



FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 12th, 13th, 14th, 15th and 30th days of September 2005 and the 22nd day of February 2006, by the Coroner's Court of the said State, constituted of Anthony Ernest Schapel, Deputy State Coroner, into the death of Christopher James Sinclair-Spaan.

The said Court finds that Christopher James Sinclair-Spaan aged 21 years, late of 21 Mary Street, Kapunda, South Australia died at the Royal Adelaide Hospital, North Terrace, Adelaide, South Australia on the 18th day of July 2002 as a result of closed head injury and retroperitoneal and pelvic haematoma due to fractured pelvis. The said Court finds that the circumstances of his death were as follows:

1. Introduction and reason for Inquest

- 1.1. Thursday 17 July 2002 was Christopher Sinclair-Spaan's twenty-first birthday. He celebrated it with friends that evening. In the early hours of the following morning he drove the car owned by his friend Darren Hiscock.
- 1.2. In a street in the town of Kapunda in which Christopher Sinclair-Spaan lived, and which is about 78km north of Adelaide, the vehicle driven by Christopher collided with a stobie pole. There were two other occupants. Darren Hiscock was sitting in the front passenger seat and Nicole Baker was sitting in the rear. The magnitude of the impact is measured, among other things, by the fact that the vehicle came to rest against the pole with the side of the pole intruding into the vehicle by some distance. This fact caused Christopher Sinclair-Spaan and Nicole Baker to become trapped in the vehicle. They were extricated more than two hours later. Both were seriously

injured. Christopher Sinclair-Spaan was later that morning to die from his injuries at the Royal Adelaide Hospital (RAH). Nicole Baker survived. Darren Hiscock was extricated from the vehicle at a relatively early stage. He was conveyed by ambulance to the Kapunda Hospital with non life-threatening injuries.

- 1.3. The collision occurred at about 3am and emergency services were then mobilised. They included both professional and voluntary members of the South Australian Ambulance Service (SAAS), State Emergency Service (SES), the Country and Metropolitan Fire Services (CFS and MFS) and the police. The female occupant of the vehicle was conscious at times. She had suffered among other injuries, a fractured femur. Her limbs were trapped under the seat still occupied by the driver. She was obviously in severe pain and was extremely distressed. It does not appear that the deceased regained any significant level of consciousness. He had suffered a head injury, and as well, a severe pelvic injury.
- 1.4. In due course, a retrieval team from the RAH also arrived. The team included an intensive care medical practitioner and an intensive care nurse. The deceased and Ms Baker were extricated from the vehicle some time after the arrival of the retrieval team. The retrieval team had travelled by ambulance from the RAH to the scene. Attempts had been made to mobilise the team by air but, it is said, the helicopter was unable to fly to the location because of the weather conditions prevailing at the time.
- 1.5. The deceased had suffered a closed head injury as well as a retroperitoneal and pelvic haematoma due to a fractured pelvis. This is the cause of death expressed by Dr John Gilbert, the forensic pathologist who performed the post-mortem examination of the deceased (report verified by affidavit, Exhibits C3 and C3a). Dr Gilbert enlarges upon the cause of death:

‘Death was due to severe blood loss into the pelvic soft tissues and retroperitoneum associated with pelvic fractures. Death was also contributed to by a significant closed head injury.’

(Exhibit C3a, p5)

The deceased had suffered a severe crush injury to his pelvic region which is a particularly vascular region of the body. The space in the vehicle that he had occupied before the collision had been greatly diminished as a result of the intrusion of the pole. This had no doubt accounted for the crush injury, and as well, the

deceased's entrapment in the vehicle. The deceased bled internally in the pelvic area due to the disruption of blood vessels in that region. At post-mortem, extensive haemorrhage was located in the soft tissues of the pelvis and elsewhere in the body. Despite efforts at the scene to maintain his blood volume by what were massive transfusions of blood expanders and blood, the deceased I find went into irreversible hypovolaemic shock which reflects the fact that his peripheries and vital organs had become deprived of oxygen carrying blood for too long. Although the closed head injury may have played some role in the deceased's death, I am satisfied that death, as Dr Gilbert has suggested, was essentially due to the severe blood loss I have described. I find that the cause of the deceased's death was that expressed by Dr Gilbert, namely closed head injury and retroperitoneal haematoma due to fractured pelvis.

- 1.6. No less than four ambulances and their personnel had attended this unfortunate scene. This figure included the ambulance that ultimately delivered the RAH retrieval team. An experienced intensive care paramedic was a member of one of the other ambulance crews. It was he who in the main attended to the welfare of the injured persons, particularly to the deceased whose injuries were quickly and accurately assessed to be life threatening. The efforts of the intensive care paramedic have universally been lauded as demonstrating a high level of dedication and competence, even heroic. Once the RAH retrieval team arrived, they acted quickly, and in the circumstances that prevailed and with the resources at their disposal, the conclusion that they did all they could to save the deceased's life is a compelling one.
- 1.7. The events of that morning, however, have been punctuated by a number of question marks, stemming in the main from suggestions that there was undue delay in the extrication of the injured persons from the vehicle and that the scene was under-resourced in terms of life saving fluids and, it is said, human medical resources. The latter issue has been engendered by the suggestion that existing protocols meant that a local medical practitioner should have been called to the scene in order to lend assistance. It is contended that the ambulance personnel, and in particular the intensive care paramedic to whom and to whose role I have referred, were overwhelmed by the enormity of the situation and that the incident could have benefited from the skills that a local medical practitioner or practitioners could have brought to the incident. I examined issues such as the above and when the whole

incident is viewed in the round, I examined whether anything could or should have been done differently, and if so whether it might have prevented the deceased's death or have improved his chances of survival.

2. The SAAS Procedural Notice and Protocol relating to Rural Trauma Systems Response

- 2.1. This document was promulgated by the South Australian Trauma Advisory Committee in April of 1997 and was designed to 'enhance systems of care to victims of trauma in rural areas' (Exhibit C21j). The Notice sets out criteria for the activation of Trauma Team response, that is to say, the attendance of a hospital retrieval team at the scene of a rural accident involving trauma. The criteria for such activation included motor vehicle accidents with intrusion greater than 35cm, a motor vehicle with entrapment, altered conscious state upon patient examination and pelvic instability. Any one of these criteria would have called for the activation of a Trauma Team in this particular instance. As well, the Procedural Notice attaches a Protocol entitled 'Ambulance Service: Rural Trauma Protocol' which is said in the Notice to have been developed to ensure 'the early involvement of Local Medical Officers'. In the particular circumstances of this case, the Protocol could be seen to bite, which meant that the SAAS were obliged to 'Notify LMO and/or activate support (Paramedical/ALS) response'. There was not inconsiderable debate in the Inquest as to whether the notification of a local medical officer was, because of the use of the phrase 'and/or', a discretionary matter to be assessed by the attending intensive care paramedic or whether such notification was mandatory in the circumstances that prevailed here. One argument was that the 'and/or' was designed to cater for the situation where say, because of the remoteness of the particular location, a local medical officer may not have been in existence or may not have been available. There was also considerable argument addressed to me as to the utility of the attendance of a local medical officer at a rural trauma scene in any event, especially where an intensive care paramedic, who has a greater level of training and expertise in resuscitative measures than an ordinary paramedic, was in attendance. There was argument, for instance, about the comparative levels of skill of intensive care paramedics and local medical officers. It was postulated that the latter might in the main be general practitioners who could conceivably have gained little experience in, or not have the aptitude for dealing with, traumatic roadside scenes with entrapped

victims in the dark, away from the relative comfiture of the clinic. I am bound to say that I found these debates to be largely unhelpful. In my view, the SAAS Procedural Notice and Protocol manifestly mandate the notification of an LMO. As seen, the Notice clearly states that the Protocol was developed to ensure the ‘early involvement of Local Medical Officers’ and the Protocol itself also contemplates the notification of such practitioners in each of the sets of circumstances therein described.

- 2.2. Many rural medical practitioners have been trained in EMST which is a training regime designed to educate doctors in dealing with emergency trauma. There were at least three such practitioners physically in Kapunda during the night in question. One of them, Dr Paramaswaami Parasuramar, was called to the Kapunda Hospital to treat the young man Darren Hiscock who had been taken by one of the ambulances to hospital at an early stage of the proceedings. Dr Parasuramar and another local practitioner, Dr Robert Lecons both gave evidence before me. Both were EMST trained and both satisfied me that they had the skill necessary to effect many of the emergency medical procedures that were employed in this particular case. I deal with those procedures in due course.
- 2.3. Dr Hugh Grantham, who is the Medical Director of the SAAS and who gave evidence in the Inquest, said that there was a role for both an intensive care paramedic and a local medical officer in respect of rural trauma. I agree fully with Dr Grantham when he said at T416 that to compare and contrast the two roles in a competitive manner was not reflective of how the system should work. He said that both health professionals brought to a rural accident scene specific expertise, and that this expertise should be utilised.
- 2.4. Dr Grantham also agreed that it would have been preferable if a local medical officer had attended the scene of this accident. He said:

‘Yes, I do, in fact. The LMO should always be invited if to attend such a scene. It’s a case of more hands and more mutual support is always nice, even if they physically cannot add anything to the exact patient management of the day.’ (T417)
- 2.5. The ‘extra set of hands’ concept was one that was articulated by many of the witnesses who gave evidence. To my mind, the wisdom of the idea cannot be denied, especially in an incident such as this where there were multiple injured persons, two of whom were very seriously injured.

- 2.6. I will in due course deal with the reasons as to why a local medical officer did not attend this scene. Suffice it to say at this point, there were at least two local practitioners who would have been available to attend. I have already mentioned Dr Lecons. A Dr Peter Clements, another Kapunda practitioner, attended the scene but only after the deceased and Ms Baker had been removed from it.
- 2.7. Before turning to the events relating to this particular case, I should deal with one of the arguments that was advanced in support of the contention that local medical officers had limited utility at a rural trauma scene. It was said that many practitioners would have a questionable aptitude in dealing with on-site trauma. The suggestion is that they may be unused to the non-clinical environment or unused to performing medical procedures in circumstances where access to patients, because of entrapment, was not optimal. There may well be practitioners, even EMST trained, who fit the above description. No doubt, such a practitioner would be able to recognise his or her limitations in that regard. Presumably if such a practitioner was called to a trauma scene and could only offer very limited input because of the scene's peculiar circumstances, he or she would say so. No doubt in such a circumstance, the practitioner could at least attempt to organise the attendance of a doctor who was more suited to the occasion. But to extrapolate this difficulty into one which would universally prevent the attendance of a local medical officer at a trauma scene would in my view be specious. It seems to me that the difficulty could be overcome by having those rural practitioners who are willing and able to attend trauma scenes in country areas properly identified such that the local hospital or SAAS, whichever might be considered to be appropriate, could contact the practitioner, confident in the knowledge that the practitioner could bring something of utility to the particular scene.

3. The order of events

- 3.1. According to neighbours, the collision occurred very close to 3am on the morning in question. The first ambulance crew arrived at the scene at 3:20am or a couple of minutes later. This crew included a voluntary SAAS officer, Carol Seeliger, who was also a registered nurse. This was a local Kapunda crew and it was designated Kapunda 181. The SAAS officers initially had difficulty locating the site of the accident scene, possibly because of imprecise directions. The scene was assessed upon their eventual arrival. Ms Seeliger was unable to detect a carotid pulse for the

deceased at first, and thought for that reason that he had already passed away. He was then heard to groan. A pulse and respiration was then detected. A stiff neck collar was applied to the deceased. The other occupants of the vehicle were attended to. Another SAAS crew, Angaston 188, also arrived at some point.

- 3.2. The SAAS communications audiotape transcript (Exhibit C31) reveals that at 3:30am Kapunda 181 communicated by radio with Berri Communications Centre (Berri Comcen) to arrange for a doctor. At almost the same time, a professional, 'career' SAAS crew (Tanunda 181) consisting of an intensive care paramedic, Colin Smith, and another paramedic, communicated to the effect that they were about 15 seconds away from the scene. This communication was followed by a further communication from Kapunda 181 to Berri Comcen, namely:

‘Yep so leave the doctor ... *cutting out*’

(Exhibit C31, p3)

Ms Seeliger told me in evidence that this communication was made in the knowledge that the Tanunda 181 professional crew, comprising an intensive care paramedic, was just about to arrive at the scene. Her view was that in those circumstances the necessity for a local doctor to attend the scene would be a matter for that intensive care paramedic, Colin Smith. I accept her evidence on that issue. In due course, the retrieval team from the RAH arrived and intensive care registrar, Dr Simon Hockley, testified that after his arrival he endeavoured to have a local doctor attend. In circumstances that are not entirely clear, a local practitioner, Dr Peter Clements, arrived at the scene some minutes after the deceased and Nicole Baker had been removed by separate ambulances. I return to this issue later. Suffice it to say the only medical practitioner to attend, as distinct from paramedics, was Dr Hockley.

- 3.3. A retrieval team from the RAH was mobilised. Exhibit C21g, a further SAAS communications audiotape, reveals that communications concerning the attendance of an RAH retrieval team commenced between 3:12am and 3:14am at which time a call was made to a registered nurse at the Intensive Care Unit at the RAH. Dr Hockley was on call at home that morning and was notified that he was required to attend the scene in Kapunda. He proceeded to the RAH and was ultimately mobilised by ambulance.

- 3.4. Efforts were made to mobilise the retrieval team by helicopter and the communications records reveal that there was in my view the appropriate level of consideration given to the feasibility of that taking place, given the existing weather conditions. In the event a decision was made in consultation with the Bureau of Meteorology and SAPOL Aircraft Services that the helicopter would not be able to fly to Kapunda. I received in evidence the statement verified by affidavit of Gregory Mellberg who is the Chief Pilot in Aircraft Services. His statement sets out the existing and forecast weather conditions that prevailed on the night as well as flight limitations and parameters. He concludes:

‘During the early hours of the morning on July 18th the forecast indicates extensive areas of fog and low cloud. In my opinion a flight at night to Kapunda, with hill in the area to a height of 1495 feet, would not appear possible.’

(Exhibit C20a, p3)

That conclusion in my view is supported by the available data and I am satisfied that everything that could be done to mobilise the retrieval team from the RAH by air was in fact done.

- 3.5. I am also satisfied that the retrieval team, mobilised as it was by road, was organised expeditiously and reached the scene in the shortest time possible. I am told that since the events with which the Inquest is concerned, there is now a retrieval team situated at the RAH at all times. In the particular circumstances of this case, as seen, Dr Hockley had to be called from home, but I am satisfied that the delay occasioned thereby was kept to a minimum. Dr Hockley was en-route at 3:40am and arrived at the scene, it is noted, at about 4:42am, at which time Dr Hockley took over the care of the patients.
- 3.6. In the meantime, intensive care paramedic Colin Smith had commenced administering fluids to the deceased and also, inter alia, intubated him with an intratracheal tube. In order to do this, the roof of the vehicle had to be removed to enable access to be gained to the deceased. Mr Smith told me that about 10 to 15 minutes elapsed between the roof being removed from the vehicle and the arrival of the retrieval team. It was in that period that Mr Smith intubated the deceased. When Dr Hockley arrived, he noticed that the tube was imperfectly positioned, such that in all probability, the left lung was not being adequately ventilated. Mr Smith had noticed the inadequate ventilation to the left lung and suspected a pneumothorax. I go into this in more detail

later but shortly before the arrival of the retrieval team, Mr Smith attempted to decompress the left chest by needle insertion. In the event, there was no pneumothorax and in any case it appears that the application of the needle was blocked by the deceased's rib cage.

- 3.7. Upon the arrival of the retrieval team, Dr Hockley assessed the situation. He had already formed some idea of what was taking place as he had been in radio and mobile telephone communication with ambulance personnel. Dr Hockley has described the scene upon his arrival as chaotic and I have no doubt that it was. By that time the two patients had been trapped for over an hour and a half and Nicole Baker was very distressed. Dr Hockley does, however, in no way attempt to diminish the efforts of Mr Smith.
- 3.8. Dr Hockley, who had brought six litres of blood to the scene, administered it as well as a large quantity of other blood expanding fluid. His view was that the deceased was not being infused at a sufficient level. He built on the 16 gauge IV cannula that Mr Smith had utilised and managed to upgrade it to an 8.5 French which is capable of delivering fluid at a much greater rate. Dr Hockley administered adrenaline to support the blood pressure.
- 3.9. In circumstances I will describe later, the deceased and Nicole Baker were extricated from the vehicle under Dr Hockley's supervision. This occurred at 5:34am, nearly an hour after the retrieval team's arrival. The deceased was taken in one ambulance to the RAH where they arrived at 6:46am. Dr Hockley had to secure further blood during the journey. He called ahead to the Lyell McEwin Health Service who arranged for the police to collect it. The police met the ambulance on the way. Nicole Baker was taken by separate ambulance to the Lyell McEwin.
- 3.10. Dr Hockley says that upon his arrival at the scene the deceased was profoundly hypotensive and was experiencing hypovolaemic shock. He states that Mr Smith was doing a very good job of resuscitating the patient but that the circumstances suggested that the SAAS were overwhelmed. He observed the imperfect intubation and rectified it.
- 3.11. Dr Hockley also endeavoured to secure the attendance of a helicopter with a view to having it transport the deceased to hospital once he was extricated. Again, air mobilisation was hampered by the weather conditions.

3.12. Further attempts to revive the deceased at the RAH failed and he was certified deceased at about 8:15am on 18 July 2002.

3.13. Dr Hockley raises a matter of concern. He testified that on more than one occasion he requested the attendance of a local medical practitioner to assist him at the Kapunda scene. His reasons for making those requests were as follows:

‘Clearly, the scene was an overwhelming one. I had arrived at a situation that was chaotic with one man who was clearly dying and another one trapped in the back, who potentially the same thing could have happened to. They had been trapped without medical assistance, and I mean a medical officer, for approximately one hour and 25 minutes. At that time, they had not managed to extricate the patient and that their resuscitating measures really had not helped the patients at all. In fact, I think that he had deteriorated.’ (T198)

Dr Hockley could not precisely recall the identity of the person to whom he had made the requests for a local doctor, but believes it would have been a member of the SAAS.

3.14. I accept the evidence of Dr Hockley in this regard. For reasons that are quite unclear, the request for further medical assistance does not appear to have been passed on. The logical place to which the request would have been conveyed was the local Kapunda Hospital. Dr Parasuramar was in attendance there, but he was occupied with the injured Darren Hiscock who had already been extricated and conveyed to the hospital in one of the ambulances. Dr Parasuramar was not requested to actually attend the scene. I received in evidence the statement verified by affidavit of Dianne Hart who is a registered nurse and who was duty at the Kapunda Hospital that morning (Exhibit C12 and C12a). She had heard the original transmission by Ms Seeliger that a doctor was not required at the scene, but she had arranged for Dr Parasuramar to come to the hospital to deal with Darren Hiscock. Ms Hart believes that she thereafter contacted SAAS communications twice and asked if they required a doctor at the scene and was told that there was a retrieval doctor coming. This appears to have been the reason, or at least a part of it, as to why Mr Smith did not consider it necessary for a local doctor to attend at a time before the arrival of the RAH retrieval team, but it would not explain why Dr Hockley’s requests for a local doctor were not acted upon once that team had arrived. A Dr Clements later arrived at the scene after the patients had been removed from it but there is insufficient

evidence for me to conclude that this was necessarily as the result of an SAAS request (Exhibit C23 and C23a). If it was, it was far too late.

- 3.15. Whether Dr Hockley's requests were not passed on because of the chaotic nature of the incident, or for some other logistical reason, it is difficult to know. Plainly such a request should have been passed on. The observation to be made, however, is that if the relevant protocols had been clearly established and clearly understood at the time, a local doctor would have been at the scene even before the arrival of the retrieval team. It is hoped that in future there will be no repeat of the misunderstandings that occurred here and that a desperate situation of a kind here witnessed would be properly resourced at the earliest possible time.

4. **Did the non-attendance of a local medical officer have any effect on the outcome in this case?**

- 4.1. There is no question but that Intensive Care Paramedic, Colin Smith had his hands full. He was the most senior and most qualified paramedic at the scene. He was confronted with a situation which had unfolded in cold, dark circumstances and he had to deal with two patients both of whom were critically injured and trapped. By far and away the single most important issue threatening the deceased's survival was his internal blood loss. Mr Smith had to deal with this profoundly difficult issue. Mr Smith delivered several litres of blood expanders in an effort to maintain the deceased's circulatory volume and blood pressure. This was delivered via a single 16 gauge IV cannula, inserted into the right arm. It is possible to deliver blood expanders simultaneously through dual IV, one inserted in each arm. This enables a greater volume of fluid to be infused more quickly. However, a diminished circulating volume can cause the veins to collapse rendering the insertion of IV lines a difficult if not impossible exercise. The difficulty with infusing non-oxygen carrying fluids in order to maintain circulatory volume is that in due course the oxygen carrying capability of the blood volume becomes reduced. In effect, the blood becomes diluted of oxygen carrying components and eventually the vital organs become deprived of oxygen.
- 4.2. Associate Professor Geoffrey Parkin, the senior consultant in intensive care at Monash Medical Centre and formerly the director of the Monash Intensive Care Unit,

was called in the Inquest to give evidence. He explained the mechanism of what is known as hypovolaemic shock thus:

‘Q. What's the actual mechanism of death caused by hypovolumic (sic) shock.

A. Arguably cellular oxygenation failure. The patient is left without a venous return and so the cardiac output falls. There's not enough blood returning to the heart so the heart can't pump out any more than is coming into it, so the cardiac output is falling, and as was stated earlier, the haemoglobin is falling by dilution, and not only does each litre of blood carry less oxygen, but there are less litres of blood going to the tissues every minute, so the tissues are being deprived of an oxygen delivery, both by the anaemia and the low flow state, and so cellular function starts to fail and some of the cells that are failing are the cells of the heart, and so the heart doesn't pump so well. Some of the cells that are failing are the cells in the central nervous system that are controlling the cardio-vascular dynamics. Some of the cells that are failing are the muscular cells in the walls of the arteries and the veins, so quite often the tone is lost in the walls of the circulation which further - leading to the loss of muscular tone in those cells which further drops the mean pressure in the circulation and therefore worsens the venous return. So, it's a progressive process of cellular failure in many organs. Other things can happen, including the fact the liver, which is no longer being properly infused, no longer clears lactic acid from the circulation, the patient becomes progressively more acidotic and the urine output shuts down, the kidneys shut down, so there's diminished infusion to the brain with it's control function for the circulation, so it's a positive cascade, if you like, of decline.’ (T524-T525)

4.3. It was his view, from an examination of the clinical records relating to the deceased, that the deceased ‘was a long way down the track of hypovolaemic shock by the time the RAH retrieval team had arrived’ (T524). It will be remembered that blood was not given to the deceased until after the arrival of the retrieval team. He was given six litres of blood at the scene by Dr Hockley. This blood had been brought by the retrieval team. The Kapunda Hospital did not maintain blood because blood deteriorates quickly and might therefore become unusable before there is any need for it. Dr Hockley managed to obtain a further six litres of blood en-route from Kapunda to Adelaide. This was obtained from the Lyell McEwin Health Centre. Dr Hockley utilised a wide bore cannula to administer the blood and other blood expanders. The wide bore cannula, known as a French 8.5, was inserted by Dr Hockley at the scene building on Mr Smith’s existing 16 gauge IV. Its effect was to allow for a considerably greater rate of delivery of fluid. This type of cannula was not available to Mr Smith. Mr Smith, in any event, told me that he was deliberately running the patient ‘dry’, meaning that he was conscious of the fact that a balance had to be achieved between on the one hand maintaining a sufficient circulatory volume and on

the other not making matters worse by disturbing possible clot formation at the site of bleeding thereby increasing the rate of bleeding. Dr Grantham supported this strategy. He said:

‘A. Yes, that is an appropriate practice when there is a haemorrhage that has not been controlled. By that, I mean that if there is a haemorrhage from an open blood vessel, say an arm, and you have controlled it by applying pressure, then there is no restraint on it to what level you push the fluid. If, however, the bleeding is internal, perhaps from a ruptured liver or in this case the pelvis, there is considerable debate in trauma circles as to the correct level you should transfuse a patient up to. May I go on, just on theory?’

Q. Yes.

A. As we have already heard, there is not a lot of point continuing to fill a patient up with clear fluid that carries no oxygen. If you do fill a patient with clear fluid carrying no oxygen to the point where they have a normal blood pressure, it is likely or it is thought that you will displace blood clots that are already there that are stopping haemorrhage, and so although you achieve for a short while or time a better blood pressure, you may pay for it later down the track by running out of oxygen carrying haemoglobin and blood-clotting factors from your circulating volume, because neither of those are in what you are putting in. So, prior to the availability of blood and/or a surgeon to stop the haemorrhage, we have taken the approach, particularly the Ambulance Service, to try and hit this balancing act. The balancing act is a fine line between giving them enough fluid to keep their blood pressure high enough to provide some oxygen to cells and keep them from going into an irreversible shock process without overfilling them. So, what Colin was describing was an appropriate approach of using a peripheral pulse as a gauge of when that point was.

Q. Did you see any aspect from the brief of evidence that suggests that Colin erred in any approach to the administration of fluid.

A. I think that he was doing an appropriate approach to balancing the fluid versus the peripheral pulse to try and hit that sweet spot. There were times, you have heard, when they were falling behind with the fluid and he needed to speed it up but I still think that was the appropriate approach. It is a very difficult sweet spot to hit and so nobody ever manages to get it perfectly.’ (T431-T432)

4.4. On the other hand, Dr Hockley rejected this as a valid strategy. He pointed to the fact that the deceased had a closed head injury as well. The brain injury in his view dictated that cerebral perfusion of blood was extremely important and that the deceased’s systemic blood pressure had to be maintained. To my mind this was obviously a question of balance. Mr Smith clearly opted for what he regarded as a safer approach. The fact of the matter in any event was that Mr Smith did not have a

wide bore cannula at his disposal. In relation to a second IV, Mr Smith was asked at T164:

‘Q. You have got one IV in, did you ever put a second one in.

A. I don't recall going for a second - I do recall looking at the right arm but I don't know why that wasn't placed or whether I got sidetracked on to something else or what happened there.

Q. Do you recall whether or not Dr Hockley ever put an IV in.

A. Not that I can recall, no.

Q. So did it ever become necessary from your observations to put a second IV in the driver prior to him leaving the accident scene - albeit it is a desirable - was it ever necessary for his treatment.

A. The first IV was patent the whole way through and maintaining, as I said, that minimal level at most times. I think we were coping reasonably well with it.’ (T163-T164)

- 4.5. While Associate Professor Parkin said that he could understand Mr Smith’s dilemma in endeavouring to maintain a ‘sweet spot’, in his view the rate of restoration of the blood was imperfect and that this was the most likely reason that the deceased moved into a state from which he could not be recovered. He based that latter opinion on the following:

‘It seems to me that eventually we came to a state where infuse the patient as you would, their circulation could not be restored and the man's health could not be restored. When the retrieval team arrived he was unresponsive and white and cold and had a feint carotid pulse, was shut down and shocked, to use some of the words that were used, and it seemed to me that even from that point, even though the rate of infusion was then increased, the consequence was not that his circulation suddenly turned around and he warmed up and blood pressure returned and he started to look healthy again. He seemed to remain in a shocked state and by the time he arrived, for instance, at the Royal Adelaide Hospital, we'd commented upon his very low CO₂ level in his blood, which seemed to me to imply that his metabolic rate was probably becoming very low and his tissue oxygenation was irreversibly failing. So it seems as though he entered what was well-known in these circles as being irreversible shock.’ (T503-T504)

- 4.6. Associate Professor Parkin expressed the view that rapid infusion of blood expanders even before the arrival of the retrieval team, may have been beneficial, but he was very guarded as to whether this particular patient would in any event have survived. In his report (Exhibit C33) he had expressed the view that there was perhaps a 5%

possibility of survival in these circumstances. In evidence, he explained what he meant by that. He said:

‘Well, with the sort of best estimate technique, I think. I guess what I’m trying to say would be that the probability would be low, because even if we had achieved those things early in the piece I believe the patient was still bleeding very briskly into the pelvis and into the pleural cavities, he was cold, his coagulation was probably impaired, there was a long way to take him from Kapunda to the Royal Adelaide Hospital, and putting all of those things together, together with his already unconsciousness, I think the chances of success would be low. I don’t say they would be zero. I think they would be low.’ (T505)

- 4.7. Dr Lecons, a local practitioner told me at T481 that he had experience in hospital settings of inserting wide bore cannulas. He was asked whether he would have had the capacity to perform such a procedure at the scene of an accident and he said:

‘Look, I’d have the capacity to have a go at it and it is a technique that is difficult. In fact, two weekends ago I was in Brisbane doing a refresher for the EMST course and had some lengthy discussions about this particular device and I reflected that I’d found it difficult on at least one of those occasions that it - going into the ante cubital fossa eye in front of the elbow that I’d found that it didn’t - that it didn’t run because it’s a very, very large bore device and difficult to insert. So if that was put in in good lighting with staff around and exposure, if you translate that into a trauma scenario in an entrapped patient, yes, I would have a go but it would be a very difficult procedure to do.’ (T481)

Dr Lecons said at T486 that he may have had a better chance of securing wide bore access, but acknowledged that it may not have been possible to do any better than the paramedic had done.

- 4.8. In all of the circumstances, it is difficult to conclude that the attendance of a local medical officer would have made any appreciable difference as far as securing an optimum rate of fluid infusion was concerned. On one interpretation of Associate Professor Parkin’s evidence, his chances of survival even with wide bore delivery were almost negligible. This is especially so when it is remembered that the deceased had an internal injury that was rapidly bleeding and that there was a need not to over-infuse him with fluid that did not carry oxygen. What the deceased required was an infusion of blood and this was only effected after the arrival of the RAH retrieval team who administered blood using the wide bore cannula. Ambulances generally do not carry blood for the same reasons that some local rural hospitals such as Kapunda do not keep it. In the circumstances that prevailed in this particular case, time very much worked to the disadvantage of the deceased. There was difficulty in removing

him from the scene. He was trapped in the vehicle, an issue I deal with shortly. He also suffered from the tyranny of the distance from Adelaide from where the retrieval team had to travel and return.

- 4.9. The availability and infusion of blood, however, is perhaps one area where local knowledge and expertise can make a difference. Dr Lecons, who lived 300 metres away from the scene, but was unaware of what was transpiring, told me that there would have been blood available at the Gawler Hospital. He said that he imagined that it could have been transported to the scene in about half an hour and that if he had been called to the scene, he could have commenced administering it before the arrival of the retrieval team. He suggested that this could have taken place perhaps 15 minutes before their arrival. There is no evidence that Mr Smith appreciated this fact or whether it even entered his mind on the occasion in question. He was preoccupied with dealing with the situation at hand and was conscious of the fact that the retrieval team was on its way. However, it seems to me that the above is a good illustration of the value of local knowledge of resources and how the same can be utilised to good effect. It is also an illustration of how effective coordination between the SAAS and local medical expertise could make a difference.
- 4.10. There was another matter that was raised as a concern and it related to the fact that at one point in time the intratracheal tube that was utilised to deliver 100% oxygen to the deceased's lungs became imperfectly positioned with the consequence that only one lung was being ventilated. I accept Mr Smith when he says that he had originally placed the tube to the ideal depth of 21cm at lip. However, it is plain that, as often happens undetected, the tube became dislodged causing it to enter the right bronchus. This had the effect of cutting off the supply of oxygen to the left lung. Partially as a result of this, it appears that Mr Smith formed a belief that the left lung had collapsed, possibly due to a tension pneumothorax which occurs when air escapes from a damaged lung into the cavity between the lung and the chest wall. The build up of air under pressure can act upon the heart and ultimately cause it to stop. The suspicion of a tension pneumothorax caused Mr Smith, on advice given on the telephone by Dr Hockley who was still en-route, to attempt to decompress the left side of the chest by inserting a needle into it. This procedure in the event turned out to be wholly superfluous and was no doubt an unnecessary distraction. At post-mortem there was no pneumothorax detected. The conclusion that the left lung was not being ventilated

because of imperfect intubation is irresistible. The intubation was only rectified when Dr Hockley detected the difficulty and withdrew the tube a sufficient distance to re-ventilate the left lung.

- 4.11. In a situation where the deceased's perfusion was already compromised by the pelvic bleeding, it is said that the non-ventilation of the left lung would have further reduced oxygen delivery to the tissues. Associate Professor Parkin told me this at T528:

- ‘A. In such a situation only the blood going through the right lung is being ventilated and only the blood going through the right lung is being oxygenated. So the blood going through the left lung would still be blue, it would still have the venous oxygen partial pressure and when it joined in the left atrium with the blood coming from the right lung, it would serve to desaturate, reduce the oxygen partial pressure and the oxygen saturation of the blood being pumped out from the left heart into the aorta. So, yes, it would be deleterious to the patient's oxygenation situation to be just ventilating the right lung.
- Q. Would such deoxygenation have any knock-on effect, in terms of his chances of recovery.
- A. Yes - if we say that the mechanism of decline that winds up with irreversible shock is ultimately due to cellular oxygen starvation, where there's not enough blood flow to carry oxygen to the tissues, that state of affairs would be aided and abetted to some extent by deoxygenation of the blood going out in the circulation, as a consequence of ventilation of just the right lung.’ (T528)

- 4.12. Associate Professor Parkin agreed that any adverse consequences would be affected by the duration over which one lung was being deprived of oxygen, but stated that if the duration in question had been as little as 10 to 12 minutes, sub-optimal oxygenation for such a period would not have loomed large in the overall cause of the deceased's death. It is that period of time which I am urged to find was the duration of the imperfect intubation. It seems to me that the period of time of 10 to 12 minutes is a fair estimate. While I think that the ‘extra pair of hands’ in the form of a local medical officer would probably have detected the imperfect intubation, and then have taken steps to rectify that situation, it is impossible to say that the deficient ventilation of the deceased's left lung contributed to the tragic outcome in this case. Nevertheless, the imperfect intubation was an unfortunate occurrence and probably would have been avoided if Mr Smith had at his disposal the expertise of a local doctor. Dr Lecons told me, and I accept this, that judging the position of an intratracheal tube ‘is absolute bread and butter to us’ (T485).

- 4.13. Concern was also raised during the hearing that what appeared to have been a direction by Dr Hockley to give atropine to the deceased was ignored. Atropine is a drug given to stimulate heart rate. It is given to patients who are bradycardic, that is to say, patients who have a dangerously low heart rate. Dr Hockley had no recollection of ordering the administration of atropine, but there is some evidence from the communications log (Exhibit C31) that he did. I was concerned that this had been an important instruction and one that had been ignored. I was ultimately satisfied that the issue was inconsequential. There had been a suggestion by Ms Seeliger in a radio communication that the deceased was 'going braddie', jargon for bradycardia (Exhibit C31, p7). This seems to have prompted the radio communication by Dr Hockley en-route that the deceased should be given atropine. I was satisfied that Ms Seeliger's reference to bradycardia was not a true reflection of the state of the deceased's wellbeing at the time. Ms Seeliger explained to me that although the deceased's pulse rate had slowed, he was not actually bradycardic. I was satisfied with this explanation and there is no evidence that the deceased's wellbeing or resuscitation was compromised by a failure to administer atropine.
- 4.14. There seems little doubt on the evidence that the deceased, having been trapped in the vehicle in the cold for an extended period also suffered from hypothermia and that this did not improve his chances of survival. The infusion of fluids that were below body temperature, if not chilled, would not have helped matters. Associate Professor Parkin suggested that there could have been measures utilised to minimise the risk of hypothermia such as the provision of warm air blowers and blood warmers. Such measures were not available to the intensive care paramedic nor to the retrieval team. In any event there are practical difficulties standing in the way of the delivery of measures such as those suggested. It is difficult to be critical of the fact that the deceased was allowed to develop hypothermia. In the circumstances that existed, it is hard to see how this could have been guarded against, given that the deceased was trapped in the vehicle for an extended period and given that it was necessary for some of this clothing to be removed in order to effect emergency treatment.

5. **The delay in extrication**

- 5.1. The first ambulance had arrived at 3:20am or a couple of minutes later. The deceased was extricated at 5:34am. The roof of the vehicle was removed by SES personnel, but this only enabled greater access to the deceased and had no impact on the ability to

extricate him. There were three things standing in the way of rapid extrication. Firstly, the deceased was wedged into the space that had once been the driver's position. The stobie pole's intrusion into that space served to prevent extrication by the usual method of cutting the vehicle away from the patient, a dangerous procedure even in ideal circumstances. Secondly, the efforts to remove the deceased by moving the seat caused severe pain and distress to Nicole Baker who had a broken femur and whose limbs were trapped under the driver's seat. Thirdly, there was concern that the removal of the deceased would result in more copious internal bleeding sustained by the rapid release of pressure on the pelvis. Ultimately, the idea was hatched that the car be winched away from the pole. This idea was carried into effect, thereby securing the deceased's extrication. This manoeuvre occurred nearly an hour after the arrival of the RAH retrieval team. It has to be recognised that this was not simply a matter of the SES of their own initiative going in with their equipment and then freeing the deceased. The SES personnel were at all times acting on advice from the clinician when it came to the matter of safe extrication.

- 5.2. At first blush, two hours seems to be an inordinate time to have elapsed before extrication. At some point in time, the deceased was going to have to be removed from the vehicle come what may. The risk of his incurring further internal bleeding and suffering other adverse consequences existed whether he was removed two hours or two minutes after the arrival of the emergency services. The extrication was ultimately supervised by Dr Hockley who gave strong pain killers to Nicole Baker and formed a pelvic sling for the deceased. Why these strategies could not have been implemented earlier was to me a somewhat perplexing question. Although the idea of winching the vehicle away from the pole was said to be novel, it did not strike me as an idea that could be celebrated as a stroke of genius. This is not to disparage the efforts of the emergency services. Theirs was an exceedingly difficult task. But when examined in isolation from other considerations, the idea of removing the vehicle away from the pole, as opposed to cutting it away from the trapped patients, seems like an idea that could have been executed earlier.

- 5.3. On the other hand, the immediate welfare of the trapped casualties was of overwhelming importance. Dr Hockley, who impressed me as a resourceful man, but equally a man not given to hyperbole, told me this:

‘We were unable to extricate this man because his lower limbs were actually crushed under the dashboard and the pedals of the car, and also impinged upon by the door because of the intrusion of the Stobie pole into the vehicle. The SES people were doing their best to try and relieve this but this was difficult to do. In this situation, a crush injury, such as this, without adequate resuscitative fluids, intubation and airway control on board, if he was to be decompressed without this, this may actually result in his death as a result of release of large amounts of organic acids and also potassium due to crush injury.’ (T195)

In addition, he said:

‘Q. Are you able to describe how the two patients were extricated from the vehicle.

A. I'd have to say with extreme difficulty. The problem was that the person in question, or the deceased, was in the front of the vehicle and had his legs pinned down and the young lady was in the back and stuck under - partly stuck under the back seat. So whenever you tried to move the front seat that impinged on her and crushed her. As a result of that, trying - but we weren't able to get her out either, so we had to make some pretty difficult decisions so we gave some analgesia to the girl in the back because of her fractures and stabilised them and then with great difficulty began to pull the vehicle apart and try and pull his legs out. At the same time, we did end up squashing her in the back, unfortunately, but it was the only way that we could get them both out.’ (T202)

- 5.4. When everything is considered, I do not think that there is any proper basis to criticise the delay in the extrication. It would be idle to suggest that had a local medical officer been present, the strategies devised and implemented by Dr Hockley would necessarily have occurred at an earlier time. But Dr Peter Sharley who is the Director of Retrieval Services at the RAH, suggested in evidence that a local doctor may have been able to provide pain relief for Nicole Baker such that extrication of the injured persons may have been effected earlier. There is much to be said in favour of this observation. It is possible in my view that an additional professional mind may have devised the same strategy as Dr Hockley and this is another illustration of the desirability of having a local doctor present so that every possible chance of survival can be provided to the stricken patient.

- 5.5. While the presence of a local doctor may not have made any significant difference in this particular case, it is worthwhile setting out Dr Sharley's views about the desirability of it in general terms:

'The scene as described; I wasn't there, but as described to me is one of high demands and very stressful. I think if there are two unconscious people trapped in that car, that all appropriate medical assistance should have been called. What could they have done? I don't believe that in the hour or hour and 20 minutes or whatever it was before the retrieval team got there, I don't believe that you can actually effectively run the command of the scene, and seek about procuring extra resources, supervise the management of two unconscious people and actually coordinate or have input into the extrication of those people. That is a huge demand.' (T303)

6. **Recommendations**

- 6.1. By virtue of Section 25(2) of the Coroners Act 2003 the Court is empowered to make recommendations that might prevent, or reduce the likelihood of, a recurrence of an event similar to the event that was the subject of the inquest.
- 6.2. There is in my view a need for the SAAS Procedural Notice and Protocol to be clarified as far as its stipulation about contacting a local doctor is concerned. I think that the original intention that a local medical officer be called in any event to a rural trauma scene should be expressly articulated and I recommend that further consideration be given by the South Australian Trauma Advisory Committee to that issue.
- 6.3. Dr Sharley also expressed reservations about the stipulation in the Protocol which provides a 30 minute margin between initial notification and the commencement of medical intervention either at the scene or arrival at hospital. Dr Sharley pointed to the illogicality of introducing a 30 minute delay into the activation of the process of retrieval of a critically unwell or injured patient who clearly needs to be in a major trauma centre. I agree that the issue requires further consideration and I would recommend that the South Australian Trauma Advisory Committee give due consideration to that issue.
- 6.4. I would also recommend that the Department of Health consider devising a strategy whereby rural medical practitioners, EMST trained or otherwise, who are capable of rendering emergency medical assistance at rural trauma scenes and are willing to do

so, be identified and that their identities be made readily available to the SAAS and to the relevant rural hospitals.

- 6.5. I heard evidence from Dr Sharley as to the existence of a AIRO medical consultant who is able to coordinate resources in situations involving the attendance of retrieval teams at rural trauma scenes. The consultant who, as I understand it, operates from the RAH, is able now to coordinate resources such as blood, and to coordinate mobilisation by air or otherwise of retrieval teams, the idea being to relieve the retrieval team of many of the logistical hurdles that arise. At the time of Inquest, the AIRO consultant was a concept that was confined in its operation to retrieval teams operating out of the RAH exclusively. Dr Grantham was of the view that it is desirable that there ought to be centralised control involving all participants of retrieval services and that the control not be confined in its scope to any one hospital or unit. I would recommend that the Department of Health give consideration to introducing a centralised AIRO consultant to coordinate retrieval activities generally and not be confined to the one trauma centre.
- 6.6. I have earlier mentioned the issue of hypothermia. As seen, there are practical difficulties in its prevention, particularly in relation to entrapped patients. However, I think it appropriate to make a general recommendation that the Department of Health give consideration to developing strategies for the prevention of entrapped patients developing hypothermia.

*Key Words: Motor Vehicle Accident; Country Areas; Retrieval Teams;
Local Medical Officers*

In witness whereof the said Coroner has hereunto set and subscribed his hand and

Seal the 22nd day of February, 2006.

Deputy State Coroner