Urologist, Dr C

Anaesthetist, Dr D

A Private Hospital

A Report by the

Health and Disability Commissioner

(Case 05HDC18424)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Parties involved

Mr A	Consumer
Mrs A	Consumer's wife
Mr B	Complainant/Consumer's son
Dr C	Provider/Urologist
Dr D	Provider/Anaesthetist
A Private Hospital	Provider/Private hospital
Ms E	Registered nurse, the private hospital
Ms F	Registered nurse, the private hospital
Ms G	Registered nurse, the private hospital
Ms H	Registered nurse, the private hospital
Ms I	Registered nurse, the private hospital
Ms J	Registered nurse, the private hospital
Mr K	Registered nurse, the private hospital
Ms L	Registered nurse, the private hospital
Ms M	Registered nurse, the private hospital
Ms N	Registered nurse, the private hospital
Ms O	Registered nurse, the private hospital
Dr P	General/Vascular surgeon, the public hospital
Ms Q	Theatre Co-ordinator, the public hospital
Mr R	Theatre nurse, the public hospital
Ms S	Anaesthetic technician, the public hospital
Dr T	Anaesthetic registrar, the public hospital
Ms U	Hospital manager, the private hospital

Complaint

The Commissioner received a complaint from Mr B about the services provided by urologist Dr C, anaesthetist Dr D, and a private hospital. The following issues were identified for investigation:

- *Whether the care provided to Mr A by urologist Dr C on 6 and 7 December was appropriate.*

- *Whether the care provided to Mr A by anaesthetist Dr D on 6 and 7 December was appropriate.*

- *Whether a private hospital provided appropriate services to Mr A on 6 and 7 December.*

An investigation was commenced on 2 February 2006.

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

Information reviewed

Information received from:

— Mr B
— Dr C
— Dr D
— Ms E
— Ms F
— Ms G
— Ms I
— Ms H
— Ms J
— Mr K
— Ms L
— Ms M
— Ms N
— Ms O
— The District Health Board Complaints Facilitator
— Ms U, Hospital Manager, the private hospital
— Chief Clinical Nursing Advisor, the private hospital
— The Coroner

Mr A's clinical records were obtained from the private hospital and the District Health Board. ACC provided a copy of its decision regarding Mr A's claim and a copy of the independent advice provided to ACC by anaesthetic specialist Dr Forbes Bennett. The Commissioner obtained independent expert advice from anaesthetist Dr David Chamley and urologist Dr Patrick Bary.

Information gathered during investigation

Summary

Mr A, aged 61 years, was admitted to a private hospital on 6 December for a radical prostatectomy for prostate cancer. Dr C, urologist, performed the surgery during the afternoon list, concluding at 6.50pm. The anaesthetist was Dr D. Mr A lost 7,600ml of blood during the surgery. Dr D commenced volume replacement and blood pressure management in theatre and continued this treatment in the recovery room. Mr A was transferred to the ward five hours later at 11.50pm. His condition continued to cause concern and was managed by Dr D in consultation with Dr C. At 3.15am, when Mr A had shown little response to Dr D's management plan, Dr C was consulted and Mr A

was transferred to a public hospital for emergency explorative surgery. Mr A suffered a cardiac arrest on arrival at the public hospital theatre suite. Following his resuscitation, Dr C operated and, during the surgery, perforated Mr A's left internal iliac vein. A vascular surgeon was called to assist and was able to stop the bleeding and repair the damage to the vein. Mr A lost 18,000ml of blood during this second operation. He suffered irreparable brain damage as a result and died a short time later.

Chronology

2000
On 30 June 2000, Mr A's general practitioner found that Mr A had an enlarged prostate, and an elevated PSA (Prostate Specific Antigen). Mr A's general practitioner referred Mr A to Dr C for assessment.

Three weeks later, on 20 July 2000, Dr C first saw Mr A. Dr C organised ultrasound examinations and performed a series of biopsies. The result of the biopsies did not indicate a malignancy, and Mr A was discharged back to his general practitioner. However, on 22 July, Dr C received an elevated PSA result for Mr A. Dr C telephoned Mr A with the result and advised him to have further PSA tests.

Dr C continued to monitor Mr A's PSA results. On 24 August Dr C was advised that Mr A's latest PSA had increased significantly from the result eight months earlier. Dr C contacted Mr A and advised him to have a further ultrasound and biopsy. These investigations were performed on 15 October and showed areas of cancer in the prostate gland.

4 November — prostatectomy decision
On 4 November, Dr C discussed the results with Mr and Mrs A, who agreed that Dr C should perform a radical prostatectomy.

During the 4 November meeting, Dr C advised Mr A of the risks of radical prostatectomy, including urinary incontinence and erectile dysfunction. Dr C recognised that "the surgery would be made more difficult because of the large size of the prostate gland" and warned Mr A that he might need a blood transfusion. Mrs A stated that Dr C did not adequately convey the extent of the potential blood loss or the subsequent risks or potential outcomes of the level of blood loss this surgery could cause.

6 December — surgery
On 6 December, Mr A was admitted to the private hospital for the agreed surgery. Dr C had scheduled Mr A third on the afternoon theatre list. Prior to the surgery, Dr D saw Mr A on the surgical ward to take his medical history and assess him for the anaesthetic. (Mr A had not been seen at a pre-anaesthetic assessment clinic.) Dr D noted that Mr A had been admitted to the public hospital three years earlier with chest pains. Mr A informed Dr D that he had been assessed by cardiologists and was not suffering ongoing ischaemic heart disease. However, the ECG (electrocardiograph)

performed on Mr A at admission showed some evidence of heart ischaemia. Dr D was not aware that Mr A had a very enlarged prostate.

Dr D stated:

> "Pre-operatively I regarded [Mr A] as having minor to moderate (rather than major) risk factors for coronary artery disease (the moderate factor being his ECG changes). … I advised [Mr A] that I would offer him general anaesthesia and suggested an epidural be placed to provide him with improved pain relief following surgery. … I recall mentioning to [Mr A] his cardiac risk but reassured him that the risk of serious cardiac complication appeared to me to be low. For patients undergoing radical prostatectomy I also routinely mention that they may require a blood transfusion. I also outlined the technique of epidural insertion and its risks."

Mr A was checked into theatre at 3.45pm by Ms E, anaesthetic nurse. Dr D commenced ECG, blood pressure and pulse oximetry monitoring, sited the epidural and administered the general anaesthetic. Dr C began Mr A's operation at 4pm, performing a retropubic nerve-sparing radical prostatectomy. Nurses Ms I and Ms H assisted.

Ms E stated that Mr A's blood loss was apparent "right from the outset of the surgery". She noted that the suction canister was filling quickly and brought this to the attention of the circulating theatre nurse, Ms F. Ms G, the second circulating theatre nurse, said that at about 5pm the scrub nurse indicated to her that the second suction canister needed changing. Ms I and Ms H reported that they were having difficulty keeping up with suctioning. The nursing staff heard Dr D mention the blood loss to Dr C. Ms G said that at the end of the surgery there were five or six near-full suction canisters. She had not seen this amount of blood loss before in other radical prostatectomies.

Ms J, the post-anaesthetic care unit (PACU) senior registered nurse, stated that the theatre staff informed her that Mr A was bleeding intra-operatively. She is unsure of the time at which she was informed. Dr D requested an Istat (point of care blood-testing device) and asked Ms J to arrange for the public hospital blood bank to supply further units of blood and fresh frozen plasma.

Dr D stated:

> "[Mr A's] surgery was complicated by considerably greater blood loss than usual but appropriate facilities existed at [the private hospital] to manage this (large bore IV access, rapid infusion fluid warmers and pressure infusion bags). The blood loss was steady throughout surgery rather than precipitous at any point. I advised [Dr C] that [Mr A's] blood loss was greater than expected and he commented that the blood loss was large as a result of the large size of the prostate gland. I specifically recall that he was confident that he had gained adequate control of haemorrhage during the period he was 'sewing up'. Boluses of vasopressor drugs Ephedrine and

> Metaraminol were administered during the surgery to maintain adequate blood pressure. A progressive tachycardia [rapid heart rate] was observed, suggesting a degree of hypovolaemia [low blood volume], during the later part of the procedure."

Dr C stated:

> "No specific difficulties were encountered during this operation but it was more difficult because of the size of the prostate gland and because the patient had been anxious to have a nerve sparing procedure so that if possible, erectile function would be maintained. Blood loss through the procedure was steady and there was one episode of transient hypotension [low blood pressure] intra-operatively. The operative time was two and a half hours and the measured fluid loss was 7.5 L of which 5 to 6 L was blood. 2.5 L blood was transfused intra-operatively and 2 L of colloid were given."

The surgery finished at 6.50pm and Mr A was transferred to PACU.

As Mr A had been in theatre longer than usual for this type of surgery, Ms J informed the ward co-ordinator that Mr A would be delayed in returning to the ward, and explained the reason for the delay. Ms J was concerned about Mr A's blood loss and, after discussion with the surgical ward's afternoon team leader, registered nurse Ms L, she asked Dr C if he wanted a "special"[1] nurse arranged for Mr A when he returned to the ward. The suggestion was declined.

Ms E assisted Dr D to transfer Mr A from theatre to PACU. Ms J and registered nurse Mr K cared for Mr A while he was in PACU.

Mr K stated:

> "[Dr D] stayed in PACU. [Mr A's] blood pressure dropped further. [Dr D] had set a parameter of 90[mmHg] systolic or above, so Ephedrine (a drug which elevated the blood pressure) 15mg subcutaneous was charted, to be repeated as necessary. [Mr A] was relatively stable initially, however, his hypotension then progressed. [Dr D] advised that the hypotension was to be managed with the medication he had charted. [Mr A's] blood pressure reached 90[mmHg] systolic and [Dr D] left the PACU. I was aware that [Dr D] had spoken with [Dr C]."

At 8.20pm Mr A was reviewed by Dr C together with Dr D, and it was agreed that he would be managed conservatively with intravenous vasopressors and blood transfusions, with the expectation that bleeding would subside. Dr C then left the hospital.

[1] A "special" nurse is a nurse dedicated to care for just one patient.

Mrs A stated that the family were kept waiting uninformed for five hours while Mr A was in recovery. They were only told that the surgery "went well".

Dr C stated:

> "We were faced with the decision whether to return immediately to the operating theatre or to continue to treat the patient conservatively with blood volume replacement. The problem with returning to the operating theatre is that the anastomosis has to be taken down and this then is difficult to repair subsequently."

Ms J stated:

> "Multiple 'phone conversations with anaesthetist ([Dr D]) initiated by myself [at about 7.30pm] re [Mr A's] blood pressure and condition. Incremental doses of Aramine ordered and given. [Mr A's] blood pressure stabilised. [Dr D] requested one last increment of Aramine and transfer of [Mr A] back to the ward by 2100 [9pm]. [Mr A's] family were invited in to the PACU. A full explanation was given re the delay in PACU. The family were very appreciative regarding the visit and explanation."

Mrs A stated that it was only after she asked the medical staff a second time if she could see her husband that she was allowed to go in to him. She was not informed of the extent of the concern about her husband and was unaware that Dr C was considering re-operating.

Dr D stated:

> "At 2130 [9.30pm] there was further deterioration in [Mr A's] blood pressure and staff in recovery and I had concerns that there was continued surgical blood loss. There had been an initial measured loss of 400ml in the large bore Haemovac drain sited in the wound, but this had quickly settled. However, I place little confidence in wound drains as an accurate reflection of the presence or absence of haemorrhage after surgery. The nursing staff and I were closely monitoring [Mr A's] pulse, blood pressure and urine output as more accurate reflections of his blood volume status. … Further boluses of Metaraminol and Ephedrine were administered and blood sent to a medical laboratory for determination of Hb [haemoglobin levels] and coagulation status, to determine whether coagulopathy [abnormal clotting] may have contributed to continued haemorrhage."

At some time between 11pm and midnight, Dr D discussed Mr A's condition with Dr C. They discussed moving Mr A to the public hospital. Dr C believed the bleeding would stop of its own accord. Dr D did not introduce an invasive arterial or central venous pressure monitor because he believed that the non-invasive pressure monitoring provided a reliable and accurate gauge of blood pressure. Dr D stated:

> "In retrospect the use of invasive monitoring may have been appropriate in [Mr A's] case and I greatly regret not doing so and that, following my discussion with [Dr C] at approximately 2330–2400 [11.30pm to midnight], I retained responsibility for [Mr A's] care. But at the time my judgement, guided by the advice of [Dr C], was that his surgical situation was settling and that [Mr A's] blood pressure was responding to fluid infusion."

Dr D and Dr C agreed that Mr A would continue to be managed at the private hospital. Ms L arranged for a nursing agency to supply a registered nurse experienced in intensive care to "special" Mr A.

Mr A was transferred to the surgical ward at 11.50pm and registered nurse Ms M was assigned to "special" him. Ms M recalled that Dr D stayed in the room with Mr A "most of the night".

7 December — deterioration/transfer to the public hospital

There is a discrepancy about the time that Dr D left the hospital to go home (two kilometres from the hospital) for food and to rest. Dr D stated that he left the hospital about 1am with the intention of returning at 2am. Registered nurse Ms N, the surgical ward charge nurse, recalled that he left at 1.30am after telephoning Dr C from the nurse's desk telephone to advise him he was leaving the hospital temporarily. Ms M recalled that Dr D went home at 3am.

The clinical records, however, show that Dr D was telephoned at home by nursing staff at 1.45am and informed that Mr A's blood pressure had fallen to 75mmHg systolic. Dr D returned immediately.

At 2am Mr A complained of chest pain. He was given glyceryl trinitrate spray to control the chest pain, and Dr D contacted the public hospital to discuss the availability of theatres and the possibility of transfering Mr A for ongoing intensive care. Dr D took a further blood sample from Mr A for laboratory testing and found that the results strongly indicated continuing haemorrhage and a developing coagulopathy (abnormal clotting). He telephoned the public hospital again to speak with the on-call haematologist, who authorised giving Mr A platelets, FFP (fresh frozen plasma) and cryoprecipitate. Dr D contacted the blood bank to alert them to the requirement for coagulation products and more blood for transfusion.

Dr D also contacted Dr C, who arrived at the private hospital at about 3am and agreed with Dr D that re-exploration of Mr A's operation site was indicated. Ms N arranged the ambulance transfer for Mr A. Dr D telephoned the public hospital anaesthetic registrar, Dr T, who informed him that she was on her way to Delivery Suite to perform an epidural on a woman in labour, but would be free in time to receive Mr A in theatre.

Dr D had discussed with Mrs A, on several occasions during the night, that her husband could be continuing to bleed and might need to be transferred to the public

hospital for further surgery. Mrs A was present when the decision to transfer was made. Mrs A and Ms M accompanied Mr A in the ambulance. Dr D drove ahead to forewarn the Emergency Department staff. Dr C met them at the public hospital emergency department. Ms M formally handed over Mr A to the Emergency Department staff and returned to the private hospital.

The public hospital
On arrival at the public hospital at 4am, Mr A was transferred directly to the operating theatre. Dr C stated:

> "[T]he urology trainee registrar who would have normally assisted here had been on vacation and her flight had been delayed that day because of difficult weather. In addition my urological colleague at [the public hospital] was on leave. An alternative would have been to request assistance from either a general surgeon or a vascular surgeon, but this was not done."

Dr D intended to transfer the care of Mr A to the public hospital anaesthetic registrar, but she was still involved in the care of the Delivery Suite patient at that time. Anaesthetic technician Ms S was instructed to assist Dr D until Dr T was free.

Mr A was alert and uncomplaining on arrival at the theatre suite. However, as he was being transferred to the operating table Mr A lost consciousness. His peripheral pulses were weak although his ECG was still showing normal sinus rhythm. Dr D instructed the anaesthetic technician to assist him to intubate Mr A and asked Dr C to begin cardiac massage until a stronger peripheral pulse was palpable. The anaesthetic registrar arrived and assisted in establishing arterial and venous lines while Dr C prepared to operate.

Dr C stated:

> "The cardiac arrest provided a degree of urgency and not enough focus was given to requesting surgical assistance because of this event. …
>
> We estimated that this period of deterioration was less than 3 mins. CPR was begun by myself while [Dr D] performed an intubation and administered intravenous adrenaline. [Mr A's] blood pressure responded quite quickly to this.
>
> When we reopened the wound there was some free blood but it was not dramatic in quantity. To access the field the vesico-urethral anastomosis (join between bladder and urethra) was taken down to control bleeding. The internal iliac arteries were exposed. On the left side an injury to the left internal iliac vein occurred while slinging the left internal iliac artery and heavy bleeding occurred which was controlled with digital pressure."

The surgery commenced at 4.15am. Registered nurse Mr R was initially the nurse scrub/assistant to Dr C, but when further assistance was required, Mr R asked the

theatre co-ordinator, Ms Q, to "scrub in" and act as the Scrub Assistant. On 8 November, Ms Q informed the District Health Board's Event Review team that she recalled Mr R asking Dr C if he required the assistance of a vascular surgeon. Dr C initially agreed but then changed his mind. Ms Q recalled that she asked Dr C on three further occasions whether he wanted a vascular surgeon called. A vascular surgeon, Dr P, was called at 4.50am.

Dr D stated:

> "Direct manual compression of the area was maintained while we waited for [Dr P's] arrival and considerable bleeding continued during this time. At one stage I asked [Dr C] to consider compression of the aorta to reduce blood loss in order to allow us to catch up with fluid infusion in the face of major haemorrhage."

Dr P told the District Health Board Event Review team that on arrival he noted that there was a large amount of bleeding and the wound had been packed. Dr P was able to control the venous bleeding with suturing. He used a self-retaining retractor to obtain better exposure and when it appeared there was no further bleeding within the pelvis, it was possible to reconstruct the bladder.

Dr D stated:

> "Periods of profound hypotension, severe ST depression on the ECG and bradycardia [very slow heart rate] occurred. On two occasions hypotension down to the systolic pressures of below 40mmHg was observed. Further boluses of adrenaline were administered followed by infusions of adrenaline and nor-adrenaline and boluses of calcium chloride to preserve cardiac and vascular function. Close communication with the haematology department ensured that there were no delays receiving and administering blood and blood products."

The operation concluded at 8am. The measured blood loss at the end of the procedure was 18,000ml.

Mr A was transferred to the Intensive Care Unit, intubated and ventilated. Dr D's involvement in Mr A's care ceased on the morning of 7 December, but he continued to take an interest in Mr A's subsequent progress.

The family of Mr A was initially given a potentially favourable prognosis. However, a CT scan confirmed the presence of irrevocable brain damage. Mr A died a short time later.

Three months later, Dr C and Dr D met with members of the family and their general practitioner to discuss the events leading to Mr A's death.

Additional information

Post-mortem
On 26 December, a post-mortem examination was performed on Mr A by a pathologist. The pathologist concluded her report:

> "Autopsy reveals that death of this 61 year old male is due to cerebral hypoxia resulting from massive blood loss due to a 'rent' in the iliac vein and chemical peritonitis resulting from a dehiscent lesion [splitting open] at the vesicular urethral anastomotic [join] site status post-prostatectomy.
>
> Additional other factors influencing the death consist of an acute myocardial infarction [heart attack] (subacute at the time of post mortem) that was due to severe occlusive coronary artery atherosclerosis exacerbated by the haemodynamic instability of the decedent due to massive blood loss. Additional exacerbating factors consist of moderate to severe pulmonary emphysema, an old myocardial infarction, clear cell carcinoma of the kidney and severe coronary artery atherosclerosis."

The Coroner has not held an inquest, pending the outcome of the Commissioner's investigation**.**

ACC
On 11 May ACC informed Mrs A that her medical misadventure claim had been accepted as medical mishap.

Dr C's response
Dr C advised the Commissioner:

> "All my operations are recorded in surgical audit. With regard to radical prostatectomy, intraoperative blood loss, operative time, functional outcomes namely potency and incontinence rates and also the pathology of the specimen are recorded. I had noted over approximately one year a higher transfusion rate than would be considered the norm (about less than 20%). I wondered about this a great deal. To a certain extent I considered this less important than functional outcomes which were good. Intensive pursuit of haemostasis during these operations can damage the delicate neurovascular bundles which are important for potency and incontinence. Nevertheless, I had discussed this with a colleague […] and undertook a careful evaluation of the surgery by obtaining a DVD published by Dr P Walsh, who is a recognised authority on this procedure and prior to each radical prostatectomy I would go through this DVD. I had done this on the Sunday prior to [Mr A's] operation.
>
> Immediately following [Mr A's] outcome I discontinued major surgery apart from 'on call requirements'. My scope of practice at both [the private hospital] and [the public hospital] changed with the assistance of my colleague.

> [Dr D] and myself decided to discontinue doing radical prostatectomies at [the private hospital] following this case. I have subsequently returned to perform them at [the District Health Board] with a careful audit of all outcomes.
>
> I sought an ophthalmological colleague to assess my eye sight. He has made a report which suggests that it was not impaired for this type of surgery. Nevertheless I obtained a further set of surgical loupes for deep pelvic surgery. Because of the distress caused by this event I sought the assistance from an Occupational Health Specialist at [the District Health Board]."

Dr D's response
Dr D advised the Commissioner:

> "I believe that the post-operative care of surgical patients is the joint responsibility of both surgeon and anaesthetist. Both have specialised medical training in their specific medical fields. Of the two, the anaesthetist is more familiar with the most appropriate monitoring and resuscitation techniques, while the surgeon has specialist knowledge in examining patients with intra-abdominal bleeding and techniques of managing such problems.
>
> Whilst I am familiar with the technique of vascular embolisation to control haemorrhage, I believe it is the surgeon's responsibility to decide how best to control any haemorrhage. The actual decision to change from a conservative management to surgery or some other intervention is usually made following consultation between the anaesthetist and surgeon. It was my view that the surgeon retained the final decision regarding whether or not to return to theatre, that being their area of expertise. However, since [Mr A's] death, I have resolved to take a more aggressive approach to patient management.
>
> Anaesthetists and surgeons are frequently faced with patients in the recovery ward who are obviously continuing to bleed. However, it is only the minority of these patients who are taken back to theatre. This period managing a patient who is bleeding post-operatively can be fraught with difficulty as the correct moment at which the decision should be made not to continue a conservative approach, but to return to theatre is not always easy to clearly identify. And this was the case with [Mr A]. I am still devastated that I did not make different clinical decisions on the night in question. Whilst an earlier transfer would not have prevented the catastrophe which occurred during his second operation, it may have led to that operation being performed earlier and would have removed the lingering sense of doubt that his family and I experienced that I could have done more to prevent his death."

Dr D subsequently advised the Commissioner:

> "I would also like to take this opportunity to formally commend the nursing staff working in recovery and medical wards at [the private hospital] on the night of

these events. I appreciate that many of them have felt a sense of responsibility following this incident and I have spoken to many, but not all, of them since these events. They all performed their duties faultlessly."

The private hospital's response

Ms U, Hospital Manager at the private hospital responded to the family's letter of 7 March, and advised:

"We appreciate your need for answers to the valid questions you have raised, and [the private hospital] will provide you with answers where it can. [The private hospital] is looking into the events surrounding [Mr A's] care and this may result in further information that will allow us to provide a more comprehensive response. …

One issue that we can respond to at this stage is the adequacy of the hospital's services to carry out radical prostatectomies. The hospital is equipped with suitable facilities to provide services to patients undergoing radical prostatectomies. Such operations are performed by other urologists at this hospital and other similar private hospitals around New Zealand."

Ms U also advised the Commissioner:

"[The private hospital] provides the physical facilities, equipment, supplies, nursing and support staff for day patient and inpatient elective surgery across a range of specialties including urology surgery. The hospital does not employ the surgeons or the anaesthetists. … Surgeons and anaesthetists apply to 'register' or be credentialed to provide patient treatment and care at [the private hospital] and undertake annual procedures for continuation of registration. …

The primary responsibility for patient treatment and care is the surgeon's as the admitting specialist. … The anaesthetist also provides care while the patient is in the hospital, including the pre-anaesthetic assessment, the anaesthetic and peri-operative care to discharge for day patients/short stay cases, or within the first 24 hours post operatively as usual custom and practice for longer stay patients and from then as long as the patient/surgeon requires their services prior to patient discharge. …

The hospital standing order protocol dated 2004, 'Standing Order for Management of Haemodynamically Unstable Adult' [see Appendix A] includes the situation for the administration of Aramine [a vasopressor]. Please note this includes Aramine administration in the absence of the visiting practitioner and the purpose of this document is to provide additional guidelines for the nursing staff in emergency situations and where there is no specialist anaesthetist present in the hospital.

In [Mr A's] case, the anaesthetist was present and responsible for prescribing of Aramine and the nurses working under his direct instructions. Each dose of

> Aramine was administered following the direct orders of the attending doctor and then by infusion under 'Special Nursing Care' (SNC). SNC is care where an appropriately experienced nurse provides continuous direct patient care to one patient. [Mr A] had SNC from the time of his admission to the Recovery Room/Post Anaesthetic Care Unit (PACU) and when PACU closed, in the ward setting with a 'special', an appropriately experienced SNC nurse until his admission to [the public hospital]. Aramine or similar medications would never be administered to any patient receiving usual ward post-operative nursing care as this level of medication requires special monitoring.
>
> The process [of transferring Mr A to the public hospital] was managed consistent with the guidelines [Transfer of Patient to Another Healthcare Facility – see Appendix B] and taking into account that the anaesthetist had been in constant attendance (having left the hospital briefly and coming back immediately when called) and having had contact with the surgeon. Both the surgeon and the anaesthetist assessed [Mr A] and made the decision to transfer. [Mr A's] care was continued in the ambulance by the anaesthetist and [the private hospital] 'special' nurse."

In relation to the private hospital's investigation into the circumstances of Mr A's treatment, Ms U advised:

> "The death of [Mr A] was of significant concern to [the private hospital]. When we learned of the tragic outcome, our Serious (Sentinel) Event Investigation process was initiated. … The hospital met and corresponded with [Mrs A] and the family and has retained contact throughout the investigation process and information has also been provided to the ACC. [The private hospital] Serious (Sentinel) Event Investigation Report, which details the hospital care provided, includes clinical records, investigation findings and our [private hospital] Action Plan.
>
> The investigation and management process is in two phases. Phase one of the investigation initially focussed on the hospital systems and processes and the quality of nursing care. The results of our investigation confirmed that the care provided to [Mr A] by [the private hospital] was appropriate. … The focus of phase two of the investigation process was directed to the medical treatment and care and we were fortunate that the opportunity was presented for [the private hospital] to join with [the District Health Board] in establishing a Review Team which comprised a specialist urologist and anaesthetist. …
>
> In the course of our hospital investigation we identified improvements and these are included on our Hospital Action Plan, updated 23 February 2006. These improvements are enhancements to our systems and process and while they would have had no material impact on [Mr A's] care, they do form part of the hospital's learning and commitment to continuing quality improvement in patient care services."

The improvements that Ms U referred to include:

- setting up pre-anaesthetic clinics
- 30 minute update on blood loss for major cases between anaesthetist and surgeon
- surgeons are required to review all patients on site who have a greater than four-hour stay in PACU
- review the criteria for discharge from post-anaesthetic care unit (PACU) and admission to ward.

The private hospital provides visiting medical practitioners with an Annual Procedures Form for continuation of "registration" with the hospital. The hospital also requires the visiting medical practitioners to provide a copy of their annual practising certificate and evidence of their current indemnity insurance. The relationship the hospital has with its medical specialists is described in the private hospital's Registration Guide for Visiting Practitioners, which states:

> "Visiting practitioners are solely responsible for their own medical practice and conduct and the hospital is not liable for any act, error or omission of any practitioner."

On 28 June 2006, the Chief Clinical Nursing Advisor at the private hospital, advised:

> "When new surgeons or anaesthetists apply to [the private hospital], they complete an application process which includes their CV, references from colleagues and an outline of their clinical practice. This is reviewed by a local clinical committee and checked by a national governance group. The surgeon is expected to undertake a self audit programme. A clinical indicator summary report and eventful cases for review process [occurs], including unexpected outcomes, transfer of patients and other cases of note, and is reviewed by the Hospital Clinical Medical Committee and the Quality Committee."

Independent advice to Commissioner

Urology advice
The following expert advice was obtained from an independent urologist, Dr Patrick Bary:

> "I have read the guidelines for independent advisors and agree to follow these guidelines.
>
> I am a fully qualified consultant urologist, gaining my FRACS in 1981 and having been in consultant urological practice in Australia and New Zealand since 1984.
>
> I am not aware of any conflict of interest in my giving an opinion about this matter. The urological community in New Zealand is small and therefore I know Dr C. I rang him to ask if there were any reason he could give that I should not give an opinion and he stated that there was not. I would emphasise that neither the nature of the complaint nor the clinical problem involved was discussed.
>
> I have been asked to give an opinion on the care provided to [Mr A] by [Dr C].
>
> I have read the following as supporting information on which I shall base my report:
>
> A. Letter of complaint from [the family], dated 12 December 2005
> B. Response to the Commissioner from [the Coroner], dated 24 February 2006
> C. Response to the Commissioner from [Dr C], dated 24 February 2006
> D. Response to the Commissioner from [Dr D], dated 6 March 2006
> E. Response to the Commissioner from [the private hospital], dated 13 March 2006
> F. [Mr A's] clinical records provided by [the DHB] on 7 March 2006
> G. Various correspondence, reports and clinical records from [the private hospital] and [the public hospital].
>
> 1. *Did [Dr C] comply with accepted standards when he performed the radical prostatectomy on [Mr A] on 6 December?*
>
> [Dr C] chose, having discussed the situation with [Mr A], to undertake a nerve sparing radical prostatectomy. This is done in order to try to preserve potency. It is generally accepted that a nerve sparing procedure, because of the close proximity of the nerves to the prostate and to blood vessels, will be associated with increased blood loss. This can occur because it is felt safer in the long term to accept some increased bleeding rather than chance damage to the nerves in cauterising the adjacent blood vessels. The vessels are generally small and are not generally responsible for large volume blood loss.

[Mr A's] operation took between 2.5 and 3 hours and during that time blood loss was estimated at about 7 litres. During the procedure the blood pressure was maintained satisfactorily but it was necessary to administer 2400 ml of red cells as well as electrolytes and inotropes to achieve this. The anaesthetic chart also records a significant increase in heart rate during this time. There is no comment in the operation note about any specific cause of blood loss. [Dr C] reports that blood loss was steady and it would appear he was aware of the amount as the operation proceeded.

At the time of the end of the procedure [Dr C] was apparently satisfied that blood loss was under control, enabling him to close [Mr A's] abdomen and finish the operation.

Opinion:
The blood loss in this operation was very high and the reason is not apparent from the notes I have been given. Both [Dr C and Dr D] have stated that blood loss for radical prostatectomy in their experience is between 1500 and 5000 ml and loss in this operation was considerably greater. However, having stated that, it appears that removal of the prostate and joining of bladder neck to urethra were achieved satisfactorily, haemostasis was to [Dr C's] satisfaction at the end of the operation and [Mr A] was in a stable state when he arrived in recovery, making an adequate urine volume and with a satisfactory blood pressure. Fluid and anaesthetic management by [Dr D] appears to have been very satisfactory.

I would consider that [Dr C] did not provide an appropriate standard of care in this situation, given that blood loss during radical prostatectomy when done by [Dr C] is generally higher than would be expected and that the volume of blood loss during [Mr A's] operation is considerably greater than [Dr C's] average. I consider the severity of departure from that appropriate standard of care to be mild.

2. *Was [Dr C's] contribution to the management of [Mr A's] post-operative hypotension appropriate?*

In the postoperative period, having arrived in recovery at 1854 hrs, the information shows that [Mr A's] blood pressure and pulse were initially satisfactory but later varied despite the use of fluid and blood replacement and also inotropes. His epidural anaesthetic continued throughout, though at varying dosage. No invasive monitoring was done. His urine output remained steady. He was given two units of plasma after 1900 hrs. His initial Hb was 82, rising to 99 g/L after 2 units of red cells then 109 g/L on a Medlab result from 2330 hrs on 6/12/04. INR at that time was 1.3. His BP later dropped and a follow-up Hb was 61 g/L with platelets of 53 x10^9/L. As stated by [Dr D] calls were made to [the public hospital] and arrangements made to transfer [Mr A]. A further unit of red cells was commenced at 0320 hrs. Transfer was

achieved at 0400 hours on [7 Decemeber] and in the meantime [Dr D] had, apart from a brief period, closely overseen [Mr A's] management.

I am not able to find, from the information available to me, when [Dr C] left the hospital after the operation but it would appear to have been after 2020 hrs when a discussion was held between [Dr C and Dr D] about [Mr A's] state and the decision was made to continue to treat him conservatively. [Dr C] was next contacted about midnight and returned to the hospital at about 0300 on [7 December].

Opinion: In the post-operative period the management of fluid balance and resuscitation generally is done by the anaesthetist with the surgeon managing any surgical aspects. There should always be good communication between the two on all aspects of care. There appears to have been a long period of time during which there was a lot of resuscitative work being done by [Dr D] but no communication between the two specialists. Perhaps this was because [Dr D] was attempting to adhere to the original idea of conservative management, given his and [Dr C's] previous experience of the cessation of bleeding in this period. Discussion at about midnight again resulted in a conservative approach as at that time BP and Hb were adequate. It may be that, as [Dr C and Dr D] had often experienced large volume blood loss with this operation in the past, without significant sequelae, there was no sense that this post-operative course was different. Although this is understandable in my opinion it would have been wise for [Dr C] to reassess [Mr A] himself at or before midnight before reaching his conservative decision. It is obvious [Dr D] was worried given his earlier calls to [the public hospital] but I cannot state from the information I have how much the degree of this concern was communicated to [Dr C]. I am not aware of the possibility of a return to theatre out of hours at [the private hospital] or whether this was discussed by [Dr C and Dr D], but it may have made a decision to re-explore [Mr A's] wound easier were an operating theatre and staff readily available.

I would consider that [Dr C] did provide an appropriate standard of care in this situation, given the information on which he was acting and given his previous experience with this procedure.

3. *The relative responsibilities of [Dr C] and [Dr D] in providing post-operative care.*

   I have alluded to this in the section above but the final decisions must be made by the person in total charge of [Mr A's] care, i.e. [Dr C]. These decisions would of course be made after consultation with all associated personnel.

4. *How is the decision to transfer a post-operative patient to an intensive care facility made in these circumstances? Is this the responsibility of the surgeon or the anaesthetist?*

Again this has been discussed above. I'm sure if the anaesthetist felt that the best management for the patient were that he or she be transferred it would be very unlikely that the surgeon would disagree. It would be in the end a decision made after discussion between the two.

5. *Were the actions taken regarding transferring [Mr A] to [the public hospital] appropriate?*

   These actions appear to me to be entirely adequate. [Dr D] had been in contact with [the public hospital] and did a great deal to facilitate the transfer through to [the public hospital] operating theatre. My only concern with respect to this is that [Dr D] apparently called [the public hospital] soon after 0200 hrs on [7 December] to arrange transfer but transfer did not finally occur until 0340 hrs. There is no evidence to explain this in the information available to me.

6. *Would depleted coagulation factors affect the management of haemodynamic issues post-operatively?*

   In the presence of large volume blood loss and transfusion there is always a possibility of defects in the coagulation process. In [Mr A's] case the initial results from Medlab taken at 2330 hrs on [6 December] showed a Hb of 109 g/L, platelets of 89 x 10^9/L, APTT 35.2 sec, INR 1.3. In other words mildly anaemic with low platelets and minimal derangement of clotting. However it was very likely to change given ongoing instability and further transfusion and a later result at 0242 hrs on [7 December] showed Hb 61 g/L, platelets 53 x10^9/L. At 0346 hrs INR was 1.9, APTT 50.6 sec, fibrinogen 0.97 g/L. In other words by this time clotting factors were significantly deranged. At about this time [Dr D] had rung [the public hospital] and blood bank to arrange appropriate replacement.

   Opinion: The depletion of coagulation factors would have been an added factor in [Mr A's] continued bleeding and it could well have been helpful to have complemented the two units of plasma given earlier in the evening. Whether this was considered or discussed by [Dr D and/or Dr C] is not apparent to me in the information available. It did appear that the first evidence of considerable derangement was at 0242 hrs on [7 December] and therefore it may have not been thought to be necessary before then.

7. *Was [Dr C's] management of [Mr A] when he arrived at [the public hospital] appropriate?*

   Upon [Mr A's] arrival in the operating theatre at [the public hospital] [Dr C] was present and participated in [Mr A's] resuscitation prior to operating on him. He then undertook an emergency exploration of [Mr A's] wound, evacuating a large amount of clot and blood ([Dr D] noted about 2L in the suction soon after commencement). His initial assistance was from a nurse

acting as scrub nurse and assistant, then later another nurse joined them as an assistant. [Dr C] took down the join between bladder neck and urethra in order to gain a better view of the deep retropubic area. There was soon a great deal more bleeding which had resulted from a tear in the left iliac vein while [Dr C] was attempting to sling the left iliac artery. At that point [Dr C] applied pressure to the area and called the vascular surgeon, [Dr P], who arrived within about 40 minutes as far as is evident from the information to hand. [Dr P] ligated and divided the left iliac artery to gain access to the L iliac vein, then sutured the tear in the vein. During the time of surgery there was massive blood loss and replacement, causing episodes of low blood pressure that were not sustained and at the end of the procedure blood pressure was stable. This information is gleaned from the reports and anaesthetic record. I was unable to find an operation note in [the public hospital] records forwarded to me.

Opinion: [Dr C] was present on [Mr A's] arrival at [the public hospital] operating theatre and contributed to his resuscitation prior to operating on him. He then commenced the operation with limited assistance. The only evidence I have about his and others' thoughts on this is from the interviews undertaken in Paper 'A'. It would have been of considerable benefit to have a senior colleague to assist [Dr C], particularly given the time of day, the previous operation, the continuing blood loss and the need for resuscitation immediately prior to this operation. I cannot find evidence, in the information given to me, whether [Dr C] considered this or not but there is a statement from [Dr C] that the urology registrar was not available.

I would consider that [Dr C] did not provide an appropriate standard of care in this situation in that he did not seek experienced assistance from the onset, his departure from that standard being moderate."

Anaesthesic advice

The following expert advice was obtained from an independent anaesthetist, Dr David Chamley:

"Further to your letter of 18 April 2006, I agree to provide independent expert advice on the above case, in particular to provide independent expert advice about whether anaesthetist, [Dr D] provided an appropriate standard of care to [Mr A].

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

I am a registered medical practitioner, NZMC 10251. I am a specialist anaesthetist, and have practiced as such for 22 years in a major metropolitan teaching hospital. In addition to my clinical practice as an anaesthetist, I have been Head of the Department of Anaesthesia for 10 years, and Clinical Director of Surgical Services in that same hospital for the past 3 years. My practice is split between public (75%), and the private sector (25%). My practice involves exposure to major

haemorrhage, and I provide rostered specialist cover for a post surgical level 1 Intensive Care Unit in the public sector, in addition to post-operative care of my private patients.

This report is based on the information provided to me by HDC. My conclusions are the result of a review of relevant literature, and my own personal experience.

Instructions from the Commissioner

To provide independent expert advice about whether anaesthetist [Dr D] provided an appropriate standard of care to [Mr A].

Complaint

- *Whether the care provided to [Mr A] by anaesthetist [Dr D] on 6 and 7 December was appropriate.*

- *Whether [the private hospital] provided appropriate services to [Mr A] on 6 and 7 December.*

Information reviewed

- Letter of complaint from [the family] forwarded by [a Health and Disability Consumer Advocacy Service], dated 12 December 2005, marked with an 'A'. (Pages 1 to 24)
- Response to the Commissioner from [the Coroner], dated 24 February 2006, marked with a 'B'. (Pages 25 to 37)
- Response to the Commissioner from [Dr C], dated 24 February 2006, marked with a 'C'. (Pages 38 to 51)
- Response to the Commissioner from [Dr D], dated 6 March 2006, marked with a 'D'. (Pages 52 to 63)
- Response to the Commissioner from [the DHB], dated 7 March 2006, marked with marked with an 'E'. (Pages 64 to 77)
- Mr A's clinical records provided by [the DHB] on 7 March 2006, marked with an 'F'. (Pages 78 to 605)
- Response to the Commissioner from [the private hospital], dated 13 March 2006, marked with an 'F'. (Pages 606 to 890)

Synopsis of the Event

[Mr A], aged 61 years, was admitted to [the private hospital] on [6 December], under the care of urologist [Dr C], for radical prostatectomy for carcinoma of the prostate. There were two small cases on the list prior to [Mr A], who was third on the list.

[Mr A] was assessed by anaesthetist [Dr D] on the day of surgery, and a plan of epidural anaesthesia combined with general anaesthesia agreed.

[Mr A's] medical history included admission to [the public hospital] 3 years previously for investigation of chest pain, diagnosed as pericarditis. Of note, an echo performed at that time showed no significant abnormality, and he had had no further follow up arranged. He was able to work as a baggage handler at [a airport] with no problems with moderate exercise, but had some shortness of breath with severe exercise. He had no shortness of breath when lying flat, and had had no chest pain of the type experienced 3 years previously during the preceding 3 months. He was a smoker. He was taking Doxazosin, an alpha blocking drug for his prostatic symptoms, and not for hypertension. ECG on the day of admission showed Q waves and some T wave inversion in leads III and AVF, consistent with some cardiac ischaemia. His pre-operative haemoglobin was 143, with platelets of 235, and blood had been cross matched and was available. His baseline admission blood pressure was 156/82 with a pulse rate of 76. He weighed 75 kgs.

Anaesthesia consisted of an epidural, (T10/11, with a single pass of a 16G tuhoy needle, with no pain, paraesthesiae, blood or CSF being elicited) which was placed awake in theatre, followed by general anaesthesia. This consisted of induction with Propofol, Relaxation with Vecuronium, and analgesia of Fentanyl, Desflurane. Oxygen and Air were used, along with an epidural infusion of Bupivacaine and Fentanyl. No invasive arterial, or central venous pressure monitoring was planned, or used.

The operation commenced at 1600hrs. A significant amount of blood was lost during the procedure, in total the estimated loss was 7600mls, and frequent boluses of ephedrine and metaraminol were used to maintain blood pressure. Volume replacement was crystalloid (Plasmalyte) 5000mls, colloid 2000mls (1500 Gelofusin, 500 Haemohes) and Blood 10 units. The blood loss was said to be steady throughout the surgery, rather than precipitous at any point.

The surgery finished at around 1850hrs, and [Mr A] was transferred to the recovery unit. [Dr D] considered that he had not adequately replaced the blood volume lost at this point and he anticipated needing further volume, 2 units of Fresh Frozen Plasma being charted. [Mr A's] blood pressure was causing concern and four boluses of 50 mcg's of Metaraminol were given to maintain [Mr A's] blood pressure.

At 2020hrs [Mr A] was reviewed by [Dr C] together with [Dr D], and it was agreed that he would be managed conservatively with intravenous vasopressors and blood transfusions with the expectation that bleeding would subside. [Dr C] then left the hospital.

A Haemoglobin estimate by ISTAT at 2020 showed an Hb of 82, and [Dr D] ordered a further 2 units of blood. [Mr A's] blood pressure continued to be low,

and further 2 boluses of Metaraminol, and 2 boluses each of 15mg subcutaneous Ephedrine were used to maintain [Mr A's] blood pressure over the next hour (2025–2130 hrs).

At 2135 hrs the epidural rate was decreased to 6 mls per hour. [Mr A] continued to have a low blood pressure, and a further 5 boluses of Metaraminol were given by 2200 (now a total of 11 boluses Metaraminol, 2 of Ephedrine).

At 2200hrs [Dr D] was asked to review [Mr A], and he requested that an infusion of Metaraminol be started (concentration 20mgs in 50 mls total — to run overnight at between 4–6 mls /hr to keep the systolic above 90) — this was commenced at 2230. A nursing 'special' was arranged for the ward at around this time, this was an agency nurse with ICU experience.

At 2240 [Dr D] was again asked to review [Mr A], as his blood pressure had dropped to 60/43, pulse 100/min (his epidural block at this point covered dermatones T8–L4). A further bolus of Metaraminol was given at 2245, the infusion was increased to 8 mls/hr, and a colloid fluid, Gelofusion was started. The lowest blood pressure recorded so far was 58/37. Fluids given in recovery appear to have been 2 units of blood, 2 units of Fresh Frozen Plasma, and 500mls of gelofusin, plus some Plasmalyte.

A further ISTAT test at around 2300 showed a haemoglobin of 99, bloods were sent to the laboratory for formal testing, and for a coagulation screen. This showed a haemoglobin level of 104, platelets were low at 89, and a slightly raised INR at 1.4.

[Dr D] contacted [the public hospital] to discuss the availability of theatres and possibility of transfer of [Mr A] for ongoing intensive care. At some time between 2300 hrs and 2400hrs [Dr D] discussed [Mr A's] condition with [Dr C]. It was agreed that [Mr A] would continue to be managed at [the private hospital]. [Mr A] was transferred to a general ward at 2340hrs and assigned a 'special nurse' who had intensive care experience. His last blood pressure recording in recovery was 94/50. [Dr D] remained with him in the ward for the next 40 minutes, finally leaving the hospital at 0030hrs intending to return at 0200, however, he was recalled at 01.30 when [Mr A's] blood pressure was again causing concern (systolic 75). A further blood sample taken showed an Hb of 64, platelets of 40, and an INR of 1.9. Further fluids were given, the epidural infusion rate reduced. [Dr D] rang [Dr C], requesting he return to the hospital to review Mr A. At about this time [Mr A] complained of chest pain. He was given Nitroglycerin sublingual spray with effect. His blood pressure was low, with the automated monitor showing readings of 60/40, and 50/40. An ECG was performed which shows signs of acute myocardial ischaemia. (Not enough oxygen was getting to the heart.) [Dr D] again called [the public hospital] about theatre availability and possible transfer. [Dr C], on arriving and reviewing [Mr A] agreed to his transfer to [the public hospital]

In the ward he appears to have received 2000mls Gelofusin, 1000 mls haemohes and 1 unit of blood with an infusion of Metaraminol running at 8mls/hr.

The transfer took place at 0340hrs and [Mr A] was transferred to the operating theatre. [Dr D] intended to transfer the care of [Mr A] to [the public hospital] anaesthetic registrar, but she was involved in the care of another patient at that time. On arrival at theatre [Mr A] lost consciousness and arrested. He was intubated and resuscitated by [Dr D]. The anaesthetic registrar arrived and assisted in establishing arterial and venous lines. [Dr D] did not hand over care to the registrar, nor did he request the on-call specialist come in to take over [Mr A's] care, but rather stayed and gave the anaesthetic himself with the registrar's assistance. A scrub nurse assisted [Dr C] to reopen. A large quantity of blood was found in the retropubic space which appeared to be originating from the left side of the pelvis. In the process of exploration, the left internal iliac vein was torn, and there was extensive bleeding, with an associated precipitous drop in blood pressure. There were periods of profound hypotension, with systolic pressures below 40mmHg, with severe ST depression and bradycardia (all signs of inadequate oxygen supply to the heart). Adrenalin boluses, followed by infusions of both Adrenalin, and NorAdrenalin, with boluses of Calcium Chloride were required to maintain function. (This indicates that extreme measures were required to resuscitate [Mr A].)

Compression was applied and a vascular surgeon was called. The vascular surgeon controlled the bleeding; however, [Mr A] lost 18 litres of blood during the procedure. The detailed automated record from the monitor is not available, only a hand made record, which [Dr D] noted 'does not completely reflect the instability we encountered'.

[Mr A] was transferred to Intensive Care. The family were initially given a potentially positive outcome; however there was irrevocable brain damage. The investigative process took 4-5 days, and [Mr A died a short time later].

Comment

The care provided by [Dr D] was in general of a very high standard, and I can only admire the diligence with which he provided close and intense personal supervision of [Mr A's] care in recovery, in the ward at [the private hospital], and in theatre at [the public hospital]. It would have been reasonable and appropriate for [Dr D] to have handed over [Mr A's] care to the specialist anaesthetist on call for [the public hospital] after transferring, then resuscitating him from his cardiac arrest: that he did not do so indicates his dedication.

There are areas where the care provided by [Dr D] and [Dr C] could have been improved, indeed, in a perfect world they would have been. This does not mean that the care provided was not of an appropriate standard, but merely that we are human, and are not perfect. Similarly the fact that there was an extremely

unfortunate outcome does not indicate that the level of care provided was substandard.

Assessment and anaesthetic plan
[Dr D's] assessment of [Mr A's] health pre-operatively was in line with accepted practice and published recommendations.[1] That this did not detect his severe underlying cardiac simply illustrates the lack of symptoms of heart disease that [Mr A] experienced, and the difficulty of detecting this without extensive, and generally unproductive investigations, which in themselves are not innocuous.

The planned anaesthetic, a combined epidural and general anaesthetic was appropriate, and current literature suggests that this combination offers advantages such as reduced blood loss, reduced complications and reduced overall stay in hospital.[2,3,4]

Invasive Monitoring
[Dr D] did not establish or use invasive cardiovascular monitoring, i.e. he did not establish an arterial pressure, or a central venous pressure monitoring line. The 'typical blood loss' expected by Dr D, from his prior experience with [Dr C] was in the order of 1500–5000 mls, with blood losses of 4000–5000 mls being 'not uncommon'. [Mr A] weighed 75kgs, which implies a blood volume of approximately 4250mls, so a blood loss in the vicinity of 1 entire blood volume was a reasonable expectation.

It should be noted that the factors which affect blood loss in this operation are mainly the experience of the surgeon, with reviews suggesting that surgeons who conduct more than 15 RRP's [radical prostatectomies] per annum tend to have a lower blood loss, the size of the prostate gland, with sizes in excess of 50 grams being associated with a higher blood loss, and the type of anaesthesia, with regional anaesthesia being associated with a lower blood loss, although there are suggestions that the combination of both epidural and general anaesthesia eliminates this.[5,6] Surgical expertise, and the size of the prostate are the two most important factors.[4,6]

This level of blood loss in previous radical retropubic prostatectomies done by [Dr C and Dr D] is consistent with that seen in the literature, although it is very clearly at the high end of the spectrum[7,8] (blood loss is reported as ranging from the negligible (200mls or so) to 7700mls). It does not appear that [Dr C] advised [Dr D] preoperatively that [Mr A] had a reasonably large prostate, and that in consequence more extensive blood loss could be anticipated than their usual.[6] This is consistent with common practice, and although communication could, and perhaps should, be better, it is not below the common standard.

The question is, should [Dr D] have inserted invasive monitoring in a case with this sort of anticipated blood loss?

There is no clear answer, some anaesthetists would use invasive monitoring when anticipating this sort of blood loss, some would not. In some institutions it is standard practice to insert such monitoring in view of the potential for a high blood loss, however there is no such standardised approach to practice in the private sector in New Zealand, nor as far as I am aware is this standard practice in any major hospital, with this decision being left to the individual anaesthetist. Insertion of central venous monitoring is not an innocuous procedure. There is a significant incidence of complication associated with the use of invasive monitoring, in particular with the use of central lines, with the incidence of mechanical complications, eg haemorrhage and pneumothorax being in the order of 5–19%, and infection 5–26, and thrombosis in 2–26% of cases.[9]

Not to insert invasive monitoring at the start of the anaesthetic was, in my opinion, reasonable, and was an acceptable standard of care.

During the case [Mr A] lost a substantial amount of blood, estimated at 7600mls, or somewhat more than one and a half times his blood volume. (The literature suggests that surgeon and anaesthetist both tend to underestimate blood loss,[10] furthermore this loss was based on the measured fluid loss, swabs were not weighed, they could be expected to contain a considerable volume of blood.) This is a significant transfusion, and with ongoing blood loss anticipated it would have been appropriate for [Dr D] to have inserted a central venous line to monitor central pressure, as an indicator of the adequacy of the circulating volume. This could have been inserted during the latter part of the operation when it became apparent that the blood loss was greater than anticipated, or in the recovery unit when it became clear that [Mr A] was haemodynamically unstable, and was requiring boluses of vasopressors to maintain his blood pressure. By 2020hrs when both [Dr C and Dr D] reviewed him, it was not possible to be certain whether his low blood pressure was due to the effects of the epidural, or to ongoing concealed blood loss, or a combination of both. [Mr A's] haemoglobin was only 82 by ISAT, suggesting that bleeding was likely to be at least partially responsible for his low blood pressure. It would have been appropriate at this time to have inserted a central venous line, had it not been done earlier. I emphasise that there is no 'standard' as such for the use of central pressure monitoring. It is clear that [Dr D] was sufficiently concerned that he felt unable to go home, although his home is very close (2 km) to the hospital, and he remained in the hospital during [Mr A's] entire stay in recovery, and for the early part of his stay in the ward.

It is my opinion that invasive monitoring should have been established by this time, and I believe that most anaesthetists would be mildly, or moderately critical of [Dr D] for not doing so, particularly in view of the further drop in blood pressure noted at 2130, and his increasing requirement for vasopressors.

Unfortunately the recovery record is spread over 4 pages (the first one of which is missing from the records available to me), and this does not clearly show the general trend of his blood pressure. [Mr A's] admission blood pressure was 156/82.

The three records available show persistent hypotension. The second page shows only 3 recordings between 1955hrs and 2100hrs where the blood pressure exceeded 100 systolic, and these correlate with the administration of boluses of metaraminol — not all of these boluses appear to have resulted in a BP greater than 100 systolic. Continuing on to the third page the general trend of blood pressure is downwards until 2140, where for 10 minutes the systolic exceeds 100 — this is following the administration of boluses of subcutaneous ephedrine and 2 boluses of iv metaraminol. The blood pressure then trends down again despite further boluses of Metaraminol, and an infusion was started at 2230, with a temporary increase in blood pressure. The nursing notes for this time record multiple episodes of very low blood pressures, with systolic pressures in the vicinity of 60.

The epidural pain record clearly shows, on one piece of paper, the course of blood pressure and pulse on the ward, with an abbreviated set of recordings from recovery. This shows persistent low blood pressure, and slowly increasing heart rate, with the exception of the 30 minutes from 0030hrs to 0100hrs. This is the only period, other than a single recording at 0300hrs, when the blood pressure met the charted minimum required systolic BP of 80. Over the course of this record the heart rate slowly climbs from about 85 to 105.

During his time in recovery he received a total of 4730mls of fluid, and his output was: urine 390mls, and blood loss via the drain was some 400–700mls — not all the original records are available to me to confirm this.

Use of Vasopressors

The use of Metaraminol, and ephedrine to maintain blood pressure is a standard technique, both to counteract the sympathectomy induced by epidural block, and as a temporising measure in hypovolaemia while replacing fluids. It is commonly used in the intraoperative setting, in the form used by [Dr D]. The use of infusions of, or boluses of Metaraminol, or other vasopressors in recovery is again a relatively common technique.

In this case, boluses were required frequently in recovery, and then an infusion was established. This is reasonable and prudent in view of the requirement to maintain blood pressure. It is however common when a constant infusion is required to constantly monitor blood pressure with intra-arterial monitoring. There are no set standards as such which say that this should be done, it is left to the discretion of the individual anaesthetist, as circumstances differ. For example, infusions of phenylephrine (another vasopressor, which has largely replaced Metaraminol) have been recommended for use to counteract the hypotension caused by regional anaesthesia in caesarean section, and in that scenario, where the hypotension has a clearly defined cause, and time course, monitoring of blood pressure with non-invasive techniques is eminently reasonable. In [Mr A's] situation however the cause of the low blood pressure was not clear, nor was it possible to predict a time course. It was clear that ongoing bleeding was a significant contributory cause, and

I believe that most anaesthetists would be moderately critical of not establishing invasive arterial pressure monitoring.

During his time in recovery, and on the ward, he was significantly hypotensive, despite vasopressors and fluids. The inability to meet this target which he himself had set, should have resulted in more action from [Dr D].

[The private hospital] operating guidelines do not make any reference to the use of vasopressor infusions in the ward. This probably is an indication that they are not normally used on the ward. I do not know what [the public hospital's] guidelines are, but strongly suspect that they would require that patients having infusions of vasopressors should not be cared for in the general wards, but only in specialist units such as the Intensive Care, or Coronary Care units.

At 2020hrs [Mr A] was reviewed by both [Dr D and Dr C], and a decision was made to continue conservative management, which at this time appears very reasonable. At this point [Dr C] left the hospital, and was not contacted until sometime between 2300 and 2400 — the notes available to me give several differing times.

At this discussion the only information available to [Dr C] was that conveyed by [Dr D]. [Dr D] states that he 'communicated clinical information including blood pressure and pulse, urine output and wound drainage, cerebral state and the results of tests including Haemoglobin'. [Dr D] further states that he considered the cause of [Mr A's] hypotension was hypovolaemia, and that he clearly stated this to [Dr C], both at 2330 and at 0300. [Dr C] did not see [Mr A] again until somewhat after 0300hrs.

[Dr D] was clearly seriously concerned by [Mr A's] condition, in that he had gone as far as contacting [the public hospital] to find out about theatre availability. It is not clear at what time this occurred.

It seems that during his first telephone conversation with [Dr C] he either did not communicate the extent of his concern to [Dr C] adequately, or that he was re-assured by [Dr C's] suggestion that the bleeding would ultimately stop.

The decision to transfer [Mr A] to the ward with an infusion of vasopressor was not appropriate. The appropriate course of action would have been to transfer him to [the public hospital's] Intensive Care Unit.

I fully support [Dr D's] comment that his constant presence, plus a special nurse with Intensive care experience was at least as effective as the care he would have received in the urology ward at [the public hospital].

I do not however agree that this would have been as effective as the care [Mr A] would have received at [the public hospital intensive care], primarily as in the ICU

he would almost certainly have had invasive monitoring placed, and he would probably have had more frequent sampling of blood tests. The potential of these two interventions was to detect the significant hypovolaemia that [Mr A] suffered somewhat earlier than was the case in the ward at [the private hospital]. This may have avoided his initial cardiac arrest, but would probably not have changed the ultimate decisions to re-operate, nor the catastrophic blood loss which occurred during the second operation.

The decision to maintain conservative treatment

This is primarily a surgical issue. It is however a very difficult one. The incidence of identifiable bleeding points, as opposed to generalised ooze at re-operation is very low.[10] In enquiring of theatre availability at [the public hospital] [Dr D] clearly considered that re-exploration was a strong possibility. Exactly when this phone call was made is not clear, [Dr D] states that it was around 0200hrs, and was before he contacted [Dr C] the second time, and before [Mr A] developed angina.

Specific questions asked:

1. Please comment generally on the care provided to [Mr A] by [Dr D]. If not answered above, please provide the following advice, giving reasons for your view:

   i. Were [Dr D's] actions between 6.50pm and 12.30am, in relation to [Mr A's] post-operative hypotension, reasonable? If not, what else should he have done?

   [Dr D's] actions such as they were, were reasonable. However, in view of the ongoing low blood pressure, the increasing requirement for vasopressor to maintain blood pressure, and the evidence of ongoing bleeding, he should have established invasive monitoring. This could either have been done at [the private hospital], or by transferring [Mr A] to [the public hospital's] Intensive Care Unit, where invasive monitoring would almost certainly have been established.

   Invasive monitoring would have provided a better guide to the adequacy of fluid replacement. Transfer to [the public hospital] ICU would probably have also resulted in more frequent blood tests, which in combination with the venous pressure would have given a better indication of ongoing blood loss.

   ii. Was [Dr D's] treatment plan in relation to the continuing use of the vasopressor, Aramine, appropriate and did it comply with standard practice? If not, how should this have been managed?

[Dr D's] use of the vasopressors Aramine (Metaraminol) and Ephedrine was appropriate, although it could have been more aggressive in meeting the target blood pressure he had set.

More relevant is the question of where should this have been carried out?

There are no set standards for the use of vasopressors, however, it is my opinion that in the face of an ongoing, and increasing requirement for vasopressor, most anaesthetists would wish to have invasive monitoring of blood pressure (an arterial pressure monitoring line).

The decision to transfer [Mr A] to the ward was inappropriate. If he required continuous Metaraminol (and there is no doubt that he did), then he also required continuous monitoring of his blood pressure to establish the effectiveness of the drug. Equipment to do this was available in the recovery area. He should have been transferred to a location where invasive arterial monitoring was possible, and in effect this would have meant [the public hospital] Intensive Care Unit. [The private hospital's] operating guidelines manual makes it clear that such 'technically advanced monitoring' is an ICU function, and [the private hospital] does not provide this facility.

iii. Should [Dr D] have considered invasive monitoring when [Mr A's] condition continued to cause concern?

According to [Dr D's] letter he did consider this. Not only should this have been considered, it should have been established.

iv. Was there any basis for [Dr D] to consider that [Mr A's] condition was settling at about 12.30pm? If not, what was happening at this time?

Yes, there was a reasonable basis for [Dr D] to believe that [Mr A's] condition was settling around midnight. His urine output had been 390 mls over the previous 4 hours, which is about 1.3 mls/kg/hr, which is a reasonable volume. His blood pressure, although low had been maintained by the infusion of Metaraminol, and the infusion rate had been able to be reduced from 8 to 5 mls/hr, and his heart rate had dropped (2300–2330) from 100 to 85 beats/minute. No additional boluses of Metaraminol had been required. These all suggest that the combination of fluids and vasopressor was maintaining circulating volume, and possibly improving it.
[Mr A's] haemoglobin was 82 by ISTAT at 2020hrs, since then he had received 2 units of blood, which could be expected to raise his haemoglobin level by about 20 assuming there was no further major loss, and his ISTAT Hb at 2300hrs was 99, suggesting that his condition was stabilising.

v. Did [Dr D] consult appropriately with [Dr C] about [Mr A's] condition? If not, what else should he have done?

[Dr D] consulted appropriately, but did not effectively convey the level of concern which he appeared to display by his action.

vi. Please comment on the relative responsibilities of [Dr D and Dr C] in providing post-operative care.

Postoperative care is a shared responsibility, however in different areas of care the relative responsibilities of [Dr D and Dr C] differ. [Dr D] was primarily responsible for medical aspects of [Mr A's] care — in particular cardiovascular and fluid management — ie. his blood pressure and heart, and for his pain management, whereas [Dr C] was primarily responsible for surgical aspects, such as his bleeding, and management of catheters, drains, infection control and wounds. There are areas such as blood loss, leading to hypotension, where the two are inextricably linked, and surgeon and anaesthetist must communicate and work together.

vii. Should [Dr D] have arranged for [Mr A] to be transferred to [the public hospital] earlier? Was it his responsibility to arrange this transfer?

[Mr A] should have been transferred to [the public hospital] earlier.

Ideally he should have been transferred from [the private hospital recovery room] to [the public hospital] Intensive Care Unit.

[Mr A's] cardiovascular management was primarily the responsibility of [Dr D], and he was primarily responsible for the decision as to where [Mr A] was cared for on leaving Recovery — the ward or at [the public hospital].

Had he considered it essential to transfer [Mr A], then he would have been responsible for initiating the transfer, but not for organising the details of this, which would have been done as in [the public hospital] guidelines

viii. Was [Dr D's] management of [Mr A] at [the [public hospital] appropriate? *Yes.*

2. If, in answering any of the above questions, you believe that [Dr D] did not provide an appropriate standard of care, please indicate the severity of his departure from that standard.

The failure to establish invasive monitoring in the presence of transfusion of at least one and a half blood volumes by the end of the operation, and a

greater volume in recovery, of ongoing hypotension, of an increasing requirement for vasopressors, and of ongoing bleeding was not an appropriate standard of care, and I believe that the majority of anaesthetists would be mildly to moderately critical of this.

Similarly the decision to transfer [Mr A] to the ward while on an infusion of vasopressor, where there was no facility for invasive monitoring was not appropriate, and in my opinion, most anaesthetists would be mildly to moderately critical of such a decision.

3. Are there any aspects of the care provided by [Dr D] that you consider warrant additional comment?

In view of the questions asked by the family, it is worth adding the following comment. I consider that it is worth adding the comment that although there could have been some improvements in [Mr A's] care, particularly in the areas of communication, of earlier transfer to [the public hospital], and earlier use of invasive monitoring, it is unlikely that any of these would have changed the ultimate outcome. The ongoing hypotension in recovery and the ward at [the private hospital] may have contributed to a degree of cardiac ischaemia, and to his arrest on arrival at [the public hospital] theatre, however his death was not due to a cardiac injury, but was due to brain injury. Although there are no formal recordings of his mental function, there is no suggestion in the record that his mental functioning was in any way impaired before his transfer to [the public hospital]. It is most probable that the injury which led to his irreversible brain injury occurred in association with the major blood loss during his second operation.

I would further add that although there are areas where I consider [Dr D] erred in decisions he made, the degree of commitment and care he displayed in his attendance on [Mr A] over the night was exemplary.

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Additional anaesthetic advice

Dr Chamley was asked to advise whether Mr A should have been seen at a pre-anaesthetic assessment clinic. Dr Chamley advised that there is enormous potential benefit in patients being seen beforehand at an anaesthetic clinic, particularly patients with co-morbidities. Mr A's problem was the bleed. The anaesthetist is dependent on the information provided pre-operatively. Dr D was not aware, until the surgery, that Mr A had a larger than normal prostate. The anaesthetist often does not have access to the surgeon's records and, even if they do, the records may be in the surgeon's own shorthand, if recorded at all.

Code of Health and Disability Services Consumers' Rights

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

RIGHT 4
Right to Services of an Appropriate Standard

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

…

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

Other relevant standards

The Medical Council of New Zealand's publication *Good medical practice: A guide for doctors* (2004) states:

"1. Patients are entitled to good standards of medical care. The domains of competence that follow are medical care, communication, collaboration, management, scholarship and professionalism.

Medical care

Good clinical care

2. Good clinical care must include:

- an adequate assessment of the patient's condition, based on the history and clinical signs and, an appropriate examination
- providing or arranging investigations or treatment when necessary
- taking suitable and prompt action when necessary …"

Opinion

Breach — Dr C

Right 4(1) of the Code of Health and Disability Services Consumers' Rights (the Code) states that every consumer has the right to have services provided with reasonable care and skill. Right 4(5) states that every consumer has the right to co-operation between providers to ensure quality and continuity of services.

The Medical Council of New Zealand specifies that patients are entitled to good standards of medical care. The doctor must make an adequate assessment of the patient's condition, based on the history and clinical signs, and an appropriate examination. A doctor must also take suitable and prompt action when necessary.

Mr A was referred to urologist Dr C by his general practitioner on 20 July 2000 for assessment and treatment of an abnormal prostate. Dr C monitored Mr A over the following years until Mr A's blood tests in August indicated that ultrasound and biopsy investigations were required. These tests were performed on 15 October and, as a result, Dr C advised Mr A that a radical prostatectomy was required.

Dr C told Mr A about the risks of radical prostatectomy and the likely complication, given the large size of his prostate, that he might need a blood transfusion. Mr A agreed to undergo surgery. The surgery was scheduled to take place at the private hospital on 6 December.

Prostatectomy
Dr C chose to undertake a nerve-sparing radical prostatectomy in order to try to preserve Mr A's erectile potency. My independent urology expert, Dr Patrick Bary, advised that it is generally accepted that a nerve-sparing procedure will be associated with increased blood loss because of the close proximity of the nerves to the prostate and blood vessels. However, Mr A's blood loss was very high.

The theatre nurses assisting with Mr A's operation noted that Mr A's excessive blood loss was apparent from the outset of the surgery. The scrub nurses reported to Dr C that they were having difficulty keeping up with suctioning the blood. The anaesthetist, Dr D, advised Dr C that Mr A's blood loss was greater than expected. The blood loss was steady rather than precipitous at any point. Mr A lost five to six litres of blood during the operation. Dr C had not informed Dr D, prior to the operation, that Mr A had an enlarged prostate.

Prior to the operation, Dr C had conducted a self-audit and found that over approximately one year he had had a higher transfusion rate (during his radical prostatectomy operations) than would be considered normal. He had discussed the situation with an experienced colleague and watched a DVD on this procedure before operating on Mr A. Dr C "to a certain extent" considered his transfusion rate was less

important than the functional outcomes of the surgery, which were "good". Dr C stated that although he experienced no specific difficulties with Mr A's surgery on 6 December, it was made more difficult because of the size of the prostate. He was satisfied at the end of the operation that the blood loss was under control.

Dr Bary advised that the removal of Mr A's prostate and the joining of the bladder neck to the urethra was achieved satisfactorily and Mr A was in a stable state when he arrived in the post-anaesthetic care unit (PACU). However, he stated:

> "The blood loss in this operation was very high. … Both [Dr C and Dr D] have stated that the blood loss for radical prostatectomy, in their experience, is between 1500 and 5,000ml. The loss in this operation was considerably higher. …
>
> I would consider that [Dr C] did not provide an appropriate standard of care in this situation, given that blood loss during radical prostatectomy when done by [Dr C] is generally higher than would be expected, and that the volume of blood loss during [Mr A's] operation was considerably higher than [Dr C's] average."

Dr Bary regarded this as a mild departure from an appropriate standard of care.

I accept Dr Bary's advice that it is generally accepted that a nerve-sparing prostatectomy is associated with increased blood loss, but that the loss in this operation was considerably greater than would normally be expected. I also note that Dr C had not alerted Dr D, prior to the operation, to the fact that Mr A had an enlarged prostate — which made the surgery more difficult and increased the risk of blood loss. In my opinion, Dr C did not provide Mr A with an appropriate standard of surgical care, and did not consult appropriately with his anaesthetist. In these circumstances Dr C breached Rights 4(1) and 4(5) of the Code.

Postoperative management

Mr A arrived in PACU at 6.54pm on 6 December. His blood pressure and pulse were initially satisfactory. At 8.20pm Dr D and Dr C discussed Mr A's postoperative management and decided to treat him conservatively. It appears that Dr C left the hospital after this discussion. At 11.30pm Mr A's blood pressure dropped and blood tests showed that his haemoglobin and platelet levels were abnormal.

During the postoperative period, the management of fluid balance and resuscitation is the responsibility of the anaesthetist. However, there should be good communication between the surgeon and the anaesthetist. Dr Bary commented that there appeared to be a long period of time when Dr D was undertaking a lot of resuscitative work on Mr A and there was no communication between him and Dr C.

Mr A was transferred to the surgical ward into the care of a "special" nurse at 11.50pm. At about midnight Dr C and Dr D spoke again about Mr A's management. Mr A's blood pressure and haemoglobin were adequate at this time and they agreed to continue the conservative approach. It appears that Dr C had previously experienced

large volume blood loss with this type of operation without significant consequence and this may have reassured him that Mr A would be no different. Dr Bary advised that it would have been wise for Dr C to have reassessed Mr A at midnight before deciding to continue with conservative management.

At 3.46am on 7 December, blood tests taken by Dr D indicated that Mr A's clotting factors were significantly deranged. Dr Bary advised that the depletion of Mr A's coagulation factors would have been a factor in his continued bleeding; it may have been helpful if he had been given additional plasma at this time. However, there is no evidence that Dr C was informed about this situation. Dr Bary considered that in light of Dr C's past experience and the information he was given during the postoperative period, he provided Mr A with an appropriate standard of care.

The public hospital
At 3am Dr D contacted Dr C because Mr A's blood pressure had dropped and he was experiencing chest pain. Dr C arrived at the private hospital and agreed with Dr D that re-exploration of Mr A's operation site was indicated. Dr D telephoned the public hospital to alert the anaesthetic and theatre staff of the imminent transfer of Mr A.

The urology registrar was not available to assist Dr C with Mr A's surgery because of disrupted travel arrangements. The consultant urologist was on leave, and although the alternative would have been for Dr C to request assistance from a general surgeon or a vascular surgeon, this was not done.

Mr A arrived at the public hospital at 4.15am and was transferred directly to theatre. Mr A was alert and communicating on arrival at the theatre suite but while he was being transferred to the operating table he suddenly deteriorated. Dr D intubated Mr A with the assistance of the theatre staff. Dr C assisted with cardiac massage until Mr A's condition was stable enough for the surgery to proceed.

Dr C began the emergency exploration of Mr A's wound and evacuated a large amount of clot and blood from the wound. When Dr C took down the join between the bladder neck and the urethra (to obtain a better view of the deep retropubic area) and attempted to "sling" the left iliac artery, he tore the left iliac vein. This resulted in further massive blood loss. I note that the theatre co-ordinator asked Dr C three times if he required the assistance of a vascular surgeon before Dr C agreed and vascular surgeon Dr P was called. Dr P arrived within 40 minutes and sutured the tear in the iliac vein.

Dr Bary advised:

> "I would consider that [Dr C] did not provide an appropriate standard of care in this situation in that he did not seek experienced assistance from the onset, his departure from that standard being moderate."

I accept Dr Bary's advice regarding Dr C's management of Mr A's surgery at the public hospital. In my opinion, Dr C did not provide Mr A with an appropriate standard of surgical care when he re-operated on Mr A at the public hospital. Nor did he adequately ensure quality and continuity of care when he delayed seeking experienced assistance. In these circumstances, Dr C breached Rights 4(1) and 4(5) of the Code.

Breach — Dr D

Assessment and anaesthetic plan
Dr D did not see Mr A in a pre-anaesthetic assessment clinic. Dr D first saw Mr A on the surgical ward on 6 December to take his medical history and assess him before surgery. Dr D noted that Mr A had a history of chest pains but was reassured as he had been assessed by a cardiologist as not suffering ongoing heart disease. However, an ECG taken earlier that day showed some evidence of heart ischaemia. Dr D was not aware (having not been informed by Dr C) that Mr A had an enlarged prostate.

My independent expert anaesthetist, Dr David Chamley, advised that Dr D's assessment of Mr A's health preoperatively was in line with accepted practice, and his plan for combined epidural and general anaesthesia was appropriate. Current literature suggests that this combination reduces the likelihood of complications and blood loss and shortens the patient's overall stay in hospital.

Postoperative management
Mr A's surgery was complicated by considerably greater blood loss than is usual. Following the surgery, Mr A was transferred to PACU at 6.50pm. Mr A was initially stable but his hypotension progressed. Dr D set a parameter of 90mmHg systolic, below which Mr A's blood pressure should not fall, and charted a combination of drugs (vasopressors) to manage his blood pressure if it fell below this. At 8.20pm Dr D discussed his management plan with Dr C, and they agreed that Mr A should be treated conservatively with intravenous vasopressors and blood transfusions. They expected that the bleeding would subside. Dr D considered that the private hospital had the appropriate facilities, such as large bore intravenous access, rapid infusion fluid warmers and pressure infusion bags to manage Mr A's hypotension.

Dr Chamley noted that Dr D did not establish or use an arterial pressure or central venous pressure monitoring line (invasive cardiovascular monitoring) to monitor Mr A's condition postoperatively. There is no clear answer to whether Dr D should have inserted invasive monitoring. In some institutions it is standard practice. However, there is no standardised approach to practice in the private sector in New Zealand — this decision is left to the individual anaesthetist. Dr Chamley advised that there is a significant incidence of complications associated with the use of invasive monitoring, such as haemorrhage and pneumothorax (air in the chest cavity). It was reasonable

and acceptable for Dr D not to have inserted invasive monitoring at the start of Mr A's anaesthetic.

During the surgery, it is estimated that Mr A lost more than one and a half times his blood volume. This was a significant amount and, with further blood loss anticipated, at this point it would have been appropriate for Dr D to have inserted a central venous line to monitor Mr A's central pressure, to ensure there was adequate circulating blood volume.

Mr A needed boluses of vasopressors to maintain his blood pressure. Dr Chamley advised that Dr D's use of the vasopressors to maintain Mr A's blood pressure is a standard technique.

At 8.20pm when Dr D discussed his management plan with Dr C, he could not be sure whether Mr A's low blood pressure was caused by the effects of the epidural, concealed ongoing blood loss, or a combination of both. He noted that Mr A was significantly hypotensive during his time in PACU and the ward, and his haemoglobin at that time was very low. This suggested that continued bleeding was playing some part. Dr Chamley noted that Dr D had set parameters for Mr A's blood pressure. When Dr D was unable to meet the targets he had set for himself, he should have taken further action.

Dr Chamley stated:

> "It is my opinion that invasive monitoring should have been established by this time, and I believe that most anaesthetists would be mildly, or moderately critical of [Dr D] for not doing so, particularly in view of the further drop in blood pressure noted at [9.30pm], and his increasing requirement for vasopressors."

At 9.30pm there was a further drop in Mr A's blood pressure. PACU staff and Dr D closely monitored Mr A's pulse, blood pressure and urine output to determine his blood volume status. He was given further boluses of vasopressors and blood samples were sent to the laboratory for urgent analysis of his haemoglobin and coagulation status. Between 11pm and midnight Dr D called Dr C to discuss his concerns about Mr A. Dr Chamley advised that there was a reasonable basis for Dr D to believe that Mr A's condition was settling around midnight. It was agreed that Mr A could be managed at the private hospital with a "special" nurse in attendance.

Dr Chamley did not consider Dr D's decision to transfer Mr A to the ward with an infusion of vasopressor appropriate. Although Dr D's attendance and that of a nurse with specialist experience in intensive care would manage Mr A as effectively as in a urology ward at the public hospital, it was not as effective as the care Mr A would have received in the Intensive Care Unit (ICU) at the public hospital. Dr Chamley advised that if Mr A had been transferred to ICU he almost certainly would have had invasive monitoring through a central line, and more frequent blood sampling. These interventions would have detected Mr A's significant hypovolaemia earlier. Although

this would not have changed the decision to re-operate or the catastrophic blood loss that occurred during the second operation, it may have prevented Mr A's initial cardiac arrest.

Dr Chamley advised:

> "[Dr D's] failure to establish invasive monitoring in the presence of transfusion of at least one and a half blood volumes by the end of the operation, and a greater volume in recovery, of ongoing hypotension, of an increasing requirement for vasopressors, and of ongoing bleeding was not an appropriate standard of care, and I believe that the majority of anaesthetists would be mildly to moderately critical of this.
>
> Similarly the decision to transfer [Mr A] to the ward while on an infusion of vasopressor, where there was no facility for invasive monitoring was not appropriate, and in my opinion, most anaesthetists would be mildly to moderately critical of such a decision."

Postoperative care is a shared responsibility between the surgeon and the anaesthetist. Dr D was primarily responsible for Mr A's cardiovascular and fluid management, and Dr C for Mr A's bleeding and wounds. Adequate communication between the surgeon and anaesthetist is essential, particularly when the postoperative course deviates from the normal.

In response to the provisional opinion, Dr D advised that he "did clearly state" that he was concerned that Mr A was unstable in recovery and continuing to bleed. Dr C's response to Dr D's expression of concern was that tamponade tends to stop continued pelvic bleeding after prostatectomy, and that he believed Mr A's bleeding would settle.

Dr D stated, "I do not believe Dr C's non-attendance was because of a failure on my part to communicate my concerns. Dr C understood my concerns and discussed them with me. Dr C was reassured that the bleeding would tamponade and stop, and reassured me of the same." Dr Bary stated that Dr D and Dr C had previously experienced large blood loss with this type of operation and "there was no sense that this post-operative course was different".

Dr Chamley advised that "there was a reasonable basis for Dr D to believe that Mr A's condition was settling around midnight". However, Dr D concedes that his failure at 1.45am to communicate to Dr C that Mr A's condition was deteriorating "fell short of best practice". He said the focus of his attention was Mr A's chest pain and he regrets he did not ask a nurse to contact Dr C at that time.

I accept Dr Chamley's advice regarding Dr D's management of Mr A's postoperative care. In failing to establish invasive monitoring, and in transferring Mr A to the ward while on an infusion of vasopressor, Dr D did not provide Mr A with an appropriate

standard of anaesthesic care. In these circumstances, Dr D breached Right 4(1) of the Code.

I note that Dr Chamley commended Dr D for the "diligence with which he provided close and intense personal supervision in Mr A's care", and stated that the degree of commitment and care Dr D provided to Mr A was exemplary. It would have been reasonable for him to hand over Mr A's care to the public hospital specialist anaesthetist on transfer and again after resucitating Mr A. It indicates Dr D's dedication that he did not do so.

No Breach — The Private Hospital

The private hospital credentials surgeons and anaesthetists to provide patient treatment and care at the hospital. To be credentialled with the hospital, medical practitioners are required to provide evidence of an annual practising certificate and medical indemnity insurance. The hospital's Clinical Medical Committee and Quality Committee review the surgeon's audit data and eventful cases. The private hospital provides the physical facilities, equipment and support staff for day patient and inpatient elective surgery across a range of specialties. The admitting specialist has the primary responsibility for patient treatment and care.

From the time that Mr A was admitted on 6 December, the private hospital provided the physical facilities and support services required by Dr C and Dr D.

While Mr A was receiving hypotensive treatment in PACU and the ward, the nursing staff worked under the direct instruction of Dr D. The doses of the vasopressor Aramine were administered in accordance with Dr D's direction and the hospital's policy. When PACU closed, the hospital management arranged for an appropriately experienced agency nurse to special Mr A on the ward.

When Dr D and Dr C decided at 3am on 7 December that Mr A's condition warranted transfer to the public hospital, the transfer was conducted in accordance with the hospital's patient transfer policy. The special nurse accompanied Mr A and Dr D in the ambulance to the public hospital.

The private hospital has conducted an internal inquiry into the circumstances of Mr A's treatment, and has identified areas where systems and processes could be enhanced. Although these issues had no material impact on Mr A's care, the hospital's management was of the view that they provided learning opportunities and would enhance continuing quality improvement.

The private hospital management have met and corresponded with Mr A's family regarding their concerns about the treatment provided to Mr A. The hospital

management has maintained contact with Mr A's family to provide them with information about the investigation process.

In my opinion, the private hospital provided services of an appropriate standard to Mr A and did not breach the Code. Furthermore, I am satisfied that the private hospital took reasonable actions to prevent the relevant omissions in clinical care on the part of Dr C and Dr D (by its annual credentialling processes, including review of eventful cases and surgical audit data) and is therefore not vicariously liable for their breaches of the Code.

Actions taken

Dr C advised that as a result of these events he has:

- discontinued major surgery apart from "on-call" requirements, and changed his scope of practice both at the private hospital and the public hospital with the assistance of his colleagues;

- discontinued performing radical prostatectomies at the private hospital. Dr C has resumed perfomorming radical prostatectomies at the public hospital. He carefully audits all outcomes of his surgery;

- had his eyesight assessed by an ophthalmologist. The ophthalmologist's report stated that his eyesight was not impaired for urological surgery. However, Dr C purchased a further set of surgical loupes to ensure that his vision is adequate for deep pelvic surgery;

- sought the assistance of the District Health Board occupational health specialist because of the degree of distress he experienced at the outcome of Mr A's surgery.

Dr D advised:

> "I was, and remain, extremely distressed at the terrible outcome for [Mr A] and his family. For a period, I wanted to avoid anaesthetising patients for any major abdominal surgery, at either [the private hospital or the public hospital] and I spoke to the head and deputy heads of [the public hospital] Anaesthetic Department to adjust my daytime and on-call schedules accordingly. I have subsequently recommenced performing anaesthesia for major surgery at [the private hospital]. However, I have decided that I will not anaesthetise for any major abdominal surgery at [the private hospital] in the future and, on two occasions when approached to, I have suggested that the surgeon performs such procedures at a hospital with intensive care facilities."

Additionally, Dr D advised that he has taken a more aggressive approach in selecting and managing patients. He now more frequently involves surgeons and other specialists when unexpected postoperative events are encountered, and is more insistent on early transfer.

Actions taken

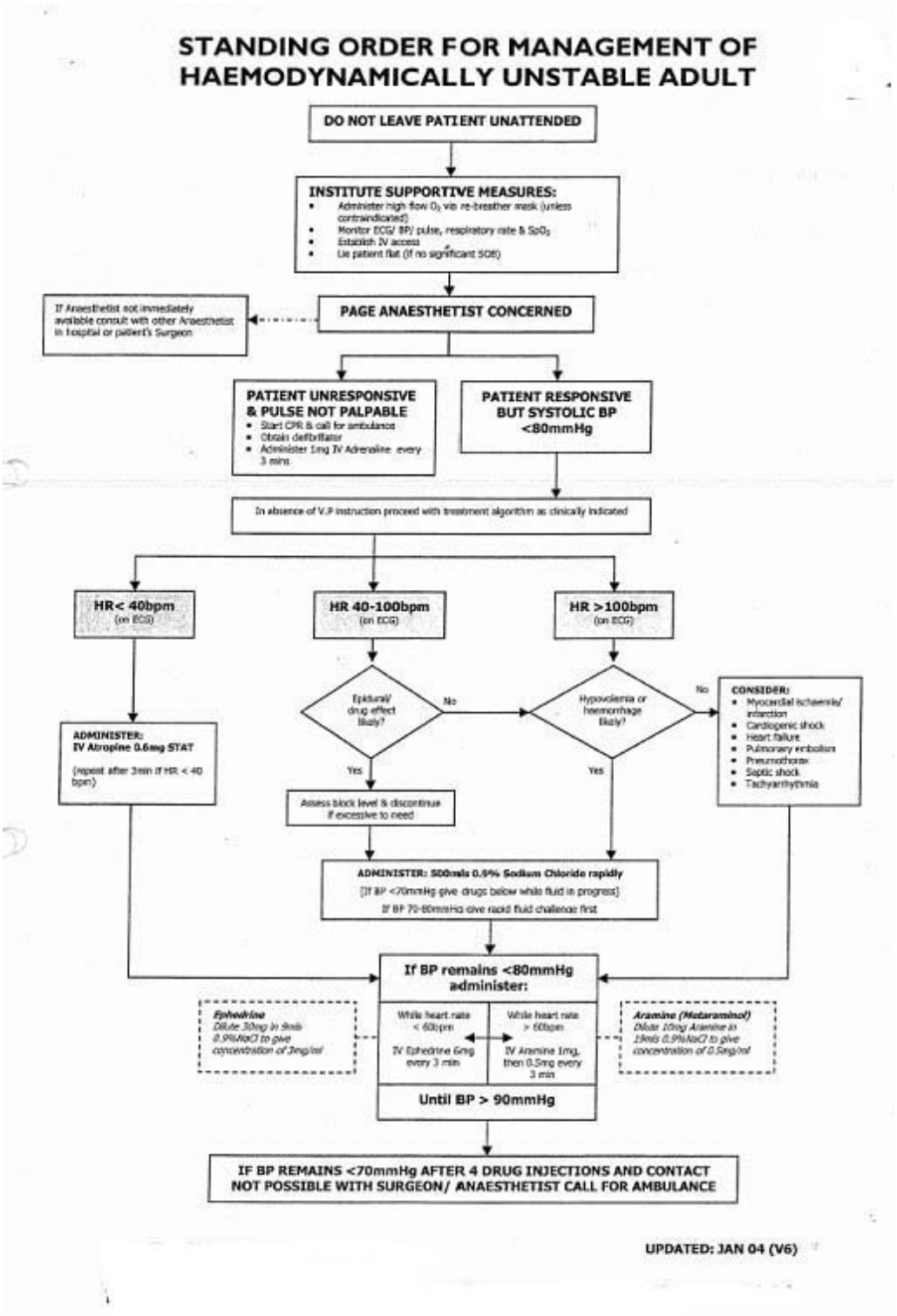
Dr C and Dr D have provided written apologies, which have been forwarded to the family.

Follow-up actions

- A copy of my final report will be sent to the Medical Council of New Zealand, the Ministry of Health, and the District Health Board.

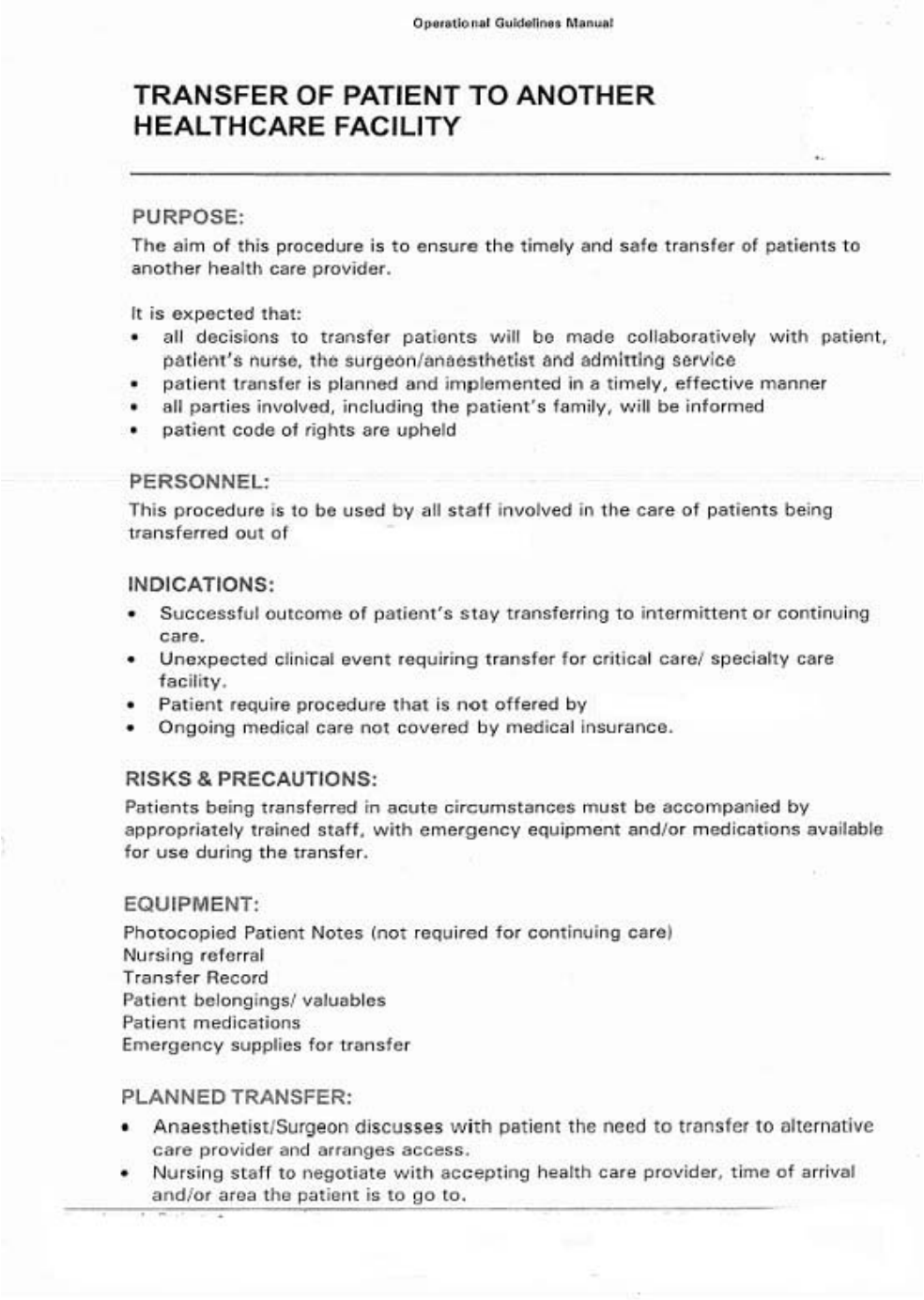
- A copy of my final report, with details identifying the parties removed, will be sent to the Royal Australasian College of Surgeons, the Australian and New Zealand College of Anaesthetists, the New Zealand Society of Anaesthetists, and the New Zealand Private Hospitals Association and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A



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

Appendix B



Operational Guidelines Manual

TRANSFER OF PATIENT TO ANOTHER HEALTHCARE FACILITY

PURPOSE:

The aim of this procedure is to ensure the timely and safe transfer of patients to another health care provider.

It is expected that:

- all decisions to transfer patients will be made collaboratively with patient, patient's nurse, the surgeon/anaesthetist and admitting service
- patient transfer is planned and implemented in a timely, effective manner
- all parties involved, including the patient's family, will be informed
- patient code of rights are upheld

PERSONNEL:

This procedure is to be used by all staff involved in the care of patients being transferred out of

INDICATIONS:

- Successful outcome of patient's stay transferring to intermittent or continuing care.
- Unexpected clinical event requiring transfer for critical care/ specialty care facility.
- Patient require procedure that is not offered by
- Ongoing medical care not covered by medical insurance.

RISKS & PRECAUTIONS:

Patients being transferred in acute circumstances must be accompanied by appropriately trained staff, with emergency equipment and/or medications available for use during the transfer.

EQUIPMENT:

Photocopied Patient Notes (not required for continuing care)
Nursing referral
Transfer Record
Patient belongings/ valuables
Patient medications
Emergency supplies for transfer

PLANNED TRANSFER:

- Anaesthetist/Surgeon discusses with patient the need to transfer to alternative care provider and arranges access.
- Nursing staff to negotiate with accepting health care provider, time of arrival and/or area the patient is to go to.

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

- Ensure patient family are aware of transfer and expected time of transfer.
- Patient's/ family's concerns are identified, documented and where possible addressed.
- Pack patient's belongings and return valuables (these may be given to the family).
- Complete all patient care documentation, including a nursing referral form and 'Patient Transfer Record'.
- Collate relevant notes and photocopy. Package photocopies and any X-rays for transfer with the patient to receiving health care provider.
- Arrange appropriate transport.
- A registered nurse may be required to accompany the patient if clinically indicated., and obtain a taxi chit for the return trip.
- On arriving give a verbal handover to receiving staff.
- Collect belongings e.g. pillows, gowns etc.
- Return to by taxi.

ACUTE TRANSFER:

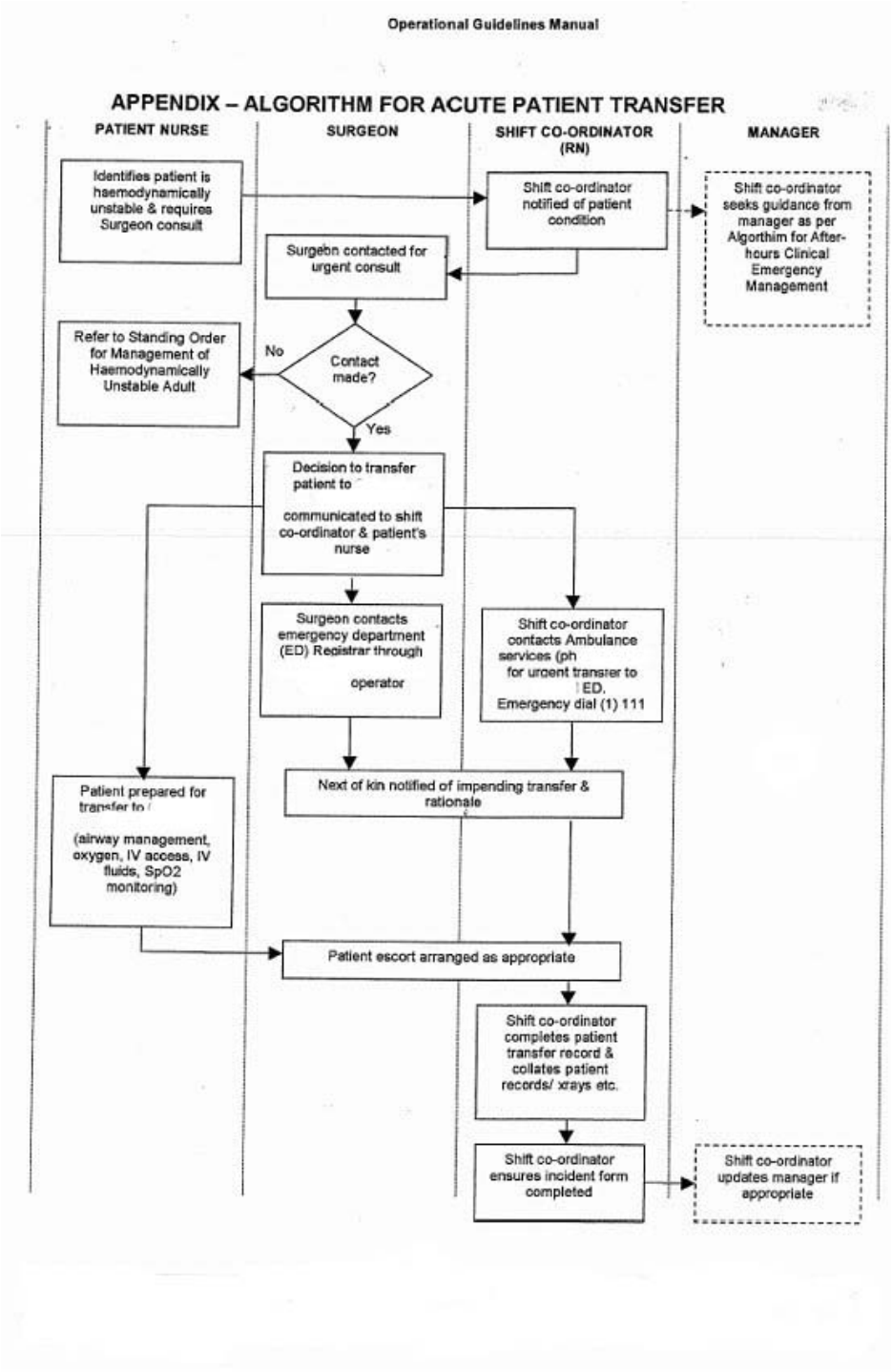
An acute transfer is one that may be required when it is decided that the patient's condition is too unstable to be managed in the Environment. This transfer may occur from the theatre, recovery or ward area.

The procedure is as above with the following additions or amendments:

- Shift Co-ordinator (RN) assumes delegated authority after-hours to co-ordinate patient transfer
- Communicate clearly to the ambulance the urgency of the transfer.
- It is essential that the relatives are made aware of the patient's condition. It may be more appropriate for the anaesthetist or surgeon to convey this information.
- Ensure appropriate emergency equipment and/or medications are available during transport
- Ensure the patient has an IV cannula insitu that is patent and secured firmly.
- If accompanying the patient, continue appropriate monitoring/therapy during the transfer e.g. SpO2 monitoring, IV fluids, airway management.
- Send patient notes via facsimile if unable to photocopy notes prior to transfer.
- Complete an incident report of the transfer and "Patient Transfer Record".

ASSOCIATED DOCUMENTS:

- Algorithm for Acute Patient Transfer (see attached appendix)
- Patient Transfer Record – Operational Guidelines Manual
- After-hours Clinical Emergency Management Algorithm – Operational Guidelines Manual
- Health & Disability Services Code of Consumer Rights 1996
- Health & Disability Sector Standards 2.5 & 4.8



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