diagnosis*
- *Control their pain with simple analgesics, or manipulation if necessary.*

SUMMARY

This fit and healthy 25-year-old man had the rare misfortune to develop an infection in an area at the edge of his spinal cord in his lower back. It is possible that the area was injured when strained eight days previously — a common occurrence. What was unlucky is that a bacteria entered his blood stream — possibly via a mildly infected abrasion on his skin (described in the post mortem) — and managed to settle in this area before his immune system could clear it.

Subsequently this infection developed and irritated his lower back, causing intense discomfort and spasm. This development of epidural abscess is a rare condition. It is even more rare for it to develop in otherwise fit and healthy young adults.

Being fit and healthy, his immune system probably held the infection in partial check to the extent that he did not show external signs of infection (such as fever). However, this particular infection may have been a virulent form that produced less inflammation than usual. Furthermore it is likely that some of the signs of fever were inadvertently suppressed by his use of paracetamol and anti-inflammatory drugs (both of which have an effect of reducing fever as well as pain).

Unfortunately, his main symptoms were pain and spasm in the lower back: a very common symptom of a common condition (simple back strain) that is seen frequently by doctors and physiotherapists and is usually 'benign' in that it typically settles in a few days or weeks. There is a strong emphasis in guidelines to limit the use of unnecessary investigations and unwarranted therapies for so many people who will usually recover by themselves.

The challenge for clinicians is to detect the small number of serious underlying diseases in all the many cases of back pain that they see. Guidelines help filter out risk factors ('red flags') and thereby identify the small proportion of cases that warrant special investigation. Unfortunately, [Mr A] did not display any of these red flags apart from having 'severe pain'.

In particular, [Mr A] had no fever or signs of external infection to raise concerns about a rare spinal infection.

It is reasonably common to see young and middle-aged adults in emergency departments presenting with moderate–severe back pain, sometimes so severe that they cannot mobilise by themselves. Typically, these patients are assessed

and most receive standard treatment in ED, sufficient to enable them to start mobilising, and are then discharged home (often in some pain) with advice to continue pain-killers and to try to keep mobilising, with a view to their improvement over the next few days or weeks. [Mr A's] presentation to ED was not evidently different from so many other patients who present like this.

There were a few suboptimal aspects to his assessment and care in ED but it is unlikely that they would have greatly affected the chances of him being discharged home.

- There was no formal assessment of his nerve function in his bladder or bowel that is part of the recommended assessment to detect a rare cauda equina compression syndrome. However, the post mortem report indicates that his cauda equina was not compressed so, even if a formal assessment had been made, it would have probably been within normal limits.

- His inability to pass urine in ED was probably attributable to pain, dehydration and his drugs but could have been an early warning of cauda equina syndrome and should have warranted more formal assessment — but, as mentioned above, it would probably have been cleared.

- He had abnormal neurological findings on initial assessment by the junior doctor who did not appreciate their significance, assuming that they were secondary to his pain and spasm – but she did not formally recheck these later when his pain had eased.

The junior doctor who assessed [Mr A] was working in isolation in one part of the ED on a very busy shift. She sought the advice of a consultant and it appears that the full neurological findings and severity were not conveyed clearly. Her concept of acute back pain was that it was usually benign and the emphasis was on finding adequate pain relief to enable the patient to go home.

A debatable decision was made to give an intramuscular injection of morphine to ease his spasm and pain and then discharge him home while the morphine was still in his system. The logic is that a good dose of analgesia can break the vicious cycle of pain causing spasm which in turn cause more pain and spasm. The problem with this approach is that morphine can hide a more serious problem and the patient may be stuck at home as the morphine wears off hours later, in just as much pain.

Having improved with the morphine, he was not formally re-examined by the junior doctor to confirm her assumption that [the] initial abnormalities simply reflected pain rather than neurological impairment but she was told that his pain had eased and that he could walk unassisted, fulfilling her understanding of the desirable outcome.

Ideally, [Mr A] would have been re-examined and/or held in ED after the morphine was injected, long enough to be sure that he maintained his improvement as the dose wore off. There were issues of ED overload and space restrictions which may have tipped the decision to discharge him early.

But it must be remembered that [Mr A] did not die because of his back pain or directly from his epidural abscess. He died because the infection spread via his blood stream around his body, causing generalised infection that quickly overwhelmed him. Once established, Staphylococcus aureus sepsis has a high morbidity and mortality.

The critical issue would have been to identify that he had an infection and start antibiotics as soon as possible, with or without spinal surgery to drain the epidural infection.

Even if his infection had been diagnosed during his ED admission and treatment started at that stage, there is a moderate chance that he would have been critically ill, may still have died and could have been left with significant residual impairment.

There were two other alternatives to simple discharge:

- admit him for observation and pain relief. The re-emergence of his pain, the neurological deterioration and the serious infection would have declared itself eventually (as he developed septic shock) by which time he would have been seriously unwell, possibly too late to intervene effectively, even if treatment was started in ED;
- or to run a routine blood test for signs of inflammation.

In retrospect, if blood tests had been undertaken for ESR and/or CRP it is highly likely that they would have been abnormal and would have alerted his physicians to the possibility of infection.

However, such a test is not part of the recommended routine assessment of back pain, especially in an otherwise fit and healthy young man.

A case can be made for ordering tests for CRP and ESR as part of the work-up of any patient with moderate–severe back pain, especially if they are on paracetamol or NSAID medication that could be suppressing signs of infection. Perhaps this should be part of the standard guidelines.

SPECIFIC QUESTIONS RAISED BY THE COMMISSIONER

Re: [Dr D]

I was asked to comment on:

1. Whether [Dr D's] assessment of [Mr A] was adequate.

   It is important context that she was a relatively junior doctor working very hard, mostly on her own, in a busy part of the department — so busy that she could not write her medical notes at the time that she saw each patient (she had five sets of notes to write up later in the evening).

   I could find no evidence of the teaching she had received about back pain or whether a guideline or resource was available in ED (although the Clinical Director, in her statement [#00088] alludes to 'ACC publishes guidelines …') but if these were readily available her assessment fell below the optimum standards in that:

   – She did not formally assess signs of cauda equina syndrome (perineal sensation, anal tone and sensation, bladder distension, urinary retention) in a patient with moderate–severe worsening back pain.

   – She did not appreciate the possible significance of him being unable to pass urine (as possible cauda equina impairment).

   – She did not document or describe an examination of his central abdomen, including whether there was a distended bladder that could have indicated urinary retention (this is a relatively limited test for possible cauda equina syndrome, compared to using a bladder scanner).

   – She states some strong ideas about back pain that reflect her limited experience and incomplete knowledge, resulting in a tendency to minimise significant symptoms. Examples include (#00073 — discussing his pain in his left buttock), 'it is common for acute back pain to radiate down into the buttocks and thighs so this did not cause concern', and later 'he could straight leg raise to about 30 degrees on the right and slightly less than this on the left. Again, this is not unusual with acute lower back pain' (in fact, bilateral limited straight leg raise is potentially very significant) and she effectively ignored or minimised the potential neurological sign of an absent knee jerk (reflex) of the left knee. She assumed that leg weakness was due to pain. In fact, these findings are also potential indicators of significant neurological impairment. It seems that she thought so little of these findings that she did not convey them to her consultant. I suspect that if she had described the patient in terms of having severe pain, radiating down one thigh, associated with an absent knee jerk on that side along with

bilateral limited straight leg raise, leg weakness and unable to pass urine it would have alerted the consultant to more serious possibilities.

– [Dr D's] failure to fully outline her abnormal neurological findings to the consultant was a crucial omission but it seems that she had picked up some misleading ideas about the assessment of back pain and the significance of abnormal findings during her time in ED and failed to appreciate their significance.

– Overall, this represents a mild departure from the standard of care for acute back pain. However, this probably reflects limited supervision or training or guidelines rather than an individual issue — for example, there is no evidence that her supervising doctor had checked any of these points with her or advised her on this.

2. Whether [Dr D's] management plan for [Mr A] was reasonable.

In the context of her being a junior doctor working alone, her heavy workload and the fact that she had discussed the case with a consultant, her management plan was of a reasonable standard, consistent with practice in other EDs.

3. Whether [Dr D] should have considered any other assessments or examinations.

Ideally she would have repeated the neurological examination on [Mr A] after he was more relaxed after morphine. She had initially detected a number of abnormalities that could have indicated significant nerve impingement but she was clearly too busy to recheck this, having minimised the abnormalities when she did elicit them the first time.

Ideally she would have assessed [Mr A] more systematically for possible cauda equina syndrome, as described in Question 1.

Overall, this reflects a mild departure from the standard of care but is consistent with heavy workload, suboptimal supervision and inadequate guidelines or teaching.

It seems likely that a blood test for ESR and/or CRP would have alerted the clinicians to a serious underlying infection but, in the absence of 'red flags' being identified by the junior doctor, it was consistent with standard guidelines to omit a blood test and X-rays.

4. Whether [Dr D] should have discussed [Mr A's] condition further with one of the senior Emergency Department medical staff.

In light of the fact that she had already discussed the case with a consultant, had implemented his suggestion (to give intramuscular morphine) and had the desired outcome (reduced pain), it seems reasonable that she did not discuss the case further.

This is in the context that the consultant accepted her description of the case, was too busy to review the patient himself and that no 'red flags' were described to indicate more active investigation.

5. Whether it was reasonable to discharge [Mr A] from ED on the evening of 13 April 2007.

   This was a borderline decision.

   Overall, it was reasonable for a junior doctor to send a patient like this home, having discussed the case with a consultant and having made a joint plan and followed it.

   However, there were some issues that ideally might have made the wider Emergency Medicine service hesitate to send the patient home. These reflect underlying issues of heavy workload, suboptimal supervision and perhaps inadequate teaching and guidelines:

6. Assessment for possible cauda equina syndrome.

   There seems to have been an inadequate assessment of this syndrome, one of the few emergencies associated with back pain. It is insufficient to simply ask whether the patient has any problems with their bladder and bowels. Indeed, the patient could not pass urine (attributed at the time to his pain and analgesia). A systematic assessment for this was required and a consultant ideally would have checked that this had been done. In light of the post-mortem report regarding the unaffected cauda equina, this may have been normal but is a 'systems issue' for assessment of other patients with back pain.

7. Overlooking or minimising significant examination findings:

   A number of clinicians recorded the signs that, in retrospect, reflected irritation of the spinal cord or its lining, particularly the limited straight leg raise sign (noted by the physiotherapist, the GP and [Dr D]).

   As described in question 3, it appears that [Dr D] did not appreciate the potentially serious findings of severe pain radiating down one leg with markedly limited bilateral straight leg raise, an absent knee reflex in that leg, leg weakness and a 'markedly abnormal' gait. It is not clear whether the supervising consultant checked on these signs or whether they were

described to him in the request for advice. She did not go back to check the findings when the patient was more relaxed (under the influence of morphine). It is remarkable that the system allowed a junior doctor to make these findings without activating more intensive review.

8. Overlooking the presence of a potential 'Red Flag'

In the case of [Mr A], a single ACC Guideline 'Red Flag' may have applied: 'severe unremitting night-time pain', although the crucial definition of 'severe' is subjective. A high level of pain was noted in the retrospective reports from a number of staff that were involved in [Mr A's] care:

– Triage nurse (#00056): 'his behaviour was consistent with it to suggest he had severe low back pain.'

– Assessment nurse (#00060): '[Mr A] remained distressed after lying down,' and (#00062): 'we often treat severe back pain with this combination (of drugs).'

– The ambulatory unit nurse (#00066): '(he) complained of pain 9/10 in his back.'

– The doctor described the pain in her notes as 'ongoing, severe pain …'

The use of morphine for back pain is discouraged in most guidelines and was another marker of severity.

To be fair, many patients who present to ED with back pain would describe their pain as 'severe' so it is not a particularly useful discriminator. [Dr D] noted that in this ED, (#00072): 'it is not uncommon to have to give IV morphine to get on top of the pain initially…'

9. Discharging a patient under the influence of a narcotic

Sending a patient home while still under the influence of a moderate dose of intramuscular narcotic carries the risk that the patient would be at home when the analgesia wore off thus leaving the patient as bad as before, if not worse. Ideally, the patient would be held to assess his progress after the drug wore off. This decision contrasts with the statement that he would have been kept for observation if an intravenous dose was given — which would have worn off faster.

10. Incomplete recordings

There were no recordings of pulse or temperature after 1645h: despite the patient being given morphine and other pain-killers after 1800h. I suspect that this contravenes the hospital policy for administration of narcotics. If [Mr A] was developing a fever or shock, there were no recordings to detect this.

11. Incomplete discharge advice

There is no indication that specific discharge advice was given about the symptoms that would warrant urgent review. The documented discharge advice was to 'return if pain not settling …' Ideally these would have been clear advice to return if the patient had new sensory symptoms in his legs, any change in sensation or control of his bladder or bowels, any fever. This should be routine for all patients discharged with back pain.

This last point is relevant because the patient's partner describes him developing worsening symptoms overnight, including continuing inability to pass urine despite several attempts, hypersensitive skin then loss of sensation in his legs and ongoing pain. Specific advice might have emboldened his partner to insist that he return to hospital in the face of his reported reluctance to do so. Indeed, he was probably in the throes of septic shock and may not have been able to make any rational decisions himself at that late stage.

– Overall, the combined decision to send the patient home at that time and in that manner was a mild–moderate departure from the standard of care, in the context of a busy understaffed department. This is an issue for the service generally rather than a reflection on the junior doctor who was left to manage his care.

– The lack of specific discharge advice represents a mild–moderate departure from the standard of care.

12. Whether [Dr D's] standard of documentation was adequate

Overall this was an adequate standard, allowing for the fact that some important assessment facts were omitted (as discussed above) and the neurological exam was limited in detail. It is evident that workload seems to have adversely affected the doctor's ability to write comprehensive and timely notes.

It is suboptimal to write up several charts hours after the patients have been discharged, as occurred in this case. The doctor commented that this was

not her usual practice and that this reflected her heavy workload and multiple demands on her time.

Re: Canterbury DHB

1. Were there any deficiencies in the management of Christchurch Hospital ED that may have contributed to the death of [Mr A]?

There were a number of deficiencies at Christchurch Hospital ED that may have contributed to the untimely discharge from hospital.

1) A lot of evidence has been presented about deficiencies in resources: understaffing, a crowded department with inadequate space, inability of consultants to be consistently available to review cases and provide optimal supervision of several junior doctors. These factors inevitably lead to suboptimal care and increase the risk of poor outcomes despite the best efforts of staff on the floor.

— **Resource limitation seems to underlie most of the suboptimal aspects of care in this case**. This represents a moderate departure from the optimal standard of care, carrying a significant risk of adverse outcomes especially for 'borderline' cases.

2) The apparent lack of good systematic discharge instructions (addressed in question 5).

— The lack of a systematic discharge advice format (including a hard copy of comprehensive discharge instructions) represents a mild–moderate departure from the standard of care.

3) A possible lack of teaching or readily accessible guidelines regarding (in this instance) the common problem of back pain. No evidence was presented on this issue but it is notable that none of the nursing or medical staff mentioned the existence of any guideline, abnormal neurological findings were overlooked and the use of narcotics in this ED was described as 'not uncommon' even though this is discouraged by standard guidelines.

— If this was the case, this represents a mild departure from the standard of care.

4) If so, what other systems could have been in place at Christchurch Hospital ED to ensure appropriate treatment and care of patients?

Adequate supervision is a systems and resource issue.

In most parts of the inpatient hospital system, a supervising consultant systematically reviews all the cases of the junior medical staff via a combination of telephone access and routine ward rounds. Emergency Medicine has traditionally been an exception, despite the fact that it is a chaotic work environment, includes a large number of undifferentiated patients presenting across a wide range of conditions and has a significant error rate. It is one of the few areas of the hospital where a substantial proportion of patients can be assessed and discharged by junior medical staff without specialist review.

There is risk involved. Junior medical staff are relatively inexperienced in clinical work and must base their management on what they have learned at medical school — a condensed version of 'standard' / classic features of disease across the full range of disease. Specialists have spent another 5–7 years gaining a greater experience of the wide variations from these 'classic' presentations and learning the many subtleties and pitfalls in their delineated area of expertise.

Effective supervision requires a supervisor to be accessible and approachable in a timely manner. The supervisor needs adequate time to review the history, clinical notes, test results and the doctor's examination findings, then to discuss the issues in a way that teaches the junior doctor as well as refines the care of the patient. This is the basis of the 'ward round' system used by non-ED inpatient services.

The most effective supervision is systematic and 'pro-active': every patient is reviewed jointly (by the junior doctor and supervisor). In some EDs in the USA, it is mandatory for the supervisor to personally review all patients prior to leaving the department.

The Australasian College for Emergency Medicine has published a statement about the standard of supervision for the most junior doctors, those in their first year after graduation (interns) who work in EDs: Guidelines on Role of Interns in the Emergency Department (updated 2004) — available on-line (excerpts below — emphasis in bold is mine):

www.acem.org.au/media/policies_and_guidelines/G19_Role_of_Interns_in_the_ED_August_2004.pdf

'2.2.1 The current structure of medical undergraduate training means that, in the vast majority of cases, new graduates have not had sufficient practical exposure and experience to function safely and effectively in an ED unless supervised.

3.2 ***Where interns are included among the ED medical workforce, the roster profile will be structured so as to allow direct supervision, case by case, by a medical officer in at least the third post-graduate year, at all hours of the day.*** *There will be capacity for case-by-case supervision of technical skills, interpretation of tests (including X-rays) and decision-making (in relation to both therapy and disposition).'*

There is a gradual increase in clinical autonomy beyond the first House Surgeon year and the degree of supervision becomes less systematic. However, a second year House Surgeon is still very inexperienced and needs significant guidance. [Dr D], in her second post-graduate year, was left to run a separate section of the ED (the ambulatory area) by herself for some of the evening and had to decide for herself when to seek a supervisor's advice. This placed her and her patients at some risk. When this advice was sought, the designated consultant could not be located and she had to seek out a second consultant who, in his statement says (#00081), 'I was too busy to review the patient myself.'

Resource constraints in many EDs require supervisors to use a limited passive/reactive form of supervision that deviates from the ACEM standard in a number of steps:

- Only selected cases are reviewed — the junior doctor must recognise that there is an issue that requires advice. This carries the risk that a problem that seems to be straightforward and common (such as back pain) is actually a manifestation of an uncommon but serious disease that is not appreciated by the inexperienced doctor. That is to say, the system relies on a junior doctor recognising any 'red flags', some of which are part of an expert body of knowledge.
- Supervisors must be actively located then interrupted in their own work. This is a psychological barrier when supervisors are busy managing their own patient load, overseeing the functioning of the department, fielding enquiries from multiple sources and applying their specialist skills to selected cases. There is the added stress if junior doctors have to leave their own patients and workload to do this.
- The supervisor is too busy to fully review the case and must focus on a key issue, trusting that the junior doctor has made an adequate assessment and has conveyed all the relevant points.

  This case is perhaps an illustration of the risks associated with 'reactive' selective supervision. The House Surgeon sought consultant advice on only one issue — pain relief — in the context that 'I was not concerned that there might be something else going on'. This conviction that there was no other concern was apparently

conveyed to the consultant who describes being told (#00081) that '([Mr A]) was observed to get up and go to the toilet without apparent distress. The nursing staff were not overly concerned. There were no 'red flags' … and this appeared to be a straightforward case of mechanical back pain.'

In retrospect, the consultant was not given a complete picture. It did not accurately reflect the finding of a 'markedly abnormal gait' nor that the nurses described his pain as '9/10' or 'severe'. He is likely to have had more concern had he been informed that the patient was developing increasingly severe pain over eight days, radiating down one leg with markedly limited bilateral straight leg raise, an absent knee reflex on that side, leg weakness and unable to pass urine. Because the significance of these findings was not appreciated (or was minimised) by the House Surgeon it seems that they were not conveyed clearly (if at all) to the consultant.

If the consultant had time to personally assess the patient and review the neurological exam, it is quite possible that the severity of the patient's condition would have been appreciated and different management advised.

This system adds risk to patient care and also to the confidence of junior medical staff who inevitably make some errors secondary to inexperience. In at least two metropolitan EDs in New Zealand, House Surgeons no longer have a service role in ED because of this clinical risk and insufficient availability of supervising consultants in the face of high workloads.

- This case suggests that Christchurch Hospital ED seems to have insufficient resource for adequate supervision of its junior medical officers. This relates to workload and the high proportion of junior doctors compared to supervisors. This constitutes a moderate risk to its standard of care.

2. <u>Adequate guidelines and training</u>

There is a growing body of knowledge about effective guidelines, including that they need to be:

- relevant and consistent with local practice
- systematically taught
- readily accessible
- reinforced and audited
- consistently followed and mentored by senior staff.

There was no evidence presented about any formal guidelines about back pain in this ED even though it is a condition commonly seen in ED, is associated with uncommon but serious diseases (eg abdominal aortic aneurysm, cauda equina syndrome) and national guidelines have already been developed (ACC-sponsored NZ Guidelines Group).

- The apparent lack of access to a departmental guideline constitutes a mild–moderate risk to its standard of care.

3. Adequate access to observation beds for patients who are in distress and not yet stable

   There is more pressure to discharge patients early, at the expense of prolonged observation, when there is inadequate access to observation beds. An observation area is a valuable option to confirm that a patient's condition is stabilised or improving and that treatment is adequate for discharge.

   - The limited access to beds for prolonged observation (at least overnight) constitutes a mild–moderate risk to its standard of care.

4. Developing a system of discharge advice

   The apparent lack of comprehensive advice seems to be a systems issue: for example, there is a very small space (3 x 6cm) on the discharge summary to document advice.

   Discharge advice is an important safety and communications issue. It should ideally be verbal advice reinforced with written instructions.

   Discharge instructions should list the significant symptoms that warrant urgent review. Written advice is very useful for patients and their associates who must assimilate a lot of information at the time of discharge. Printed pre-formatted advice sheets (such as those typically given for head injury) are one option.

   1) Extra points
      Emergency Department staff in all EDs could contemplate a policy to perform screening tests of ESR and/or CRP for patients with moderate–severe back pain that is not settling well with standard therapy. These tests are very sensitive to the small number of cases of infection and are simple to perform.

      The threshold for ordering these tests should be lower if the patient is using paracetamol or non-steroidal inflammatory drugs that could be masking the signs of infection.

There is a risk associated with discharging a patient home while still significantly under the influence of narcotics that could be masking deterioration in the underlying problem.

Dr Garry Clearwater"

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

Appendix 3

Further expert advice was obtained from Dr Garry Clearwater in light of the responses to my provisional report:

> "… As outlined in my original advice, I think that there were issues in [Dr D's] care, of underestimating some significant findings and then omitting to review those findings to check whether they had resolved. Overall, I would categorise these as 'misguided' but understandable actions for a doctor in their second House Officer year in the context of high workload and suboptimal supervision. My concerns in that respect are detailed in my report, quoted on pages [46–50].
>
> The standard expected of a doctor at this level of training is lower than one would expect from a registrar or a consultant with expert knowledge of Emergency Medicine.
>
> [Mr A] presented with a rare condition (epidural abscess), in an atypical manner (no risk factors for infection, no recorded fever). He was managed by a relatively inexperienced junior doctor in a chaotic busy department. In a setting of reasonable workload and on-site active supervision, I expect that the atypical features of [Mr A's] case would have been more readily detected.
>
> Regarding her discussions with the consultant in another part of the department, this seems to have been a classic case of a junior doctor not recognising the limits of her knowledge. [Dr D] did not recognise that there were potentially serious 'red flags' in the limited neurological exam that she undertook. She interpreted these findings as being part of a typical case of severe back pain and did not think that they warranted detailing to the consultant. Instead, she asked a simple question regarding the next appropriate level of pain relief to use and no discussion took place regarding differential diagnosis or, specifically, about the neurological findings. She did not recognise the atypical aspects of his case, did not convey concerns about the diagnosis (because she did not have any) and the supervisor was not presented with diagnostic concerns.
>
> [Dr D's] management of this case can be viewed in the light of a significant body of research regarding errors in medical care and how they occur.
>
> **Doctors in ED work in a chaotic and distracting work environment**
>
> An observational study of doctors in three USA EDs found that they were briefly interrupted on average every six minutes (31 interruptions in three hours). They had more intrusive interruptions (events that required a change of attention lasting more than ten seconds and subsequently requiring a change in task) on average over nine minutes (Chisholm 2000). The number of interruptions was strongly correlated to each doctor's patient load. This study cited other research that

indicated interruptions and distractions are common factors in pilot error, nuclear power plant shutdowns and drug dispensing errors.

- In this case, it was generally acknowledged that [Dr D] was working alone in a busy chaotic clinical area with high workload. Her ability to make considered thoughtful decisions was compromised.

ED doctors use short-cut cognitive strategies to simplify their decisions and make them more efficient

Heuristics are 'abbreviation' decision strategies that jump quickly to an answer: they may be in the form of 'rules of thumb' that cut through the need to undertake an exhaustive work-up of all possibilities. They may take the form of 'pattern recognition': a set of features that suggest a diagnosis when they occur together.

'The special milieu of the ED is dominated by heuristic thinking, a cognitive process that simplifies … decision-making operations. It flourishes under the uncertainty arising from the requirements to assess patients with whom the patient is usually unfamiliar, within narrow time frames and often with limited resources.' (Crosskerry 2000)

A limited number of diagnostic hypotheses are generated very rapidly

Doctors start evaluating information before they see each new patient (if they read a report from ambulance crew, the assessment nurse or a referring doctor). 'Within minutes of beginning a patient encounter, physicians use both verbal and nonverbal cues from the patient to generate diagnostic hypotheses … They may be generated as rapidly as 28 seconds after beginning the encounter, with the correct diagnosis occurring around 1–7 minutes into the encounter' (Kuhn 2002). Within that time, a doctor will have formed 2–6 provisional hypotheses. Much of the subsequent time is spent confirming or reviewing these hypotheses.

Early, rapidly-framed diagnostic hypotheses are often correct
'The more rapid a diagnostic hypothesis is selected, the more apt it is to be correct.' (Kuhn 2002) '(Heuristic) shortcuts considerably reduce the "costs of search" and, in the vast majority of cases … will be right.' (Crosskerry 2000)

There is a trade-off between rapid decision-making and the risk of error
While these strategies are essential efficiencies for coping in the chaotic pressured environment of ED, they inevitably carry a risk of error, especially in cases that are atypical. 'If the initial hypotheses or selected illness scripts do not contain the correct diagnosis, there is a large chance that diagnostic error will occur.' (Kuhn 2002) This is sometimes referred to as the 'SATO phenomenon' (Crosskerry 2000). Speed (S) and Accuracy (A) are inversely related: the faster one has to make decisions, the higher the risk of inaccuracy; there is often a Trade Off (TO) between the two.

Inductive errors
'The logic of experience … based on small numbers' (Crosskerry 2000). Diagnoses are often made on the basis of classic features: if most experience is gained initially by making diagnoses like this, and since most cases fit within the classic picture, there is a tendency for inexperienced doctors to be reinforced into making these simple associations. With more experience, a doctor appreciates the wide variety that actually occurs.

- In this case, based on her limited experience of assessing back pain in ED, [Dr D] expected that a young man with severe back pain was likely to have a benign painful back strain: this was the default interim diagnosis which coloured her subsequent management.

Anchoring
Making a premature diagnosis on the basis of initial information elicited early in the consultation and subsequent information is not incorporated appropriately. Typically the patient reports a major symptom that bothers them most. Staff determine too early that this is the problem and focus on this one aspect.

- In this case, [Dr D] identified the main problem as escalating benign back pain secondary to suboptimal pain relief and mobilization. In this light, she felt that her primary concern was to address the need for 'adequate pain relief and early mobilization'.

Confirmation bias
Disproportionate attention is directed to data that appear to support an early diagnostic hypothesis and inadequate attention is paid to information that might disprove the diagnosis. **'The combination of anchoring with confirmation bias can dangerously compound the error'** (Crosskerry 2000). 'When doctors believe that the history or visual inspection has led to a particular illness script … they quit asking questions and move on to the physical examination (which) may be used largely to confirm or refute the hypotheses.' (Kuhn 2002)

Search satisficing
Also known as 'bounded rationality' or 'premature closure'. The doctor stops looking for further abnormalities, having determined that a satisfactory level of evidence has been gained in the early phase of assessment. Premature closure is very common in analysis of diagnostic errors.

- In this case, [Dr D] interpreted the neurological findings (limited power in the legs, abnormal gait) as being attributable to the underlying pain. The high pulse rate was also attributed to pain. She discounted the significance of an absent knee reflex by attributing it to pain and limited relaxation. The absence of fever seemed to rule out infection as an issue. [Dr D] became more certain that the issue was simply to find adequate pain relief.

Ambient conditions
Also known as RACQITO phenomena: Resource Availability (RA) constrains Continuous Quality Improvement (CQI), requiring a Trade Off (TO) (Crosskerry 2000). Work conditions significantly affect the ability to make good decisions: eg excessive workload, low staffing levels, stress, inadequate support systems. Distractions are common.

- These are the features of the work environment when [Mr A] presented to [Dr D's] care.

Thus, I feel that the tragic outcome in this case occurred in conditions that were ripe for error and could have happened to any number of junior doctors in the same circumstances. With that in mind, I applaud the report's emphasis on addressing the underlying systems and resource issues in ED, as they offer the best opportunity to prevent a similar error in the future:

- staffing and facility resource;
- workload;
- promoting appropriate departmental guidelines;
- adequate systematic supervision of junior doctors (an issue that is being separately addressed by the Australasian College for Emergency medicine in an updated policy document that will strengthen the supervision of doctors beyond the first House Officer year).

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