CORONERS COURT

OF NEW SOUTH WALES

Inquest:	Into the death of Thomas Redman
File number:	2015/370471
Hearing dates:	16 and 17 May 2018; 12 and 13 June 2019
Date of findings:	24 January 2020
Place of findings:	Downing Centre Local Court, Sydney
Findings of:	Magistrate Ross Hudson
Catchwords:	CORONIAL LAW - cause and manner of death - catastrophic injury - rural emergency response - pre hospital transfer
Representation:	***Counsel Assisting:*** May 2018 - R McIlwaine instructed by K Llewellyn, Legal, NSW Department of Communities and Justice June 2019 - C Melis instructed by B Holliday-O'Brien, Legal, NSW Department of Communities and Justice ***NSW Ambulance Service and Hunter New England Local Health District:*** G Wright instructed by D Aydin, NSW Crown Solicitor's Office ***Mr Brenton, Mr Dougherty and Mr Burrow, NSW Paramedics:*** J Chapman instructed by K Ruschen, Bartier Perry ***Dr Kim and Dr Tall:*** T Hackett instructed by E Phipps, Avant Law ***Family of Thomas Redman:*** May 2018 - D Hooke SC with N Broadbent instructed by L Wilk, Catherine Henry Lawyers June 2019 - B Epstein instructed by E Woodward, Catherine Henry Lawyers

Mr Cook, Helicopter Pilot:
J McCombe, instructed by Westpac Rescue Helicopter Services

Findings:

The findings I make under section 81(1) of the *Coroners Act 2009* (NSW) are:

Identity

The person who died was Thomas Redman.

Date of Death

He died on 16 December 2015.

Place of Death

He died en route to Taree Airport, in a Westpac Helicopter in flight from Gloucester Soldiers Memorial Hospital.

Cause of death

He died of an incised wound to his right axilla, which caused extensive haemorrhaging leading to subsequent exsanguination.

Manner of death

Mr Redman died while en route to hospital in a retrieval helicopter after sustaining a catastrophic injury in Barrington NSW. Despite emergency response and intervention, he died of his injuries.

Contents

REASONS FOR DECISION

INTRODUCTION

1. At around 9.30am on 16 December 2015 Mr Thomas Redman ('Thomas') suffered a large laceration after putting his arm through a window on a rural property outside of Gloucester, at Barrington NSW. It caused an incised wound in the right armpit which completely transected the basilica vein, brachial artery and subscapular artery causing a massive loss of blood.

2. He died some time shortly before 2.00pm that day in a Westpac Helicopter in flight from Gloucester Soldiers Memorial Hospital to Taree Airport.

THE ROLE OF THE CORONER

3. The primary duty of a coroner, as described in s 81 of the *Coroners Act 2009* (NSW) (the 'Act') is to make findings as to:

   a) the identity of the deceased;
   b) the date and place of the person's death
   c) the physical or medical cause of death; and
   d) the manner of death, or in other words, the circumstances surrounding death.

4. In addition, to the above, pursuant to s 82 of the Act, the coroner may make recommendations in relation to matters that have the capacity to improve public health and safety in the future which are connected to the death in question.

5. This inquest is not a criminal investigation or proceedings intended to determine fault or lay blame. It is an examination of the circumstances of the manner of Thomas' death, to understand how the situation developed and evolved and what action was taken by the necessary services and the response of the same services.

6. In this case there is no question as to the identity of Thomas or to the approximate time or place of his death. Rather the inquest focused on dealing with a number of issues, ranging (and in summary) from the treatment provided by the paramedics, the decision to transfer to John Hunter Hospital, the treatment provided by Dr Kim and Paramedic Officer Burrow, the nature and extent of decisions made by Dr Tall – Senior On Call Consultant, whether the State Retrieval Consultant should have been involved earlier in Thomas' treatment, consideration of transferring Thomas earlier to Manning Base Hospital, and the role, if any, that Dr Al-Mahaidi, a surgeon operating at Gloucester Hospital should have had in the treatment of Thomas.

THE EVIDENCE

7. The Court took oral evidence overall several days at each of Taree and Forster Courts. The Court also received extensive documentary material. This included witness statements, medical records, and photographs.

8. Further and more specifically the inquest received the benefit of evidence of an esteemed conclave of five medical experts. The collective qualifications and

experience of the members of the conclave was of great assistance in focusing on the issues arising out of Thomas' death.

9. In summary, and at the outset, it should be stated the evidence revealed that the nature of the injury suffered by Thomas was extraordinary, both in terms of initial and definitive treatment. The injury sustained was immediately threatening due to the rapid and significant blood loss and significant difficulty controlling blood loss. It was a very challenging case for both the responding paramedics and medical retrieval team. As one medical witness put it in evidence, "to put it in perspective, the scarcity of this condition would such be that even in a major trauma service, of which there are six or seven in NSW, no single one would see more than a handful of such cases each year."

BACKGROUND

10. Thomas was 18 years of age at the date of his death and had a sad history of mental illness including attempts at self-harm, possible previous suicide attempts and had been scheduled under the provisions of the *Mental Health Act 2007* (NSW).

11. He resided on the date of his death with his mother, Ms Jane Redman and sister, Ms Sarah Redman at 721 Thunderbolts Way, Barrington.

12. His mother had made many attempts to obtain appropriate treatment for him.

13. On 18 November 2015 he was arrested and charged by police following a domestic related matter in which his mother was the victim. An Apprehended Violence Order was served on him. He was on bail and due to appear at Gloucester Local Court on 16 December 2015.

14. Ms Jane Redman had attempted to have this application withdrawn by attending Gloucester Police Station some days before the date for his court appearance without success. She was told that she would have to speak to the Police Prosecutor at Court on 16 December 2015.

15. Prior to and particularly on the day of his court appearance he became extremely agitated about his appearance at court apparently concerned that he may be scheduled under the *Mental Health Act* again.

16. On 16 December 2015 despite the best efforts of his mother, Ms Jane Redman, Thomas refused to attend Court. His mother accompanied by his grandmother Mrs Wendy Redman left him at home at the family residence at Barrington West to attend Court and try and have the proceedings against him withdrawn.

17. Thomas was left at home alone. Although present at the nearby residence of his grandmother Mrs Wendy Redman at 7 Barrington Road, Barrington West were his uncle Mr Peter Redman, and a friend of Mrs Wendy Redman, Mr Ron Taylor.

18. Shortly before 9.30am, Thomas came up to the 7 Barrington Road property, and demanded his mother's phone number. Mr Peter Redman provided this to Thomas and after some discussion about Thomas' problems returned to mixing milk. Very shortly after this Peter Redman heard a smashing sound and looked up and saw blood spurting from Thomas' arm.

19. This action by Thomas was deliberate; however the Court on an assessment of the

material cannot be satisfied as to whether it was an attempt at suicide or an impulsive act of selfharm carried out in anger or fear by Thomas.

THE NATURE OF THE INJURY AND CAUSE OF DEATH

20. The injury occurred after Thomas put his arm through a glass window.

21. The direct cause of death was an incised wound to the right axilla. The wound had completely transected the basilica vein, brachial artery and subscapular artery causing extensive haemorrhage leading to subsequent exsanguination and death.

22. The incision was 150mm in length exposing a 100 x 120mm area in the right axilla. The incision was clean edge arc shaped. The adjacent muscles, soft tissues and large nerve bundles were also transected.

23. The transected artery was located approximately 15cm from the heart and located in a region which was difficult to apply effective compression to stop further bleeding.

TIMELINE OF 16 DECEMBER 2016

Date and time

24. The incident occurred at approximately 9.30am on 16 December 2015 at Barrington, NSW ('the property').

25. Thomas was described as having, "blood spurting out from [his] armpit" and "gushing out of him".[1]
26. 000 was called at 9.32am by Thomas' uncle, Peter Redman. At the same time, Peter put pressure on the wound.

27. In Dr John Vinen's opinion, most of the blood loss suffered by Thomas would have already occurred prior to the 000 call. [2]

The first responders

28. The paramedics were assigned at 9.35am, and were en route at 9.38am.[3] The paramedics were Hugh Dougherty and an intensive care paramedic, Ian Brenton.

29. The ambulance responded with lights and sirens and arrived at the property at 9.46am, and treatment commenced immediately.

30. Thomas was conscious and talking. His wound was packed with multiple large trauma pads, the arm lowered to the patient's side to close the wound and direct pressure applied against his body. Thomas was administered high flow oxygen and IV fluids; he had no palpable radial pulse or blood pressure. A tourniquet could not be used because of the location of the wound. It appeared to paramedics that there

[1] Statement of Peter Redman, Tab 12 at [8]; TS NSW Ambulance recordings, Tab 8; Statement of Hugh Dougherty, Tab 14
[2] Report of Dr Vinen, Tab 5, p17
[3] Statement of Hugh Dougherty, Tab 14

was a lot of blood on scene and, "aprox 1 litre lost from patient."[4] The wound appeared to be "deep" in the right armpit.

31. The paramedics, through the NSW Ambulance Northern Control Centre, contacted the Aeromedical and Retrieval Service Control Centre ('Control Centre') and provided a MIST[5] report at 9.54am including a verbal report as to a, "severe partial amputation of the right arm".[6] The Control Centre was informed, by the Northern Control Centre, to activate the helicopter immediately to transfer Thomas to a major trauma centre.[7] This was at 9.55am. The closest major trauma centre was John Hunter Hospital in Newcastle. At 9.56am the Control Centre helicopter despatcher, known as the Rapid Launch Trauma Coordinator (RLTC), called the Newcastle helicopter base to task them on the case. This call took 4 minutes and detailed information about the scene location was given. The call concluded at 10.00am.[8]

The Control Centre

32. The Control Centre tasks aeromedical vehicles and medical teams to critically ill patients for pre-hospital and inter-hospital transfers throughout NSW.[9] The present case was a pre-hospital transfer. The Control Centre maintain an oversight of its resources either via the tracking systems, or through monitoring the mission updates typed into the CAD system by the relevant NSW Ambulance control centre, in this case, the Northern Control Centre.

Pre-hospital mission

33. In general, a response to a patient in a pre-hospital setting is referred to as a "pre-hospital mission". Where a patient has not reached a health facility, a pre-hospital mission involves the NSW Ambulance Service responding to the scene and transporting the patient to an appropriate hospital. What are known as the T1 and T3 Protocols apply to pre-hospital missions involving the management of major trauma.[10] The NSW Ambulance Service tasks helicopters in accordance with the T3 protocol. These protocols are explained in further detail below.

34. In the pre-hospital environment a major trauma patient is defined as any patient that meets any of the criteria of the Trauma Triage Tool. Major trauma refers to patients with multiple injuries requiring complex multidisciplinary management or single system injuries of a potentially life-threatening nature requiring complex management at specifically designated and equipped health facilities. There is no dispute that Thomas was a major trauma patient.

The State Retrieval Consultant

35. The role of the State Retrieval Consultant ('SRC') is to assist in the day to day

[4] Statement of Hugh Dougherty, Tab 14
[5] Major Trauma Criteria - Mechanism, Injuries, Signs and Symptoms, Transport (MIST)
[6] Statement of Hugh Dougherty, Tab 14; Statement of Ian Brenton, Tab 15; NSW Ambulance Incident detail Report, Tab 24
[7] Statement of Hugh Dougherty, Tab 14; Statement of Ian Brenton, Tab 15
[8] Statement of Dr Gary Tall, Tab 19 at [11]
[9] Statement of Dr Gary Tall, Tab 19 at [2]
[10] Protocol T1: *Pre-Hospital Management of Major Trauma* (July 2015) and T3: Helicopter Operations - *Major Trauma - Primary Response* (July 2015). Both protocols have since been updated

operational and clinical coordination of Aeromedical Operations in NSW. This includes the provision of clinical advice when necessary to requesting practitioners and retrieval services, facilitating regional and metropolitan hospital networks, assisting with the operational and clinical coordination of all retrieval activity and assisting with clinical triage of the Air Ambulance caseload and pre-hospital helicopter tasking.[11]

36. On 16 December 2015, the SRC was Dr Richard Mahoney. Dr Mahoney was based in Lismore and was not physically located in the Control Centre on the day. The SRC has support if needed from the Senior On-Call Consultant. The role of the Senior On-Call Consultant is to be available if the SRC is temporarily unavailable due to another tasking or if the SRC requires a second opinion. On 16 December 2015, Dr Gary Tall was the Senior On-Call Consultant. As the senior clinician physically located at the Control Centre, he took charge of the clinical discussions. [12]

37. The Clinical Coordinator of the Control Centre relevantly provides oversight and tracking of missions to ensure appropriate progression with escalation as required by the SRC. The Clinical Coordinator on the day was Jon Newman.

38. Road paramedics are able to contact the SRC for advice regarding the treatment or transport of critically ill or injured patients. It would also be open to the medical team on the helicopter on a pre-hospital mission to contact the SRC for clinical input. [13] Contact is made through the Control Centre.[14]

At the scene and prior to the arrival of the helicopter retrieval team

39. At 10.13am, paramedics were given an ETA of the helicopter of 10.35am, and advised of a "quick load at the location due to weather".[15]

40. Thomas was moved into the back of the ambulance. The paramedics' evidence is that they moved him because he would be out of direct sunlight, not exposed to the flies which were in great numbers at the scene (being a summer's day) and away from the pool of blood he was lying in, thus reducing his infection risk. [16]

41. Due to the massive blood loss Thomas had sustained, he became agitated and combative and caused the packing under his armpit to dislodge and that started the bleeding (haemorrhaging) again at 10.34am.[17] Maintaining haemorrhage control of Thomas was the paramedics' biggest problem, with one paramedic required to maintain constant pressure on the padding on the wound. [18]

Helicopter retrieval team en route to Barrington and at the scene

42. The helicopter took off from Newcastle at 10.10am. [19]

[11] Statement of Dr Sarah Coombes, Tab 55 at [20]
[12] Statement of Dr Gary Tall, Tab 19 at [16]
[13] Statement of Dr Sarah Coombes, Tab 55 at [27]
[14] Statement of Dr Sarah Coombes, Tab 55 at [35]
[15] Cook, TS, 12 June 2019, p10
[16] Statement of Ian Brenton, Tab 15 at [12]; Brenton, TS, 12 June 2019, p26
[17] Statement of Hugh Dougherty, Tab 14; Dougherty, TS, 16 May 2018, p45
[18] Brenton, TS, 12 June 2019, p27
[19] Flight Record of Westpac Rescue Helicopter Service, Tab 29

43. On board the helicopter was the retrieval doctor, Dr James Kim and critical care helicopter paramedic, Michael Burrow. The helicopter carried two units of O negative blood. All Retrieval Services throughout NSW now carry three units of O negative blood. This is managed by the local or designated blood bank for the service. [20]

44. When the helicopter landed at 10.41am with engines off at 10.45am, Thomas was assessed immediately. He appeared extremely agitated and combative, trying to sit up, lifting his arms and folding his legs, and paramedics were attempting to hold him down.[21] Blood was attached to the IV line and given.

45. At the same time, Dr Kim removed the blood soaked bandage and the dressings applied to the wound, which he observed to be oozing with blood, to see if better haemostasis could be obtained.[22] Dr Kim observed a little gush of blood when the dressings were removed.

46. Celox granules and gauze were applied onto the wound by Dr Kim whilst trying to maintain as much pressure as possible. Crepe bandages were also applied in an attempt to put the arm closer to the body. Tranexamic acid was also administered via the IV cannula. According to Dr Kim, appropriate haemostasis was achieved.[23]

47. Thomas became more agitated and difficult to manage. The IV access on the left arm was lost after one unit of blood was finished.[24] Thomas was taken out of the ambulance on the stretcher so that Dr Kim could access his left hand side and try and insert the IV cannula. Ketamine was given to him. IV access was not achieved and Thomas became bradycardic and went into cardiac arrest. Dr Kim elected to drill a hole into Thomas' humerus so that he could be given interosseous blood.[25] One milligram of adrenaline was given through the IO access. CPR was given and spontaneous circulation re-established. Thomas was intubated during the resuscitation process.

48. At 11.45am Gloucester Soldiers' Memorial Hospital ('Gloucester Hospital') was advised to call in an on-call doctor and have bloods ready. [26]

49. Thomas was taken to Gloucester Hospital by road ambulance at 11.47am to obtain more blood products and further stabilise him before transfer to John Hunter Hospital.

50. Dr Kim was of the view that Thomas was too unstable to be transported by helicopter to Gloucester Hospital.[27]

51. The helicopter departed at 11.56am, to head to Gloucester Hospital.

52. A second unit of blood was given in transit to the hospital.[28]

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[20] Statement of Dr Richard Mahoney, Tab 20 at [18]
[21] Statement of Dr Jin-Ku Kim, Tab 16; Statement of Michael Burrow, Tab 18; Kim, TS, 16 May 2018, p74 and 12 June 2019, p56
[22] Statement of Dr Jin-Ku Kim, Tab 16; Kim, TS, 16 May 2018, p74
[23] Statement of Dr Jin-Ku Kim, Tab 16; Kim, TS, 16 May 2018, p55
[24] Statement of Dr Jin-Ku Kim, Tab 16; Kim, TS, 16 May 2018, p76
[25] Kim, TS, 16 May 2018, p77
[26] Statement of Michael Burrow, Tab 18; NSW Ambulance Incident Detail Report, Tab 24
[27] Kim, TS, 16 May 2018, p81
[28] Statement of Dr Jin-Ku Kim, Tab 16

Arrival at Gloucester Hospital

53. The ambulance arrived at Gloucester Hospital at 12.05pm. The helicopter arrived at 12.03pm, landing in the sports ground near the hospital. [29]

54. On arrival, Thomas was profoundly hypothermic with a temperature of 33.3C. No palpable peripheral pulse could be detected and no blood pressure could be registered. Oxygenation was 80% when bagging. There was little evidence of ongoing bleeding.[30]

55. After a few failed attempts, an IV cannula was inserted by the GP Registrar, Dr Sanjana Acharya, for the transfusion of blood to Thomas. [31] Three units of blood were given to the patient. All available blood from the Hospital was used, which was 3 units. No other blood products were available onsite. Thomas was intubated, on adrenaline and sedation infusions. Haemostasis was achieved.[32] Some form of stability was achieved, however Thomas remained critically ill. [33]

56. Dr Saad Al-Mahaidi, a general surgeon, was operating with Anaesthetist Dr James Bird on that day at the hospital. Dr Bird offered his and Dr Al- Mahaidi's assistance on two separate occasions. The offers of assistance were declined by Dr Kim. [34]

57. The Control Centre's Senior On-Call Consultant, Dr Gary Tall, was first made aware of Thomas' case at around 12.36pm by the Control Centre's clinical coordination nurse, Jon Newman. [35]

58. Dr Tall works fulltime as the Clinical Manager of Retrieval with NSW Ambulance, a position he has held for the last 14 years. He has worked continuously in medical retrieval in NSW since 1993. His responsibilities include clinical oversight of the activities of the Control Centre. Dr Tall was in his office, adjacent to the Control Centre at the time. As the SRC (Dr Mahoney) was remote from the Control Centre, and this was a complex and time critical case, it was appropriate for the Clinical Coordination nurse to initially advise Dr Tall.

59. Michael Burrow called the Control Centre at 12.43pm and a teleconference occurred with Dr Kim, Dr Tall and the SRC. As the senior clinician in the Control Centre, Dr Tall took charge of the clinical discussion.[36]

60. The teleconference participants were told by Mr Burrow that he had spoken to the pilot, Peter Cook, and that they were "*not in a good situation as far as weather. There's thunderstorms impending. He's basically said if we can leave now he's got a window otherwise we're gunna get thrashed by storms. John Newman mentioned something about getting some blood. The pilot did suggest maybe if we went to Taree and he'd be happy to get in at Taree and have a car waiting with some blood*…"[37]

[29] Flight Record of Westpac Rescue Helicopter Service, Tab 29; Cook, TS, 17 May 2018, pp80-81
[30] Gloucester Soldiers' Memorial Hospital Records, Tab 33
[31] Gloucester Soldiers' Memorial Hospital Records, Tab 33; Statement of Dr Sanjana Acharya, Tab 49; Kim, TS,16 May 2018, p84
[32] TS of NSW Ambulance recordings, Tab 8, p46 line 6
[33] Kim, TS,16 May 2018, p 84 and 13 June 2019, p26
[34] Statement of Dr Saad Al-Mahaidi, Tab 53
[35] Statement of Dr Gary Tall, Tab 19
[36] Statement of Dr Gary Tall, Tab 19
[37] TS NSW Ambulance recordings, Tab 8, p45, lines 8 -13

61. The discussion proceeded as follows:[38]

MALE VOICE: That's sort of going in the wrong direction, isn't it?
MALE: I think they want to go coastal to go around the storms.
MALE VOICE: Yep
MALE: They did mention it wasn't a big diversion and it would suit them to get some fuel anyway because there are (indistinct) on
MALE VOICE: okay, if you want to do that we can tie up – we can arrange some blood for you. We've already spoken with Taree blood bank and…
MALE: Yep
MALE VOICE: You'd be going to the airport at Taree, would you?
MALE: Yes. So our plan would be to, yeah, just to go to Taree Airport, get some fuel, get some blood and then continue to John Hunter. I guess given that what you've just said then for that option we'd sort of need to start packaging now. If James is going to start looking for arterial lines and things like that we're likely to miss our window.
MALE VOICE: Yeah. No. In that case if you're going to lose your window then just get out of there…
MALE: okay, right.
MALE VOICE: …and do what you can on the way, but if you've got, you know, one big IV access plus an IO which you can run the sedation through or something…
MALE: Yep.
MALE VOICE: …and if you think you've stopped the bleeding then you should just get going.
MALE: Yeah. We're pretty happy we've got haemostasis and we've got – we've now got monitoring. We've got some access and it's running.

62. During this teleconference, it was decided to transport Thomas to Taree airport for refuel of the helicopter as well as gaining access to more blood products. The Control Centre would arrange for blood products to meet the helicopter at Taree Airport. During the call, it was made clear by Dr Tall that, "if the blood's not there at Taree Airport" the retrieval team should just refuel and keep going. [39]

63. A request was received from the Control Centre by Manning Base Hospital for 5x Packed Cells, 5x Fresh Frozen Plasma, and 5x Cryoprecipitate at 1.05pm.[40]

Departure from Gloucester Hospital

64. Around 1.05pm, Thomas departed Gloucester Hospital. At the time of departing Gloucester Hospital, Thomas' blood pressure was recordable and heart rate had picked up – HR ~ 70bpm and BP ~ 110/80 at transfer. Thomas was then loaded into the road ambulance and driven to the sports ground near the hospital where the helicopter was waiting. Thomas was unloaded from the road ambulance and re-loaded onto the helicopter. [41]

65. The helicopter engines were turned on at 1:30pm and departed for Taree at

[38] TS NSW Ambulance recordings, Tab 8, p 45, line 15 to p46, line 7
[39] TS NSW Ambulance recordings, Tab 8, p47
[40] Statement of Dr Osama Ali, Tab 54
[41] Statement of Michael Burrow, Tab 18; Gloucester Soldiers' Memorial Hospital Records, Tab 33

1.32pm[42], with an estimated time of arrival of 1.55pm.[43]

66. Dr Kim said in evidence that from the conclusion of the teleconference at around 12.55pm to the ultimate departure of the helicopter around 30 minutes later, Thomas was "packaged" up, including getting all the medical team's gear ready and onto the aircraft and getting Thomas safely onto the stretcher. Because of the very sensitive nature of the patient's condition, extreme care was taken to remove the patient because any bumps could have potentially changed the clinical state of the patient. In Dr Kim's experience, 30-35 minutes of transit time would have been "a very good time" for the medical team.[44]

67. Dr Tall contacted John Hunter Hospital and arranged for a vascular surgeon and emergency surgery facilities for Thomas' treatment as soon as he arrived.[45]

68. At 1.42pm Thomas again had a cardiac arrest.[46]

69. Dr Tall was advised of this whilst in transit to Taree Airport. He contacted Taree Hospital and arranged a surgical team to undertake emergency surgery to attempt to stem Thomas' blood loss at Taree Hospital.[47]

70. Resuscitation attempts failed.

71. Thomas died of cardiac arrest at around 1.45pm on 16 December 2015 while in the helicopter[48], some 4 hours after he sustained his injury.

Weather

72. The weather forecast for the day of 16 December 2015 indicated that the weather was generally adequate for visual flight in the Taree/Gloucester area. However, the forecast did indicate the possibility of thunderstorms in the day.[49] The helicopter would have been able to fly directly to John Hunter Hospital from Gloucester Hospital. The pilot, Mr Cook, was more concerned about getting to Taree than Newcastle as the storm was closer to the Taree area.[50] The helicopter could have tracked directly from Gloucester to Newcastle (with possible minor diversions) on 16 December 2015, if required to do so, without the need to refuel.[51] The helicopter did refuel at Taree. Mr Cook said this was because it would have been "almost incompetent not to take on fuel when it was available"[52] and there was time to refuel.[53]

73. Mr Cook said that on the day, he was following the weather on the ipad/iphone on the Bureau of Meteorology website, specifically the radar imaging loops that are

[42] Flight Record of Westpac Rescue Helicopter Service, Tab 29
[43] TS NSW Ambulance recordings, Tab 8, p88
[44] Kim, TS, 12 June 2019, p46, lines 21-50; p47, lines 1-8
[45] TS NSW Ambulance recordings, Tab 8, p71
[46] TS NSW Ambulance recordings, Tab 8, p92
[47] TS NSW Ambulance recordings, Tab 8, pp 97-99
[48] Statement of Dr Jin-Ku Kim, Tab 16; Flight Record of Westpac Rescue Helicopter Service, Tab 29
[49] Statement of Peter Cook, Tab 50
[50] Supplementary Statement of Peter Cook, Tab 50A; Cook, TS, 17 May 2018, p118
[51] Further supplementary statement of Peter Cook, Tab 50B at [27]
[52] Cook, TS, 17 May 2018, p121, line 48
[53] Further supplementary statement of Peter Cook, Tab 50B at [9]

available on that website. [54]

74. Mr Cook and Mr Burrow had a conversation about the weather at Gloucester Hospital just prior to the teleconference between the medical team, SRC and Senior On-Call Consultant. Mr Burrow believes it took place in the corridor outside of the resus bay.[55] Mr Burrow recalls Mr Cook having the "company iPad" and was looking at the radar imaging and was using that as an adjunct to explain to him the weather.[56] Mr Cook could not recall where the conversation took place. It is suffice to say that, looking at the matter with the benefit of hindsight, both parties left that conversation with a different understanding.

75. Mr Cook vaguely recalls talking to Mr Burrow.[57] He recalls Mr Burrow requesting his opinion on the possibility of diverting to Taree rather than tracking back to Newcastle. Mr Cook recalls Mr Burrow saying that blood supply was the critical issue and they had depleted all the blood and the nearest blood was Taree. Mr Cook recalls responding by saying "Yes, that's possible, but we really need to depart as soon as possible because of the storm activity in the area."[58] Mr Cook next recalls Mr Burrow telling him (it can be reliably inferred after the teleconference) words to the effect of, "Okay, that's what we would like to do."[59] Mr Cook maintains that, to his understanding, both then and now, the purpose of going to Taree was not to collect fuel; rather it was a medical decision made by those treating Thomas.[60]

76. Mr Burrow, similarly, could not remember specifics of the conversation with Mr Cook.[61] He said there were lots of facets to the conversation. He was trying to explore all the options. Taree was the closest resource for blood and that came from a conversation he had with the Control Centre. He recalls Mr Cook mentioning that because of the weather it would be ideal to get some fuel at Taree as well. So, Mr Burrow came up with the conclusion that it would be in everyone's best interest if, "we made a plan to go to Taree, both to get fuel and to get blood."[62] It was Mr Burrow's understanding that Mr Cook was saying he could fly to John Hunter Hospital from Gloucester Hospital taking a coastal path and he would need to stop for fuel in Taree. [63]

77. Mr Burrow acknowledged in his evidence that conversations at Gloucester Hospital were "occurring with a lot of concurrent activity whilst treating the patient" and he was "possibly distracted". [64] This is not at all surprising as Mr Burrow's primary focus would have been patient care. He said one of the other conversations he would have had would have been with Dr Kim and it would have included the need to get more blood. This is consistent with evidence given by Dr Kim that at Gloucester Hospital his main focus was getting more blood rather than providing Thomas with definitive treatment. To Dr Kim's mind the patient was too unstable to fly to Newcastle without any blood products whatsoever. [65] The conversation between Dr Kim and Mr Burrow tends to show that getting more blood product was a matter that factored into Mr

[54] Cook, TS, 17 May 2018, p118, line 6 and 12 June 2019, p3
[55] Burrow, TS, 17 May 2018, p151, line 12
[56] Burrow, TS, 12 June 2019, p14, line 39
[57] Cook, TS, 17 May 2018, p118, line 19
[58] Cook, TS, 17 May 2018, p118, line 39
[59] Cook, TS, 17 May 2018, p118, line 43
[60] Cook, TS, 17 May 2018, p122, lines 1-5
[61] Burrow, TS, 17 May 2018, p151, line 18
[62] Burrow, TS, 17 May 2018, p151, lines 20- 34
[63] Burrow, TS, 17 May 2018, p151, lines 1-5
[64] Burrow, TS, 17 May 2018, p156, lines 29-38
[65] Kim, TS, 16 May 2018, p99, lines 39 - 46

Burrow's thinking.

78. Ultimately, the evidence shows that Mr Burrow and Mr Cook left their conversation with a different understanding. It was Mr Burrow's understanding that was put to the members of the teleconference. Relevantly, Dr Kim said in evidence that he was told, by Mr Burrow in the teleconference, that it was not possible to fly direct from Gloucester Hospital to the John Hunter Hospital and that there was a need to go coastal and it was necessary to land at Taree Airport to refuel.[66]

79. Dr Tall similarly said in evidence, that in that teleconference he was advised, by paramedic Burrow, that a direct flight to John Hunter Hospital was not going to be possible due to weather and that they would have to go via Taree. Dr Tall's preference was for Thomas to be flown directly to John Hunter Hospital. Had there been no impediments, the strong preference of Dr Tall would have been to go directly to John Hunter Hospital rather than divert to Taree for bloods.[67]

80. Dr Kim said that even if he had become aware that a direct flight to Newcastle was possible without the need to divert to Taree, he would have rung up Dr Tall or Dr Mahoney again to ask their advice.[68] Had this been the case, the strong preference of Dr Tall would have been that Thomas be flown directly to John Hunter Hospital. The duty of care for the patient lies with the most senior clinician looking after the patient. In this case that was Dr Kim. But, as Dr Tall observed in evidence, Dr Kim would be wise to take input from a variety of sources. [69]

81. From an assessment of the evidence it can be concluded that tracking from Gloucester to Newcastle would not have changed the outcome for Thomas, having died en route to Taree, prior to even landing, which is a shorter distance than Newcastle. The set of circumstances does however raise the issue of a breakdown in communication in what were difficult circumstances but also in a "whole mission" that had "weather issues." [70]

Facilities available at Gloucester Hospital and Manning Base Hospital as at 16 December 2015 [71]

82. Neither Gloucester Hospital nor Manning Base Hospital had vascular surgery services nor any surgeons with vascular subspecialties.

83. In many respects the resources at Gloucester Hospital were limited. Gloucester Hospital had 3 units of blood available.

84. The blood stock on hand on 16 December 2015 at Manning Base Hospital was as follows:
    - o+ve - 13 units
    - o-ve - 11 units
    - Fresh Frozen Plasma (FFP) - 45 units
    - Platelets-0 units
    - Cryoprecipitate - 36 units

[66] Kim, TS, 16 May 2018, p97, lines 12- 50
[67] Tall, TS, 12 June 2019, p73, lines 8-25, p74, lines 1-2
[68] Kim, TS, 16 May 2018, p99, lines 39-46
[69] Tall, TS, 12 June 2019, p74, lines 10-14; Expert conclave, TS, 13 June 2019, p 12, lines 17-29
[70] Cook, TS, 12 June 2019, p13, line 39
[71] Statement of Dr Osama Ali, Tab 54

Facilities available at John Hunter Hospital

85. John Hunter Hospital is a Tertiary Trauma Hospital that provides a vascular service.[72]

THE ISSUES RAISED AND EXAMINED AT INQUEST

85. The factual scenario above, raises the following issues:

a. Was the treatment provided by Paramedic Officers Dougherty and Brenton to Thomas reasonable, appropriate and in accordance with good emergency practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

b. Was the decision to transfer Thomas to John Hunter Hospital by the Aero Medical Retrieval Service reasonable and appropriate in all the circumstances?

c. Was the treatment provided to Thomas by Dr Kim and Paramedic Officer Burrow reasonable, appropriate and in accordance with good emergency medical practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

d. Were the decisions made on the day by the Senior On Call Consultant, Dr Tall, as to transfer of Thomas and generally, reasonable, appropriate and in accordance with good emergency medical practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

e. Should the State Retrieval Consultant have been involved in dealing with Thomas' treatment earlier than 12.36pm on 16 December 2015? If so, would this have made any difference to the outcome of the treatment of Thomas?

f. Should consideration have been given to transferring Thomas to Manning Hospital Taree for treatment at an earlier time having regard to its proximity and the climatic conditions prevailing in the area?

g. Should consideration have been given to involving Dr Al-Mahaidi, a surgeon who was operating at Gloucester Hospital on 16 December 2015, in the treatment of Thomas?

EXPERT CONCLAVE

86. The expert conclave was eminently qualified and consisted of:

a. Dr John Vinen, emergency physician with experience in the retrieval, pre-hospital environment.

[72] NSW Health: *Selected Speciality & Statewide Service Plans (No.6) - NSW Trauma Services,* Tab 47, pp61, 82; Statement of Dr Osama Ali, Tab 54

b. Dr John Raftos, specialist emergency physician, St Vincent's Hospital and one of the first doctors in the Westpac helicopter rescue service which ran from North Shore Hospital between 1976 and 1994.

c. Dr John Crozier, vascular and trauma surgeon at Liverpool Hospital. Dr Crozier has a military background having been deployed to Rwanda and subsequent military deployments. This has given him familiarity with helicopter base and pre-hospital care and retrieval.

d. Dr Andrew Pearce, emergency physician and a pre-hospital and retrieval medicine specialist at the Royal Adelaide Hospital.

e. Dr David Hardman, vascular surgeon, Canberra Hospital. Dr Hardman has not worked in the helicopter service.

DETERMINATION OF THE ISSUES

Was the treatment provided by Paramedic Officers Dougherty and Brenton to Thomas reasonable, appropriate and in accordance with good emergency practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

87. There were significant challenges faced by the paramedics:[73]

- The seriousness of Thomas' condition on arrival
- The type of injury he sustained
- Vascular access and inability to use a tourniquet
- Lack of blood, blood products and other agents
- The location of the scene of injury being a considerable distance from a trauma centre
- Lack of locally available doctors with the required vascular skills

88. In light of the above challenges and circumstances and in contemplation of the evidence, the treatment provided by the paramedics was both reasonable and appropriate, noting their immediate actions in their treatment of Thomas, including, the packing of the wound, application of direct pressure, lowering his arm to one side, administration of oxygen and IV fluids and moving Thomas from the sunlight. In support of this, Dr Vinen noted that there was nothing else they could do in the circumstances. [74]

89. Further, the experts were not critical of the decision to move Thomas out of the paddock and into the back of the ambulance where there was equipment. This also had the effect of decreasing the time from when the retrieval team arrives and moving to the helicopter as the patient is "packaged" and "prepared". [75]

Failure to request advice from the SRC

90. The SRC can be contacted and involved at the scene by the Control Centre in circumstances where a paramedic requires some clinical advice. The SRC is freely available to them, being in the Control Centre between 7am and 11pm and then on

[73] Report of Dr Vinen, Tab 5, p14
[74] Report of Dr Vinen, Tab 5, p18
[75] Expert Conclave, TS, 13 June 2019, p5, lines 40-50; p6, lines 1-9

the phone at home after then. [76] This did not occur on the day in question. Mr Dougherty said that he would not say he was terribly au fait with the fact that advice of this kind was available to him through the Control Centre. He said paramedics call the Control Centre and provide the MIST report but beyond that, he has never had to seek assistance or get a second opinion at the scene.[77] Mr Brenton similarly said that he was not aware that he could request advice from the SRC and it fell to the Control Centre to contact the SRC after paramedics provided their MIST report.[78]

91. The Court is of the view that the paramedics should not be criticised for not positively requesting the advice of the SRC at the scene. They involved the Control Centre and provided their MIST report. This should have been sufficient for the Control Centre to escalate the matter and involve the SRC. Changes made (over the last several years) to the T1 Protocol and guidelines around the involvement of the SRC have effectively addressed this problem.

92. It is however noted by the Court, that it is concerning that the paramedics were not aware, through their training or otherwise, that it was open to them to request the assistance of the SRC at the scene. However, the changes made to guidelines around the involvement of the SRC (now) put a positive obligation on the Control Centre to ask for specific information from paramedics to inform decisions about the involvement of the SRC at an early juncture.

Decision to wait for the helicopter

93. The issue of whether the paramedics should have transported Thomas to Gloucester Hospital, with the helicopter rendezvousing at Gloucester Hospital, created a division of opinion amongst the medical experts and witnesses at inquest.

94. Dr Tall is not critical of the paramedics not transporting Thomas by road to Gloucester Hospital. He did not think they could have safely transported Thomas with one person driving and the other fully occupied with keeping pressure on the wound. Thomas' agitation at the time would have also made it "almost impossible to manage him."[79]

95. Dr Vinen expressed the view that to transport Thomas via ambulance whilst maintaining treatment would have been very difficult if not impossible.[80] Dr Pearce agreed. [81] Dr Crozier similarly said there are difficulties in achieving haemorrhage control in that body region.[82] In Dr Raftos' opinion there was a substantial delay after paramedics staunched the bleeding and this could have been avoided by transporting Thomas directly to Gloucester Hospital.[83] Dr Hardman said paramedics should have transported Thomas to the hospital as soon as possible. [84]

96. The paramedics said they followed the T1 protocol which was in place at the time. The T1 protocol was updated in July 2018. At the relevant time, the T1 Protocol supported paramedics to extend travel time up to one hour to the highest level

[76] Tall, TS, 12 June 2019, p70, lines 23-27
[77] Dougherty, TS, 17 May 2018, p49, lines 43-50, p50, lines 1-11
[78] Brenton, TS, 17 May 2018, p62, lines 31-49
[79] Tall, TS, 12 June 2019, p76, lines 28-38
[80] Vinen, TS, 13 June 2019, p3, lines 25-27
[81] Pearce, TS, 13 June 2019, p3, lines 47-50, p4, lines 1-2
[82] Crozier, TS, 13 June 2019, p3, line 41
[83] Raftos, TS, 13 June 2019, p3, lines 29-34
[84] Hardman, TS, 13 June 2019, p4, lines 4-11

trauma service, in this case, the John Hunter Hospital.

97. The Transport Destination Matrix in the T1 Protocol as at the date of Thomas' death looked like this:

Transport Destination Matrix

Designated TRAUMA service	For all major trauma patients within a 60 min travel time from scene
T1 preferred* Destination	For all major trauma patients within a 60 min travel time from scene that cannot be transported directly to a trauma service
Local Hospital*	For major trauma patients when transport to a trauma service or T1 preferred destination cannot be achieved within a 60 min travel time from scene
Closest Emergency Department *	Complete & unrelievable airway obstruction

*Request the Control Centre notify AMRS to facilitate retrieval of the patient on to a Trauma Service
Note: The Aeromedical Retrieval Service (AMRS) Retrieval Consultant can be contacted for advice and approval via the Control Centre when it is considered in the patient's best interests to extend the transport time beyond 60 minutes from scene in order to reach a higher level facility.

98. The retrieval arrangements do include contemplation of retrieval from a local hospital.

99. The Transport Destination Guidelines on page 2 of the July 2015 T1 protocol include the following:

- *"Where transport directly to a designated trauma service cannot be achieved, AMRS are to be advised as early as possible via the Control Centre. The AMRS consultant may, if considered reasonable and in the interest of patient care, authorise extended transport. Alternatively they can commence retrieval arrangements." [emphasis added]*

- *Once a staging or destination hospital has been determined in conjunction with the AMRS consultant, paramedics should comply with the agreed choice. On occasion there may be circumstances where it is necessary for the paramedic to divert from the agreed action.* ***In these circumstances it is imperative that the paramedic / scene supervisor clearly communicates the change to the Control Centre at the earliest opportunity for the notification to the AMRS consultant."***

100. The final point on page 3 of the protocol, noted below, contained within a highlighted red box, reads as follows:

> *"The transportation of patients should not be delayed awaiting the arrival of an aircraft, medical team or higher skill level. Paramedics should depart scene for hospital. If required, liaise with the medical team through the Control Centre to arrange an appropriate rendezvous point."*

Important points to consider prior to requesting a helicopter response:

- Helicopter activation, mobilisation and response time requires at least 20 minutes, therefore the earlier the call the more timely the response
- Inability to land directly at the scene will result in delayed response
- The time taken to load the patient into the aircraft

A request to call off a helicopter response should be accompanied by the rationale and a MIST report to the Control Centre.

*The MIST report provides the Aeromedical Control Centre with essential information required to assist in the tasking decision making process

The transportation of patients should not be delayed awaiting the arrival of an aircraft, medical team or higher skill level. Paramedics should depart scene for hospital. If required, liaise with the medical team through the Control Centre to arrange an appropriate rendezvous point

101. Manning Base Hospital is classified as a T1 preferred destination. T1 preferred destinations are NSW Ambulance nominated hospitals and whilst these generally have more resources than a local hospital, they are limited in their capacity to manage a major trauma patient. For this reason there is a requirement for paramedics to notify AMRS (the previous name given to the Control Centre) via the Ambulance control centre to facilitate retrieval of the patient on to a Trauma Service.

102. The local hospital in this case was Gloucester Hospital. The drive from Barrington to Gloucester Hospital takes approximately 8 minutes. [85]

103. The drive from Gloucester to Taree takes approximately 1hr 10 min to 1 hr 15 minutes and additional time from Barrington West.

The NSW Trauma Services Plan

104. The NSW Trauma Services Plan, in respect to pre-hospital transport and bypassing of the closest hospital provides:

> *9.5 NSW Trauma Services Model*
> *It is the goal of the NSW Trauma Services Plan to integrate all hospital facilities into an inclusive trauma network in order to provide definitive trauma care to all injured patients throughout NSW*

[85] The evidence of the OIC was that it takes approximately eight minutes from the Gloucester Ambulance station to Barrington West: Chester, TS, 17 May 2018, p19, line 26

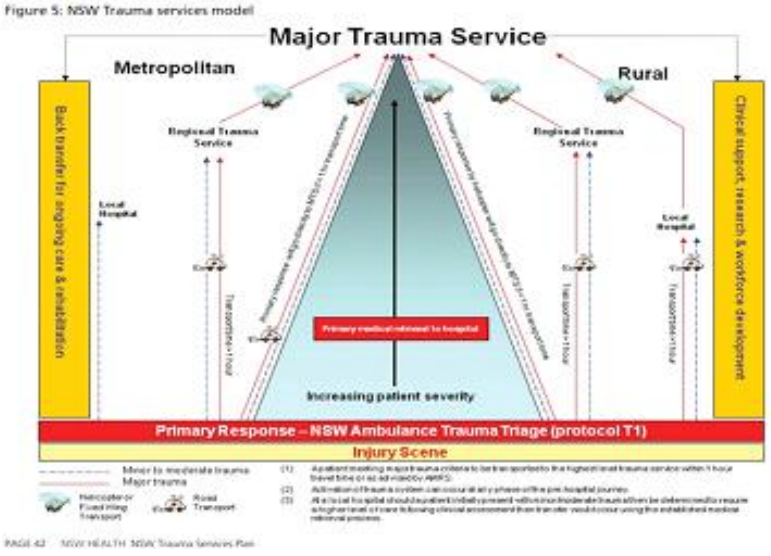
The appropriate identification of patients with serious injury and their timely arrival at an appropriate hospital are crucial to the effectiveness of the trauma system. The NSW trauma system is underpinned by the prehospital management of major trauma program undertaken by the ASNSW to identify the most appropriate trauma care requirements for the patient and transport the patient to the appropriate level of service. All trauma patients attended by the ASNSW are assessed according to Protocol T1:Pre-hospital Management of Major Trauma. (Appendix 1) This protocol includes support for paramedics to transport patients meeting major trauma criteria to the highest level trauma service within a one hour travel time. This travel time can be potentially extended upon discussion with the duty AMRS Consultant, if it is in the best interests of the patient. The premise of minimising the time the patient spends in the pre-hospital environment is one of the main drivers of trauma systems. Figure 5 details an integrated, comprehensive, trauma service model for NSW.

…

In instances where patients with moderate to severe trauma who either self-present, present by private transport or are transported to a RTS or local hospital, these hospitals will advise the MTS of the patient's arrival, and a decision can then be made as to the appropriate action, whether the patient should be retrieved to the MTS, and advice can be given as to resuscitation and care of the patient…

105. The picture diagram in Figure 5 below, referred to in the extract above, graphically clarifies the inclusion of local hospitals in the services model.

Figure 5: NSW Trauma services model



The left side of the graphic applies to metropolitan areas, the right side to rural areas. The figure clearly shows that where transport time from scene is greater than 1 hour, the local hospital is the appropriate destination (by ambulance), with retrieval by helicopter on to the major trauma service.

The left side of the graphic for metropolitan areas does, however, bypass the local hospital altogether.

106. The NSW Trauma Plan also specifically states:

> 9.3 Designated Trauma Services
>
> …
>
> In rural areas, where travel times are too great for patients to be transported direct to a RTS rural hospitals will provide initial assessment and resuscitation; and a

limited stabilisation prior to early transfer to the appropriate RTS or MTS…[86]

107. The July 2015 A1 protocol principles of care included the following:

> 6. Transportation decisions – For patients transported via Ambulance
>
> - Time on scene must be kept to a minimum with treatment provided en-route
> - If the arrival time of clinical back up exceeds the load and transport time to hospital, consideration should be given to a "load and go" approach

108. The July 2015 A8 protocol included the following:

> **1**. **Urgent transport** – certain life-threatening conditions require minimal on-scene time and rapid transport to hospital for immediate definitive treatment.
> …
> **2. Treatment**
> …
> - In general the only procedures that should be considered at the scene are:
>   - **ABC** including **AIRWAY MANGEMENT, INITIATION OF CPR and DEFIBRILLATION**
>   - Initiation of **HAEMORRHAGE CONTROL**
> - **ALL OTHER TREATMENT** should be given en route
> - In circumstances where the load and transport time to hospital is very short a "load and go" approach with treatment en route should be implemented
> - Ask the Control Centre to notify the receiving hospital as soon as possible via Code 3
>
> …

109. Overlaying the protocols referred to above is the concept of the "golden hour", referenced in the NSW Trauma Services Plan at paragraph 3.3 as follows:

> *The accepted timeframe for this pre-hospital period has been an hour from injury to arrival at hospital, commonly referred to as 'the golden hour'. The total pre-hospital period is taken from the time of injury, and is comprised of the Ambulance response time (current benchmark 10 minutes), the time taken treating the patient at the scene of the accident (benchmark is up to 20 minutes) and the time to transport the patient to the hospital (the travel time, benchmark 30 minutes).*

110. The NSW Trauma Services Plan, 2009, also, relevantly provides the following:

> ***3.3 Pre-hospital transport time***
>
> *A key requirement of a trauma system is to deliver a patient to the appropriate level of trauma service in as timely a manner as possible, minimising the time from injury to when the patient can receive definitive trauma care;* ***"the right patient, to the right hospital, in the right time"****. In the pre hospital environment the use of a pre hospital trauma triage tool determines the appropriate hospital destination equipped with the resources to best meet the patient's needs. This approach may mean bypassing the closest hospital.*
> *…..*

[86] NSW Health: *Selected Speciality & Statewide Service Plans (No.6) - NSW Trauma Services*, Tab 47

The premise is that it is preferable to travel further to deliver a patient to an appropriately equipped and experienced hospital (a major trauma service or regional trauma service) bypassing lower level hospitals, than taking a patient with major trauma to a hospital which is not equipped or experienced in managing these complex patients. Patients taken to a non-designated trauma service are delayed in transfer to a major trauma service for commencement of definitive trauma care. This delay can potentially impact on patient outcome. [Emphasis added].[87]

111. Thomas was not going to reach the John Hunter or Manning Base Hospital within a 60 minute travel time from scene as provided for in the TI Protocol at the relevant time.[88] The next option was to take him to Gloucester Hospital or await the arrival of the helicopter.

112. The paramedics' evidence is that the following matters would have mitigated against a road transfer to hospital: the wound required immediate and constant pressure; the stability/agitation of the patient; the poor state of the roads with limited stopping bays and lack of suspension in vehicle; the fact that there would be only one paramedic in the back of the ambulance maintaining pressure to the wound, and the risk of dislodgment of any clot they had achieved to stem bleeding;[89] the paramedic would be unable to apply pressure effectively from his seat while wearing a seat belt;[90] if Thomas went into cardiac arrest, the ambulance would have to pull over to perform CPR;[91] Gloucester Hospital is not a trauma facility and lacks the facilities required to treat a critical care patient such as Thomas. [92]

113. In the opinion of the paramedics, by requesting a helicopter the trauma hospital, including blood, comes to the patient.[93] It is also relevant to note that the Control Centre did not advise the paramedics to take a different course other than wait for the helicopter retrieval team.

114. Transferring Thomas by road ambulance to Gloucester, to meet the helicopter there, and to have him administered with 3 units of available blood at the hospital, was a hypothetical explored during inquest. The hypothetical presupposes that Thomas would have survived the trip. It was however a course open to the paramedics and/or for the Control Centre to direct the paramedics to do. This is especially because both the T1 and T3 Protocols provided that transportation of patients should not be delayed awaiting the arrival of a helicopter or medical team. Paramedics should depart scene for hospital and liaise with the medical team through the Control Centre to arrange an appropriate rendezvous point if required. The updated T1 Protocol continues to advise that time on scene should be minimised where possible. However, the paramedics were faced with a very complex and difficult case. To their minds, he needed immediate transfer to John Hunter Hospital. [94] The potential trip by road ambulance could have compromised both Thomas' and their safety.

115. Would moving Thomas to Gloucester at this point in time have made a difference to the outcome? This is difficult to answer. Dr Tall said that had Thomas been transferred by road to Gloucester (and presuming he had survived the trip) the reasons that he would have been in a better condition would be because of access to blood products and

[87] NSW Health: *Selected Speciality & Statewide Service Plans* (No.6) - *NSW Trauma Services*, Tab 47
[88] Brenton, TS, 12 June 2019, p39, line 13
[89] Dougherty, TS, 16 May 2018, pp 46, 48, 190; Brenton, TS, 16 May 2018, p65
[90] Dougherty, TS, 17 May 2018, p198
[91] Dougherty, TS, 17 May 2018, p198
[92] Statement of Hugh Dougherty, Tab 14 at [15]; Statement of Ian Brenton, Tab 15 at [13]; Dougherty, TS, 16 May 2018, p46; Brenton, TS, 16 May 2018, p61
[93] Statement of Hugh Dougherty, Tab 14 at [16]; Statement of Ian Brenton, Tab 15 at [13]
[94] Dougherty, TS, 16 May 2018, p 46, lines 19-38; Brenton, TS, 17 May 2018, p61, lines 45-47

resuscitation skill rather than any surgical possibilities. [95]

116. The paramedics' treatment of Thomas was to a high standard and it does not follow that the suggested misconception and application of the T1 protocol renders their treatment unreasonable or not in accordance with good emergency practice. Any protocol dealing with the preservation of life, acknowledges the possibility for diversion from the set rule in certain circumstances. However, it does not (and cannot) prescribe what those circumstances might be.

117. In light of the dynamics and situation which the paramedics were confronted with in the specific set of circumstances detailed and outlined above, the system or decision making process which led to the order of events regarding the transport of Thomas in dire circumstances, cannot be criticised. Unfortunately, this was an extremely unique case, in many regards, and no matter what decision was made regarding transport, the likelihood of Thomas surviving was extremely low. [96]

Was the decision to transfer Thomas to John Hunter Hospital by the Aero Medical Retrieval Service reasonable and appropriate in all the circumstances?

118. In Dr Vinen's opinion, there was in effect no other viable option other than deciding to transfer Thomas to John Hunter Hospital. Thomas had a very serious vascular injury requiring the expertise of a vascular surgeon to control the bleeding and repair the lacerated arteries and veins. He also required high level intensive care. This expertise and the facilities were only available at John Hunter Hospital. While some blood was available at Gloucester and Manning Base Hospital, the surgical expertise and high-level ICU was not.

119. Flying a vascular surgeon to Gloucester Hospital or other destination was also not a logistically feasible option.[97]

120. Ultimately, the decision to transfer Thomas to John Hunter Hospital by the AMRS was reasonable and appropriate in all the circumstances.

Was the treatment provided to Thomas by Dr Kim and Paramedic Officer Burrow reasonable, appropriate and in accordance with good emergency medical practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

On scene

121. The Retrieval team were presented with a very challenging situation:[98]

- a critically injured patient in a rural location without the required surgical or ICU expertise available
- a patient who had lost more than 40% of his blood volume
- a patient with no radial pulse or blood pressure at time of first assessment on scene
- a deep laceration involving multiple arteries with difficult to control bleeding, minimal blood available with no Fresh Frozen Plasma or platelets available on scene
- a patient requiring urgent vascular surgery expertise and high level ICU

[95] Tall, TS, 12 June 2019, p91, lines 7-9
[96] Report of Dr Vinen, Tab 5, p15
[97] Expert Conclave, TS, p10, lines 22-50; p11, lines 1-13
[98] Report of Dr Vinen, Tab 5, p18

Removal of the pads

122. There was some disagreement amongst members of the expert conclave on whether or not it was appropriate for Dr Kim to remove the pads packed by the paramedics at the scene. Dr Hardman and Dr Raftos were of the opinion that those pads should not have been removed on the basis that the bleeding had been reasonably controlled and the consequence of removing the pads would have been to cause further bleeding and according to Dr Hardman, consequent or subsequent to that, the cardiac arrest sustained by Thomas. It was therefore an incorrect decision. It would have been reasonable to eventually examine the wound, but in controlled circumstances, in hospital where there was equipment and surgical expertise.[99] Dr Raftos said that if Dr Kim had not removed the pads and the subsequent cardiac arrest had not occurred, it may have been reasonable to take him straight to Taree. [100]

123. Dr Vinen, Dr Crozier and Dr Pearce were of a different view, preferring to support the judgment call made by Dr Kim to remove the pads. As Dr Crozier put it, "the call has to remain with the treating medical officer."[101] The doctor needs to be in a position to make a balanced judgment about whether the bleeding is stemmed to allow safe air transport to a place of care.[102] Dr Pearce concurred with Dr Crozier. [103]

124. Dr Kim removed the pads to discern whether there was an adequate haemostasis achieved and whether there was any further damage control that he could have done to slow down or stop the bleeding. He also removed the pads to assess what kind of injury Thomas had sustained.[104] The removal of the pads and the visualisation of the wound was "a quick action" and "a very quick look".[105]

125. To meaningfully apply the celox granules he needed to apply them directly to the wound which would have necessitated a removal of the pads. Dr Hardman said that the application of the topical granules, "were not better than a hope."[106] Dr Kim disagreed with the proposition that he should only have removed the pads in a hospital where he had access to equipment and lights because he sees his job as assessing the nature of the injury and providing necessary treatment.

126. Dr Tall was not critical of Dr Kim removing the pads. He believes it was an important thing to do and something he would have done himself [as would Dr Pearce].[107] Dr Tall's evidence was that it is notoriously difficult to know whether bleeding has been stopped because you cannot see where it is, you cannot take for granted the ambulance officers have stopped the bleeding and the concern is the multiple dressings can hide the fact there's ongoing uncontrolled bleeding.

Clamping

127. Dr Kim said that the retrieval doctor carries equipment to clamp vessels, including a couple of clamps.[108] Had he seen a transected vessel (or anything "clampable") he would have pulled it forward and clamped it and that would have achieved the better

[99] Raftos, TS, 13 June 2019, p6, lines 26-34; Hardman, TS, p7, lines 20-32
[100] Raftos, TS, 13 June 2019, p9, lines 7-12
[101] Crozier, TS, 13 June 2019, p6, lines 45-46
[102] Vinen, TS, 13 June 2019, p6, lines 17-24; Crozier, p6, lines 36-50; p7, lines 1-5
[103] Pearce, TS, 13 June 2019, p7, lines 7-18
[104] Kim, TS, 12 June 2019, p43, line 10
[105] Kim, TS, 12 June 2019, p58, lines 6-10
[106] Hardman, TS, 13 June 2019, p7, lines 31-32
[107] Tall, TS, 12 June 2019, p76, lines 48-50; p77, lines 1-5
[108] Kim, TS, 12 June 2019, p44, lines 47-50; Kim, TS, 17 May 2018, p96, line 49

haemostasis.[109] This is consistent with what he told attendees of the teleconference. [110] Relevantly, Dr Kim has previous surgical experience. He holds a Bachelor of Surgery from Cardiff University (2007). He has trained in the UK and worked as a trainee there in Critical Care Medicine. He completed his National Service as an Army doctor for two years in Korea. He started working for the Hunter New England Local Health District in various Emergency Departments from 2013 and commenced the role of Retrieval Registrar in February 2015.

128. Dr Kim's aim was to achieve some sort of haemostasis, either from the clamping or the manual compression; the first option not being achievable, he elected to use gauze to apply pressure. However, because of the area in which the wound was, direct compression against a very hard surface was not adequately achievable. All he could do was apply trauma pads and gauze and try and achieve as much compression as possible. [111]

129. Dr Kim genuinely believes that by the time the medical retrieval team got there, Thomas had already lost a considerable amount of blood for the medical team to make any difference by clamping or stopping the bleeding any further. [112]

Removal to Gloucester Hospital

130. Thomas' cardiac arrest at the scene was the "main reason" why Dr Kim decided to go to Gloucester Hospital. Dr Kim said, "the extent of the blood loss from when the retrieval team got to Thomas, evidently from the cardiac arrest, was a lot more severe and a lot more considerable than I anticipated."[113] The cardiac arrest indicated that death was potentially imminent.[114] All the experts agreed that blood loss was the cause of Thomas' cardiac arrest at the scene.[115]

131. The members of the expert conclave were in consensus that Thomas should have been transported to Gloucester, certainly after the cardiac arrest.[116] Had the decision been made to take Thomas to the John Hunter Hospital without additional blood being collected at Gloucester Hospital he would have died in transit as a result of haemorrhagic shock due to inadequate intravascular volume to maintain an adequate blood pressure.[117]

132. Overall, Dr Kim exercised reasonable and appropriate clinical judgment at the scene (and throughout the course of his involvement in this matter). The balance of the expert opinion supports this. Dr Kim was confronted with an extremely serious trauma case and he dealt with this unfortunate and dynamic situation professionally.

At Gloucester Hospital

Declining the offer of assistance

133. Dr Raftos opined that an attempt should have been made to clamp the artery at

[109] Kim, TS, 17 May 2018, p96, lines 46-50; p97, lines 1-6; Kim, TS, 12 June 2019, p44, lines 47-50
[110] TS of NSW Ambulance recordings, Tab 8, p42
[111] Kim, TS, 12 June 2019, p45, lines 4-12
[112] Kim, TS, 12 June 2019, p52, lines 9-11
[113] Kim, TS, 12 June 2019, p65, lines 35-41
[114] Kim, TS, 12 June 2019, p65, lines 48-50
[115] Expert conclave, TS, 13 June 2019, p11, lines 48-50; p12, lines 1-10
[116] Expert conclave, TS, 13 June 2019, p8, lines 38-50; p9, lines 1-50; p10, lines 1-17
[117] Report of Dr Vinen Tab 5, p22

Gloucester Hospital, there being a surgeon there, Dr Al-Mahaidi.[118] Dr Hardman was also of the opinion that Dr Al-Mahaidi should have been involved - Gloucester Hospital being Thomas' definitive place of care. Dr Hardman was critical of Dr Kim's decision not to involve the surgeon and anaesthetist at Gloucester Hospital, describing this as a gap in the medical management.[119] Dr Crozier said that Dr Kim exercised the right judgment call in not accepting proffered support but in continuing, as he was, protecting the airway, continuing breathing support and trying to administer what blood product was available.[120] Thomas needed a full suite of transfusion type capability, intensive care support and an extraordinarily well and professionally trained theatre staff. [121] Dr Pearce added that once haemostasis had been obtained at Gloucester Hospital, the patient needed to be moved from there expeditiously in the helicopter to the definitive level of care. [122] Dr Vinen added that Dr Kim knew Thomas best of all and was obviously comfortable at that stage that he did not require additional help.[123]

134. Dr Kim considered that Thomas required more blood products and a vascular surgeon to definitively fix the problem. He believed that the general surgeon and anaesthetist could not be of any further assistance in terms of what had already been achieved at the time. [124]

135. Dr Crozier helpfully painted a picture of what Thomas' injury likely looked like and why, a picture of a single artery with a "nice placement of a clamp" is not a realistic picture. The actual injury is a laceration that has cut a large amount of muscle, artery and vein. The torn muscle would not have been coagulating; there being large areas from which blood is oozing.[125] Against this, is Dr Al-Mahaidi's evidence that he would not have done anything different to what Dr Kim had already done and would only have attempted clamping if there was no other way of controlling the bleeding and Thomas was going to die. He said, in keeping with what Dr Crozier said, in practice it is not easy and the equipment at Gloucester Hospital is not sufficient for that.[126]

136. On all the evidence before the Court, it is concluded that no criticism should be made of Dr Kim not taking up the offer of assistance by Dr Al-Mahaidi and Dr Bird.

Advising the SRC and/or Senior On-Call Consultant of the presence of a surgeon

137. Dr Kim did not advise the SRC or Senior On-Call Consultant that Dr Al-Mahaidi and an anaesthetist were at Gloucester Hospital and had offered their assistance. [127] He should have. This is albeit the fact that Dr Tall said that he was aware through his years of experience that Gloucester Hospital does some minor surgeries and there may have been a surgeon and an anaesthetist on site but equally may not have been at the time.[128] Dr Tall said that it would have been useful to have been informed so that he knew of all the possible options because it is "always best to make a decision with all the information available." [129]

138. Had Dr Tall known of the presence of Dr Al-Mahaidi it would not have altered his

[118] Raftos, TS, 13 June 2019, p12, lines 45-50
[119] Hardman, TS, 13 June 2019, p13, lines 40-50; p14, lines 1-9
[120] Crozier, TS, 13 June 2019, p13, lines 3-18
[121] Crozier, TS, 13 June 2019, p15, lines 22-35
[122] Pearce, TS, 13 June 2019, p13, lines 24-39
[123] Vinen, TS, 13 June 2019, p14, lines 37-41
[124] Kim, TS, 16 May 2018, pp85-86, lines 46- 51
[125] Crozier, TS, 13 June 2019, p18, lines 31-43
[126] Supplementary statement and file note of Dr Saad Al-Mahaidi, Tab 53A
[127] Kim, TS, 12 June 2019, p53, lines 9-12; Tall, TS, 12 June 2019, p74, line 43
[128] Tall, TS, 12 June 2019, p74, lines 43-46
[129] Tall, TS, 12 June 2019, p75, lines 1-4

advice. Gloucester Hospital was not equipped to provide the surgical expertise to even do "damage control surgery" with this type of injury. A surgical approach is via a separate incision underneath the collarbone where control of the blood vessels is gained by temporarily tying them off to stop the bleeding.[130] Further blood would be required in any such surgery to resuscitate the patient and keep them alive – blood that Gloucester Hospital had been depleted of after having provided Thomas with its only available 3 units.[131]

139. With Dr Tall's knowledge that there was no vascular equipment for this type of catastrophic injury at Gloucester Hospital, advice of Dr Al-Mahaidi's presence would have only further confirmed that he could not really assist and was of no practical consequence in this case.

140. Whilst it may have been 'ideal' and a matter of completeness for Dr Kim to advise the Senior On-Call Consultant, or direct Mr Burrow to advise him, of the presence of the surgeon and anaesthetist at Gloucester Hospital and their offers of assistance, this information did not detract from the professionalism of Dr Kim and ultimately conveying this information was not detrimental to overall care of Thomas or alter the unfortunate outcome.

Were the decisions made on the day by the State Retrieval Consultant, Dr Tall, as to transfer of Thomas and generally, reasonable, appropriate and in accordance with good emergency medical practice? If not, did any failures have an impact on the ultimate outcome of the treatment of Thomas?

141. All experts, except for Dr Raftos and Dr Hardman agreed that John Hunter should have been the ultimate destination after Gloucester – a single transfer to a point of major definitive care, the major trauma service[132]. Dr Raftos said Thomas needed critical care and a hospital with critical care facilities and Manning Base Hospital has that and it was the next point in travel and John Hunter Hospital may have been feasible for more definitive treatment. [133] Dr Raftos said that the thinking around only trauma centres being able to manage critically injured people is faulty thinking. He said there are a lot of base hospitals that do manage trauma.[134]

142. However, Dr Crozier and Dr Pearce put the nature of Thomas' injury into the Australian experience of trauma management. The experience within Australia of dealing with this type of injury is minimal and that is why we have dedicated centres with experts who are able to deal with these minimal number of highly complex and catastrophic injuries and that is why we have a system in place to try and get these patients there, rather than putting other people under pressure to try and pick up pieces that is not their area of specialty. [135]

143. The decision to go to Taree, more specifically, Taree Airport was, based on an understanding by Dr Tall, as relayed by Mr Burrow that the helicopter could not track directly to Newcastle from Gloucester because of the weather and refuel requirement of the aircraft.

144. As it transpired, there appears, on the evidence, to have been a communication misunderstanding between Mr Burrow and Mr Cook. Dr Tall was not to know and could only give his advice based on the information he received from Mr Burrow. On the evidence of Dr Tall, if he knew that the aircraft did not need refuelling and there was a

[130] Tall, TS, 12 June 2019, p75, lines 25-29
[131] Tall, TS, 12 June 2019, p75, lines 45-49
[132] Crozier, TS, 12 June 2019, p20, lines 11-13
[133] Raftos, TS, 13 June 2019, p19, lines 24-33
[134] Raftos, TS, 13 June 2019, p20, lines 49-10; p21, lines 1-8
[135] Crozier, TS, 13 June 2910, p22, lines 1-26; Pearce, TS, 13 June 2019, p22, lines 28-42

window in which the helicopter could fly directly from Gloucester to Newcastle, this would have been the preferred approach.

145. Counsel Assisting raised with Dr Tall and the expert conclave the possibility of the pilot participating in teleconferences when decisions are being made regarding patient transport and weather is a factor. The expert conclave agreed that the pilot should be involved, regardless of the fact that they are present during a clinical discussion. As Dr Pearce reflected, "…to say that the pilot can cut themselves off clinically and not know what's happening in the back is impossible. They see it…. It's pressure and it is very difficult but their number one aim… is to make sure that the safety of the vessel and safety of those that are flying in it..."[136]

146. Dr Tall said that a system has been introduced called "an aviation clinical risk matrix"[137] where the pilots utilise a scoring system of safety when asked whether a patient of a certain weight can go from A to B. The pilot produces an aviation risk score. The patient is then clinically triaged and the two assessments are put together to determine the risk benefit of going or not going. Importantly, questions around weather and safety come from the pilot and no one else and the pilot is routinely involved at the beginning and if the weather precludes some options that were previously thought feasible, the pilot would be spoken to again rather than to get the information second-hand.[138]

147. It would appear that Thomas' case would have benefited from the pilot's attendance at the teleconference rather than the teleconference attendees receiving information about the weather second hand and somewhat piecemeal. Dr Tall agreed and confirmed that this is already occurring with aid of the aviation clinical risk matrix. [139]

148. The Court finds that, otherwise the decisions made by Dr Tall were reasonable and appropriate in the circumstances which required time pressured judgment calls to be made and acted on.

Should the State Retrieval Consultant have been involved in dealing with Thomas' treatment earlier than 12.36pm on 16 December 2015? If so, would this have made any difference to the outcome of the treatment of Thomas?

149. The experts unanimously agreed that the SRC should have been involved at the time the helicopter was requested. That should have been a trigger for the Retrieval Consultant to be involved.[140] Dr Raftos said that one of the outstanding features of this matter was that there was no one in "overall control" until very late in the piece when Dr Tall became involved. [141] Dr Pearce made the observation that in this case there were many moving parts. The Retrieval Consultant needs to be aware and involved from a supervision and logistical point of view and in this way, help take logistics away from the clinical treating team. [142]

150. As already noted, the SRC can be contacted and involved at the scene by the Control Centre in circumstances where a paramedic requires some clinical advice. The SRC is freely available to them, being in the Control Centre between 7am and 11pm and then on the phone at home after then. [143] This did not occur on the day in question.

[136] Pearce, TS, 13 June 2019, p30, lines 22-30
[137] Tall, TS, 12 June 2019, p83, lines 18-19
[138] Tall, TS, 12 June 2019, p83, lines 12-43
[139] Tall, TS, 12 June 2019, p83, lines 12-43
[140] Vinen, TS, 12 June 2019, p4, lines 22-32
[141] Raftos, TS, 12 June 2019, p4, lines 34-46
[142] Pearce, TS, 12 June 2019, p5, lines 1-16
[143] Tall, TS, 12 June 2019, p70, lines 23-27

151. The SRC can also be contacted by the retrieval doctor at the scene. This also did not occur on the day. Dr Tall said in evidence that it is clear that the retrieval doctor and paramedic had their hands full, managing a very difficult situation. Sometimes, the retrieval doctor may ask a member of the air crew to call the Control Centre to give the "heads up" that they might need some help.[144] This also did not occur.

152. Dr Tall was not critical of the medical retrieval team not contacting the SRC through the Control Centre. The protocols in place at the time did not warrant his involvement any earlier than when he became involved. The Acting Executive Director of Aeromedical Operations within the NSW Ambulance Service, Dr Sarah Coombes similarly said in a statement that, with such a critically unstable patient she would not expect the medical team to have time to make a telephone call to the Control Centre, either prior to or during transport to Gloucester Hospital. To do so may have compromised patient care. [145]

153. In a pre-hospital setting, the relevant policy - AOC CLIN 3 - Consultant involvement - mandates the involvement of the SRC prior to team departure where it is identified that a critically ill patient is being transported from a pre-hospital location to a hospital that is unlikely to be able to provide definitive care for the patient[146], in this case, Gloucester Hospital. Dr Tall said this was an appropriate time for his involvement.[147]

154. The Court finds that the SRC should have been involved in this most complex case when the helicopter was tasked.

155. Changes made to both the T1 Protocol and the protocols around the involvement of the Retrieval Consultant effectively address this issue.[148]

156. Control Centre staff are now directed to obtain the following relevant information from ambulance officers where it is available and applicable in the appropriate escalation to and subsequent proactive involvement of the SRC:

- clinical information
- nearest paramedic; clinical level and ETA
- nearest hospital; level of care (specialty service or doctor present) and transport time
- nearest blood products if relevant.

157. With respect to the T1 protocol, if a patient meets Major Trauma Criteria, paramedics are authorised to transport up to 60 minutes Metropolitan / 90 minutes Regional from scene in order to reach the appropriate destination. The additional time added to regional areas is an acknowledgment that the benefits for patients with major trauma reaching a major trauma service outweighs the risk of an extra 30 minutes in transfer time.[149]

158. Secondly, mandatory notification by paramedics via the Ambulance Control Centre to the Aeromedical Control Centre ('ACC') is required for direction on a suitable destination for patients unable to be transported directly to the appropriate destination indicated in the transport destination algorithm. In this case, the algorithm places Thomas in the "Immediate life threat" category – an exsanguinating patient requiring blood products, which requires the mandatory request to the ACC to seek direction on the appropriate destination. Transport would be to the closest Trauma Service or destination as confirmed by the ACC. Early notification from the scene to the receiving hospital is also provided for in the updated T1 Protocol.

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[144] Tall, TS, 12 June 2019 p70, lines 37-50
[145] Statement of Dr Sarah Coombes, Tab 55 at [38]
[146] NSW Ambulance work instruction, Tabs 47A , 65, 70
[147] Tall, TS, 12 June 2019, p78, lines 7-12
[148] NSW Ambulance: T1- *Pre Hospital management of Major Trauma* (July 2018), Tab 65
[149] Tall, TS, 12 June 2019, p80, lines 6-9

159. One can now appreciate that the SRC would be highly likely to be involved in a case like Thomas' from at least when paramedics arrived on scene, made their assessment and contacted the ACC. The updated protocol positively involves the ACC where paramedics are faced with circumstances like those in Thomas' case.

160. It is apposite to observe that the earlier version of the T1 Protocol also provided the involvement of the AMRS (as it was then called) under the heading "Transport Destination Guidelines". It read:

- Where transport directly to a designated trauma service cannot be achieved, AMRS are to be advised as early as possible via the Control Centre. The AMRS consultant may, if considered reasonable and in the interest of patient care, authorise extended transport. Alternatively they can commence retrieval arrangements.
- Once a staging or destination hospital has been determined in conjunction with the AMRS consultant, paramedics should comply with the agreed choice

…

161. It can be observed however, that the updated T1 Protocol is more robust in this regard than the previous iteration in that it is now a MANDATORY NOTIFICATION for paramedics to contact the ACC who then obtain relevant information for the appropriate escalation to and subsequent proactive involvement of the Retrieval Consultant. There is no ambivalence about this. As Dr Tall put it in his evidence, "by having improved some of these protocols over time, we're trying to increase the clinical oversight of all cases of critically ill patients, in both pre-hospital and inter-hospital transfers. But a couple of these changes in the protocols have mandated rather than made optional the necessity to contact the State Retrieval Consultant." [150]

162. In the circumstances of this case with the dynamics and complexities it presented, it is apparent that the SRC and/or Senior On-Call Consultant should have been involved when the helicopter was dispatched to the scene, to provide critical central oversight of the incident.

Should consideration have been given to transferring Thomas to Manning Hospital Taree for treatment at an earlier time having regard to its proximity and the climatic conditions prevailing in the area?

163. Dr Raftos expressed the opinion that after Gloucester Hospital, Manning Base Hospital was the next point in travel and could have provided trauma management sufficient prior to transfer to John Hunter for definitive care. He was alone in this view.

164. The trauma system in NSW is based on a networked system of hospitals, designated to provide different levels of trauma service in metropolitan, urban and rural settings. There is recognition in the NSW Trauma Services Plan that in rural areas, patients may be required to be transported to the nearest hospital for stabilisation, irrespective of the availability of trauma services at the hospital. However, for this particular injury, which was of exceptional gravity, it is clear that neither the local hospital nor the regional hospital were equipped to provide definitive care.

165. Those involved with Thomas' care were presented with a dynamic and complex situation for which there was no simple solution. Neither Gloucester nor Manning Base Hospital had vascular services or high level ICU to provide the care that Thomas urgently required.

166. In the circumstances, attempting to get Thomas to the higher level care he needed at the John Hunter Hospital was appropriate. This was always the overall mission and it

[150] Tall, TS, 12 June 2019, p80, lines 43-47

was an appropriate and reasonable one given the nature of Thomas' injury.

Should consideration have been given to involving Dr Al-Mahaidi, a surgeon who was operating at Gloucester Hospital on 16 December 2015, in the treatment of Thomas?

167. As earlier discussed (above at [135], [137], [139]) Dr Al-Mahaidi would not have done anything different to what Dr Kim had already done and would only have attempted clamping if there was no other way of controlling the bleeding and Thomas was going to die. He said, in keeping with what Dr Crozier said, in practice it is not easy and the equipment at Gloucester Hospital is not sufficient for that.

CONCLUSIONS ON THE EVIDENCE

168. As Dr Vinen has opined, prior to and following the arrival of the paramedics, Thomas was in severe shock. He was "pale, sweaty and suffering large blood loss. He had "unpalpable blood pressure." He had lost more than 40% of his blood volume [most likely > 50%] and was therefore in Grade IV shock.[151] Thomas' condition was "in extremis" [152] due to blood loss. His chance of survival therefore was remote unless he was able to receive the treatment he required without delay, control of bleeding and resuscitation including massive blood transfusion. Even if this treatment was immediately available, survival was unlikely. [153]

169. The decisions made by the first responding paramedics, the medical retrieval team and Dr Tall were reasoned and appropriate in all the circumstances which were dynamic and extreme and do not expose any shortcomings that cannot be explained.

RECOMMENDATIONS

170. The following recommendations are made arising from the evidence pursuant to section 82 of the *Coroners Act 2009* (NSW).

The availability of whole blood

171. It is acknowledged that there has been progression in the Blood Management Procedure from the Control Centre since late 2015. This procedure originally had Liverpool Hospital in Sydney and relevant blood banks in Western NSW being notified to activate a Massive Transfusion Protocol, which is authorisation to prepare a predetermined number of multiple blood products to administer to patients with traumatic hypovolaemic shock. The Control Centre then coordinates the transport of these products from the blood bank which prepared them to a peripheral hospital or pre-hospital scene that has a patient requiring these products, usually utilising the assistance of the police. The audio recordings outline the Control Centre undertaking this procedure to deliver such products to Taree airport.[154] The Blood Management Procedure has now become a State wide policy.[155]

172. There is, however, still more work to be done around the availability of "whole blood", especially in rural and remote areas. Thomas received two units of blood at the scene and three at Gloucester. He then needed to replace plasma as well as platelets and cryoprecipitate – components of whole blood rather than just the packed blood cells. As Dr Vinen said, patients like Thomas need whole blood.[156] Patients who bleed whole

[151] Report of Dr Vinen, Tab 5, p12
[152] At the point of death
[153] Report of Dr Vinen, Tab 5, p10
[154] TS of NSW Ambulance recordings, Tab 8, p55
[155] Submissions on behalf of Dr Gary Tall and Dr James Kim at [109]
[156] Vinen, TS, 13 June 2019, p31, lines 24-27

blood need whole blood to replace what they have lost especially in a situation where there has been significant blood loss, like this case. [157]

173. The issue of whole blood availability is a big issue.[158] Small hospitals like Gloucester would usually only have two or three units of universal donor red cells and they would invariably have no clotting factors. Dr Tall said that clotting factors are available that can be stored at room temperature which retrieval services could carry around with them in backpacks. Dr Tall said that such clotting factors are widely used in Europe for exactly this purpose. Giving retrieval teams clotting factors to carry around at room temperature would be particularly useful to rural patients in small hospitals where there are currently no clotting factors available.

174. There is currently no approval by the therapeutic goods administration for the use of clotting factors in this way. Dr Tall said that there is presently a process underway, in association with the Australian Red Cross Blood Service and NSW Ambulance Service, of convincing NSW Health Pathology to allow retrieval teams to carry clotting factors.

175. **Recommendation 1 to the Minister for Health:** That the relevant agencies, including, but not limited to, NSW Health and NSW Pathology give consideration to developing and implementing, as a matter of priority, a policy for the use of clotting factors by retrieval services.

Geolocational Blood App

176. A free Geolocational Blood App was developed and implemented by Dr Tall and others in association with the NSW Institute of Trauma and Injury Management (a NSW Health facility) sometime in the last three to four years.[159] The App improves the ability to quickly locate blood products.[160] Retrieval doctors and paramedics who work on helicopters generally all have it on their phone. The App however is not "absolutely reliable" because it is not in real time. That means, for example, a medical officer may pull up Gloucester Hospital to see what blood is available but not know that a patient may have used that blood ten minutes ago and the App has not been updated to reflect that change.

177. Negotiations between the Australian Red Cross Blood Service, NSW Ambulance Service and NSW Health Pathology are in train to try and get that information to be in as real time as possible. One can appreciate that having real time information about what blood products are available to a medical team in the area proximate to the scene where they are treating a critically ill patient, would inform decisions about transport and clinical care and allow medical teams to better balance risk and benefit in that decision making process.

178. **Recommendation 2 to the Minister for Health:** That the relevant agencies give consideration to developing and implementing a system by which the Geolocational Blood App operates, as far as possible, allowing real time availability of up to date information as to which blood products are available at hospitals throughout NSW.

CONCLUSION

179. Finally, I express my sincere condolences to the Redman family for their profound and ongoing loss. It was abundantly clear to the Court that Thomas was deeply loved and his

[157] Hardman, TS, 13 June 2019, p31, lines 31-21
[158] Hardman, TS, 13 June 2019, p31, lines 31-21
[159] Tall, TS, 12 June 2019, p82, lines 33-42
[160] Statement of Dr Tall, Tab 19 at [48]

family continue to acutely feel his loss. I thank the Redman family for their attendance at Court throughout the duration of the inquest.

180. I thank Counsel Assisting, Ms Christine Melis, and the instructing solicitor, Ms Bianca Holliday-O'Brien, for their assistance in the preparation of this inquest.

181. I also make a special mention of Mr Robert McIlwaine who was the original Counsel Assisting in this matter and passed away on 20 May 2018.

182. I close this inquest.

Magistrate Ross Hudson
24 January 2020