Orthopaedic Surgeon, Dr B

Anaesthetist, Dr C

A Report by the

Health and Disability Commissioner

(Case 05HDC02988)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Parties involved

Mr A	Consumer (dec)
Dr B	Provider/Orthopaedic surgeon
Dr C	Provider/Anaesthetist
A private hospital	Provider/Hospital
A public hospital	Public Hospital
Public hospital 2	Public Hospital
Dr D	General practitioner
Ms E	Registered nurse
Ms F	Anaesthetic technician
Ms G	Registered nurse
Ms H	Registered nurse
Dr I	Anaesthetist
Ms J	Registered nurse
Mr K	Registered nurse
Ms M	Registered nurse
Ms L	Registered nurse
Ms N	Registered nurse
Ms O	Registered nurse
Ms P	Enrolled nurse
Ms Q	Registered nurse
Dr R	General physician
Ms S	Anaesthetic technician
Ms T	Registered nurse

Complaint

On 28 February 2005 the Commissioner received a complaint about the services provided by a private hospital to Mr A. The following issue was identified for investigation:

- *The appropriateness of care and treatment provided to Mr A by a private hospital in February 2005 until his admission to a public hospital on 13 February 2005.*

The investigation was commenced on 8 April 2005. On 29 August 2005 the investigation was extended to include orthopaedic surgeon Dr B. The following matter was notified for investigation:

- *The appropriateness of the care and treatment provided to Mr A by Dr B in February 2005 until Mr A's admission to a public hospital on 13 February 2005.*

Names have been removed to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's name.

On 29 September 2005 the investigation was further extended to include anaesthetist Dr C, as follows:

- *The appropriateness of the care and treatment provided to Mr A by Dr C in February 2005 until Mr A's admission to a public hospital on 13 February 2005.*

Completion of the investigation has been delayed by legal process, notably a mediation on 6 March 2007 that resolved the issues relating to the private hospital, but necessitated further investigation of the issues discussed in this report.

Information reviewed

Information was obtained from:

- Mr A's family
- Dr B
- Dr C
- The private hospital
- Ms H
- Ms J
- Ms F
- Ms T, registered nurse
- Ms S, anaesthetic technician
- A radiology service
- A District Health Board
- Another District Health Board
- ACC
- Dr I

Independent expert advice obtained from orthopaedic surgeon Dr Denis Atkinson and anaesthetist Dr Vaughan Laurenson.

Information gathered during investigation

Overview
Mr A (aged 81) was admitted to a private hospital on 10 February 2005 for elective spinal surgery under orthopaedic surgeon Dr B and anaesthetist Dr C. Both Dr B and Dr C have visiting privileges at the private hospital but are not employees.

Mr A's upper dental plate was removed prior to the anaesthesia because it was noticeably loose. (Mr A had both upper and lower dentures. Only the upper denture needed to be removed prior to the anaesthesia.) The anaesthetic and surgery were uneventful and Mr A was transferred to the recovery room. On his return to the ward, Mr A's upper denture was noticed to be missing but attempts to locate it were unsuccessful. Mr A's condition deteriorated and he subsequently developed respiratory complications. On 13 February 2005 Mr A went into respiratory arrest — caused by his upper denture being lodged in his pharynx (throat). Mr A was successfully resuscitated, but never fully regained his previous good health. He was unable to continue living independently, and died in 2007 from a pneumonia-related condition.

A key question during the investigation was how Mr A's upper denture came to be replaced into his mouth. It appears that it was replaced while he was still in the recovery room, but it has not been possible to establish the exact details of what happened.

Mr A's preoperative assessments
On 10 November 2004 general practitioner Dr D referred Mr A to Dr B to investigate symptoms of weakness and pain in his back and right leg, which had developed following a fall at home on 6 July 2004.

Dr B initially saw Mr A on 24 November 2004. Dr B described Mr A as "severely incapacitated" and considered that his symptoms were likely to be secondary to a right-sided disc prolapse (collapse) within the lumbar spine and spinal stenosis (narrowing). He recorded:

> "[Mr A] is an 81-year-old retired gentleman who on 6 July 2004 fell over and hit a dressing table and injured his back and since then has had severe right sciatica. This is causing him to walk in a stooped position. As you know he normally walks stooped over anyway due to a thoracic kyphosis [excessive outward curvature of the spine]. However he is much worse now."

Mr A had suffered an injury in 1949 when he fell from a power pole — resulting in mild right hemiplegia (paralysis) and a slightly muffled speaking voice. Mr A (and his son) denied the presence of any particular effects from his 1949 injury.

Mr A had an MRI scan on 1 December 2004. Dr B reviewed Mr A on 8 December 2004 and recommended surgery. Dr B recorded:

> "This [Mr A's MRI scan dated 1 December 2004] shows severe compromise of his spinal canal at the L3/4 level with what looks like an acute central to right-sided disc prolapse compromising a stenotic canal."

Dr B noted that Mr A's main problem was the right sciatic pain he had developed since his fall, with the disc prolapse being the cause. Dr B recommended that Mr A undergo an L3/4 decompression and discectomy (excision of invertebral disc) with instrumented fusion of the L2 to L4 vertebrae. Dr B went through the "pros and cons and complications" of surgery with Mr A, and it was decided to proceed. Mr A's surgery was given a clinical priority of "medium", with a proposed surgery date of January/February 2005.

Dr C assessed Mr A by telephone on 22 December 2004 to help plan resources for his admission. Dr C explained that "it was not a full consultation". Dr C wrote:

> "He [Mr A] is very limited by severe pain in his leg. His main problem is of severe cyphoscoliosis [kyphosis]. He has no cardiac or respiratory problems at present. He is on no medication. His main risk factors for surgery are his chest and his age. No further investigation or treatment is required."

Dr C considered that Mr A was fit for the proposed surgery but would require chest physiotherapy postoperatively.

Hospital admission and surgery

Mr A was admitted to the private hospital on 10 February 2005. The admission documentation was completed by registered nurse Ms E, who gave Mr A a small white tub with a generic hospital label attached (with Mr A's patient details), to store his dental plates during the operation. Ms E also taped Mr A's wedding ring, so it would not come off during surgery.

Mr A was taken to the preoperative room, and registered nurse Ms T completed the preoperative checklist. Dr C was also present. Ms T recalls that Mr A's dentures were "in situ". She explained that standard procedure was to remove dentures in theatre, and denture containers were normally provided at the time. She cannot recall seeing a denture container with Mr A's notes.

Dr C conducted his preoperative assessment of Mr A. Mr A's anaesthetic consent form was yet to be completed, and he was unable to sign this himself because of his right hand paralysis. (Mr A's surgical consent form had already been completed by his relatives.) Dr C obtained Mr A's verbal consent, and noted that he was unable to sign on the consent form. Mr A was then given a sedative, and an intravenous leur was

inserted. Dr C proceeded to the anaesthesia room to prepare the anaesthesia drugs, while Mr A was taken through to the operating room.

Mr A was then taken from the preoperative room into theatre. Prior to intubation, charge anaesthetic technician Ms F removed Mr A's upper denture after it fell to his tongue when his mouth was opened. (Mr A's dental surgeon explained that his last examination of Mr A was in October 2004, and Mr A's dentures were functioning well. However, it is possible that the dentures could have become loose prior to Mr A's surgery.)

Ms F put Mr A's upper denture in a denture carton, which she obtained from the anaesthetic drawer. Ms F then labelled the carton with a hospital label, and placed it with Mr A's notes on the computer workstation. Ms F has no recollection of receiving a pre-labelled carton for Mr A.

Dr C confirmed that a "loose fitting upper plate" was removed prior to the intubation of Mr A. Dr C explained that it is his standard practice to remove dentures prior to intubation. He does not recall seeing the upper denture after surgery. He stated:

> "At intubation a loose fitting upper denture was removed before the tube was placed, no lower denture was seen. This was stored by [Ms F] in the white carton."

Dr C explained that a patient ceases breathing shortly after the anaesthesic drugs take effect, and is ventilated by hand prior to the placement of the endotracheal tube. Oxygen is then provided through the endotracheal tube via the theatre "circle system".[1]

Immediately prior to surgery, Mr A was placed in a prone position on a "Wilson Frame" — a curved frame with a cranking mechanism (to determine the degree of flexion) over which the patient is placed face down.

Dr B commented that he takes responsibility for the positioning of his patients, although during spinal surgery the anaesthetist actually positions the head. Dr B explained:

> "[Mr A's] stooped posture did not affect his position on the Wilson frame. Once he was anaesthetised he was no longer in a stooped posture because the stooping was related to muscle spasm secondary to the severe pain he was getting from his nerve root compromise in the back. [Mr A] was positioned on the Wilson frame exactly the same way I position all my patients."

[1] Mr A's anaesthesia was primarily maintained by remefentanil, nitrous oxide and isoflurane.

Dr C stated that Mr A's stooped posture "resolved a little" under anaesthesia and did not particularly affect his positioning. He stated:

> "[Dr B] and myself positioned [Mr A] on the frame in theatre after intubation. Particular attention was taken to maintain the neck [in] the neutral (preop) position, avoiding undue flexion or extension."

Ms F commented that often a "bag of fluid" is placed under the patient's forehead, to guard against pressure areas and hyper-extension. She cannot recall whether this occurred in Mr A's case, but it was standard practice to take additional measures to support the head.

Registered nurse Ms G arrived in theatre when Mr A was on the operating table. She noticed that Mr A's upper denture was in a labelled white container on the computer workstation. Ms G stated that she moved the container from the computer desk on to the anaesthetic locker.

Following the uneventful completion of the spinal surgery at approximately 6pm, Mr A was moved from his prone position on the Wilson frame and positioned in a supine manner on his bed. Dr B supervised the movement and Dr C was responsible for the airway maintenance.

Dr C informed me that Mr A was apnoeic (not breathing) and unconscious due to "excess opioid at the end of anaesthesia". He explained that most patients return to consciousness reasonably soon after the anaesthesia gases are withdrawn shortly before the end of the procedure. Mr A's slower recovery was possibly due to the pethidine he was given towards the end of the surgery, at around 5pm.[2] Dr C stated:

> "Because it was the last case of the day I decided that it was wise to continue his recovery in the recovery room rather than in the operating theatre."

Anaesthetic technician Ms S helped transfer Mr A from the operating table to his bed. She then cleaned up the anaesthetic equipment, and wiped the area clean. Ms S did not see Mr A's denture container.

Transfer to recovery room

Dr C expected Mr A to recover in a few minutes and transferred him to the recovery room with the endotracheal tube in situ, using a T bag to maintain his breathing. During the transfer, the T bag was connected to an oxygen cylinder. Dr C commented:

[2] The surgery commenced at approximately 3.30pm. Mr A's blood pressure chart shows a drop in blood pressure around 5pm, which had resolved by the completion of the surgery.

> "It is a balance between the patient's desire to breathe and the narcotics' respiratory depression of their breathing and it's difficult to predict this exactly and the balance point has to be estimated by the anaesthetist.
>
> …
>
> And I believed that the patient was not breathing, was apnoeic, as [he] went down the hallway and into recovery and he probably received one or two minutes of assisted ventilation in recovery before he started to breathe spontaneously for himself."

Arrival in recovery

Registered nurse Ms H received handover from Dr C when Mr A arrived in recovery. Ms H commented that there is an expectation that when patients arrive in recovery they are breathing spontaneously. She stated:

> "The patient was apnoeic on arrival with an endotracheal tube in situ. The anaesthetist ([Dr C]) assisted ventilation using a T bag. While listening to the handover from [Dr C] and attaching monitoring equipment to the patient, I observed that there was a denture carton on the shelf next to the monitor. At this time the patient's vital signs were satisfactory and oxygen saturations were maintained with assisted ventilation."

Mr A is documented to have arrived in recovery at 17.58. The nursing care summary states:

> "Apnoeic on arrival, assisted ventilation, ET [endotrachael] tube in-situ — Anaesthetist present."

Ms H recalls that she could not see into the denture carton, which was sealed shut with a lid. The denture carton was on a shelf area, which was shared by the recovery patients. (She also did not particularly associate the denture carton with Mr A, at the time, and does not recall seeing a label on the carton.)

Dr C stated that it was standard practice to transfer patients from theatre to the recovery room with a T bag. He acknowledged that it was "probably" not standard care to assist ventilation with a T bag. However, he emphasised that he only assisted Mr A's ventilation for one to two minutes. Mr A was of relatively small stature, and the oxygen he received via the T bag was adequate. Dr C stated:

> "[W]hen the patient had transferred from theatre to recovery they are on oxygen cylinder at ten litres and then the tubing is disconnected from the oxygen cylinder and connected to the wall oxygen at ten litres a minute.
>
> …

> And by closing the end of the endotracheal tube the patient's lungs are filled with oxygen for a period of ten to fifteen seconds and then the finger is removed from the end of the T bag and the patient exhales so in that way 100 percent oxygen is delivered to the patient."

Documentation in relation to recovery of breathing/consciousness
Mr A's observation chart documents that he was not breathing at 17.58, 18.00 or 18.05. No recording was taken at 18.10. Mr A is then recorded to be breathing at 18.15 (at a rate of 10 breaths per minute). Mr A's nursing care summary records an overall score of "1" for his breathing on arrival in recovery. This is defined as "Laboured or limited spontaneous but shallow respiration. May have oral airway."

Mr A is recorded to have regained consciousness at 18.15. The nursing care summary states:

> "Narcan [naloxone] given by anaesthetist at 18.10. Patient awake shortly after in extreme pain. IV [intravenous] pethidine given. Patient restless and appeared quite distressed."

Dr C's absence from the recovery room
Ms H stated that Dr C administered naloxone after approximately 15 – 20 minutes but then left the recovery room to check on his patients from earlier in the day, before returning to extubate Mr A. Ms H stated:

> "I was not comfortable to be left with a patient who required assistance with breathing. At this stage [Mr A] was being ventilated. It was for this reason I asked [Dr C] to remain in the recovery room until [Mr A] was awake and the endotracheal tube had been removed. [Dr C] did not reply to me and left for approximately five minutes in which time I asked [Dr I] who was present in recovery, if she would assist me until [Mr A] was awake and maintaining his own airway. [Dr C] arrived back in the recovery room just prior to [Mr A] waking up."

Registered nurse Ms J was also present in recovery when Mr A arrived. Ms J was (initially) looking after another patient. Ms J recalls that Mr A was unconscious and not breathing when he arrived (or alternatively, his respirations were very shallow). Ms J explained that the T bag deflates and inflates as the patient breathes — but it may be difficult to detect whether a patient is breathing. However, the oxygen saturation level of the patient is constantly monitored.

Ms H stated that Mr A was not breathing spontaneously and was not conscious, until after the administration of naloxone. She commented that, if Mr A had recovered his breathing to any extent, "it certainly wasn't adequate". She also stated that the T bag "required no action from me". Ms H explained that naloxone takes effect "within

minutes" and she felt it was Dr C's responsibility to stay until Mr A was breathing spontaneously, even if not fully awake.

Ms J recalls Ms H advising Dr C that she would "prefer" it if he could stay. Ms J does not recall Dr C responding, and is unsure whether Mr A was breathing at the time. Ms J recalls that Dr C proceeded to prepare and administer naloxone to Mr A, removed his endotracheal tube, then left the recovery room.

Anaesthetist Dr I confirmed that she was present in the recovery room caring for another spinal surgery patient and became involved with Mr A's care at Ms H's request. Mr A was unconscious but breathing spontaneously when she entered the room with her patient, and he was later extubated. She stated:

> "… I recall being rather surprised to find another patient sitting partially upright with an endotracheal tube in situ. There were two recovery nurses in attendance and [Ms H] was responsible for the patient identified as [Mr A]."

Ms H said that nothing untoward occurred while Dr C was absent — for approximately five minutes. She stated that Dr C returned shortly after Mr A was "rousable to voice". Dr C extubated Mr A and then left the recovery room.

Dr C's recollection

In response, Dr C advised that he does not recall Ms H asking him to remain in the recovery room. Dr C stated that he did not leave the recovery room for the ward until after Mr A had been extubated. He said:

> "After a few minutes in recovery I decided to give a small dose of Naloxone. [Mr A] made a rapid return to full consciousness and was extubated semi sitting and fully awake. He was orientated and moving all limbs appropriately. I then left recovery to do a ward round."

Dr C advised that Mr A was "extubated sitting and awake" in recovery at approximately 6.20pm. Mr A's mouth was thoroughly suctioned at extubation and no upper denture was seen (or placed). Dr C stated that he left Mr A in the care of recovery nursing staff at about 6.30pm.

Dr C subsequently advised that he is "no longer sure exactly what happened" and that he may have left the recovery room for a period of time to review other patients who had undergone surgery that day. He would then have returned to administer naloxone to facilitate extubation. Dr C doubted that he would have administered naloxone prior to leaving the recovery room. He stated that naloxone is a fast-acting drug that reverses the effects of the narcotics that have been administered and takes less than one minute to take effect. Dr C surmised that he left recovery around 6.02pm, returned at 6.10pm and administered naloxon, and then extubated Mr A at 6.12pm prior to his

regaining consciousness at 6.15pm. Dr C stated that it would not have been possible to ventilate Mr A for 15 minutes and also to have left the recovery room. He also commented:

> "It is so long ago, I am not clear. I think Nurse [Ms H's] statement is mistaken and internally inconsistent."

Dr C stated that Mr A was breathing on the T bag while he was away from recovery, but breathing for himself, ie, spontaneous breathing rather than assisted breathing. He established by his "clinical judgement" that Mr A was breathing by himself before he left the recovery room. Dr C stated:

> "[I]n my clinical assessment of the patient I would look at the anaesthesia monitor, the recovery room monitor which shows his pulse rate, his blood pressure, his oxygen saturation and his respiratory pattern and breathing, and people caring for him and then I'd leave.
>
> …
>
> [S]o I'm reasonably sure that [Mr A] breathed for himself and that period of about five minutes while I was away from the recovery and then I returned and he still wasn't awake and he was given Narcan [naloxone] to wake him up."

Dr C considered that he would have left the recovery room at approximately 6.02pm or 6.05pm and then returned at 6.10pm. He stated:

> "[T]he nursing notes refer to him [Mr A] being conscious at 15 minutes past so the naloxone would take perhaps one minute to work and then one minute to suction him and extubate him so say that takes you to 12 minutes past and conscious at 1815."

Dr C explained that, in total, Mr A would have been on the T bag from 5.58pm (after the surgery and during the transfer to recovery) until 6.10pm (when naloxone was administered). The oxygen cylinder was used for the approximately two minutes it took to transfer Mr A to the recovery room, after which he was receiving wall oxygen (through the T bag). Accordingly, Mr A was not awake, but was breathing on his own in the period after he was transferred to the wall oxygen. Dr C stated:

> "I just want to bring to your attention the recovery room nursing record that shows that his [Mr A's] pulse was absolutely stable between 60 and 80 beats a minute for the entire two hour stay and that his blood pressure was absolutely rock solid normal and that his oxygen saturation from 6 o'clock until 7 o'clock when he left was 99 or 98 percent for the entire period. So I consider that this is

> very clear documentation that his cardio vascular and respiratory state was entirely stable in the recovery room."

Further recovery room care
Ms H stated that on waking Mr A was "distressed and restless" and appeared to be in significant pain. However, she felt "relatively comfortable" being left with his care. The other recovery nurse, Ms J, commented that Mr A had been unconscious for "what seemed a long time" and was in "extreme pain" when he awoke at 6.15pm. Ms H stated:

> "As [Dr I] was still present in the recovery room after [Dr C] left I asked for her assistance. The patient's distress was obvious and at my request she administered the first dose of the prescribed pethidine for [Mr A]."

Dr I confirmed that she administered pethidine to Mr A because Ms H was concerned that he was unsettled and appeared to be in pain. Dr I does not recall seeing Mr A's upper denture at any time.

At approximately 6.40pm, Ms H left Mr A in the care of Ms J. Ms H stated that Mr A "wasn't really awake enough" to have replaced his own denture during his time in recovery.

Ms J administered further pethidine to Mr A, and continued to monitor his vital signs. She recalls that Mr A did not appear to have a top denture in place. However, Ms J stated that she was unaware that Mr A had a dental carton with him in the recovery room, and she did not notice a denture carton in the space behind his bed. Ms J explained that when patients leave the recovery room, their belongings and notes get "put back onto the bed". When Ms J tidied up Mr A's bed space prior to his transfer to the ward, there was "nothing" for her to "put on the bed".

Ms J commented that there was "no way" Mr A would have been able to replace his teeth himself, owing to the extent of his sedation. In addition, Mr A was under constant supervision and it would not have gone unnoticed. It is not possible that another person could have replaced the denture as nursing staff remain with patients for the duration of their time in the recovery room.

Return to ward
Registered Nurse Mr K accompanied Mr A back to the ward at 8.30pm. Mr K commented that Mr A was confused but rousable to voice, and in pain. Mr A was encouraged to use his pain relief pump, and went back to sleep.

Mr A's daughter asked Mr K about her father's upper denture. Mr K searched carefully but could not locate the denture, and Mr A was unable to respond to queries about the missing denture because of his confused state. Mr K stated that Mr A "did

not seem" to have his dentures in situ — but he did not perform a "mouth care" as Mr A was too sleepy. Mr K notified the duty nurse manager, who checked the recovery room but was unable to find Mr A's upper denture.

Mr K noted that Mr A's respiration rate had decreased to 6-10 breaths per minute, but his oxygen saturation rates were stable and satisfactory (92% when asleep and above 95% when awake). An alarm was set to warn staff if Mr A's oxygen saturation rate fell below 90%.

Mr K handed over Mr A's care to night shift registered nurse Ms M. Ms M recalls the duty nurse manager advising that she had been unable to find Mr A's denture in the theatre or recovery ward. Ms M said that she checked Mr A's bed for the denture. She stated that Mr A was stable and comfortable through the night and did not have a 'wheeze".

Friday 11 February 2005
Registered nurse Ms L was allocated Mr A's care for the morning shift on 11 February 2005. Ms L was advised during handover from the night staff that Mr A's upper denture had been missing since his operation the previous day. She conducted a thorough search for the missing item.

Ms E spoke to Mr A on Friday morning (when she entered his room) and also noticed that he was not wearing his upper denture. Ms E enquired about this because she had sent the container to theatre with Mr A prior to his surgery. Mr A told her that the upper denture had been lost, and that staff had been looking for it since his time in theatre. Ms E noted that Mr A's voice was husky, and she thought this was the result of being intubated.

Ms L assisted Mr A with breakfast of milky porridge, but as he was bringing up sputum, was "very chesty", and was unable to tolerate more than a couple of spoonfuls, she advised him to ingest only fluids.

Mr A's condition did not improve and Ms L contacted Dr C for advice. Dr C ordered a Ventolin 2.5mg nebuliser. This was administered, but to no effect. Ms L contacted Dr C again and he ordered a diuretic — frusemide 20mg — which resulted in some improvement.

On his ward round, Dr B reviewed Mr A. Mr A said that the pain had gone from his leg but that he was concerned that his upper denture had been lost. His voice was reduced to a whisper, and Dr B considered that this was due to postoperative intubation irritation of the larynx. However, Mr A was not specifically complaining of throat pain.

On the afternoon shift registered agency nurse Ms N noted, at approximately 4.30pm, that Mr A was short of breath when speaking, and his chest was "wet". Ms N telephoned Dr C, who ordered further oral frusemide to be administered, as the earlier dosage had given Mr A some relief. Dr C recalls:

> "... [T]he nurse rang me to say he [Mr A] was having difficulty swallowing and had noisy breathing and a wet cough. Unfortunately this was attributed by me as being due to CHF [congestive heart failure] and his previous hemiplegia."

Ms N said she asked Dr C whether he remembered seeing Mr A's upper dental plate and he advised that "everyone was looking for the plate".

Later in the shift Ms N observed that Mr A's sputum had become "thick, frothy and pink". Mr A was becoming increasingly distressed, his temperature was 38°C and nebulisers were having "little effect". Ms N contacted the nurse duty manager, who instructed her to administer intravenous (IV) morphine. Ms N also contacted the house surgeon, who reviewed Mr A and consulted Dr C, who suggested IV frusemide.

Following the administration of IV frusemide and morphine, Mr A settled and there was a reduction in his breathing noise. Mr A's oxygen saturations were maintained at 93%. He slept well until 4am, at which time he woke up with a "slight wheeze". A Ventolin nebuliser was administered with little effect. Mr A's oxygen saturations were maintained at 91 - 94%. Dr C was not contacted again that night about Mr A's respiratory condition.

Saturday 12 February 2005
In the morning Dr B and Dr C reviewed Mr A and decided that he may have a combination of bronchitis and congestive heart failure. Chest X-rays and sputum samples were ordered. Dr C was to review the chest X-ray with Dr B on Sunday.

Dr I saw Mr A when she checked on one of her patients who was sharing a room with him. She stated:

> "… [Mr A] had noisy, moist breathe sounds and after giving instructions for my own patients, asking the nursing staff if anyone, i.e. medical staff, was coming in to see [Mr A] as his breathing caused me concern. I was reassured that this was occurring and that a chest X-ray was ordered. I noted the request for X-ray form on the ward board and left the hospital mid morning."

Two chest X-rays were taken that morning and the films were delivered to the ward before midday. They showed congestive heart failure.

Ms O, registered agency nurse, noted during the afternoon shift that Mr A was frustrated by frequent coughing. The duty nurse manager was notified and Mr A was

moved to a single room. His oxygen saturation was noted to be 88% at 4.25pm and 91% at 9.50pm. At approximately 10.30pm Ms O removed phlegm from Mr A's throat using a suction catheter, after which Mr A stated he felt better. Overall, Ms O considered that Mr A's condition from initial handover was unchanged.

Dr C commented that Mr A's recordings suggested that he remained unwell but stable through the afternoon and evening.

On the night of 12 February 2005, enrolled nurse Ms P documented that Mr A was "very chesty" and "fidgety" and had refused the nebuliser, oxygen via mask and nasal prongs, and suction. Mr A had settled by 3am but his oxygen saturations remained low at 76% and he was having difficulty communicating.

Dr C believes that he should have been contacted about Mr A's deterioration:

> "The nurses should have called me at 3am when they noticed that his oxygen saturation was 75%. If I had been called at that time the outcome may have been better."

Sunday 13 February 2005
At 8.00am duty nurse manager Ms Q was informed by nursing staff that Mr A's condition had markedly deteriorated. Ms Q assessed Mr A and noted that he was requiring significant respiratory effort to breathe. Mr A was lethargic and his last set of oxygen saturation recordings were only 76%. Ms Q contacted Dr C and Dr B.

While nursing staff were assisting Mr A to wash, he stopped breathing and became unresponsive. Ms L reported that "[Mr A] had been very restless and anxious before this. Chesty and coughing up copious phlegm." Dr B arrived and administered oxygen. There was little improvement in Mr A's oxygen saturation level of 46%. Dr C arrived and Mr A was intubated. During the laryngoscopy (visual examination of the throat with a laryngoscope) Mr A's upper dental plate was found to be lodged in his pharynx. The denture was removed and Mr A was then intubated. At approximately 9.15am Mr A was transferred to a public hospital, accompanied by Dr C.

Undiagnosed neurological condition
Mr A was transferred to another public hospital (public hospital 2) on 22 February 2005 where an MRI scan on 24 March 2005 revealed a syrinx (cavity) and wasting of musculature within the tongue — suggestive of syringomyelia, an undiagnosed neurological condition. General physician Dr R stated:

> "… [I]t is likely that [Mr A] has had an asymptomatic syrinx (cavity) in the cervical cord and brainstem for many years, but the events following his back surgery and subsequent resuscitation with manipulation of the head and neck have altered the fluid dynamics within the posterior fossa and syrinx and resulted in this

> acute deterioration in neurological function. There is not likely to be any specific treatment for this other than supportive cares he had been receiving."

Reflections on Mr A's care

Dr C and Dr B reviewed the chest X-rays following Mr A's respiratory arrest and considered that it was possible, with very close scrutiny, to see the dental plate in Mr A's pharynx. The denture was on the extreme edge of the X-ray and was poorly exposed. In these circumstances, Dr C commented that the working diagnosis of congestive heart failure — a common complication of elderly patients after surgery — was reasonable.

In relation to the location of the missing denture, Dr C stated:

> "Normal practice is to replace them when the patient requests it, or the patient replaces their own dentures. In [Mr A's] case … the upper plate was removed and placed in a carton at intubation by me and as witnessed by the anaesthetic technician and theatre nurse. His pharynx was clear at intubation and extubation. There is no record of it being replaced in recovery by [Mr A]. I can only assume that it was replaced on the evening of surgery and that it slipped to the back of his throat that night."

Investigation by the private hospital

There was no specific process at the private hospital for the tracking of dentures and the investigation did not establish how the upper denture was returned to Mr A. The private hospital advised:

> "In all of our investigation we have been unable to ascertain who replaced the upper dental plate and when this was done. All of the staff involved were asked this question and responded that it was not them and they did not see anyone else do it."

Further investigation by this Office also was not able to establish how Mr A's denture came to be replaced.

The private hospital sentinel event report noted:

> "It appears that when oxygen saturation was low attempts were made to improve ventilation by administering intravenous lasix [frusemide], ventolin, nebulisers and high oxygen. Oxygen flow rates were then weaned following some relief from the lasix and ventolin. The anaesthetist was contacted a number of times on Friday (11/02/05) by nursing staff and following review, by the medical officer.
>
> It is possible that the medical staff were unaware of the patient's deteriorating condition during the afternoon and night of the 12/02/05, though the anaesthetist was contacted a number of times on day one. The clinical team may have assumed

that the symptoms displayed were due to a chest infection and that appropriate action was being taken.

The review identified a number of shortcomings in the documentation in respect of accurate, timely, and sequential entries from medical and nursing team."

The sentinel event report made the following key recommendations:

1. Ward and Operating theatre review of documentation.

2. Process form ensuring sequential and timely documentation of interventions.

3. Tracking process for patient property.

4. Essential staff changes are documented.

5. System to ensure recovery staff document that the anaesthetist is happy to discharge patient from recovery.

6. Process and parameters for escalating to the next level information relating to concerns about a Patient's condition.

7. Documentation compliance audits.

8. Reflective practice for all staff to ensure lessons are learnt.

The private hospital has advised that it will implement the recommendations of the sentinel event report, which have been submitted to its clinical advisory board for approval.

ACC
Mr A's ACC claim was not considered under the criteria for medical misadventure as the injury occurred within the context of surgery already covered by ACC. Mr A's claim was accepted by ACC on the basis that he had developed "laryngeal difficulties and swallowing difficulties" as a complication of treatment for a covered injury.

Independent advice to Commissioner

Orthopaedic advice
The following expert advice was obtained from orthopaedic surgeon Dr Denis Atkinson on 20 January 2006:

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

I, Denis Atkinson, am a vocationally registered orthopaedic surgeon. I am a Fellow of the Royal Australasian College of Surgeons and a Fellow of the New Zealand Orthopaedic Association. I have been in public and private orthopaedic practice for 21 years. I have a specialist interest in major joint surgery. I am a member of the Board of the Professional Developments and Standards Board of the Royal Australasian College of Surgeons. I am the immediate past chairman of the Continuing Professional Development and Standards Sub Committee of the New Zealand Orthopaedic Association. I am a past member of Medical Advisory Committees to public and private hospitals in Hawke's Bay.

…

I have read and reviewed the file of documents provided to me by the Health and Disability Commissioner on 24/11/2005.

These documents include:

- Complaint letter received 28 February 2005 and related email, dated 16 March 2005 (pages 1–6)
- Notification letter, dated 8 April 2005 (pages 7–11)
- Notification letter, dated 29 August 2005 (pages 12–19)
- Notification letter, dated 29 September 2005 (pages 20–25)
- Letters and accompanying information from [the Chief Operating Officer], received 4 May 2005, 30 May 2005 (including Sentinel Event Review dated February 2005), 5 August 2005, 26 September 2005 and 26 October 2005 (pages 26–68)
- Letter from HDC to [the Chief Operating Officer], dated 13 May 2005 (pages 69–70)
- Letter from [Dr B], orthopaedic and spinal surgeon, dated 31 August 2005 (pages 71–73)
- Letter from [Dr C], anaesthetist, dated 19 October 2005 (pages 74–76)
- [Mr A's] medical notes from [the private hospital] (pages 77–146)
- Letter from [the General Manager], [a radiology service], dated 8 September 2005 (pages 147–149)
- Medical notes from [District Health Board 1] (pages 150–313)
- Information from [public hospital 2], received 20 May 2005 (pages 314–322)
- Letter from [ACC], to [Mr A], dated 20 May 2005 (page 323)
- Two X-rays, dated 12 February 2005.

…

[Mr A] suffered a respiratory arrest secondary to an upper airway obstruction from a displaced dental plate three days following routine spinal surgery at a private hospital.

[Mr A's] upper denture was removed at the time of intubation for surgery. At the time of extubation, his denture was not present in his mouth or pharynx and the denture could not be located within the hospital. On the second postoperative day it was noted that [Mr A's] upper denture was still missing.

No staff member at the private hospital reports having replaced [Mr A's] upper denture.

In the immediate postoperative period [Mr A] was noted to have difficulty with swallowing, talking and was noted to have a lot of coughing. [Mr A] had difficulty with his respiratory function and required supplemental oxygen. His mouth was suctioned in the postoperative period and no upper airway obstruction was noted.

In the postoperative period [Mr A] was examined by his surgeon [Dr B], his anaesthetist, [Dr C] and an unnamed medical officer attached to the private hospital. These medical advisers felt [Mr A's] respiratory impairment was secondary to bronchitis and a degree of congestive heart failure. [Mr A] was appropriately treated for both of these working diagnoses.

[Mr A's] medical and nursing attendants attributed some of his speech impairment to his history of a long standing right-sided weakness and to the fact that he had undergone a prolonged procedure with endotracheal intubation.

[Mr A] underwent a chest X-ray about midday on Saturday, 12 February 2005. This X-ray was reviewed by a resident medical officer at the private hospital. A diagnosis of congestive heart failure was made by the resident medical officer and this diagnosis was then communicated to the anaesthetist.

From the records provided to me, there is no written recording of the name of the resident medical officer or of his clinical assessment of [Mr A] or of his chest radiograph.

In the first 36 hours post surgery [Mr A's] condition was maintained and showed slight improvement with medical and nursing intervention. [Mr A's] respiratory function deteriorated significantly on the evening of the Saturday, 12 February 2005. His oxygen saturations were 75% on air at 0300 hours on the morning of 13 February 2005. Medical staff were not notified of [Mr A's] deteriorating condition for some 5 hours after this recording was made.

[Mr A's] choking on a dental plate following routine general anaesthesia is a most unusual complication. It is difficult to conceive how a plate of the size retrieved from [Mr A's] throat could be tolerated by a patient for longer than a few minutes. Such a foreign body could be tolerated by a patient who is obtunded [dulled] by drug therapy or previous neurological dysfunction.

'*Foreign body in upper airway: Post Graduate Medicine. Vol 86. No 3, 1989 — Reference attached.'* [3]

Investigation subsequent to [Mr A's] choking event has confirmed he does have a syrinx or cavity within the lower part of his brain stem and upper part of his spinal cord. This could lead to neurological impairment to his pharynx and throat. This may explain why [Mr A] was able to tolerate the presence of such a sizeable foreign body.

In my experience the loss of a patient's dentures while the patient is hospitalised is a not an uncommon event. Currently hospitals record when a patient's dentures are removed. My inquiries to private and public hospitals in New Zealand at present confirm there are no firm protocols as to the tracking of the whereabouts of dentures and when and by whom they were returned to the patients.

At the time of [Mr A's] admission the private hospital did not have a protocol for tracking of the patient's dentures. I know of no hospital in New Zealand at this time which has such a protocol.

In retrospect, I find it difficult to accept that a reasonable nurse or doctor would have detected the presence of the dental plate in [Mr A's] pharynx prior to the 13 February 2005. All staff were of the impression that the dental plate had been mislaid and that the plate had not been returned to [Mr A]. [Mr A] was conscious and at no time complained of having a foreign body stuck in his throat. I have reviewed the chest radiographs performed 12 February 2005. The plate is not easily seen on these chest X-rays and could be easily missed as the X-ray was performed to assess heart and lung function.

The overall care provided to [Mr A] by the private hospital was adequate. I feel [Mr A] may have achieved an improved outcome had medical staff been notified of his deteriorating respiratory function on the evening of 12 February 2005. His deteriorating respiratory function at that stage required further assessment and with further medical input his upper airway obstruction may have been identified

[3] See Appendix One.

earlier. I could not see any clear protocols or instructions to nursing staff as to when they should contact medical staff in the postoperative period.

My other concern is that an unnamed medical officer provided the clinical input into the care of [Mr A]. Of particular importance this unnamed medical officer provided an interpretation of [Mr A's] chest X-ray of 12 February 2005. It would be standard practice for such a medical officer to document the assessment, diagnosis and treatment plan in the patient's medical record, appended with their signature. A documented plan of treatment for [Mr A] would have helped nursing staff manage his condition subsequent to the afternoon of Saturday, 12 February 2005.

I feel the standard of care provided by [Dr B] in caring for [Mr A] in the period from the 10 February until his transfer to a public hospital on 13 February 2005 [was] adequate and appropriate.

It was appropriate for [Dr B] to delegate [Mr A's] care to his anaesthetist in the immediate postoperative period. It is standard practice for anaesthetists to care for complications of a patient's respiratory status in the immediate postoperative period. [Dr B's] further review of [Mr A's] condition on the first and second postoperative days was appropriate. The examination on 12 February and subsequent diagnoses, investigations and plan of management were appropriate. It was appropriate for [Dr B] to delegate [Mr A's] care to [Dr C] following the ward round of 12 February 2005. Following the ward round [Dr B] was available by phone to medical and nursing staff if necessary.

The tragic complications suffered by [Mr A] as a result of his misplaced dentures reinforces the need for hospitals to establish suitable protocols for tracking dentures and removal of dental implants. In the presence of missing dentures there must be a high index of suspicion that they have been retained in the patient's respiratory or alimentary tracts."

Anaesthesia advice

The following expert advice was obtained from anaesthetist Dr Vaughan Laurenson on 12 March 2006:

"Thank you for asking me to provide expert advice on this case. The complaint concerns the standard of care, and in particular, issues related to loss of dentures, when [Mr A] underwent surgery on the 10th of February 2005. I have read and agreed to follow the Health and Disability Commissioner's guidelines for independent advisers.

I qualified as a specialist anaesthetist (FFARACS) in 1981, and I have practised full-time in Christchurch since then. My clinical practice has a significant

component of anaesthesia for orthopaedic surgery, and I regularly anaesthetise patients undergoing spinal surgery.

…

I have reviewed the following documents which were supplied:

- Two X-rays, dated 12 February 2005
- Complaint letter received 28 February 2005 and related email, dated 16 March 2005 (pages 1–6)
- Notification letter, dated 8 April 2005 (pages 7–11)
- Notification letter, dated 29 August 2005 (pages 12–19)
- Notification letter, dated 29 September 2005 (pages 20–25)
- Letters and accompanying information from [the Chief Operating Officer], received 4 May 2005, 30 May 2005 (including Sentinel Event Review dated February 2005), 5 August 2005, 26 September 2005 and 26 October 2005 (pages 26–68)
- Letter from HDC to [the Chief Operating Officer], dated 13 May 2005 (pages 69–70)
- Letter from [Dr B], orthopaedic and spinal surgeon, dated 31 August 2005 (pages 71–73)
- Letter from [Dr C], anaesthetist, dated 19 October 2005 (pages 74–76)
- [Mr A's] medical notes from [the private hospital] (pages 77–146)
- Letter from [the General Manager], [a radiology service], dated 8 September 2005 (pages 147–149)
- Medical notes from [District Health Board 1] (pages 150–313)
- Information from [public hospital 2], received 20 May 2005 (pages 314–322)
- Letter from [ACC], to [Mr A], dated 20 May 2005 (page 323).

…

History

This has been well-documented in the overview provided by the Commissioner's office. I will only comment on points of history which are relevant to my report.

[Mr A] was booked for surgery to decompress his spinal canal at the L3/4 level, and to have a spinal fusion from L2 to L4. His anaesthetist [Dr C] reviewed his anaesthetic history by phone on the 22nd December 2004 (p86).

His preoperative assessment noted a right hemiparesis, following an accident in 1949 (p100).

He was anaesthetised using opiates and muscle relaxant, and anaesthesia was maintained with nitrous oxide and isoflurane. Once he was anaesthetised and intubated he was rolled prone onto a Wilson frame. At the end of his surgery he was rolled back onto a bed, and taken to recovery. At this stage he was still intubated and not breathing. [Dr C] ventilated him using a T bag for approximately 15 to 20 minutes. [Mr A] was eventually persuaded to start breathing by the administration of a dose of naloxone (neither the dose or time of administration appears to be recorded in the notes). [Mr A] was still intubated. At this time, [Dr C] left recovery despite the recovery nurse asking him not to. When he returned, he extubated [Mr A] (p40).

While he was in recovery, [Mr A's] upper dental plate went missing. This had been removed in operating theatre, transported to the recovery ward but was missing by the time he was transferred to the ward. Three days later, it was located in the back of his pharynx. In retrospect X-rays had shown it to be there the day before it was found.

[Mr A] had a stormy postoperative course with episodes of heart failure and/or pneumonia. A notable feature of this was coughing when he tried to eat. On the third day postoperatively, while being washed, he had an episode of acute respiratory obstruction, which was found to be caused by his denture. He was successfully resuscitated and transferred to intensive care at a public hospital where he required tracheotomy for airway management.

He was subsequently transferred to [another public hospital] for rehabilitation. While he was there, he was investigated with an MRI scan and assessed by several specialists. The MRI scan (p318) showed cord damage from T4 upwards and a syrinx (a cavity in the centre of the spinal cord) from T4 up into the medulla. The radiologist comments that these appear to be old changes. The MRI report was supported by the finding that he had wasting of his tongue muscle, again supporting long-term changes. Judging from the history, it is likely that this syrinx could be the result of damage caused by his injury in 1949.

Comment

The investigations performed at [public hospital 2] showed that [Mr A] had some pre-existing damage to the spinal cord extending up into his brainstem. His history would suggest that these dated from his injury in 1949. The MRI showed the presence of a syrinx. A syrinx may be asymptomatic or produce neurological changes very gradually. In [Mr A's] case, it appears that he had damage to his tongue muscle before he presented for surgery. Whether he had other neurological changes in his pharynx is not known.

It is my opinion that during surgery he had an acute deterioration of his neurological state. This was caused by changed fluid dynamics or positioning of the neck, which led to increased pressure within the syrinx. This damaged the brainstem and particularly the centres responsible for sensation and swallowing in the back of his mouth. There are a number of possible mechanisms for this to happen. They include:

— movement of his neck while he was being rolled either onto the theatre table or back onto his bed

— the position of his neck during surgery

— changes in CSF pressures as a result of manipulation of the cord to decompress spinal stenosis.

Of the three mechanisms it is my opinion that the position of his neck during surgery is most likely to be the cause of the injury. He was described as walking stooped over due to a thoracic kyphosis (p92). This would make positioning him particularly difficult and may have inadvertently led to him being positioned with his neck hyper-extended. It is also likely that his head was slightly lower than the rest of his body which may have increased the fluid pressures in his syrinx.

This is consistent with the conclusion reached by [Dr R] his physician at [public hospital 2] (p315).

The reasons why I think the changes occurred during the operation are that [Mr A] was very slow to breathe and he tolerated the endotracheal tube for a long time after the end of surgery. This delay in waking was much longer than I would expect after the anaesthetic technique used, and judging by his behaviour much longer than [Dr C] expected.

I think the missing denture is a symptom of the altered sensation in [Mr A's] pharynx rather than the cause of the problem. In my opinion, [Mr A's] denture was replaced while he was still in recovery. This would be normal practice, and I notice that at least one other person, who has not given a statement, was present in the recovery ward at the time. [Mr A's] denture looks complicated, and would not be easy to replace. It is probable that it was given to [Mr A] to put in himself. Because of the new, undiagnosed, reduced sensation in his mouth he incorrectly replaced it. It was in effect, hidden in the back of his mouth from then until it dislodged, blocking his airway three days later. He may have had no memory of doing this because a patient's memory is often impaired immediately after an anaesthetic.

In my opinion the events of the next two days can be explained by a patient with reduced sensation and a mechanical obstruction, his denture, in the upper airway.

This led to episodes of choking (p46) and aspiration, which would explain him being 'chesty'. This diagnosis is consistent with the X-ray taken two days postoperatively, which shows fluid and possible consolidation at the right base.

Advice asked for by the Commissioner.

- Did [Dr C] provide [Mr A] with an appropriate standard of care?

Most aspects of [Dr C's] care were appropriate and in line with contemporary standards. However, there were some aspects, which were below expected standard.

Preoperative assessment

[Dr C] had a telephone consultation with [Mr A], before he was admitted to hospital. It is not clear to me whether there was a second significant consultation in the hospital or just a rapid pre-assessment in the holding bay or anaesthetic room. It may be worth clarifying this point, because an unhurried consultation may have detected the subtle signs of partial tongue atrophy, which were present at the time. Failure to detect the signs would, in my opinion, not be regarded as an error by most anaesthetists. Failure to conduct a proper pre-anaesthetic consultation on an elderly patient for major elective surgery would, in my opinion, be regarded as a moderate failure of duty of care.

Patient positioning

Positioning the patient is jointly carried out to meet the needs of the surgeon and the anaesthetist. In my opinion, it is the anaesthetist's ultimate responsibility to ensure that the patient is positioned in a manner that will not result in any damage to the patient. While it is probable that the injury to [Mr A] occurred as a result of positioning, it is possible that it was a result of unforeseeable changes, which may have occurred during the operation in a correctly positioned patient. I have not been provided with information about the positioning of the patient or precautions taken, other than the record on the nursing notes that he was on a Wilson frame. I am therefore unable to comment on whether this represents a breach standard of care.

Postoperative ventilation

Ventilating a patient on a T bag, (p40) is substandard care as a T bag is only designed for providing supplementary oxygen to spontaneously breathing patients. In my opinion, this represents a serious breach of care.

Leaving an intubated patient

Leaving an intubated patient in the recovery ward, with a nurse who was not happy to accept the responsibility, is substandard. This is particularly noteworthy because the patient had only just started to breathe after a dose of naloxone (p40). It is my opinion that this would be regarded by most anaesthetists as a serious breach of duty of care.

Failure to diagnose lack of airway protection

[Dr C] should have recognised that something out of the ordinary was happening with [Mr A] in the postoperative period. There were a number of clues. His delayed awakening. His altered voice and trouble speaking in the postoperative period. And his difficulty swallowing and coughing fits after food. Early recognition of the abnormal swallowing would have improved [Mr A's] comfort but would not have avoided the eventual tracheotomy, because the damage had, in my opinion, already been done. It is my opinion, that this failure would be regarded as a moderate omission by most anaesthetists.

Postoperative care

[Dr C's] care of [Mr A], in the postoperative period was good. He was in regular contact with nursing staff and visited at least once a day. Despite failing to recognise the primary problem, he nevertheless treated [Mr A's] symptoms of shortness of breath in an appropriate fashion.

Chest X-rays

I have shown the chest X-rays, with identification covered, to two house officers and one specialist anaesthetist. None of them noticed the dental plate although all could see it when it was pointed out. I think it was appropriate for [Dr C] to rely on the house officer's report of the chest X-ray. I think it is highly unlikely that [Dr C] would have recognised the dental plate for what it was if he had looked at the X-rays himself. The main features on the X-rays are suggestive of pneumonia and possibly heart failure, and this was being treated appropriately with antibiotics and diuretics.

Did [the private hospital] provide [Mr A] with an appropriate standard of care?

It is my opinion that the nursing systems and standard of care in the hospital were appropriate for the management of [Mr A]. The nursing staff appeared to act appropriately and called medical staff when they considered it necessary. Nursing staff were in a position to recognise that [Mr A] was having swallowing and speech difficulties. However, it is unreasonable to expect them to make such a

diagnosis. Had they made the diagnosis it would have represented exceptionally good care.

Issues related to the dentures

Many years ago it was normal policy for patients to have their dentures removed before going to operating theatre. Apart from the severe embarrassment this caused a number of people, it was realised that having patient's dentures in place made it easier to get a good seal with a face mask in the early stages of anaesthesia and hence make anaesthesia safer. The policy was therefore changed to allow patients to have their dentures in situ when they went to operating theatre. At times, an anaesthetist may choose to leave the dentures in for the entire operation. At other times, to facilitate manoeuvres to manage the airway, the dentures will be removed. In [Mr A's] case, the loose upper denture was in the way and was removed. It would be common practice to remove the other denture at the same time but this is not essential, and failure to do so does not represent a failure of standard of care.

It is normal practice for dentures that are removed to be placed in a labelled pottle and accompany the patient to recovery, where they are normally replaced. Most units allow the patient to replace the dentures themselves when they are sufficiently awake to do so. It is my opinion that this is what happened in this case, but because of reduced sensation in [Mr A's] mouth the teeth were probably not properly reinserted or became displaced soon afterwards.

I am not aware of any standards or procedures for tracking dentures during the perioperative period other than those described above. It should be noted that while an accurate tracking system may have led to someone looking in [Mr A's] mouth, they may still not have seen his missing denture. A tracking system would not have prevented the tracheotomy or the long-term rehabilitation because the underlying damage was still present, and [Mr A] would have needed a tracheotomy to prevent ongoing aspiration of food.

Summary

It is my opinion, that [Mr A] suffered an acute deterioration of a pre-existing neurological condition during surgery, as a result of positioning or other changes caused by the surgery or anaesthesia. This led to reduced sensation in his mouth and trouble swallowing. As part of the symptoms he misplaced his denture into his pharynx and had trouble talking and swallowing. It is apparent that he was aspirating secretions and food from his mouth into his lungs which caused him to have aspiration pneumonia. I have identified some deficiencies in the standard of care, however, with the exception of problems caused by positioning, none of these would have prevented subsequent tracheotomy and long-term rehabilitation problems for [Mr A]."

Further anaesthetic advice
Further expert advice was obtained from Dr Laurenson on 15 May 2006:

> "In preparing this supplementary report I have reviewed the following documents which were supplied:
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> - Letter from your office to [Dr C] dated 28th March 2006
> - A response from [Dr C] dated 27th April 2006
> - A report from [Dr B] dated 26th April 2006
> - A report from [Dr I], anaesthetist, dated 2nd May 2006
> - A further statement from recovery nurse [Ms H], dated 6th April 2006.
>
> Further advice asked for by the Commissioner in response to issues raised in my last report:
>
> **Preoperative assessment**
>
> I previously commented '[Dr C] had a telephone consultation with [Mr A] before he was admitted to hospital. It is not clear to me whether there was a second significant consultation in the hospital or just a rapid pre-assessment in the holding bay or anaesthetic room.' It is now apparent from [Dr C's] reply, that he did not do a formal preoperative assessment other than the telephone conversation. An unhurried consultation may have detected the subtle signs of partial tongue atrophy, which were present at the time. Failure to detect the signs would, in my opinion, not be regarding as an error by most anaesthetists. He may also have taken more note of [Mr A's] posture and subsequently taken more care during positioning. Failure to conduct a proper pre-anaesthetic consultation on an elderly patient for major elective surgery would, in my opinion, be regarded as a moderate failure of duty of care.
>
> **Patient positioning**
>
> I previously commented that 'Positioning the patient is jointly carried out to meet the needs of the surgeon and the anaesthetist. In my opinion, it is the anaesthetist's ultimate responsibility to ensure that the patient is positioned in a manner that will not result in any damage to the patient. While it is probable that the injury to [Mr A] occurred as a result of positioning, it is possible that it was a result of unforeseeable changes, which may have occurred during the operation in a correctly positioned patient.' Both surgeon and anaesthetist claim to have taken all appropriate care during positioning but I note with some concern the comment that '[Mr A's] stooped posture resolved a little under general anaesthesia and did not particularly effect his positioning.' I am concerned that this may have represented a relative hyper-extension of the cervical spinal for [Mr A]. However I am still unable to comment on whether this represents a breach standard of care.

Postoperative ventilation

I previously commented 'Ventilating a patient on a T bag (p40) is substandard care as a T bag is only designed for providing supplementary oxygen to spontaneously breathing patients.' [Dr C] has confirmed that this happened. In my opinion, this represents a serious breach of care.

Leaving an intubated patient

[Dr C] disputes that this happened, but contemporary notes made by the recovery nurse and supported by the report from [Dr I], lead me to believe that it did occur. Leaving an intubated patient in the recovery ward, with a nurse who was not happy to accept the responsibility, is substandard. This is particularly noteworthy because the patient had only just started to breathe after a dose of naloxone (p40). It is my opinion that this would be regarded by most anaesthetists as a serious breach of duty of care.

Failure to diagnose lack of airway protection.

I previously commented that '[Dr C] should have recognised that something out of the ordinary was happening with [Mr A] in the postoperative period.' This comment is reinforced by the concern expressed by [Dr I] when she observed [Mr A], the following day. It remains my opinion, that this failure would be regarded as a moderate omission by most anaesthetists."

Provisional opinion

On 4 August 2006 I sent the parties copies of my provisional opinion, in which I set out my provisional view that Dr C had breached the Code of Health and Disability Services Consumers' Rights (the Code) in relation to his postoperative treatment of Mr A. My provisional view was that the private hospital and Dr B had not breached the Code. Mr A's family was provided with the "information gathered" section of my provisional report for comment.

Family's responses

In response, Mr A's family were particularly concerned that my investigation had not established precisely what had happened to Mr A's denture, including whether they had definitely been removed prior to intubation and how they came to be found in his throat. The family also queried whether it would have been possible for the denture to have been inadvertently pushed down Mr A's throat during intubation.

Dr C's responses
Dr C disputed Dr Laurenson's interpretation of events. In relation to the use of a T bag, Dr C stated:

> "I am sure that Dr Laurenson is mistaken in his interpretation of the facts. [Mr A] was transferred to recovery on a T bag and allowed to spontaneously breathe for ten minutes. He would have been apnoeic for one or two minutes at most, I probably assisted his breathing in this period. He was not ventilated on the T bag. He was extubated after being given a small dose of naloxone as he was slow to expel his tube. Many patients with an artificial airway (an endo-tracheal tube in this case) are on a T bag as they make the transition to breathing for themselves at the end of surgery. I think Dr Laurenson has misinterpreted what happened."

Dr C revised his view about whether he may have left the recovery room prior to extubating Mr A. He stated:

> "I am no longer sure exactly what happened. I accept that Nurse [Ms H's] version may be correct in saying that he came to recovery on a T-piece, he was breathing spontaneously, I handed over care, went to the ward, returned and gave him Naloxone to facilitate extubation. My reply was written 14 months after the event.
>
> …
>
> However I believed the two recovery nurses present were capable of managing the patient. I did not hear/do not recall being told by Nurse [Ms H] that she was unhappy to be left with his care. I would not have left if she had asked me to stay. She or her colleague could have called me back at any time on my cell phone. She could have pressed the alarm bell for immediate medical response at any time. She could have called for help from [Dr I] and/or she could have summoned assistance from other nurses or the anaesthesia technician. [Dr I] could have called me to advise me on my cell phone. I was about one minute away on the floor below. It appears that no deterioration in his condition occurred while I was away. I believe that as an experienced specialist I can assess the competency of my nursing colleagues and delegate responsibility when appropriate. The two nurses involved are experienced trained full time recovery nurses who I knew well and in whom I had a high degree of trust. Whilst of course I accept (particularly with the benefit of hindsight) that this is an area where criticism may be made of my management but I do not accept it is such as to warrant an adverse finding of breach of the Code of Patients' Rights."

Dr C considered that Dr Laurenson's comments about his "failure to diagnose lack of airway protection" were unfounded. Dr C stated:

> "Airway protection is a term anaesthetists use for techniques to care for the unconscious patient. It is not a postoperative diagnosis. His awakening was NOT delayed. The other 'clues' Dr Laurenson gives are non-specific. The final diagnosis of inhaled dentures is incredibly uncommon (unheard of) and no other experts have criticised me for not making it on day one or two.
>
> …
>
> His comments [Dr Laurenson's] … that I 'should have realised something was out of ordinary' is unfair as I was arranging chest X-rays, starting antibiotics and nebulisers. I realised he [Mr A] was unwell but not exactly why."

Dr C emphasised that he considered Mr A's recovery was unremarkable, and does not agree that leaving the recovery room created an undue risk for Mr A. He stated:

> "It is normal for an 82y man who has had two hours of major surgery to take time to return to full consciousness. It is not uncommon to administer Naloxone to reverse narcotics which then sometimes (unfortunately) results in severe pain. There is no way an indication that intra-operative spinal injury occurred.
>
> …
>
> I do not at all accept that the failure of [Mr A] to deteriorate was due to fortune."

Dr C disagrees with Dr Laurenson that Mr A experienced a deterioration of neurological state during the operation. He stated:

> "He [Dr Laurenson] speculates that the neck was positioned in a hyper-extended posture without any supporting evidence. [Dr B] and I are both meticulous in our positioning. Hyper-extension may cause injury if the patient has critical cervical stenosis; [Mr A] does not have any stenosis.
>
> …
>
> It is however clear that his syrinx was causing impairment preoperatively (tongue atrophy, hoarse voice, weak right hand). To suggest that he deteriorated under anaesthesia is not supported by any facts. His injury to his neck occurred in 1949 and caused lifelong disability, it was not caused by his anaesthetic.
>
> If [Mr A] had suffered cervical spinal cord injury in the operating theatre he would have had neurological signs in recovery (reduced movement in his arms and legs). As it was he seemed awake and orientated on return to the ward and the next day."

Dr Vanessa Beavis

Dr C provided a report from anaesthetist Dr Vanessa Beavis, whom he described as an "independent colleague". Dr Beavis considered that Dr C's pre-operative assessment and management were appropriate. She stated:

> "I think you [Dr C] are to be commended for contacting the patient telephonically pre his admission for surgery — this is not everyone's practice, even if it is advisable and should be. Presumably this contact allowed you to do a brief health check and screen of the patient so you could assess the need for a formal pre-op consultation or the more usual visit on the day of surgery — much in the same way as the 'pre-op health questionnaire' used by some institutions. I assume that based on this contact, no major flags were raised and you elected to see him in the routine way. I do not see any problem with this approach. While in an ideal situation, we would all like to spend time on a detailed consultation for every patient, I don't think anybody would see this as practical or possible. Even if you had done so, I don't think you would have deferred the patient for any reason, or that pre-op optimisation of some sort was indicated, or that your anaesthetic plan at that point would have been different."

Dr Beavis commented that Dr C and Dr B were experienced at this type of surgery and "meticulous positioning" was part of their regular routine. Dr Beavis thought that consideration of whether Mr A's positioning contributed to his deterioration was "highly speculative".

Dr Beavis was of the opinion that Dr C provided Mr A with an appropriate standard of care in the recovery room/post anaesthetic care unit. She stated:

> "I note that [Mr A] received 100 mg of Pethidine towards the end of the procedure and that may have contributed to his 'slow awakening'. I assume that when he was transferred to PACU [post-anaesthetic care unit] on the T bag he was in the stage of emergence where breath holding is common and that accounted for the nurse's comment that he was 'apnoeic', and required some minor ventilatory support for a brief period which you provided, by using the T bag. This again, while not my practice, is not necessarily substandard. Practice in New Zealand tends to be in a middle ground somewhere between the USA (everybody with an ETT [endotracheal tube] in PACU) to the UK (no-one with an ETT in PACU).
>
> The only area for possible censure here, is that you left the PACU when the nurses had stated they were unhappy with you leaving — you are clear that you did not hear them ask you to stay, and I cannot believe that any specialist anaesthetist would deliberately do so, if requested to remain in the room by the nurses.

> In terms of whether it is appropriate to leave an intubated patient in the care of the recovery rooms staff at all, I think that does depend on the skill level and experience of the PACU staff. Since you have worked with this team often, I assume you were confident that you were leaving the patient in a safe environment. It is not as though you were leaving the premises, or that there was only one person working in isolation, or that none of your anaesthetic colleagues were in the hospital. I believe that you would have been immediately available to them should they have been concerned, and that on your return to PACU, the patient was stable and comfortable, but not yet sufficiently rousable to extubate, whereupon he was given a dose of Naloxone, which then somewhat predictably led to the follow on scenario of pain, confusion etc — not having seen the actual notes, I don't think I can make any further comments."

With regards to Mr A's postoperative care, Dr Beavis considered that Dr C provided "excellent care".

Dr B's response

In response to my provisional opinion, Dr B expressed the view that the position of Mr A's neck did not cause any neurological damage or exacerbate any underlying neurological damage. He stated:

> "When [Dr C] and I position the patients we take great care to have the patient's neck in neutral or flexion. [Mr A] had a degree of senile thoracic kyphosis. This was accounted for when the patient was positioned on the Wilson frame. This frame allows excellent positioning of the neck in neutral or flexion as required. [Dr C] always carefully positions the forehead on a jelly roll, to prevent extension. I likewise check the position of the neck. If there are any concerns [Dr C] always enquires for my opinion as well. In [Mr A's] case his neck was satisfactorily in a neutral position.
>
> This possibility of causing a neurological lesion with neck position is only present if the patient has a cervical stenosis limiting the size of the spinal canal. This was not the case with [Mr A].
>
> To suggest that an isolated palsy to the sensation to the pharynx could be caused by a hyperextension injury to the neck would be, in my mind, anatomically impossible. Should there have been neurological damage at the time of surgery, this would have been exhibited with other neurological deficits postoperatively, which was not the case with [Mr A].
>
> [Mr A] had a well documented inability to use his right arm, which had been present since an accident many years before. This neurological deficit had been slowly progressive. There was no acute progression of the deficit postoperatively."

Further expert advice

Dr Vaughan Laurenson reviewed the above material and provided the following additional advice on 21 December 2003:

> "In preparing this supplementary report I have reviewed the following documents which were supplied:
>
> - A copy of the Commissioner's provisional report
> - Questions from the [family] in response to the Provisional report dated 21/08/06
> - A letter from [Dr C] dated 17th August 2006
> - A letter from [Dr B] dated 10th August 2006
> - Transcripts of interviews with nursing staff at [the private hospital] dated 14th November 2006
>
> This supplementary report contains further advice, asked for by the Commissioner, in response to issues raised by the responses to the provisional report.
>
> [The family] have asked whether it is possible during the process of intubation to inadvertently push dentures down a patient's throat. While it may be possible during the action of placing the laryngoscope to displace the dentures down the throat they would then be very obvious, and in the way, when intubation was attempted. This is not a credible explanation for the misplacement of the dentures. The interviews support the view that at least the top denture was removed in operating theatre and as it was missing before [Mr A] left recovery it was almost certainly in the back of his pharynx by then.

[Dr C] and [Dr B] do not appear to accept the probable mechanism of injury. They still seem to be unaware that [Mr A] had both the pre-existing syrinx extending from T4 into the brain stem and severe spinal cord stenosis at the C5 level caused by degenerative disc disease with shift C5 on C6 (318–19). There are a number of case reports in the literature of similar types of acute neurological presentations in patients with cervical syringomyelia (see references). To quote one of the papers (reference 1):

> 'In conclusion, an association of factors may act synergistically and ultimately lead to acute dissection of a syrinx: on the one hand, an increased spinal venous pressure generated by strains or Valsalva manoeuvres, on the other, abnormal postures of the spine, such as prolonged or excessive flexed neck position.'

The associated neurological damage would explain why [Mr A] did not notice his teeth wedged in the back of his pharynx, a situation which would cause a normal person distress. It would also explain his subsequent problems swallowing, may have accounted for his hoarse voice, and possibly explain some of his early postoperative

tolerance of the endotracheal tube. The combination of the two pre-existing pathologies which led to this damage is extremely rare and difficult to diagnose. However, I do not accept [Dr C's] claim that [Mr A] was neurologically normal (for him) the next day. This comparison is particularly difficult for [Dr C] to make as he had not done a proper preoperative assessment.

With regard to the events in the recovery ward. There is nothing in the interviews or letter from [Dr C], which changes the description of the events in my original report. The contemporary reports written within a week of the event must be regarded as the most accurate.

[Dr C] has asked me to consider the issue of fresh gas flow when commenting on his use of a T piece. The oxygen flow meters on our transport oxygen cylinders, and in our recovery ward, have a maximum flow rate of 14 litres per minute. I am unable to comment on whether [the private hospital] flow meters are different. Assuming a maximum flow of 14 litres per minute and a 1:1 inspiratory:expiratory ratio it is just possible to achieve an adequate minute ventilation in an emergency. However, it is difficult to ventilate a patient adequately with a T bag (it wasn't designed for this purpose), and the light plastic reservoir is prone to develop a leak with handling. I do not believe it is acceptable practice to try and maintain ventilation in an adult for 15 minutes using a T bag.

References

1. Amato VG, Assietti R, Morosi M. Acute brain stem dissection of syringomyelia associated with cervical intramedullary neurinoma. Neurosurg Rev 28: 163–7, 2005.

2. Anwer UE, Fisher M. Acute and atypical presentations of syringomyelia. European Neurology 36(4):215–8, 1996.

3. Mever SH, Postert T, et al. Acute brain stem symptoms associated with cervical syringomyelia. European Neurology 43(1):47–9, 2000.

4. Zager EL, Ojemann RG, Poletti CE. Acute presentations of syringomyelia. Report of three cases. Journal of neurosurgery 72(1):133-8, 1990."

Dr C's response

Dr C made the following additional comments in response:

"Preoperative assessment:

I would like to point out that my assessment proved adequate in all regards. [Mr A] did not have major cardiac or respiratory illness. Apart from the syrinx he was an acceptable risk for surgery. I did not diagnose his syringomyelia. A senior

and experience spinal surgeon ([Dr B]) did not make this diagnosis during his assessment either. [Mr A] had chosen not to seek any medical investigation or treatment for his weak right arm which may have led to the diagnosis being made much earlier. I understand the diagnosis was eventually made by the speech therapist some months after his admission to [public hospital 2].

Recovery room care:

The fact is that his recovery care was uneventful. He awoke 17 min[utes] after surgery, was extubated and settled on IV pain relief. His vital signs were absolutely stable throughout. There is no suggestion he was injured in any way during this period. I believe my brief absence from recovery was safe as I had confidence in the ability of the two experienced recovery nurses in attendance. I believe I could have been at [Mr A's] bedside in a minute if called. The discussion about the T bag use is irrelevant and unhelpful.

[Mr A] was a frail (55kg) elderly (82) man having major surgery for a severe lumbar spinal problem that was stopping him walking. A very serious underlying and undiagnosed neurological condition (syringomyelia) allowed him to tolerate his dentures at the back of his throat leading to aspiration pneumonia and a near fatal choking event. I believe his denture could have fallen back at any time with or without surgery. I believe it was an accident waiting to happen … My limited understanding of syringomyelia is that the bulbar palsy (throat numbness and weakness) would have slowly progressed and that he may well have suffered from aspiration pneumonia and vocal loss in the normal course of this unpleasant condition."

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.

Opinion

Preliminary comment: Mr A's upper denture
It has been established that Mr A's loose-fitting upper denture was removed prior to intubation by anaesthetic technician Ms F and placed in a white carton, next to his notes on the computer workstation. Expert anaesthetist Dr Laurenson commented:

> "Many years ago it was normal policy for patients to have their dentures removed before going to operating theatre. Apart from the severe embarrassment this caused a number of people, it was realised that having patient's dentures in place made it easier to get a good seal with a face mask in the early stages of anaesthesia and hence make anaesthesia safer. The policy was therefore changed to allow patients to have their dentures in situ when they went to operating theatre. At times, an anaesthetist may choose to leave the dentures in for the entire operation. At other times, to facilitate manoeuvres to manage the airway, the dentures will be removed."

It appears that the container was moved onto the anaesthetic locker. The container was last seen in the recovery room by Ms H while Mr A was unconscious. Ms J, who last cared for Mr A in recovery, has no recollection of having seen any denture container.

Dr Laurenson explained that it is normal practice for dentures to be replaced in recovery:

> "Most units allow the patient to replace the dentures themselves when they are sufficiently awake to do so. It is my opinion that this is what happened in this case, but because of reduced sensation in [Mr A's] mouth the teeth were probably not properly reinserted or became displaced soon afterwards."

The denture was noticed to be missing on Mr A's return to the ward, but could not be found. The recovery room and ward area were searched thoroughly. Mr A's mouth was suctioned in the postoperative period and no upper airway obstruction was noted. Mr A's upper denture could have been replaced into his mouth when he was in the recovery room — either directly by himself (although this is highly unlikely owing to his condition) or with the assistance of a staff member. However, patients in recovery are constantly monitored, and no recovery staff reported having replaced Mr A's upper denture. Alternatively, Mr A's denture may have been replaced after his return to the ward. Unfortunately, extensive investigation of this issue has not been able to establish how or by whom Mr A's upper denture was returned to him.

While I do not wish to downplay the seriousness of events that occurred in relation to Mr A's upper denture, I consider that the deterioration in Mr A's well being following his respiratory arrest was not primarily caused by the accidental lodging of his denture

in his throat. These matters are discussed below in the context of my opinion about the care provided to Mr A by Dr C and Dr B (see pages 37–40).

Breach — Dr C

Postoperative care
Under Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code), Mr A had the right to services of an appropriate standard. In my opinion, Dr C breached Right 4(1) of the Code by failing to provide Mr A with an appropriate standard of anaesthesia care in the immediate postoperative period.

The first concern relates to the use of the T bag. It is not disputed that Mr A was transferred to the recovery room after his surgery using a T bag for ventilation because he was slow to recover breathing and consciousness after the surgery. Dr C has confirmed that Mr A was apnoeic (not breathing) and the bag was used to assist breathing and oxygen delivery during the transfer to recovery. During the transfer, oxygen was supplied to the T bag from an oxygen cylinder. On arrival in the recovery room, the T bag was connected to the wall oxygen. Despite the connection to wall oxygen, Mr A would not have received any oxygen if he was not breathing himself (without manual assistance).

Mr A was connected to the T bag from 5.58pm until approximately 6.10pm (when Dr C administered the anti-narcotic agent naloxone prior to extubation).

There are conflicting accounts about how long Mr A was ventilated, and when he began breathing spontaneously. Dr C has stated that Mr A required manual ventilation for approximately two minutes. After this period of time, Mr A was breathing spontaneously, although was still connected to the T bag.

Recovery nurse Ms H recalls that Mr A did not fully recover spontaneous breathing until after the administration of naloxone (documented as 6.10pm). She stated that if Mr A had recovered breathing to any extent prior to the administration of naloxone, "it certainly was not adequate". The other recovery nurse present, Ms J, is unsure to what extent Mr A recovered his breathing prior to the administration of naloxone. Anaesthetist Dr I stated that Mr A was unconscious but breathing when she entered the recovery room (when Dr C was absent from the recovery room).

Dr Laurenson advised:

> "Ventilating a patient on a T bag … is substandard care as a T bag is only designed for providing supplementary oxygen to spontaneously breathing patients. In my opinion, this represents a serious breach of care."

In response, Dr C emphasised that Mr A's breathing was "assisted" for "one or two minutes at the most", and he was allowed to breathe spontaneously on the T bag. Dr C considered this to be relatively standard practice. His colleague, anaesthetist Dr Vanessa Beavis (who did not have the benefit of seeing the relevant clinical records) commented that Mr A may have been "in the stage of emergence where breath holding is common" and required some "minor ventilatory support for a brief period". Dr Beavis expressed the view that this was "not necessarily substandard", although not her practice.

The clinical records indicate that Mr A entered the recovery room (not breathing for himself) at 5.58pm and had not recovered breathing by 6.05pm. Naloxone was then administered at 6.10pm. There was no respiration recording taken for 6.10pm. Mr A was then recorded as breathing spontaneously at 6.15pm. Accordingly, it is most likely that Mr A began to breathe spontaneously shortly after the administration of naloxone at 6.10pm. Dr C considered that Mr A only required ventilatory assistance for approximately two minutes. However, the clinical records are consistent with Ms H's version of events (which in turn is supported by Ms J and Dr I). Dr C, admittedly, does not recall what occurred. In summary, it appears that Mr A was apnoeic on arrival in recovery, and required some form of ventilatory support for approximately 15 minutes. Dr Laurenson further commented:

> "It is difficult to ventilate a patient adequately with a T bag (it wasn't designed for this purpose), and the light plastic reservoir is prone to develop a leak with handling. I do not believe it is acceptable practice to try and maintain ventilation in an adult for 15 minutes using a T bag."

The second concern relates to Dr C's departure to check on other patients for whom he had provided anaesthetic for surgery that day. Ms H stated that Dr C administered naloxone to Mr A and then left the recovery room before Mr A had recovered breathing or consciousness, for approximately five minutes, to check on another patient. Ms H stated that she advised Dr C she was not comfortable with that level of responsibility, but received no response from him. Ms H's request to Dr C has been corroborated by Ms J (although Ms J does not recall Dr C leaving the recovery room at any stage).

Dr C does not recall Ms H asking him to remain in the recovery room and initially disputed that he left the recovery room. Dr C subsequently advised that he is "no longer sure exactly what happened". He now acknowledges that he may have left the recovery room at approximately 6.05pm to review other patients. He considers it most likely that he then returned to administer naloxone at 6.10pm and extubated Mr A at

6.12pm prior to his regaining consciousness at 6.15pm. Dr C doubted that he would have administered naloxone prior to leaving the recovery room. He also commented that he could not have ventilated Mr A for 15 minutes and also left the recovery room, as there was insufficient time.

The information provided by Dr I confirms that Dr C left the recovery room. Ms H clearly recalls that Dr C administered naloxone then left recovery. The clinical record indicates that Mr A did not recover his breathing until after the administration of naloxone at 6.10pm. I very much doubt that Dr C would have left the recovery room without satisfying himself that Mr A was breathing.

Overall, I am satisfied that Dr C left the recovery room for a period of approximately five minutes after the administration of naloxone, returning briefly to extubate Mr A around 6.15pm, and then departed. While this may not have been Dr C's normal practice (due to the fast acting nature of naloxone), there was sufficient time for this to occur. Mr A completed his recovery of breathing and consciousness while Dr C was absent. Dr C was then able to extubate Mr A immediately on his return to the recovery room.

Dr C apparently satisfied himself that prior to leaving recovery that Mr A had recovered his breathing (although it appears Mr A's respirations were relatively shallow and difficult to detect). However, Ms H was not of the same view, and was not happy being left in charge of Mr A during Dr C's absence.

Dr Beavis commented that whether it is appropriate to leave an intubated patient in the care of recovery room staff depends on the skill level of the recovery room staff. She stated:

> "The only area for possible censure here, is that you [Dr C] left the PACU when the nurses had stated they were unhappy with you leaving — you are clear that you did not hear them ask you to stay, and I cannot believe that any specialist anaesthetist would deliberately do so, if requested to remain in the room by the nurses."

Dr Laurenson advised:

> "Leaving an intubated patient in the recovery ward, with a nurse who was not happy to accept the responsibility, is substandard. This is particularly noteworthy because the patient had only just started to breathe after a dose of Naloxone. It is my opinion that this would be regarded by most anaesthetists as a serious breach of duty of care."

Dr C acknowledges that he could be criticised for leaving the recovery room. However, he believes the "two" nurses present were capable of managing Mr A

(although I note only Ms H was caring for Mr A) and that he would not have left if he had heard Ms H asking him to stay. He stated:

> "The two nurses involved are experienced trained full time recovery nurses who I knew well and in whom I had a high degree of trust."

Dr Laurenson also considered that Dr C should have realised that "something out of the ordinary" was occurring with Mr A in the postoperative period because of factors such as his delayed awakening, and trouble speaking. Otherwise, Dr Laurenson considered that Dr C's postoperative care of Mr A was of an appropriate standard. In response, Dr C emphasised that postoperative symptoms exhibited by Mr A were non-specific, and the eventual problem (an inhaled denture) and diagnosis (syringomyelia) were very uncommon.

In my view, Dr C's actions in ventilating Mr A with a T bag in recovery (for approximately 15 minutes) and then leaving the recovery room for a period of approximately five minutes, after the administration of naloxone, were quite inappropriate. I am satisfied that Mr A had recovered his ability to breathe before Dr C left the recovery room. Nevertheless, I remain concerned that Dr C left Mr A under the care of a nurse who was not comfortable accepting responsibility for a patient who she considered had not yet fully recovered the ability to breathe.

While Dr C was not far away, any deterioration of Mr A's condition would have required immediate medical attention, and possibly transfer to a better equipped room. Dr I was present, but she did not enter the recovery room until after Dr C had left, and she was attending to her own patient's needs. Mr A's observations were stable. However, there were some indications that all was not well with Mr A in the immediate postoperative period — his slow recovery to breathing and consciousness were not readily explainable. Further signs manifested the following morning, such as deterioration in his speech.

I acknowledge that Mr A's postoperative symptoms were relatively non-specific, and that Dr C's postoperative care was otherwise of a good standard.

Accordingly, I conclude that in relation to aspects of his postoperative care Dr C breached Right 4(1) of the Code.

No breach — Dr C and Dr B

Position during surgery

My expert anaesthetist advisor, Dr Laurenson, considered that Mr A's upper denture, which was found lodged in Mr A's throat after his respiratory arrest on 13 February 2005, remained undetected owing to an acute deterioration of Mr A's neurological state caused by a pre-existing syrinx (cyst in the centre of the spinal cord due either to trauma to the spinal cord or congenital developmental problems). This was diagnosed after Mr A was admitted to public hospital 2 in March 2005. Public hospital 2 physician Dr R stated:

> "[I]t is likely that [Mr A] has had an asymptomatic syrinx (cavity) in the cervical cord and brainstem for many years, but the events following his back surgery and subsequent resuscitation with manipulation of the head and neck have altered the fluid dynamics within the posterior fossa and syrinx and resulted in this acute deterioration in neurological function."

Dr Laurenson commented:

> "The investigations performed at [public hospital 2] showed that [Mr A] had some pre-existing damage to the spinal cord extending up into his brainstem. His history would suggest that these dated from his injury in 1949. The MRI showed the presence of a syrinx. A syrinx may be asymptomatic or produce neurological changes very gradually. In [Mr A's] case, it appears that he had damage to his tongue muscle before he presented for surgery. Whether he had other neurological changes in his pharynx is not known.
>
> It is my opinion that during surgery he had an acute deterioration of his neurological state. This was caused by changed fluid dynamics or positioning of the neck, which led to increased pressure within the syrinx. This damaged the brainstem and particularly the centres responsible for sensation and swallowing in the back of his mouth."

Dr Laurenson thought the most likely cause of the injury was the position of Mr A's neck during the surgery. Mr A's stoop would have made positioning him particularly difficult and may have inadvertently led to his neck being hyper-extended. His head was also probably lower than the rest of his body, which may have increased the fluid pressures in the syrinx.

Dr C considered that the missing denture was a "symptom of the altered sensation" rather than the cause of Mr A's deterioration. He stated:

> "The associated neurological damage would explain why [Mr A] did not notice his teeth wedged in the back of his pharynx, a situation which would cause a normal

> person distress. It would also explain his subsequent problems swallowing, may have accounted for his hoarse voice, and possibly explain some of his early postoperative tolerance of the endotracheal tube. The combination of the two pre-existing pathologies which led to this damage is extremely rare and difficult to diagnose."

Mr A's normally stooped posture was exacerbated after his fall in July 2004. He was assessed by Dr B as being "severely incapacitated". However, his posture was reported to have resolved under anaesthesia owing to the relaxation of his muscles and he was positioned on the Wilson frame in the normal way.

Dr Laurenson considered that the positioning of Mr A was ultimately Dr C's responsibility but he was unable to conclude whether this was done adequately — or whether there was an established causal link with Mr A's deterioration. He stated:

> "While it is probable that the injury to [Mr A] occurred as a result of positioning, it is possible that it was a result of unforeseeable changes, which may have occurred during the operation in a correctly positioned patient.
>
> Both surgeon and anaesthetist claim to have taken all appropriate care during positioning but I note with some concern the comment that '[Mr A's] stooped posture resolved a little under general anaesthesia and did not particularly effect his positioning.' I am concerned that this may have represented a relative hyperextension of the cervical spine for [Mr A]. However, I am still unable to comment on whether this represents a breach of standard of care. "

Dr B accepts overall responsibility for the positioning of his patients, although the actual positioning of Mr A's neck was undertaken by Dr C. Both Dr B and Dr C doubt that Mr A could have experienced a deterioration of his neurological state during surgery. Dr C emphasised that Mr A's neck was not placed in a hyper-extended position. Dr Beavis commented that "meticulous positioning" was part of the regular routine for Drs B and C. Dr B stated:

> "When [Dr C] and I position the patients we take great care to have the patient's neck in neutral or flexion. [Mr A] had a degree of senile thoracic kyphosis. This was accounted for when the patient was positioned on the Wilson frame. This frame allows excellent positioning of the neck in neutral or flexion as required. [Dr C] always carefully positions the forehead on a jelly roll, to prevent extension. I likewise check the position of the neck. If there are any concerns [Dr C] always enquires for my opinion as well. In [Mr A's] case his neck was satisfactorily in a neutral position.

> This possibility of causing a neurological lesion with neck position is only present if the patient has a cervical stenosis limiting the size of the spinal canal. This was not the case with [Mr A].
>
> To suggest that an isolated palsy to the sensation to the pharynx could be caused by a hyper-extension injury to the neck would be, in my mind, anatomically impossible. Should there have been neurological damage at the time of surgery, this would have been exhibited with other neurological deficits postoperatively, which was not the case with [Mr A]."

Dr Laurenson stated in response:

> "[Dr C] and [Dr B] do not appear to accept the probable mechanism of injury. They still seem to be unaware that [Mr A] had both the pre-existing syrinx extending from T4 into the brain stem and severe spinal cord stenosis at the C5 level caused by degenerative disc disease with shift C5 on C6."

Dr C further commented:

> "Apart from the syrinx he was an acceptable risk for surgery. I did not diagnose his syringomyelia [the disorder that results from having a syrinx]. A senior and experience spinal surgeon ([Dr B]) did not make this diagnosis during his assessment either."

In my view, Dr Laurenson (and Dr R) have formulated a convincing explanation for what occurred. Mr A's subsequent resuscitation, with manipulation of the head and neck, may have contributed to the deterioration of his neurological condition. However, Mr A's slow recovery to consciousness after surgery, severe pain in the recovery room and ability to tolerate the upper denture in his throat/mouth for a period of three days all indicate that it is most likely that he experienced a degree of neurological deterioration around the time of his surgery.

Mr A's neurological condition was very difficult to diagnose, and he was essentially asymptomatic preoperatively. Overall, I incline to the view that the deterioration of Mr A's neurological state was not foreseeable by Dr B or Dr C, nor the result of any failing on their part.

It follows that Dr B and Dr C did not breach the Code in relation to the positioning of Mr A during surgery.

No Breach — Dr B

Surgical and postoperative care
Dr B conducted routine spinal surgery on Mr A at the private hospital on 10 February 2005. Dr B reviewed Mr A during consecutive ward rounds after the surgery. This was in conjunction with Dr C, who assumed primary responsibility for managing Mr A's postoperative respiratory problems. It was also Dr C who acted as the point of contact for nursing staff. Mr A suffered a respiratory arrest on 13 February 2005 because of an upper airway obstruction caused by his denture.

My expert orthopaedic advisor, Dr Denis Atkinson, advised that choking on a dental plate following routine general anaesthesia is a most unusual complication. He considered it unlikely that the dental plate would have been detected earlier. The dental plate was difficult to see on the X-ray imaging of 12 February, and was easily missed. Dr Atkinson stated that it was difficult to conceive how anybody could tolerate an object the size of a dental plate for more than a few minutes. Mr A's ability to tolerate the dentures may have been due to a combination of drug therapy and his pre-existing neurological impairment.

Dr Atkinson advised that Dr B provided Mr A with an appropriate standard of care:

> "It was appropriate for [Dr B] to delegate [Mr A's] care to his anaesthetist in the immediate postoperative period. It is standard practice for anaesthetists to care for complications of a patient's respiratory status in the immediate postoperative period. [Dr B's] further review of [Mr A's] condition on the first and second postoperative days was appropriate. The examination on 12 February and subsequent diagnoses, investigations and plan of management were appropriate.
>
> …
>
> In the postoperative period [Mr A] was examined by his surgeon [Dr B], his anaesthetist, [Dr C] and an unnamed medical officer attached to the private hospital. These medical advisers felt [Mr A's] respiratory impairment was secondary to bronchitis and a degree of congestive heart failure. [Mr A] was appropriately treated for both of these working diagnoses."

It is most unfortunate that nursing and medical staff did not realise that Mr A's denture had not been misplaced but was, in fact, inside his throat. However, as Dr Atkinson has stated, this was a most unusual event, made possible only by the unfortunate coincidence that Mr A's neurological impairment enabled him to tolerate the denture. In addition, Mr A's respiratory complications were not unexpected (or necessarily a precursor to his respiratory arrest), and they were appropriately managed, primarily by Dr C.

Overall, there is no evidence to suggest that Dr B did not provide Mr A with an appropriate standard of care in relation to his surgery and postoperative care. Accordingly, Dr B did not breach the Code.

Recommendations

I recommend that Dr C:

- review his practice in light of my report
- apologise to Mr A's family for his breach of the Code of Health and Disability Services Consumers' Rights. This apology is to be sent to the Commissioner and will be forwarded to the family.

Follow-up actions

- A copy of this report will be sent to the Medical Council of New Zealand and the private hospital.
- A copy of this report, with details identifying the parties removed, will be sent to the New Zealand Orthopaedic Association, the New Zealand Association of Anaesthetists and the Private Hospitals Association.
- A copy of this report, identifying only Dr C, will be sent to the Australian and New Zealand College of Anaesthetists.
- A copy of this report, with details identifying the parties removed, will be placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix One

Foreign body in upper airway

Unsuspected cause of obstruction

Ulrik Blaschke, MD Eugene Y. Cheng, MD

Preview

Airway obstruction from a foreign body is usually an acute life-threatening event. In this case, a complete upper dental plate was the unsuspected cause of intermittent respiratory distress. The authors discuss the clinical and laboratory findings and suggest ways to prevent unnecessary delays in diagnosis and treatment.

A 52-year-old man with presumed aspiration pneumonia was transferred from an inpatient psychiatric facility to Froedtert Memorial Lutheran Hospital in Milwaukee. Past medical history showed a cerebrovascular accident followed by organic brain syndrome and seizures. At the time of admission, the patient was receiving papaverine hydrochloride, phenobarbital, amantadine hydrochloride, thioridazine hydrochloride, and phenytoin sodium. Because of his underlying neurologic problems, an accurate history of what led to his admission to the hospital was unobtainable.

His vital signs on admission were as follows: blood pressure 160/70 mm Hg, heart rate 130/min, respiratory rate 36/min, and rectal temperature 38°C (100.4°F). Examination of the head and neck showed that he was edentulous and had dry mucous membranes. The lungs had diffuse, coarse rhonchi and bibasilar rales. No stridor or wheezing was noted. Neurologic examination revealed lack of gag reflex and limited recall.

Electrolyte levels on admission were normal. Arterial blood gas studies while the patient was breathing room air showed pH of 7.43, Pco_2 of 41 mm Hg, Po_2 of 51 mm Hg, bicarbonate level of 27 mEq/L, and oxygen saturation of 87%. Phenytoin level was 15.4 mg/L, and phenobarbital level was 13.5 mg/L. Hematocrit was 43%, and white blood cell count was 10,500 with 12% bands and 74% neutrophils. Findings on a chest film were consistent with obstructive pulmonary disease and included chronic interstitial markings in the right and left lower lobes. Sinus tachycardia was seen on the electrocardiogram.

A PERPLEXING CASE

Initial medical treatment consisted of supplemental oxygen by nasal cannula and intravenous administration of tobramycin sulfate and piperacillin sodium.

Twelve hours after admission, the patient was transferred to the intensive care unit because of increasing respiratory distress. At that time, blood pressure was 110/70 mm Hg, heart rate was 135/min, and respiratory rate was 45/min with poor air exchange. Oxygen saturation determined by pulse oximeter (Spo_2) was 75% while the patient received supplemental oxygen through a nonrebreather mask. Arterial blood gas studies showed pH 7.29, Pco_2 50 mm Hg, Po_2 43 mm Hg, bicarbonate level 23 mEq/L, and 71% oxygen saturation of arterial blood.

Rapid decompensation continued: Spo_2 dropped to 55%, and no breath sounds were heard on respiratory efforts. Emergency orotracheal intubation was attempted; however, an entire upper denture was found covering the larynx (figure 1). The denture was moved with a Magill forceps to allow tracheal intubation. The denture then became lodged completely in the nasopharynx, with only a small portion of the plate visible behind the soft palate. After tracheal intubation, the patient was easily ventilated with 100% oxygen and Spo_2 improved immediately to 95%. The lodged denture was then extracted manually from the nasopharynx.

A follow-up chest film showed a calcified density, possibly a tooth,

continued

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PERPLEXING CASE CONTINUED

Ulrik Blaschke, MD
Dr Blaschke is a resident in anesthesiology, Medical College of Wisconsin, Milwaukee.

Eugene Y. Cheng, MD
Dr Cheng is assistant professor of anesthesiology and internal medicine, department of anesthesiology, Medical College of Wisconsin. His primary area of interest is critical care medicine.

in the lower right lobar bronchus. Fiberoptic bronchoscopy revealed no aspirated material. The tracheal tube was removed several hours later, and the patient subsequently did well.

Discussion

Airway obstruction from a foreign body often is a life-threatening situation that requires immediate attention. Most cases occur in the very young or the elderly.[1-4] Usually the patient is able to communicate the problem to others by showing characteristic signs of aspiration, ie, choking, coughing, or stridor. This case demonstrates the importance of upper airway examination in a patient with altered mental status who presents with intermittent respiratory distress.

Hospital management of any patient who has acute shortness of breath should include a complete history on airway and pulmonary function. If the patient cannot provide a history, then family members or other persons recently involved with the patient should be contacted. If the admitting physicians had known the patient's dental history in this case, they might have been more likely to suspect upper airway obstruction from dental materials.

A thorough physical examination is the next step in assessing a patient with possible airway obstruction. Initial examination should include visual inspection of the oral cavity with a penlight and tongue blade. Auscultation over the trachea and lung fields is critical. Stridor and upper airway gurgling or poor air movement are all signs of obstruction. If upper airway obstruction is suspected, the posterior pharynx and larynx should be visualized directly with a laryngoscope. A lateral film of the neck is also useful to evaluate the upper airway further.

In this case, a thorough upper airway examination initially would have obviated emergency intubation and treatment for aspiration pneumonia.

Conclusion

Foreign body aspiration is often life-threatening. When it occurs in adults, the diagnosis is usually obvious. However, in this case, an entire upper dental plate was found covering the larynx of a 52-year-old psychiatric patient. This atypical presentation demonstrates the importance of suspecting possible airway obstruction from a foreign body in patients with respiratory distress and altered mental status. PGM

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