CITATION: *Inquest into the death of Ricky Ryder* [2007] NTMC 084

TITLE OF COURT:	Coroner's Court
JURISDICTION:	Alice Springs
FILE NO(s):	A0025/2006
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HEARING DATE(s):	18-21 September 2007
FINDING OF:	Mr Greg Cavanagh SM
CATCHWORDS:	Reportable death at Alice Springs Hospital, medically adverse event, hospital resources, preventable death.

REPRESENTATION:

Counsel:

Assisting:	Dr Celia Kemp
Department of Health:	Mr Kelvin Currie
Dr Raoul Mayer:	Mr Roger Bennett

Judgment category classification:	B
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IN THE CORONERS COURT
AT DARWIN IN THE NORTHERN
TERRITORY OF AUSTRALIA

No. A0025/2006

In the matter of an Inquest into the death of

RICKY RYDER
ON 22 APRIL 2006
AT THE ALICE SPRINGS HOSPITAL

FINDINGS

(10 December 2007)

Mr Greg Cavanagh SM:

INTRODUCTION

1. Ricky Ryder ("the deceased") was an Aboriginal male born on 14 April 1978 in Alice Springs. He died at 4:08 pm on 22 April 2006 in the Operating Theatre at Alice Springs Hospital; he was allowed to bleed to death on the operating table.

2. Pursuant to section 34 of the Coroners Act, I am required to make the following findings:

> "(1) A corner investigating –
>
> (a) a death shall, if possible, find –
>
> i) the identity of the deceased person;
>
> (ii) the time and place of death;
>
> (iii) the cause of death;
>
> (iv) the particulars needed to register the death under the Births, Deaths and Marriages Registration Act;
>
> (v) any relevant circumstances concerning the death."

3. In addition to this, s 34(2) provides that I may comment on a matter including public health or safety connected with the death being investigated. Additionally, I may make recommendations pursuant to section 35(1), (2) & (3):

> "(1) A coroner may report to the Attorney-General on a death of disaster investigated by the coroner.
>
> (2) A coroner may make recommendations to the Attorney-General on a matter, including public health or safety or the administration of justice connected with a death or disaster investigated by the coroner.
>
> (3) A coroner shall report to the Commissioner of Police and Director of Public Prosecutions appointed under the Director of Public Prosecutions Act if the coroner believes that a crime may have been committed in connection with a death or disaster investigated by the coroner."

4. Counsel Assisting the Coroner was Dr Celia Kemp (the Deputy Coroner). Leave was granted to Mr Kelvin Currie to appear as Counsel for the Department of Health and Mr Roger Bennett to appear as Counsel for Dr Raoul Mayer.

5. Joan Johnson, the sister of the deceased's mother, and Robert Ryder, the deceased's father, attended much of the inquest and I would like to commend them for the respect they have shown to the process. They told me, through Dr Celia Kemp, that the deceased was someone who was happy and enjoyed life, and was particularly happy when he spent time with his family.

6. The death was investigated by Senior Constable Steven McGuire and I have before me a coronial brief in relation to the investigation complied by Senior Constable McGuire (Ex 3). I also have an additional six exhibits including the birth certificate of the deceased (Ex 1), the criminal decision in relation to the stabbing of the deceased (Ex 2), the medical records of the deceased (Ex 4), some statistics provided by Dr Jacob (Ex 5), a chart

prepared by Vicki Taylor, the General Manager of Alice Springs Hospital, detailing the recommendations made in response to this death and what had been done to implement them (Ex 6) and a medical officer orientation plan tendered by Vicki Taylor (Ex 7).

7. I heard oral evidence from Dr Jacob Koshy, Dr Manjula Devi, Dr Raoul Carsten Mayer, Dr Fred Boseto, Dr Jacob Oapillil Jacob, Dr Rod Mitchell, Mr Ian Bittner, Registered Nurse Alexia Jamieson, Professor Guy Maddern and Ms Vicky Taylor.

8. I thank Senior Constable McGuire for his careful work and the assistance he provided to Counsel Assisting, Dr Celia Kemp, in her trip to Alice Springs to prepare for the inquest. I also thank Vicki Taylor, Dr Meredith Arcus and the Alice Springs Hospital medical staff for their considerable efforts in assisting Dr Kemp with the preparation of this inquest. Senior Constable McGuire was unable to be present for the inquest. Instead I was ably assisted by Constable Theo Karaminidis, who I also thank, in particular for his substantial efforts to make sure the family of the deceased were aware of, and able to be present at the inquest.

FORMAL FINDINGS

9. Pursuant to section 34 of the *Act*, I find, as a result of evidence adduced at the Public Inquest as follows:

    (i) The identity of the deceased person is Ricky Ryder. He was born on 14 April 1978 in Alice Springs. The deceased lived at House 26, Charles Creek Camp, Alice Springs.

    (ii) The time and place of death was the Operating Theatre at Alice Springs Hospital at 4:08 pm on 22 April 2006.

    (iii) The cause of death was hypovolemia secondary to a haemorrhage resulting from the operative exploration of

multiple stab wounds to the thigh, that is the deceased bled to death on the operating table.

(iv) Particulars required to register the death:

(a) The deceased was male.

(b) The deceased's name was Ricky Ryder.

(c) The deceased was an Aboriginal Australian.

(d) The cause of death was reported to the Coroner.

(e) The cause of death was confirmed by post-mortem examination carried out by Dr Terry Sinton.

(f) The deceased's mother is Jennifer Johnson and his father is Robert Ryder.

(g) The deceased did not have an occupation at the time of death.

(h) The usual address of the deceased was House 28, Charles Creek Camp, Alice Springs.

CIRCUMSTANCES OF DEATH

Events leading up to the hospitalisation

10. The deceased was the victim of a stabbing that occurred in the evening of 21 April 2006. Benjamin John Hayes, Charles Hayes and Earl Harry Matthew Hayes pleaded guilty to aggravated unlawful entry and causing grievous harm in relation to their actions against the deceased. They were sentenced by Justice Thomas of the Supreme Court of the Northern Territory sitting at Alice Springs on Wednesday 18 October 2006. Her sentencing remarks were tendered to me (Exhibit 2). I rely on the facts of the matter as found

by Her Honour to the criminal standard of proof (beyond reasonable doubt) to set out how the deceased became injured. These were not a matter of contention at the inquest, and are summarised as follows.

11. Late in the morning of Thursday 20 April 2006 the deceased was at the Riverside Hotel in Alice Springs. Charles Hayes (aged 20) and Benjamin Hayes (aged 17) were also at the Hotel. There was a history of animosity between the Hayes family and the family of the deceased. There was a verbal altercation between the deceased, on one side, and Charles and Benjamin Hayes, on the other. Threats of physical violence came from both sides.

12. Charles and Benjamin Hayes returned to the Hidden Valley camp via mini bus with a group of others, after consuming a quantity of alcohol. They were very angry about what had happened at the Hotel and were openly discussing how they intended seeking out the deceased and stabbing him. Charles Hayes produced a knife at Hidden Valley Camp and told a witness that he was going to Charles Creek to stab the deceased. Benjamin Hayes armed himself with a 2 foot long steel pipe which he told witnesses he was going to use on the deceased.

13. Sometime that afternoon Charles and Benjamin Hayes went to the deceased's house. However he wasn't at home and they returned to Hidden Valley. At about 8 pm that evening Charles and Benjamin Hayes again left Hidden Valley Camp in a V6 Commodore. They picked up Earl Hayes, Gavin Hayes and Tristan Hayes. Charles Hayes also had a score to settle with Cameron Smith who lived at Amoonguna Community. Charles and Benjamin were still respectively armed with the knife and metal pipe.

14. The group drove to Cameron's Smith's residence. Charles stabbed Smith and Benjamin hit him with the metal pipe. The group then left. A sixth male, Kerry Patrick, got into the car. They went to House 26 Charles Creek Camp. Charles and Benjamin got out of the car, carrying their respective

weapons. The deceased responded to a knock at the door and came to the door. He then turned away to go back inside and Charles, Benjamin and Earl followed him inside. Charles Hayes stabbed him numerous times. Benjamin Hayes struck him with the metal pipe. Earl Hayes stabbed the deceased once in the right back shoulder with a small knife he found in the car. The group then fled the scene.

15. Police arrived at House 26 at 3 am on Friday 21 April 2006. St John Ambulance officers were dispatched at 3:02 am and arrived at Charles Creek at 3:19 am on Friday 21 April 2006. The deceased was lying on the floor with visible stab wounds and approximately 100 ml of blood around him and his clothes. He was bandaged and transported to the Alice Springs Hospital. He was conscious the entire time.

Events during the Hospitalisation

16. The deceased arrived at the Emergency Department at 3:39 am on Friday 21 April 2006. He was examined by Dr Zoe Rodgers, a Registrar in that Department. She was not called at the inquest and I am relying on her notes, and the interview she gave to police. She found that the deceased was conscious and haemodynamically stable (that is, his blood pressure and pulse rate were stable). She diagnosed a fracture to the left hand. She also described a number of stab wounds; one to the left elbow, one to the back of the left hand, one to the left clavicle, one to the left scapula and three to the left thigh. She described the three thigh wounds; one was ‘proximal and anteromedial’ (that is closer to the groin and on the front and toward the midline) and she describes this as ‘2cm, deep, appears to be arterial bleeding’. The second was also on the proximal thigh but lateral and she describes this as ‘3cm, deep, venous ooze’. The third was on the ‘posterolateral proximal thigh’ (that is on the back and away from the midline) and she describes it as ‘2cm’.

17. Dr Rodgers ordered various blood tests and in addition sent a sample of the deceased's blood for a 'group & hold' to the Pathology Laboratory. A 'group & hold' is a pre-transfusion procedure where the blood of an individual is examined to determine its blood group and to see if it has antibodies which would cause problems for transfusion. It is something that must be done before blood is provided, and doing it in advance means that blood can be provided more quickly if it is needed. There are strict demands for labelling in order to ensure that the blood is identified correctly; the ordering person has to fill out a form, which has to be signed twice, and countersigned by a witness and the ordering person has to label the blood sample itself and sign that also. In this case Dr Rodgers filled in the form correctly and the witness signed the blood sample but Dr Rodgers herself did not sign the sticker on the blood sample.

18. The sample arrived in the Laboratory at 4:30 am on 21 April 2006. The Laboratory rejected the request for a 'group & hold' on labelling grounds. The laboratory posted the fact that the 'group & hold' had not been done onto the hospital computer system as follows:

> BLOOD TRANSFUSION MISMATCH
>
> No collectors signature on specimen. Please forward a new specimen and request for Pretransfusion testing if still required.

It then goes on to describe the requirements for the sample to be accepted. To see this posting, the person checking on the hospital computer system is required to go to a screen where all the blood test results are and then click on the part saying 'group & hold' which brings up the screen saying that it hasn't been done. There is nothing on the initial screen, which shows that the 'group & hold' has been sent, that would alert someone to the fact that it had not been done.

19. Dr Rodgers requested General Surgical and Orthopaedic reviews, and the deceased was seen by both teams that morning. The Orthopaedic team

determined they needed to operate on the fractured left hand and the stab wound on the left forearm. The deceased was seen by the general surgical registrar, Dr Raoul Mayer, and an intern at about 9:15 am that morning. Dr Mayer had started as a surgical registrar at Alice Springs Hospital at the beginning of 2006. He was a first year registrar on the advanced surgical training program for General Surgery. Dr Mayer correctly determined that the three stab wounds to the left thigh needed surgery. The deceased was not seen by the surgical consultant who was on that day, Dr Boseto, however Dr Boseto was told that the deceased was going to be operated on that day. Dr Boseto has been a consultant general surgeon at the Alice Springs Hospital since February 2005. He had excused himself from the ward round that morning to attend his Friday morning clinic.

20. Dr Jacob Koshy, a senior anaesthetic registrar, reviewed the deceased at about 10 am that morning. He was working as the ward anaesthetist at that time. His job was the pre-operative evaluation of patients, that is examining patients scheduled for operations and preparing them for the operation from the anaesthetics point of view, including ordering any necessary investigations. Dr Koshy assumed a 'group & hold' had been done because he looked at the computer screen with the general blood results, which showed that it had been sent away. He did not click on the icon itself.

21. Dr Koshy gave evidence at the inquest that he considered the deceased a low bleeding risk, because his blood pressure and heart rate were stable and he had not required many fluids on the ward. His statement indicates he also relied on the opinion of the surgeons that the operation was not one with a significant bleeding risk. He gave evidence that had he considered that the deceased was at a greater bleeding risk he would have made sure a 'group & hold' had been done (that is by checking the screen) and he would have arranged for a 'cross match' to be done. A 'cross match' is the same as a 'group & hold', but in addition some blood from the patient is actually mixed with the potential donor blood to see if it is compatible. After this

the blood is immediately available, however the down side is that once this occurs the donor blood cannot be used for another patient.

22. The operation did not occur on Friday 21 April 2006 but was delayed. There are no notes on the deceased's medical file at all in relation to who made this decision and why. Dr Jacob gave evidence that the decision to defer it was made by two surgical registrars, who were not called at the inquest. They did not inform their consultant and Dr Boseto was unaware that the case had been postponed. The decision was made for two reasons; the first was that the deceased had drunk some water and the second, more significant reason, was that there were too many emergency cases that day for the theatre time available. Six other cases were also deferred for that reason on that day. The first was not sufficient reason to delay the operation and I heard evidence that the operation could have occurred regardless of the water consumed. However the fact that there were too many emergency cases for the available theatre time was something out of the control of the surgeons.

23. The operation was rescheduled for the morning of Saturday 22 April 2006. Alexia Jamieson was acting as senior anaesthetic nurse on the day. She was the most senior nurse present and thus in charge. She had been working at the Alice Springs Hospital for 19 months. There were also three additional nurses present. I heard evidence and accept that four nurses is the number required for this sort of operation and thus there were enough nurses present when it commenced.

24. The deceased was brought to theatre after another person with the same first name had been called for. The mistake was picked up by Nurse Jamieson after the deceased was already being prepared for the operation. Nurse Jamieson gave evidence that the deceased's correct consent form and notes were present so he was being prepared for the right operation. It would clearly have been of much greater concern had the wrong notes been present.

Although still a matter for concern, I find that this mistake did not contribute to the death in any way. This mix up in fact meant that the deceased was operated on earlier than he would otherwise have been.

25. The surgeons responsible that Saturday were Dr Raoul Mayer, the same registrar who had examined the deceased on the Friday, working for Dr Boseto, a consultant. The preoperative assessment was conducted by Dr Mayer. His notes state that the anterior thigh was swollen and *quite diffusely tense esp. laterally over the lateral inferior stab wounds.* In evidence he said that compared to the day before *it may have been slightly more swollen, but that's a subjective assessment and certainly very hard to quantify* (p 34 transcript). The notes made by his intern the day before state *leg swollen.* Nurse Jamieson gave evidence that Dr Mayer had said, whilst examining the thigh, that it had swollen a lot more overnight than he had anticipated. I find based on this, as well as Dr Mayer's notes, that it is likely that the thigh had swollen to some degree overnight.

26. Dr Mayer shaved the groin and prepared it with disinfectant, but did not drape the patient so that the area in the left groin over the femoral artery was fully exposed. He says in hindsight it would have been preferable to have draped it so it was exposed (this would be done to enable quick access to the femoral artery in the case of severe bleeding). Dr Mayer didn't check that a 'group & hold' had been done. He gave evidence that if he had his time again he would have checked the 'group & hold' had been done.

27. Dr Boseto did not see the deceased before surgery started, and was not present when it did start. He did not have any contact with the deceased before the operation. He was informed by his registrar, Dr Mayer, that the operation was going ahead and told Dr Mayer that he was happy for the registrar to do it. He gave evidence that this was *on the basis that he's done a few similar cases, and this is a wound on the lateral thigh and based on his assessment he was happy to go ahead and I told him 'Yes'* (p 50

transcript). Dr Boseto was in the Doctor's room, which is opposite the theatre tea room, when the operation commenced. He said that *if I had this again in the benefit of hindsight I think it's my duty to see every patient beforehand* (p 51 transcript). He said he was not aware that the thigh was swollen, nor that there had been a concern about arterial bleeding (as noted by Dr Rodgers on admission) and these things would have been important for him to know. It is important to note that Dr Boseto was Dr Mayer's supervisor in relation to this surgery.

28. The anesthetist was Dr Manjula Devi, a senior anaesthetic registrar. She had been in Australia for four months, working as a senior registrar at the Alice Springs Hospital. She had qualified and previously worked as an anaesthetist in India. She first became involved with the deceased's care at about 9:45 am on 22 April 2006 when she examined the deceased before he went to theatre. She continued making notes on the Anaesthetic Record which had been used by Dr Koshy the day before. She gave evidence that she assumed the case did not present a particular bleeding risk. She formed her opinion based on what the patient said, the stable observations of the patient and Dr Mayer's description of the surgery as a *washout* that wouldn't take long from the surgery point of view (p 17 transcript). Dr Mayer was asked about this and can't recall specifically telling Dr Devi this, but says that he may have, as this assessment was not out of line with what he was thinking. The thigh was covered by a pressure bandage and she didn't see it. Dr Devi says that she did not check whether the 'group & hold' had been done because she assumed it had been. She said if she had anticipated any problems then she would have checked it and that in retrospect she should have checked it. She said that had she been told things that indicated a greater risk of bleeding (such as that the thigh was swollen or that the original notes queried whether there was arterial bleeding or that it was anticipated that the operation would take a while) then she would have taken greater precautions. She would have talked to the blood bank and made sure

blood was available. She would probably have put in a more invasive monitor and she would have informed her consultant that she was anticipating bleeding.

29. The orthopaedic side of the operation commenced at 10 am and was completed uneventfully. Dr Mayer started operating on the thigh at about 10:35 am. He commenced exploring the thigh wounds however about 20 minutes into the operation he discovered that the bleeding in the lateral inferior wound was going to be difficult to control and he called for Dr Boseto.

30. Dr Boseto arrived promptly at about 11 am. Dr Mayer stated that during his part of the operation there was very minimal bleeding, and the bleeding really started after Dr Boseto came in and, appropriately, extended the wound. Dr Boseto says that when he came there was some bright red bleeding and venous bleeding, but *nothing really torrential*. (p 54 transcript). The inferior lateral thigh wound was the one with a lot of bleeding. Dr Boseto took over the operation and Dr Mayer became the assistant. Dr Boseto immediately extended the excision in order to access the bleeders and close them with suture ligation. He said that when he did this, and removed some clots, there was a lot of bleeding. Dr Mayer describes it as *profuse bleeding, both arterial and venous, from deep behind the bone in the thigh which is a difficult place to access* (p 35 transcript). The two used repeated packing and coagulation diathermy to try to control the bleeding. The wound bled actively for at least 40 minutes, which was the time taken to control the more serious bleeding. Thereafter the wound continued to ooze blood for an hour and a half. I find that the major part of the blood loss occurred between 11 am and 12 am, and that blood continued to be lost at a slower rate for the next hour and a half thereafter.

31. At about 11:20 am the deceased became haemodynamically unstable (that is his blood pressure fell and his heart rate went up) because of the blood lost.

Dr Devi recognised this straight away. She put in an extra line and she asked Nurse Jamieson, the anaesthetic nurse, to go and ring the pathology laboratory and see if any blood was arranged. She gave evidence that she didn't call herself because there was no phone in theatre (the nearest phone was about 3 m away and outside the theatre) and she did not want to leave her patient. Dr Devi said that she also did not know the phone number for the pathology laboratory, and it wasn't up on the wall, so she would have had to go through switch which would have taken extra time.

32. Nurse Jamieson called the pathology laboratory and reported back to Dr Devi that blood hadn't been 'group & held'. Dr Devi then requested 4 units of blood by taking a blood sample, filling out a form and asking for them to be sent across to the laboratory so that blood could be cross matched and provided. Dr Devi records that blood was requested at 11:45 am. Nurse Jamieson says she rang the laboratory to tell them the blood was coming over. The laboratory is about 300 m away from theatre so 'rovers' come and collect the units from theatre and deliver the specimens.

33. Dr Bittner is the manager of the pathology laboratory at Alice Springs Hospital and was working on the morning of Saturday 22 April. He says that the laboratory received a request form for 4 units of blood for Ricky Ryder. Dr Devi had used the wrong form; she had used the routine pathology request form rather than the special one for transfusions. On the form she had used she had not signed her name in the place for the signature of the collector. There was not a place for a witness to sign on the form, because it was the wrong form, and there was thus also no witness signature. Dr Devi was asked about this error in court and said there were two reasons for it; the first was that this was the first time she had filled out a blood request form since working at Alice Springs, previously this had already been done by the surgeons, and she was never oriented about how to fill out the form. The second reason was that she was in a hurry. She said that she wasn't aware that the ordering form needed two signatures. Nurse Jamieson

was asked about this and said it would normally be the case that as the witness she would sign the form, but she didn't. She said that she didn't pick up on this as it was a very difficult time in that they were trying to do several things at once.

34. The sample was received by a 17 year old employee at the front desk, who consulted her senior. The laboratory, following its guidelines, rejected the form. There is some dispute on the evidence as to whether the young employee rang Nurse Jamieson to tell her that the form and sample weren't correct or whether Nurse Jamieson rang to ask where the blood was and was then told that the form and sample weren't correct. Nurse Jamieson asked if the rover could take the same sample back and the young employee told her that it was against their procedures. Nurse Jamieson sent the rover anyway who arrived. An argument then ensued on the phone between Nurse Jamieson and the employee.

35. Dr Bittner was involved in this decision making and says that *after a lot of telephone calls asking us where the blood was and what we were doing I actually made a decision to accept the request form and the specimen in its original form.* He said he made this decision at about 12. The 'cross match' was then done, and the blood was available at about 12:30. His records show that it was picked up by the courier at 12:45. There are some discrepancies in the evidence as to when the blood arrived, I find it is likely that the blood arrived in the operating theatre at about 1 pm and that transfusion began within the next half hour.

36. During the wait for blood Dr Devi gave the deceased about 3.5 L of fluid, placed more peripheral lines in and tried and failed to get an arterial line. She did not call for senior help. The deceased wasn't given any repeat doses of antibiotics. The weekend arrangement was that there were two anesthetists on call, the first on call was Dr Devi and the second was a consultant, Dr Rod Mitchell. Dr Mitchell had been called in for another

matter at 10:30 am and then left at 11 am. He was then called in at midday for an anaesthetic emergency (an acutely swollen airway that needed intubation) and was in fact in the adjacent theatre dealing with that from about 12:30 pm to 1 pm. This theatre was about seven metres away from the theatre the deceased was in. He had arranged to do some teaching at 1 pm so had arranged for Dr Isaac Muthiah, another consultant, to cover him from that time. Dr Mitchell called Dr Muthiah in before 1 pm to help assist with the intubation. Shortly after 1 pm Dr Mitchell left the hospital and Dr Muthiah stayed with the patient for two further hours while they waited for a free bed in the Intensive Care Unit.

37. Despite the presence at different stages of consultants in the adjacent theatre, the first any anaesthetist other than Dr Devi heard about difficulties with the deceased was when Dr Devi called for senior anaesthetic assistance from Dr Muthiah. It is unclear exactly when this happened, the internal anaesthetic review says about 3 pm, Dr Devi thought it was more like 1:30 or 1:45 pm, and Dr Muthiah was not called to give evidence on this point. I find it was likely to be after 2 pm, that is after the surgeons had left. Dr Devi says that she was aware that if there was any problem with a patient or she was able to call the consultant and that there was no pressure not to call a consultant. However in this case her perception was that she couldn't call for help because her senior was involved in another case which was an emergency. Dr Mitchell gave evidence that Dr Devi could have called him, even if he was in the middle of another emergency case. He also said that Dr Devi could have called for help from another consultant, not officially on call, if the first one was not available. Dr Devi says she was not aware of this. In addition she says she thought that all the anaesthetic consultants were unavailable because she knew there were trial exams being conducted that day. Dr Mitchell says that he wishes he had stuck his head around the door on the day, but also that he should be able to rely on his registrar to call him if there were difficulties.

38. Dr Boseto also became concerned about the loss of blood. He says he asked several times how the patient was and got a positive response each time, the sixth time he was told to concentrate on the surgery and that the resuscitation aspect would be dealt with by the anaesthetic team. Dr Mayer says that Dr Boseto frequently inquired from Dr Devi whether or not the patient was stable and each time there was a positive answer. He says that Dr Devi did not tell them at any point that she was having trouble keeping the patient haemodynamically stable. Dr Mayer was asked whether Dr Devi was told at any stage that the surgeons were having difficulties controlling the bleeding and he couldn't recall. Dr Boseto says he never told Dr Devi that he was having difficulty controlling the bleeding. Dr Devi said that Dr Boseto kept asking her if the patient was stable and she told him that the patient was unstable, she was unhappy about it and she needed blood. Dr Boseto says he never heard that. Dr Devi can't remember being told that the surgeons were having difficulty controlling the bleeding. Nurse Jamieson says that Dr Boseto was not clear in stating how much blood had been lost and she heard Dr Devi ask twice about this. Given all the contradictions here I am unable to find exactly what was said by those present but I find that communication between the anaesthetists and the surgeons about the respective difficulties each was having was not clear.

39. There are 8 units of O negative blood (blood that can be given to people no matter what their blood type) kept in a fridge in the Emergency Department, for anybody to take when needed, in case of emergencies. It appears nobody thought to use it. Dr Devi said that she expected the blood to come, she had sent the sample around 12 and it usually takes around half an hour to 45 minutes, so she didn't think of using O negative blood then. She said that she didn't know it was available in the fridge and in her previous practice overseas the O negative blood was held in the pathology laboratory.. She was not told when she came to Alice Springs Hospital that it was kept in the fridge. She gave evidence that she had only become aware of the fact that O

negative blood was stored in the emergency department when she was told by Dr Kemp as part of proofing her for evidence a few days before the inquest. Dr Boseto also did not call for the blood. He was asked about whether he thought to use it and he said *it never crossed my thoughts actually* (p 58 transcript). He also gave evidence that he was not aware that it was available for general emergency use in the fridge in the emergency room, and had never been told that. He had previously worked at the Prince of Wales Hospital and said that he was not sure if it was available in the emergency department there. He said in retrospect that it would have been a good idea to ask for it.

40. Dr Devi said she felt she had a lack of nursing support on the day. Her anaesthetic nurse, Alexa Jamieson, had to leave to phone the pathology laboratory, and then to arrange the second theatre for the emergency. In addition Nurse Jamieson took a lunch break of between thirty and forty minutes at 12:20, while they were waiting for the blood to arrive. Nurse Jamieson gave evidence that she considered lunch breaks important as there were seven cases booked that day and the nursing staff were looking at a 15 to 16 hour day. However knowing what she does now, she regrets having taken the break. She said that when she returned to the theatre, Dr Mitchell was in the corridor and informed her about the patient requiring an emergency intubation. She needed to set up theatre for that. It is clear that more nurses were needed once the second emergency case arrived, however no additional nurses were called in. That would have been the responsibility of Nurse Jamieson. Nurse Jamieson stated that she didn't have time to make a phone call to the managers of the hospital who would know which staff to call in, the experienced anaesthetic nurses. She gave evidence that if she had had the luxury of time she would have made phone calls, however as nobody was on call she would have to ring around until people agreed to come in. She said it might have taken her half an hour to find someone. She said that there was no one else to call as the other nurses were all required

for the operation on the deceased. She said having a phone in theatre would have helped.

41. Nurse Jamieson did not mention to any of the medical staff next door that there were any concerns about the patient. She said that she did not do so because it was an emergency situation and she didn't want to *defocus* them from that situation.

42. When the blood arrived it was given to the deceased. Dr Devi gave evidence that she would have been able to give it faster if she had had either a second anaesthetist present, or a rapid infuser.

43. The General Surgeons finished up at 1:50. They packed the wound tightly to control ooze with the intention of coming back later when the patient was stable, and possible clotting problems had been resolved, to close properly. They left within about ten minutes of finishing. Dr Devi stayed with the deceased. Dr Boseto was asked about leaving and whether he considered that at that time Dr Devi needed more help. He said *there was no panicking at all at the time, and we'd completed our – what we needed to do in terms of controlling the bleeding. It seems on the surface that things were ok – were fine, and so we had other patients to see; myself and Dr Raoul and therefore we left…And then we knew that an – extra hand was – help was next door* (p 61 transcript).

44. At 3:20 pm the surgical team was called in to re-explore because despite all the blood being given to the deceased he was not responding. The team clamped the common femoral artery and then explored the two thigh wounds. Neither had bled. This means that the blood that was lost was lost before 1:50 pm.

45. A code blue occurs when someone is almost arresting or has an arrest (that is their heart stops) and means a specified group of doctors all drop whatever they are doing and arrive to help the patient. A code blue was

called at 3:40 pm. CPR was started at 3:45 pm. There were some difficulties calling the code blue. Nurse Jamieson gave evidence that she pressed the button but it didn't stay in, which it is supposed to do to indicate that it is working, and calls were not made to everybody who needed to be called. There were no regular tests of the system at that time. Nurse Jamieson ended up making a priority call to he surgeons and then asking switchboard to call other doctors, and they did arrive. However the deceased was unable to be resuscitated and was declared dead at 4:10 pm.

Expert Evidence

46. I was very impressed with the evidence given by Dr Jacob, the Director of Surgery at Alice Springs Hospital. He has extensive experience with stab wounds and I was very much assisted by his expertise. He had thoroughly looked into the circumstances of this case and I found him to be an honest and knowledgeable witness. His evidence was of great assistance to me and I accept it fully.

47. Dr Rod Mitchell, the Director of Anaesthetics at Alice Springs Hospital at the time of this death, also gave evidence from Queen Elizabeth Hospital in Adelaide where he is currently located. He also thoroughly reviewed the case from an anaesthetic perspective and I find his review was thorough and honest, and I put significant weight on his evidence.

48. I also heard from Mr Bittner, the head of the pathology laboratory, and also found him to be a very honest and extremely helpful witness.

49. Finally, Professor Maddern wrote a comprehensive report for the Alice Springs Hospital on the factors that contributed to this death. I accept his report and it has been of significant assistance to me. Professor Maddern was called to give evidence. In his evidence he seemed to repeatedly depart from his report in a way that attributed less blame to the surgeons involved and greater blame to all the other specialities. However each time the

discrepancy was pointed out to him, he accepted his opinion as expressed in the written report. Consequently I prefer his written report where it differs from his oral evidence.

MEDICAL CAUSE OF DEATH

50. It is clear that the operation was necessary and the decision to operate was correct. If it had not occurred the deceased is likely to have developed an infection and become septic and, without treatment, died. In addition the clot that was stopping him bleeding may well have dislodged and caused serious bleeding.

51. I find that the deceased lost six to eight litres of blood and that ultimately he died from hypovolemic shock. There was evidence that the deceased was coagulopathic, that is his blood was no longer able to clot. There may also have been some contribution to his death by a degree of sepsis. The forensic pathologist conducted an autopsy which did not find any alternative cause of death.

52. It is accepted that this was an avoidable death and should not have occurred. The fact that this death was preventable was immediately recognised by the Alice Springs Hospital staff and they put a considerable amount of work and thought into analysing what happened and trying to prevent it recurring. This included engaging Professor Guy Maddern, a surgeon from Adelaide, to conduct an independent, external review and co-operating fully with it. Professor Maddern gave evidence he that was very impressed with the openness of the hospital. In addition reviews were conducted by the Department of Surgery and the Department of Anaesthetics. The reviews were frank and thorough and I have found them of considerable assistance in preparing these findings. I would like to commend as outstanding the hospital's proactive approach in response to this death and their cooperation with the Coroner's office in investigating it.

53. Ms Vicki Taylor, the General Manager of Alice Springs Hospital, gave evidence before me. As part of this she told the family of the deceased on behalf of the Hospital that *we are extremely sorry that this had occurred… I think it is important when these sorts of things happen that we reflect on our practice. We take our duty of care to the Alice Springs community very seriously, and an opportunity to improve our practice is a very important one for us to take which is why we responded as we did.* (p 136 transcript)

54. Alice Springs has the highest reported incidence of stab wounds in the world. There were 1440 cases there in a seven year period. Most of the stab wounds are in the thigh, because of cultural practices, which is something unique to Alice Springs. The deceased himself had previously presented on multiple occasions with stab wounds. I thus consider it particularly important to cover in detail factors that contributed to an avoidable death from this particularly common presentation.

FACTORS THAT DID NOT CONTRIBUTE TO DEATH

55. Dr Bittner gave evidence that the strict labelling requirements that caused the samples to be rejected come from a national guideline that enforces very rigid requirements for the identification of a patient sample for pre-transfusion testing. (p 103 transcript). He described how if the wrong type of blood is given it can be fatal, and stated that blood is not given without a serious amount of thought and protocols are in place to ensure that people are given the right type of blood. There are one to two incompatible blood transfusions a year in Australia which is why the Australian Society of Blood Transfusion Group set the guidelines so rigidly. He said there are particular concerns in the Territory because indigenous patients often come in under different names, the dates of birth are not reliable, and the address is often given as care of a community. Overall there is a trouble getting reliable indicators of identity for indigenous patients. He said *[w]e were recently examined by the accrediting authority, NATA, and they insisted that*

we reject samples if the time of collection wasn't put on the specimen tube. And that's very, very rigid. You don't get those sorts of requirements for any area other than transfusion (p 103 transcript). The laboratory thus has a zero tolerance policy when it comes to pre-transfusion specimen labelling. If the specimen and the request form do not meet the requirements they are to be put in the bin. The laboratory does not send samples back to be signed properly, nor does it allow staff to come to the laboratory and correct errors in the forms.

56. I accept these requirements are appropriately strict and that in both cases the sample of the deceased's blood was appropriately rejected. In this case Mr Bittner made an exception at midday, he decided that even though the paperwork was inadequate, the specimen was correctly labelled, it had the collector's signature and it was handwritten, and the deceased had previous records which meant the pathology department knew his group. This breached Mr Bittner's own protocols. He said he has made such an exception only on one other occasion in two years. He gave evidence that had he not been there, the staff would have had to contact the Director of Pathology at Royal Darwin Hospital and would have been told that they could not use the specimen.

57. I therefore find that the strict requirements of the laboratory are appropriate and are not a contributing factor to the death. It is because the requirements are so strict that a correct sample should be sent in advance to be 'group & held', so blood is quickly available if required, and blood should be cross matched in advance if there is a risk of serious bleeding. In addition the laboratory provides O negative blood for emergencies.

FACTORS THAT CONTRIBUTED TO THE DEATH

The delay of the operation from the Friday to the Saturday

58. I find that the delay of the operation to the Saturday contributed to the death for two reasons. Firstly, because it moved the operation from occurring in hours, when there is a lot of support around, to out of hours, when there are significantly less staff working, and this negatively affected the nursing support available, the anaesthetic support available and the operations of the laboratory. Secondly, because it is likely that the delay made the operation more difficult. I heard evidence that firstly the delay would have increased the chance of infection, secondly it meant clotting factors were more likely to have been used up – and thus bleeding was more likely, and finally it left more time for there to be bleeding into the muscle, and for there to be tissue oedema, which meant that the muscle was harder to retract and thus it made the operation more difficult and the control of bleeding more difficult. Dr Jacob said that it is better to do this sort of operation within six hours of presentation. He said that it is likely that the knife used to stab the deceased was not clean, which means there is an increased chance of infection. Dr Mitchell agreed that *with the dirty wound, delay allowed time for infection to take hold.* (p 88 transcript). Dr Jacob stated that it may have been easier to control the bleeding if it had been done on the Friday. Dr Mitchell went so far as to say that the deceased would not have passed away had the delay not occurred.

The underestimation of the bleeding risk presented by the operation

59. I find that the surgical team underestimated the bleeding risk presented by the operation. Dr Jacob gave evidence that the sort of injury the deceased had on his upper thigh is *always a difficult one because it can actually – some of the knives are quite long. It can go all the way posteriorly and cut one of the vessels – what we call the deep femoral artery – which is extremely difficult to control* (p 73 transcript) He said that the location of the stab wound have made him concerned that the operation may be complicated. He said that the fact that the thigh was swollen should alert a surgeon to the fact that this was a major injury. This meant that the groin

should have been properly draped for instant access to the femoral artery, and blood should have been cross matched. Two surgeons were required because *if we are to explore the back of the thigh you can't do it alone...one doctor cannot do that by himself even with the assistance of the nurse because [the patient] needs to be turned to one side [to] explore into the depth of the tissues. You need...two sets of hands* (p 74 transcript). Dr Jacob said that if he had seen the case and the anaesthetist had asked him the bleeding risk he would have cautioned them that it may be a bleeding risk.

60. The junior surgical registrar started the operation by himself. His consultant was nearby, but not present, and did not examine the patient himself before the operation. I find that had a more experienced surgeon seen the patient, the location of the wound, the fact that it appeared deep and the fact that it was swollen, and the fact that there was some arterial bleeding at the time of admission, would have alerted them to the possibility of serious bleeding during the operation. I find that the registrar was too junior to accurately assess the likely bleeding risk. He had operated on four to five stab wounds only before this one, all at the Alice Springs Hospital. I find that he underestimated the risk and because of this did not take precautionary measures that should have been taken. This would have meant fully draping the femoral artery, at the least checking that the 'group & hold' had been done (and preferably ensuring that blood was cross matched) and making sure two general surgeons were present at the start of the operation. I do not find that any of this was the fault of the junior registrar; he had only been working as a surgical registrar for four months and had limited experience with stab wounds. The responsibility for this lies with the consultant who should have seen his patient before the operation started, and been present to supervise his junior registrar at the start of the operation.

61. I also find that both anaesthetists who assessed the patient underestimated the bleeding risk and I find that the main reason for this error was that both of them, appropriately, relied on the opinion of the surgeon, in this case the

junior surgical registrar, as to that risk. I find that had a more senior surgeon reviewed the patient, recognised the risk and made Dr Devi, in particular, aware of it then she would have taken precautions such as having blood cross matched, using more invasive monitoring and informing her consultant that the operation may be difficult. Dr Mitchell said had he been the anaesthetist and informed of a significant bleeding risk, he would have cross matched blood and put in a larger line.

Failure to check that the 'group & hold' had been done

62. I find that even though the anaesthetic and surgical registrars operating on 22 April 2006 underestimated the bleeding risk, based on what they knew they should have checked that the 'group & hold' had in fact been done. They failed to do this.

Time taken to control the bleeding

63. I find that it took too much time to control the bleeding in the thigh wound once it began to bleed actively. Dr Jacob gave evidence that 40 minutes is a long time to control a bleed. He described options to control the bleeding; exposing the femoral artery and putting a sling on it ('clamping the femoral artery') to stop blood flowing through it or packing the wound and waiting for blood to come. Professor Maddern gave evidence that if significant amounts of blood were being lost it would be appropriate to pack the wound to control it and not explore the wound further until the blood had arrived. I find that either clamping the femoral artery or packing the wound and stopping exploration of it would have been better than continuing the operation while the patient became increasingly unstable. I find that the surgeons underestimated the seriousness of the situation and, in particular, underestimated the amount of blood lost.

The failure of the anaesthetist to call for help

64. Dr Mitchell gave evidence that the deceased should have been given more fluids, perhaps up to six, seven or eight litres of fluid. In addition sepsis should have been considered and the antibiotic coverage broadened. O negative blood should have been called for and used. After the group specific blood arrived assistance would have enabled it to be delivered more quickly. Overall it is clear that the anaesthetic registrar needed help to manage the patient appropriately. Professor Maddern found that *the subsequent attempts to manage a significant haemorrhage associated with the operation were all appropriate but somewhat delayed. This delay was largely due to the fact that there were too many tasks for one anaesthetist to perform in such a rapidly deteriorating and crisis environment.* (p 4 of his Report). However the registrar did not call for help until some time after 2 pm. I find that this was partly because she perceived that her consultant on call that day was involved in another case next door and that she could not interrupt him, and partly because she was not aware that she could call for help from other consultants even if they were not on call. However I also find that the anaesthetist underestimated the seriousness of the situation of the patient, and in particular she underestimated the amount of blood lost.

The failure to use O negative blood

65. The pathology department continually maintains 8 Units of O negative blood in the fridge of the Emergency Department. Both the senior anaesthetic registrar and the consultant surgeon not only did not think to use it, but both say that they were not aware it was available. I find this perplexing and surprising. I heard evidence which I accept that that availability of O negative blood in the emergency department is a given Australia wide and it would be expected that a senior surgeon and an anaesthetic registrar would know at the very least of its availability, if not its precise location. I find that both of those persons should have asked for it. I accept Professor Maddern's opinion that using the O negative blood may well have changed the course of events.

The delay in blood

66. I find that this was caused by multiple factors. The main ones are the two doctors making errors in filling out the form requesting a 'group & hold', the failure by both surgeons and anaesthetists to check that the 'group & hold' had in fact been done, and the underestimation of the risk of bleeding leading up to the operation, if the risk had been realised then a 'cross match' would have been organised. Two lesser causes are the lack of a phone in theatre and the failure of the laboratory to ring the theatre back when they decided to reject the request, having been put on notice that blood was needed urgently. I find that the laboratory has appropriately strict guidelines and thus acted correctly both in refusing the two incorrectly filled out requests and in refusing to send back the incorrectly labelled sample to be signed. Mr Bittner gave evidence that had the blood been appropriately 'group & held', it would be available 15 minutes after a phone call from the theatre.

67. I heard varying opinions on the importance of the delay in blood in causing the death. I find that the importance of the delay was overestimated on the day, but nonetheless that the delay was a contributing factor in this death. I find that everyone was thinking that the blood was about to arrive at any moment and had they been aware of the time it was actually going to take they would probably have acted differently. However I also find that the delay in blood would not have played a part had it occurred to any medical staff to use the O negative blood which was provided for just such an eventuality.

Inability to correctly fill in blood forms

68. Mr Bittner said that about 10% of forms are filled in incorrectly and that it is a common thing for the laboratory to reject specimens and in fact it is a form of education in itself. He said he thought the large error rate was mainly due to the constant turnover of staff. He said there are doctors that

come up for four to six weeks at a time, from different hospital all over the country, it is very hard to explain to them all how to fill in forms.

Difficulties in communication between the theatre and the pathology laboratory

69. I find that the lack of phone in theatre, which meant that staff had to leave the room to make a call, hindered communication between the theatre and the laboratory.

70. In addition I find that the pathology laboratory could have been more proactive in communicating the fact that they were not going to supply the blood, given that they had been placed on notice that it was urgent. It is unclear exactly what happened in the series of phone calls but I accept that Nurse Jamieson had to keep ringing the laboratory to find out what was occurring.

Lack of nursing support

71. There were an appropriate number of nurses working that Saturday to staff one operation. However when the emergency intubation was required, some nurses were needed to assist this and no additional nurses were called in, resulting in insufficient nursing support.

The underestimation generally of the seriousness of the situation

72. I find that there was an underestimation generally by the surgical, anaesthetic and nursing teams of the seriousness of the situation that was unfolding and, in particular, of the amount of blood that had been lost. This resulted in a failure generally to call for additional help as the situation deteriorated, despite the fact that senior consultants were about 7 m away in an adjacent theatre. I accept that it is not easy to estimate the amount of blood lost, and to some extent it was guess work, but nonetheless on this day it was significantly underestimated.

Lack of familiarity with local information

73. It became apparent that staff who had trained elsewhere, and had only been at the Alice Springs Hospital for a short time, were unfamiliar with vital information such as, variously, how to fill in a blood request, the availability of O negative blood, the ease with which extra help was available, the use of infusion pumps and how to put in arterial lines. I find that a high turnover of staff at the Alice Springs Hospital is a reason for this, and a particular problem for this hospital.

Lack of communication between staff

74. Communication could have been and should have been clearer between the anaesthetist and the surgeons in theatre, and the failing was on both sides. If it had been clearer then the seriousness of the situation may have become apparent earlier. In addition there was a lack of communication amongst the surgical team about the delaying of the operation from the Friday, the decision appeared to have been made without talking to the consultant and there was no documentation of the decision whatsoever.

Other factors

75. There were some additional, and less critical, factors. The code blue button did not work, which is a matter of concern, although I find that this is unlikely to have made a difference to the outcome on the day. The anaesthetist had difficulties using the infusion pump. There was no rapid infuser available in theatres.

Conclusions

76. Overall I find that there were too many errors to suggest that this was a totally unexpected breakdown. It is apparent to me that as of April 2006 there were some serious systems and resource issues at the Alice Springs

Hospital that meant that this sort of a death was more likely to occur than it should have been.

THE HOSPITAL RESPONSE

77. There were 6 recommendations made by Professor Maddern as part of his report. In addition 8 recommendations were made arising out of the internal hospital review processes. I have attached the 14 recommendations as a table at Annexure A. I find that the recommendations were well targeted at fixing the systems issues that caused this death, and I commend Alice Springs Hospital for adopting Professor Maddern's recommendations, as well as coming up with 8 of their own, and for committing themselves to implementing the bulk of them.

78. I heard evidence from various senior medical staff about what had been done in their own areas, as well as evidence from Vicki Taylor, the General Manager, about the hospital response overall. She provided me with a Table, summarising the recommendations, the person responsible for their implementation and what has happened (Exhibit 6) which was of great assistance. I have listed in the table at Annexure A the steps that have been taken to implement the recommendations.

79. I do not intend to make recommendations that cover the areas targeted by the Hospital as they have already comprehensively been done.

80. Recommendation two has not been implemented. Dr Jacob said he was of the opinion that the two forms should be kept separate. He said that giving blood to a patient is an important decision and the separate forms highlight the significance of it. Mr Bittner also did not agree with the recommendation. He said if all the information currently on the two forms was to be contained on one form it would have to be a two sided form, which led to the risk of missing requests because the back of the form was not looked at. In addition it is a Territory wide request form so would have

to be changed for the whole Territory. I accept that the risks of blood transfusion warrant more stringent collection procedures and it is appropriate to have a special form for this, and accept that this recommendation need not be implemented.

81. Recommendation six has not been implemented fully and this highlights a very significant problem which the Alice Springs Hospital has been unable to permanently correct due to resourcing issues. I have found that the delay in the operation was a significant contributor to this death. Professor Maddern gave evidence that emergency operations being pushed out of hours was a *substantial problem*. I accept the evidence of Dr Jacob that the cause of the delay in this, and many other cases, is the lack of a designated emergency theatre. He gave evidence that 70% of cases requiring surgery are emergency cases, but they are currently mostly operated on in the evening, on weekends, or slotted in between elective cases. He states that this is suboptimal; firstly because of the reduced staff out of hours, and secondly because the extensive delays result in patients either eating or drinking while waiting, as in this case, or absconding. I also heard evidence that delays are suboptimal in terms of medical outcomes.

82. In April 2006 when this death occurred there was no dedicated emergency theatre, which meant that emergency cases were routinely delayed. Changes since that time have resulted in a dedicated emergency theatre scheduled for 3 days a week. However I heard evidence that in most weeks at least one day is cancelled, because if one nurse calls in sick then there are not enough staff to run it. In addition the funding for this theatre was special funding provided by the Acute Care Network to reduce the waiting time on the Alice Springs Hospital elective waiting list. This funding ceases at the end of 2007. The statistics also show an increase in the number of surgical admissions from 1428 in 2003 to 2472 in 2006. This is a very large number of surgical admissions. Dr Jacob said this is because there is an enormous amount of trauma in Alice Springs. There were of the order of 2800 trauma

cases in 2006 and I heard evidence that if there are more than 400 trauma cases a year then a centre should be considered as a major trauma centre according to the Royal Australasian College of Surgeons.

83. I heard evidence that a dedicated emergency theatre would cost about $5 million a year, taking into account operational costs, salaries and support.

84. I accept the evidence of Dr Jacob about the need for a dedicated emergency theatre, which receives support from recommendation number 6 in Professor Maddern's report.

RECOMMENDATIONS

85. Sadly, and unfortunately, the death of the deceased in the Alice Springs Hospital was preventable. In my view, the death occurred, inter alia, because of a lack of resources for emergency surgery. Accordingly, I recommend that the Northern Territory Government fund a dedicated emergency theatre for the Alice Springs Hospital as a matter of priority.

Dated this 10th day of December 2007.

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GREG CAVANAGH
TERRITORY CORONER

ANNEXURE A

RECOMMENDATIONS	IMPLEMENTATION
A. Arising from Professor Maddern's Report	
1. Grouped and [cross] matched blood when requested should always be checked as being available prior to the commencement of any surgical procedure.	This has been implemented. Blood is cross matched before any procedure where a major vascular injury is suspected. A recent audit showed that blood had been grouped and held in all cases, but cross matched in only 50% of cases. The head of surgery reviewed this and determined that it was appropriate cross matching. If a request has been made for blood to be 'group & held', or cross matched, the senior surgeon has responsibility to check the pathology results and ensure that it is available before proceeding.
2. The Pathology Department should consider the formation of one form suitable for blood transfusion and general blood requests rather than having different forms for different tasks.	This has not been implemented. This is not supported by the Pathology Department, and it would require changing forms across all sites in the Northern Territory. Coroner accepts the reasons behind not implementing this form.
3. Anaesthetic Registrars must be instructed of the importance to call for additional help at the earliest possible time rather than attempt to manage situations for which two anaesthetists would be better than one.	This has been implemented. It is included in a more formalized orientation program that has been introduced, and reiterated in the regular education sessions held in the department.
4. Nursing staff need to be aware that if a second theatre is opened a second team need to be called in, irrespective of the nature of the procedure that is thought to be conducted	This has not been implemented. This is essentially because of insufficient funding to support this. There are insufficient funds to establish a second on call team. Instead the practice is for staff to indicate availability over the

within the operating theatre. It is better to over staff on these occasions rather than under staff.	weekends (a 'shadow shift') and for a second team to be called as required. Over a year a second team was needed on three occasions only and it worked well.
5. Surgical Supervision should be provided for all inexperienced registrars. The Alice Springs Hospital should consider taking only second year Advanced Trainees for this rotation.	All cases going to theatre are now seen by the consultant surgeon before they go for surgery. Alice Springs Hospital has requested only second year trainees and it has been confirmed from the Alfred Hospital that this will occur, this will start in 2008.
6. Additional emergency surgical lists should be provided during the week and the rostering of nursing staff across weekends needs to be considered in the light of safe working hours and practice.	See discussion in findings.
B. Arising out of Internal Hospital Processes	
7. The senior surgeon will review all surgical patients before surgery. If it is determined that a surgical registrar will complete the case, the senior surgeon will be available for supervision and assistance at all times.	An audit of major vascular surgery files showed that 50% had documentation showing the patient was reviewed by the consultant. The Head of Surgery considers that the actual proportion of cases reviewed is likely to be higher but is not shown because of the lack of documentation in files. Discussions are taking place to improve the documentation.
8. Code Blue button in theatre to be serviced regularly and theatre staff will be educated in its use.	There is now a schedule of testing for the Code Blue button.
9. A telephone will be placed in all theatres to avoid the need to leave the theatre in an emergency.	Telephones have now been placed in all theatres.
10. An in-service of the use of the rapid infuser will be	A rapid infuser was delivered on 19 June 2007 and three training

	held for all theatre staff. Consideration will be given to the purchase of a second rapid infuser to be stored in theatre.	sessions on how to operate it have occurred since this time.
11.	It is recommended that theatre begin on time.	A review of starting times showed around 62% of operations started on time; this is something that the Hospital is finding difficult to improve on, it is being monitored through a theatre management group.
12.	It is recommended that there is an increase in ICU beds. This will require resources to increase staff.	This has not been implemented as a review shows that this is not needed.
13.	It is essential that all theatre staff, especially the nursing staff, are adequately trained and have theatre certification. Currently staff are underqualified which increases the risk for Alice Springs Hospital. Training is a priority.	By the end of 2007 8 staff will have received their formal qualifications which is close to 50% of all staff and up from 4 staff in 2006.
14.	A patient with the same first name was initially sent to theatre.	A 'right person, right site' policy is operating in theatre, and a 'time out' policy is operative. There have been in services with theatre nursing and posters placed in each theatre above the scrub sink outlining the 5 step procedure. Recent investigations show that the time outs are now occurring 100% of the time. There is a clinical nurse educator in theatre who has taken this aspect on.

Other areas of concern that were not formal recommendations	
	All surgical staff are now oriented on the storage of O negative blood in the Emergency Department and procedures to call for that blood.
	All anaesthetic staff are now oriented to the location of O negative blood.
	Haemaglobin level is to be measured one hour before all major vascular surgery and this is to occur regardless of any delay in scheduling surgery.
	During orientation (3-6 months) an anaesthetic registrar starts by working with a supervising colleague and proceeds to progressively work on their won. Until orientation is formally completed all cases are discussed with a supervising consultant before commencement. There is an orientation package in place for Anaesthetic registrars and the new head of Anaesthetics is developing a manual for this.
	Mandatory orientation program for all new doctors which includes, among many other things, a presentation by the pathology department on how to fill in blood request forms. A sheet of paper outlining all required components will be placed in the doctor's personnel file and each component will be ticked off as it is done. The orientation has to happen before the doctor starts working in the hospital.
	Northern Territory Health in the process of employing a

	transfusion nurse whose responsibility will be Territory – wide education about general transfusion procedures, including the correct way to request transfusion products.