Coroners Act 1996
[Section 26(1)]

Western *Australia*

RECORD OF INVESTIGATION INTO DEATH

Ref No: 37/18

I, Barry Paul King, Coroner, having investigated the death of ***Torran Jake Thomas*** *with an inquest held at the* ***Perth Coroner's Court*** *on* ***29 October 2018 to 31 October 2018 and 21 November 2018****, find that the identity of the deceased person was* ***Torran Jake Thomas*** *and that death occurred on* ***8 January 2015*** *at* ***Princess Margaret Hospital*** *from* ***multiple organ failure associated with hyperthermia ('Heat Stroke')*** *in the following circumstances:*

Counsel Appearing:

Mr J T Bishop assisted the Coroner
Ms K A Shepherd appeared for the National Rugby League and its employees and volunteers

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INTRODUCTION

1. On the late afternoon of 5 January 2015, Torran Jake Thomas (the deceased) was engaged in rugby league training at a rugby field at Curtin University when he was overcome with heat stroke. He was provided with first aid and conveyed by ambulance to Princess Margaret Hospital (PMH) where he was admitted into the paediatric intensive care unit with hypovolemic shock and multi-organ failure. His condition deteriorated until he died after life support was withdrawn on the evening of 8 January 2015. He was 15 years old.

2. The deceased's death was a 'reportable death' under section 3 of the *Coroners Act 1996* (the Act) because it 'appears to have been unexpected, unnatural or violent or to have resulted, directly or indirectly, from injury'.

3. Under section 19 of the Act, I had the jurisdiction to investigate the deceased's death because it appeared to me that the death was or may have been a reportable death.

4. Under section 22(2) of the Act, a coroner who has jurisdiction to investigate a death may hold an inquest if the coroner believes it is desirable.

5. Due to the public interest in health considerations related to sporting activities in warm weather, I believed that it was desirable to hold an inquest. My belief was strengthened by the support of the deceased's family, who had many questions about the circumstances surrounding the death and, in particular, whether it could have been avoided.

6. I held an inquest into the deceased's death at the Perth Coroner's Court on 29 October 2018 to 31 October 2018 and on 21 November 2018.

7. The main issues at the inquest were:

    a. the appropriateness of the decision to hold rugby league training on 5 January 2015;

    b. the quality of first aid provided to the deceased, especially the initial identification of heat stroke and the treatment provided;

    c. the time taken to call for an ambulance and the ramifications of any delay; and

    d. the appropriateness of first aid training to sports trainers associated with rugby league in Australia with respect to heat stroke and the need for any change to the content of that training.

8. The documentary evidence adduced at the inquest primarily comprised a brief of evidence,[1] which included reports, forms, and witness statements compiled by First Class Constable D Mancini of the Coronial Investigation Unit and by Counsel Assisting, Mr Bishop.

9. Oral evidence was provided by:

    a. Edward Easter, a National Rugby League (NRL) game development officer and a Level 1 sports trainer who provided the deceased with first aid on 5 January 2015;[2]

    b. Luke Young, the head coach of the West Coast Pirates, the team with which the deceased was training, who conducted the training on 5 January 2015;

[1] Exhibit 1
[2] ts 6 – 35 and ts 60 – 76 per Easter, E R J

c. Gabriella Benitez, an ambulance paramedic with St John Ambulance (SJA) who attended the rugby field and conveyed the deceased to PMH;[3]

d. David Yoon, an ambulance officer who attended the rugby field with Ms Benitez and conveyed the deceased to PMH;[4]

e. Peter Donkin, the volunteer assistant coach of the West Coast Pirates who was assisting with the training on 5 January 2015;[5]

f. Luke Ellis, the general manager of national participation and development at the NRL;[6]

g. Dr Paul Bloomfield, the chief medical officer at the NRL;[7]

h. Professor Ian Rogers, an emergency physician and professor of emergency medicine with extensive expertise in thermal physiology and the medicine of endurance exercise;[8]

i. Aisling Pawlowski, the education manager at Sports Medicine Australia (SMA);[9] and

j. Michael Hayes, the team manager of the West Coast Pirates and a chief petty officer in the Royal Australian Navy.[10]

10. Following the hearing of the inquest, SJA provided the Court with information about the instructions that would have been given to a caller by an SJA call-taker in a situation where heat exposure had been identified. SJA also provided a screenshot from its First Responder

[3] ts 35 – 59 per Young L D
[4] ts 85 – 91 per Yoon, D
[5] ts 92 – 103 per Donkin, P K J
[6] ts 106 – 125 per Ellis, L J
[7] ts 126 – 144 per Bloomfield, P R T
[8] ts 148 – 201 per Rogers, I R
[9] ts 206 – 216 per Pawlowski, A C
[10] ts 216 – 226 per Hayes, M P

app, entitled 'First Aid Fact Sheet - Heat Induced Conditions'.

11. I have found that the cause of death was multiple organ failure associated with hyperthermia ("heat stroke") and that the death occurred by way of misadventure.

12. I have made a recommendation about the content of first aid training provided to sports trainers and other first responders in relation to potential heat-related illness.[11]

THE DECEASED

13. The deceased was born in Whangarei in New Zealand on 28 September 1999. He came to Western Australia with his family on 18 November 2012. He lived in Success with his parents and older sister, and he enjoyed what his family described as a normal childhood without any serious medical conditions.[12] It was apparent from his family members' attendance at the inquest that he had a close and loving relationship with them.

14. The deceased attended Atwell College where, among other things, he played rugby league and excelled as a front rower in the school program.[13] He was a big, strong young man with an advanced athletic ability, good core skills and a quicker grasp of new skills, techniques and structures than his more experienced peers.[14]

15. In October 2014 the deceased underwent a two-week trial period as part of a selection process for the West Coast Pirates Academy for boys under 16 years old. The criteria for selection were ability on the field and attitude off the field.[15]

[11] Paragraph 112
[12] Exhibit 1, Volume 1, Tabs 9 and 10.2
[13] Exhibit 1, Volume 1, Tab 11
[14] Exhibit 1, Volume 1, Tab 13
[15] Exhibit 1, Volume 1, Tab 11

16. The deceased made the cut to the final 25 players for the West Coast Pirates.[16] During the selection process, he was weighed with electronic scales to be 122.4 kg.[17] He was 192 cm tall.[18]

17. The team, once selected, began training in November 2014.[19] The training took place at a rugby field at Curtin University at 5.00 pm for a 5.15 pm start on Mondays, Wednesdays, Thursdays and alternate Saturdays, with emphasis on both skills and conditioning.

18. According to the assistant coach, Mr Donkin, the deceased's stamina and fitness were below average compared to other players when he first started, but he improved over time.[20] According to the team manager, Mr Hayes, the deceased appeared to be fit, and he always put in 100% effort in training.[21]

19. Mr Easter also noted a marked improvement in the deceased's fitness following the trial period. He said that the deceased was one of the big forwards on the team. The forwards worked well together and encouraged each other during training. [22]

WEST COAST PIRATES

20. As I understand it, in 2014 the West Coast Pirates Academy was a development program for promising young players. Selected players would be trained as a team by high-level coaching staff and would travel to New South Wales on a playing tour in January 2015.

21. The academy was operated by the Australian Rugby League Commission WA (ARLCWA), a subsidiary of the Australian Rugby League Commission, or NRL, which is the single controlling body and administrator of rugby

[16] Exhibit 1, Volume 1, Tab 11
[17] Exhibit 1, Volume 1, Tab 11
[18] Exhibit 1, Volume 1, Tab 5
[19] ts 17 per Easter, E R J
[20] Exhibit 1, Volume 1, Tab 14
[21] Exhibit 1, Volume 1, Tab 12
[22] ts 72-73 per Easter, E R J

league in Australia. The ARLCWA operates in Western Australia as the National Rugby League Western Australia, or NRLWA.[23]

22. The NRL was responsible for setting national policies, which were implemented and administered in Western Australia by the NRLWA.[24]

23. Those national policies included policies related to coaching qualifications and sports trainer (first aid) qualifications. The policies also provided for the use of heat guidelines when NRL organisations were considering an event or a training session.[25]

24. The structure of the West Coast Pirates team's coaching and support staff comprised:

    a. Mr Easter as NRL development officer and co-ordinator of the whole program;[26]

    b. Mr Young as head coach;

    c. Mr Donkin as volunteer assistant coach; and

    d. Mr Hayes as team manager.

25. Mr Easter was qualified as a Level 3 High Performance Coach under the NRL national coaching accreditation scheme and the Australian Sports Commission Coaching Accreditation. He was also qualified as a Level 1 sports trainer.

26. Mr Young was a Level 3 High Performance coach and had formerly been a qualified first aid officer and sports trainer.

27. Mr Donkin had been qualified in first aid, and Mr Hayes had been trained to the level of senior first aid in the

[23] ts 107 per Ellis, L J
[24] ts 108 per Ellis, L J
[25] Exhibit 1, Volume 1, Tab 19
[26] ts 7 per Easter, E R J

Royal Australian Navy, of which he is still a serving member.

28. All of those men had long association with the game of rugby league and were aware of the risks of heat-related illness. Mr Easter was particularly appreciative of the potential for heat-related illness because he had emigrated from England in 2005 and had been shocked by the heat during pre-season training.[27] Mr Donkin had coached in Darwin, Townsville and Mackay, where the heat and humidity were always considered before a training session.[28] Mr Hayes was aware of heat-related illness through his role in the Royal Australian Navy, since it is specific to the area of operation in the Middle East.[29]

29. While I do not have evidence of other similar organisations to compare with the West Coast Pirates in terms of the professionalism of coaches and sports trainers, I am nonetheless impressed by the quality of qualifications and experience held by the Pirates' coaching staff, including team manager Mr Hayes, and by the support structures provided by the NRL by way of training, policies and guidelines.

30. In addition, it is apparent that the NRL had done a great deal of work in reducing the risk of hyperthermia for rugby league players. In conjunction with SMA, it had developed science-based heat guidelines and a practical checklist with an associated table in order to assess and reduce the risk of hyperthermia in the field.[30]

5 JANUARY 2015

31. The first training for the West Coast Pirates, following a 10-day break over the Christmas and New Year period, was on 5 January 2015. It was the hottest day of the year in Perth in 2015, with the temperature in the city

[27] ts per Easter, E R J
[28] ts 99 per Donkin, P K J
[29] ts 223 per Hayes, M P
[30] Exhibit 1, Volume 1, Tab 19

reaching 44.4°. At 3.00 pm, the temperature in Perth was 39.5°.[31]

32. Due to the high temperature, either Mr Easter or Mr Young contacted the team members by social media during the day to remind them to drink plenty of water.[32] At about 3.00 pm, Mr Easter went to Curtin University to prepare for the training session and to check the temperature on the field. He organised equipment and checked to make sure that there were water bottles and ice. He bagged up more ice bags from the ice machine in case they decided to use ice baths after training for recovery from injury.[33]

33. In the late afternoon, Mr Easter stood out in the field to judge the heat. He had initially thought that it was too hot to train, but as time passed and the sun got lower, the shade increased and the breeze picked up, so the conditions became similar to those in which they would usually train.[34] He checked the temperature on an iPhone app and completed a heat guideline checklist in accordance with NRL policy. The guideline recommended that the training could proceed, with extra breaks taken, shade provided, and airflow such as fans considered.[35]

34. Mr Easter conferred with Mr Young and Mr Donkin, after which he decided to go ahead with the training session but to start later than usual, to have a shorter session with more drink breaks, and to commence in the shadier part of the field.

35. According to Mr Easter, before commencing any physical activity, he had a discussion with the team in the change room about the progress and the future of the training, noting that the tour was only a week away. A couple of the boys also came up to him to demonstrate that over the break they had attained their testing targets for such

[31] Exhibit 1, Volume 1, Tab 22
[32] Exhibit 1, Volume 1, Tab 12; ts 14 per Easter, E R J
[33] ts 15-16 per Easter, E R J
[34] ts 17 per Easter, E R J
[35] Exhibit 1, Volume1, Tab 19

things as chin-ups and bridges.[36] While those activities took place, other sporting groups such as a gridiron football team and a girls' soccer team had begun training nearby.[37] When the team discussion was complete, Mr Easter sent the players out onto the field to train with Mr Young and Mr Donkin.[38]

36. The physical part of the training that day did not begin until about 5.50 pm. The first activity was a five to 10 minute warm-up known as dynamic stretching, which involved light running from the try-line out to the 10 or 20 metre line and back. After a short drink break, the formal training then began, with the players running out from the try-line to the five or 10 metre line and then dropping to the ground and running back to start again.[39]

37. At about 6.10 pm, Mr Easter had a jovial conversation with the deceased during a drinks break, after which the team started another drill.[40]

38. After another drink break, the next drill, 'the coat hanger', commenced. In this drill, the players worked with partners. One partner would stay and do a plank on the sideline at the 50-metre mark while the other partner would run from that spot to the goal posts at one end of the field and then to the goal posts at the other end of the field and then back to his partner, where he would do a plank and recover while his partner did the running segment. The players completed from four to six of those rotations.[41]

THE DECEASED DEVELOPED HEAT STROKE

39. The chronology of the next few minutes is not entirely clear due to differing accounts from the eye-witnesses.

[36] ts 17 per Easter, E R J
[37] ts 67-68 per Easter, E R J; cf. Exhibit 1,Volume 1, Tab 18 indicating that the coach of the gridiron team told the investigating police officer by telephone that his training session began at 6.30 pm on 5 January 2015.
[38] ts 23 per Easter, E R J
[39] ts 42-43 per Young, L D
[40] Exhibit 1,Volume 1, Tab 11
[41] Exhibit 1,Volume 1, Tab 13

It is clear that the deceased was performing well in the coat hanger drill. He appeared to be pushing himself and was running ahead of the three other forwards with whom he regularly trained.

40. At about 6.25 pm, when the deceased was on his last run leg of the drill, he was visibly tiring on the way back to the side-line at the 50-metre line, where he got onto the ground and lay down, apparently fatigued. The evidence varies in relation to the details of what then occurred.

41. According to notes Mr Easter made on the night of 5 January 2015, the deceased 'showed a lot of fatigue when completing the last part of a running drill, with wobbling legs and slowing to a walk. He sat down and laid down several times, but teammates convinced him to get up and keep going.'[42] In oral evidence, Mr Easter initially said that the finish line for the drill was the try-line and that, when the deceased reached it, he sat down, went back and starfished. However, when Mr Easter was told about Mr Young's evidence describing the coat hanger, he recalled that other players had assisted the deceased to the try-line where he sat down.[43]

42. Mr Young's recollection was that the players had finished the coat hanger and were at the 50-metre line having a break. They were offered another opportunity to get a drink, so they walked to the drink station at the try-line; however, the deceased remained on the ground at the 50-metre line, fully conscious. Two of the deceased's team-mates walked back to him and assisted him to walk to the drinks station.[44]

43. Mr Hayes' account, provided to investigators about 15 December 2016, was that the deceased had joined the other boys for a water break and then staggered, so two other boys helped him up and proceeded to the drink station.[45] In oral evidence, Mr Hayes recalled that the

[42] Exhibit 1, Volume 1, Tab 11
[43] ts 74 per Easter, E R J
[44] Exhibit 1, Volume 1, Tab 13
[45] Exhibit 1, Volume 1, Tab 12

deceased had been on the way toward the 50-metre line on the side-line and had been about 10 metres away when he staggered and went down on one knee. Two team-mates then helped him up and he was able to walk to the drinks station independently.[46]

44. The deceased's father, who was at the field to observe the training, said in a statement that the deceased collapsed twice: once after the run and once after walking to where his team-mates were having drink. After the first collapse, he was breathing too hard to drink from a bottle of water.[47]

45. It seems reasonably clear that, after the coat hanger, the players congregated at the 50-metre line and the deceased lay down. The players then moved to the drink station at the try-line. The deceased again lay down on the ground and he remained there. Either before the deceased lay down at the 50-metre line or as he was being assisted to the drinks station at the try-line, he was staggering and required assistance to get up and to walk.

46. It is also clear that, after the drinks break at the try-line, the other players began the next drill with Mr Young, but the deceased did not get up. Mr Young told him to try to get up, but he said that he was unable to do so. Mr Easter, who was about 10 metres away at the time, went to the deceased and also encouraged him to get up.

FIRST AID PROVIDED

47. Mr Easter stayed with the deceased at the drinks station. From about 6.30 pm to 6.40 pm, he noted that the deceased was responding by trying to sit up and by making eye-contact. His speech was mumbled as though he was out of breath and worn out, but he was not saying random things.[48] He seemed weak and tired, so Mr Easter doused him with water on his neck, head and

[46] ts 217-218 per Hayes, M P
[47] Exhibit 1, Volume 1, Tab 10.1
[48] Exhibit 1, Volume 1, Tab 11; ts 74-75 per Easter, E R J

body. His breathing slowed down to a good resting level and his pulse became regular.[49]

48. From about 6.40 pm to 6.50 pm the deceased became less responsive verbally and his eyes closed. Mr Easter put him into the recovery position, but there was little change. His eyes followed Mr Easter and he squeezed his hand when asked. His pulse rate increased and his breathing became heavier, so Mr Easter sat him upright, which appeared to resolve the breathing issue. It appears that, during this period, Mr Easter and the other members of the coaching staff began applying ice to the deceased's armpits, groin and neck.[50]

49. By 6.50 pm, the deceased's verbal response had stopped. Mr Easter and the coaching staff tried the recovery position again, but that caused the deceased's breathing to become erratic, so they sat him up again. As they sat him up, they noticed that he was limp, so at about 6.55 pm they called for an ambulance.[51]

AMBULANCE ARRIVES

50. At 7.07 pm ambulance paramedic Gabriella Benitez and ambulance officer David Yoon arrived at the deceased's location. The deceased was unresponsive, with a pulse rate of 180, a blood pressure of 79/80, a respiration rate of 42, a right atrial oxygen saturation rate of 83%, and a tympanic temperature of 39.2°. Those observations were all outside normal parameters.[52]

51. After speaking with the coaching staff and the deceased's father, Ms Benitez and Mr Yoon formed a differential diagnosis which included heat stroke. They gave the deceased oxygen and, with the help of bystanders, placed him into the air-conditioned ambulance quickly in order to have a more controlled environment where they could remove his clothing and assess him better with a second

[49] Exhibit 1, Volume 1, Tab 11
[50] ts 30 per Easter, E R J
[51] Exhibit 1, Volume 1, Tabs 11 and 17
[52] Exhibit 1, Volume 1, Tab 17; ts 79-79 per Benitez, G S

set of observations. They gave him a bolus of saline solution, which appeared to improve his blood pressure temporarily. They maintained his airway by suction, which was a priority precluding the use of ice packs.[53]

52. Ms Benitez and Mr Yoon took the deceased to the emergency department at Princess Margaret Hospital (PMH) as a priority one; that is, with lights and sirens. On the way, it appeared to them that the deceased may have displayed decorticate posturing, consistent with brain injury.[54] They arrived at the hospital at about 7.45 pm and, after some initial confusion, the deceased was transferred to a hospital bed in the resuscitation area. His temperature on admission was 41.6°.[55]

PRINCESS MARGARET HOSPITAL

53. In the emergency department at PMH, the deceased was treated for hyperthermia by applying ice packs and administering intravenous fluids. He was given a propofol infusion and was intubated before being transferred into the paediatric intensive care unit, where he was placed on a cooled bed with arctic pads.

54. Overnight, the deceased remained unresponsive, with low blood pressure despite boluses of fluid and inotropes. At 10.25 am on 6 January 2015, he was diagnosed with hypovolemic shock and multi-organ failure. He was placed on continual venovenous haemofiltration (CVVH) and medication. By 6.00 pm he was noted to be in acute renal failure, with rhabdomyolysis and worsening hepatic function. He had persistent lactic acidosis and respiratory failure. However, at that stage he was more stable than he had been earlier that day. Surgeons were concerned that the lactic acidosis may have been caused by ischaemic bowel that could be resected.[56]

[53] Exhibit 1, Volume 1, Tabs 15 and 17; ts 81 per Benitez, G S
[54] Exhibit 1, Volume 1, Tab 17; https://en.wikipedia.org/wiki/Abnormal_posturing
[55] Exhibit 1, Volume 1, Tabs 15 and 29
[56] Exhibit 1, Volume 1, Tab 29

55. Early on 7 January 2015, the deceased underwent a short laparoscopy, which revealed no evidence of ischaemic bowel. During the day, the acute liver failure and the rhabdomyolysis deteriorated further. He received blood products in addition to CVVH. There was no change in his condition overnight.

56. On the morning of 8 January 2015 it became clear that the deceased had acute liver hypoxia from the heat stroke. A gastroenterologist from PMH spoke with a hepatologist from Sir Charles Gairdner Hospital about the possibility of a liver transplant, but at that stage the deceased was not stable enough to be transferred.[57]

57. On the afternoon of 8 January 2015 the deceased was reviewed by SCGH hepatologists, a surgeon and anaesthetists in relation to his suitability for a liver transplant. In a cruel irony, he was accepted for a transplant and the process of transfer had begun when he developed unequal pupils. He was taken for an emergency CT scan of his head, which revealed cerebellar haemorrhage, tonsillar herniation and obstructive hydrocephalus. Further intervention would have been futile.[58]

58. The deceased was then provided with comfort care until life support was withdrawn at about 10.20 pm and he died shortly thereafter.[59]

CAUSE OF DEATH AND HOW DEATH OCCURRED

59. On 9 January 2015 Chief Forensic Pathologist Dr C T Cooke conducted a post mortem examination and found evidence consistent with the medical history of multiple organ failure.

60. Specialist neuropathological examination and genetic testing found no evidence of a specific neuromuscular

[57] Exhibit 1, Volume 1, Tab 29
[58] Exhibit 1, Volume 1, Tab 29
[59] Exhibit 1, Volume 1, Tab 29

disease. Microbiological testing did not identify a specific infection.

61. On 5 May 2015, Dr Cooke formed the opinion, which I adopt as my finding, that the cause of death was multiple organ failure associated with hyperthermia ("heat stroke").

62. On the basis of the information available, I am satisfied that the deceased was exercising in warm conditions when he developed heat stroke, which led to multiple organ failure and caused his death.

63. I find that death occurred by way of misadventure.

DECISION TO HOLD TRAINING

64. The evidence establishes that Mr Easter applied the NRL heat guideline appropriately in determining to go ahead with the training subject to modifications. Mr Young agreed that the conditions were appropriate and Mr Donkin, who initially thought that it was going to be a bit hot, noted that it had cooled down and that the team was going to have to play in similar conditions.[60]

65. Professor Rogers' view was that the NRL guideline had face validity and was an appropriate tool to assess risk of heat illness. He said that the guideline was used appropriately and that the conclusion it came to, which was that the risk was increased but that training could continue with some modifications, seemed entirely reasonable.[61]

66. On the basis of that evidence, I am satisfied that the decision to proceed with training was justified.

[60] ts 94-95 per Donkin, P K J
[61] ts 156 per Rogers, I R

WHY TORRAN?

67. Heat stroke is extremely dangerous, but it is rare.[62] The deceased was the only player of the West Coast Pirates to have developed heat stroke on 5 January 2015, and it seems that there were a large number of other people engaging in sport that evening. The conditions were warm, but they were far from extreme. So, why him?

68. Dr Cooke suggested that the deceased's weight, which was recorded at the State Mortuary as 135 kg, may have been a significant factor. It is worth noting that 135 kg would have been a substantial increase over the 122.4 kg recorded at the West Coast Pirates selection process in October 2014. It seems unlikely that the deceased had put on more than 12 kg during the training period with the West Coast Pirates given that he had become fitter and more agile during that time,[63] but the issue of the correct measurement of his weight did not need to be resolved because of Professor Roger's evidence, as noted below.

69. Professor Rogers said that individual susceptibility to heat stroke and heat illness varies. There are rare genetic causes, but the deceased's testing for such causes was negative.[64]

70. Professor Rogers said that the only things that he could identify in the deceased's case were the activity in which he was taking part and his size. The activity had relatively brief but intense episodes of exercise, and the deceased was big and tall with substantial body mass, indicating a lot of muscle to generate heat. He also had a lot of insulation from body fat, which would have made it hard to lose that heat. Professor Rogers did not think that his view would change if the deceased was 122 kg rather than 135 kg.[65]

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[62] ts 185 per Rogers, I R
[63] ts 72-73 per Easter, E R J
[64] ts 180 per Rogers, I R
[65] ts 180-181 per Rogers, I R

71. Professor Rogers could not identify one particular feature which would have caused the deceased to develop heat stroke, but he considered that two other relevant factors were: the evidence that the deceased had been pushing himself and the evidence of the weather conditions that evening. He thought that the weather must have played a part because the same thing would not have happened to the deceased if he had been training in 12 or 14 degrees.[66]

72. As to the possibility that the deceased had been dehydrated, Professor Rogers did not consider that hydration was as important as many people believed. The human body finely controls its hydration status subconsciously. It was only at the extreme of dehydration that it has a significant impact on heat illness. It is not possible to become dehydrated in half an hour, and it is likely that the deceased arrived at training with normal hydration and normal body core temperature. Professor Rogers did not think that dehydration contributed to the death.[67]

73. In the end, it seems that there were a number of factors which acted to make the deceased susceptible to heat stroke: the weather conditions, the nature of the exercise, the level of the deceased's exertion, and the deceased's size and mass. However, it is still not clear why the deceased was the only person to develop heat stroke.

APPROPRIATENESS OF FIRST AID

74. Mr Easter was effectively the person in charge of the first aid provided to the deceased as he was the only person at the training session who was a Level 1 sports trainer through the NRL.[68] To be qualified as a Level 1 sports trainer, in 2011 he attended a two-day course (Level 1 course) which included a component related to heat-related illness. Re-accreditation would have been

[66] ts 184 per Rogers, I R
[67] ts 182-183 per Rogers, I R
[68] Exhibit 1, Tab 13

required for him in March 2015. He had attended CPR coursed annually.[69]

75. Part, if not most, of the information that had been provided to Mr Easter during the Level 1 course was found in a NRL National Accreditation Scheme manual (Level 1 manual).[70] That manual appears to have based the information related to heat-induced illness on an SMA web download document: 'Hot Weather Guidelines for sporting clubs and associations and the physically active' (Hot Weather Guidelines).[71]

76. The Level 1 manual differentiated the symptoms of heat exhaustion (pallor, sweating, thirst, fainting and moderately elevated body temperature) from heat stroke (impaired mental function and a very high body temperature which may lead to unconsciousness and death).[72] It is unclear to me how a sports trainer would be able to know whether impaired mental function and or a very high temperature would lead to unconsciousness and death.

77. The treatment for heat exhaustion was said to be:

    a. Lie the player down

    b. Loosen and remove excessive clothing

    c. Cool by fanning

    d. Give cool water to drink if conscious

    e. Apply wrapped ice packs to groins and armpits

    f. Seek medical help

78. The treatment for heat stroke was said to be:

[69] Exhibit 1, Volume 1, Tab 11
[70] Exhibit 6
[71] Exhibit 1, Volume 1, Tab 24
[72] Exhibit 6

a. Resuscitation according to the Basic Life Support Flow Chart

b. Arrange urgent transport to hospital, preferably by ambulance

c. Give cool water to drink if conscious

d. Place the player in a cool environment and apply wrapped ice packs to groins and armpits

79. In my view, the first aid which Mr Easter provided the deceased accorded reasonably well with the Level 1 manual treatment for heat exhaustion. It is somewhat surprising that he was able to remember so much of what he had learned given that the course had taken place almost four years earlier and that the relevant section of the manual comprised three pages out of a 344-page document.

80. One fundamental difficulty which Mr Easter faced was in recognising that the deceased had heat stroke rather than heat exhaustion.

81. Professor Rogers said that, in the second 10 minutes of first aid from 6.40 pm to 6.50 pm, the deceased was exhibiting all the classic signs of heat stroke; namely, not responding normally, non-responsiveness or unable to get off the ground in a context where the ambient temperature was high, and the athletes were participating in high exertion bursts of exercise. What stood out to Professor Rogers was the deceased's persistent and worsening altered conscious state.[73]

82. Professor Rogers stated, and I accept, that the actions of those present to assist the deceased suggest that they were not all equipped with the skills to promptly recognise and respond to a case of heat stroke. The evidence suggests that they were not so equipped because the nature of training they received was based on

[73] ts 158 per Rogers, I R

then current standards of management. In my view, those standards should be altered to reflect more recent recognition of the most appropriate way to identify and manage heat stroke.[74]

APPROPRIATE TREATMENT OF HEAT- RELATED ILLNESS

83. Professor Rogers said that the use of the term 'heat exhaustion' in the Level 1 manual actually confuses people rather than helps them. It is a catch-all term for someone feeling poorly in a hot environment without knowing what is going on. He considered that it would be more helpful for people to understand the manifestations of heat stroke and, if heat stroke is even suspected, to treat for it.[75]

84. Professor Rogers said that the symptoms for heat stroke, especially the symptom of altered conscious state, are the same as for heat exhaustion, but the symptoms do not go away if the affected person lies down and has a rest. If the person does not get better in the first few minutes, the first aider should suspect heat stroke.[76] In order to determine the person's conscious state, the first aider could use a scale such as the AVPU scale (A = alert; V = responsive to voice only; P = responsive to pain only; U = unconscious).[77]

85. It is worth noting that the Hot Weather Guidelines refer to the taking of core temperature measured in the rectum as the only reliable diagnosis of a collapsed athlete to determine heat stroke.[78] Professor Roger's view was that there was no use in temperature measurement as a guideline in the field since only rectal temperature was accurate, and it can only be used in a specialised setting. He agreed that the Hot Weather Guidelines are meant to be best practice in a well-resourced medical tent.[79]

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[74] Exhibit 1, Volume 1, Tab 23
[75] ts 165-166 per Rogers, I R
[76] ts 159-168 per Rogers, I R
[77] ts 175 per Rogers, I R
[78] Exhibit 1, Volume 1, Tab 24
[79] ts 169-170 per Rogers, I R

86. As to the treatments for heat stroke, Professor Rogers said that the SMA, the definitive body for sports medicine in Australia, recommends 'strip, soak, and fan', which involved stripping off as much clothing as possible, soaking with water, and fanning with a clipboard or something similar if an electric fan is not possible. He emphasised that fanning is a critical part of the treatment because it increased evaporative heat loss.[80]

87. Professor Rogers also said that there is strong evidence to show that cold water or ice water immersion is the most effective way to cool people rapidly. A suitable substitute would be soaking towels in ice water, placing them on the person, and then replacing them every few minutes.[81] Following the inquest, Professor Rogers clarified by email that ice baths should be continued for a minimum of 15 minutes and that more than 30 minutes of cooling is unlikely to be of further benefit.

88. Professor Rogers also emphasised that there is no downside to treating heat stroke on the basis of suspicion alone.[82]

89. Professor Rogers' evidence on the proper recognition and treatment of heat stroke has some similarities with a fact sheet published by SMA in 2008, 'Beat the Heat',[83] in which heat exhaustion is contrasted to heat stroke by stating that participants who collapse *after* exercise are likely suffering from a post-exercise drop in blood pressure but some may have heat stroke (*sic* heat exhaustion?) Those who show signs of altered mental function, loss of consciousness or collapse *during* exercise are likely suffering heat stroke. In either case, because the difference is not always obvious, the treatment for suspected heat illness should be as follows:[84]

    a. Remove the person from the field and **lay the person down in a cool place**.

[80] ts 163-164 per Rogers, I R
[81] Exhibit 1, Volume 1, Tab 23; ts 177 and 186 per Rogers, I R
[82] ts 163 per Rogers, I R
[83] Exhibit 1, Volume 1, Tab 24
[84] Bold type added.

b. **Raise the legs** and pelvis to improve blood pressure and **remove excess clothing**.

c. **Cool by wetting the skin** liberally and **vigorous fanning**.

d. **Apply ice packs** to groin, skin and neck.

e. Give cool water if the person is conscious.

Persons suffering from heat exhaustion usually recover rapidly. **If the person remains seriously ill, confused, vomiting or has signs of altered consciousness**, **call an ambulance** immediately and seek medical help. If in doubt, **treat for heat stroke** as follows:

f. Continue cooling. **If available, cool in a shallow canvas/plastic bath of iced water** (5-10 minutes).

g. If necessary, cooling can continue during removal to hospital.

90. It is apparent that the proposed treatments for heat stroke in the Level 1 manual did not include all of 'strip, soak, fan' or ice water immersion.

91. At the Court's request, Professor Rogers provided a guideline for dealing with suspected heat stroke in the field (Professor Rogers' guideline). A copy of that guideline, 'Heat Stroke Advice for Sports Trainers & Coaches' is found at Attachment A.[85]

92. As I read that guideline in the context of Professor Rogers' evidence, the core instructions to first aiders are relatively straightforward:

a. If a person shows sign of altered mental state or consciousness, including inability to co-ordinate movement, in a setting potentially conducive to

[85] Exhibit 7

heat stroke, lay the person down in shade and raise the person's legs.

b. If the person's condition does not improve within a few minutes, apply aggressive cooling techniques (strip, soak and fan or, preferably if available, ice water immersion or ice water soaked towels) and call 000.

93. On the basis of the foregoing evidence, it appears to me that the first aid provided to the deceased would likely have been much more effective if Mr Easter and the other members of the coaching staff had been trained in accordance with the principles identified by Professor Rogers and had applied that training.

94. With the benefit of hindsight, the deceased may have survived the heat stroke if he had been aggressively cooled within a few minutes after he lay down and was unable to get up. While it is not possible to conclude that he would have survived, it is clear that his chances would have improved.

DELAY IN CALLING FOR AN AMBULANCE

95. For the first 10 minutes of the 30 minutes or so when Mr Easter was providing first aid to the deceased, his condition was consistent with post-exercise recovery as his pulse and breath-rate decreased. It is now clear that his symptoms from then on indicated that he had heat stroke, but SJA was not called for another 15 minutes. Given that treating heat stroke is absolutely time-critical,[86] it might seem that the delay in calling SJA would have reduced the deceased's chances of recovery.

96. Professor Rogers did not agree. He said that an ambulance should be called as soon as possible, and that every extra minute where heat stroke is not recognised and appropriately treated worsens the outcome, but that

[86] ts 177 per Rogers, I R

the critical determinant of outcome is the recognition of heat stroke in the field and the institution of basic first aid. What happens in the ambulance and in the hospital is probably playing in the margins of outcome, he said.[87]

97. In particular, Professor Rogers said that emergency services cannot arrive with many more resources than are on the field. An ambulance does not have an ice bath and has a limited amount of ice.[88]

98. I am satisfied that the delay in calling for an ambulance was undesirable, but of greater importance were the lack of recognition of heat stroke and the lack of appropriate treatment.

TREATMENT AT PMH

99. There is no evidence indicating that the treatment and care of the deceased at PMH was in any way deficient.

SMA

100. Ms Pawlowski told the inquest that SMA has delivered the Level 1 sports trainer course for the NRL since 1 January 2016.[89] As I understand the documentation she provided, the content of the component of the course related to heat-induced conditions is taken from HLTID003, a nationally recognised first aid training course known as Provide First Aid. In the 149-page manual for that course, the one page that relates to heat exhaustion and heat stroke reflects the Hot Weather Guidelines discussed above, with the attendant problems associated with that document.[90]

101. Ms Pawlowski said that, about the beginning of November 2018, SMA commenced a review into its hot weather

[87] ts 178 per Rogers, I R
[88] ts 178 per Rogers, I R
[89] ts 207 per Pawlowski, A C

guidelines, with the review being guided by Professor Periard at the University of Canberra.[91]

102. Ms Pawlowski said that SMA would happily accept a recommendation that it consider the materials provided by Professor Rogers to the inquest when conducting its review of hot weather guidelines. She anticipated that an SMA review would result in a comprehensive policy and a one-page 'takeaway' similar to Professor Rogers' guideline. She envisaged that the takeaway would be similar to the well-known DRSABCD acronym.[92]

SJA

103. During the course of the inquest, it became clear to me that the issue of the proper treatment of heat stroke would be relevant to all situations where a person was potentially overcome by heat stroke, not merely those in a sports setting.

104. As SJA regularly deals with those situations, both by receiving calls and by dispatching first responders to attend, it is crucial that the instruction it provides to callers and the guidelines it provides to its first responders are appropriate

105. Following the hearing of the inquest, Mr Bishop contacted A/Prof Paul Bailey, Clinical Services Director of SJA WA to inquire about the guidance provided by SJA call-takers to callers who report heat stroke or suspected heat stroke.

106. In a letter dated 14 December 2018, A/Prof Bailey advised that, in those circumstances, call-takers are instructed to dispatch an ambulance and then to tell the caller to: remove the person from any sources of heat, remove outer clothing, apply cool water to the entire skin surface while fanning the person, and turn on an air conditioner or fan.

[91] ts 210 per Pawlowski, A C
[92] ts 212 per Pawlowski, A C

107. Mr Bishop also asked A/Prof Bailey whether SJA had any comment about SMA adopting Professor Rogers' guideline in relation to the treatment of heat-related illness. A/Prof Bailey said that SJA supports those guidelines, which he said were in line with the current SJA guidelines, found on the St John First Responder App.

108. The current SJA guideline in the app does adopt the 'strip, soak, fan' treatment from SMA, but it appears to me that there are still some significant differences between it and Professor Rogers' guideline; in particular, the SJA guideline has retained a distinction between heat exhaustion and heat stroke. The guideline in the SJA app also refers to body temperature and the feel of the skin, and it does not contain an instruction to lay the person down and raise the legs or an instruction to use ice water immersion when available.

109. Assuming that my view is correct, if SJA decides to adopt Professor Roger's guideline, it may need to make changes to its current guideline.

RECOMMENDATION

110. The evidence at the inquest, particularly that provided by Professor Rogers, the NRL and SMA, suggests that the training provided to NRL sports trainers and to first responders of any sort with respect to heat-induced illness should reflect the guideline produced by Professor Rogers. I say 'reflect' the guideline because in my view it could be simplified further, as Ms Pawlowski suggested, into a brief step-by-step process of what to do if a first responder believes that a person may have heat illness.

111. I have relied to a large degree on Professor Rogers' expertise in relation to the appropriate first aid to be provided to a person apparently afflicted by a heat-related illness because I am satisfied from his curriculum vitae[93] that he is an authoritative expert in this area of medicine.

[93] Exhibit 1, Tab 23

However, in making the following recommendation, I have taken into account that the opinions of other experts in that area have not been adduced as evidence.

112. With the forgoing in mind, I recommend that:

> **Sports Medicine Australia, St John Ambulance and all registered training organisations who provide the nationally accredited course Provide First Aid HLTAID003 consider and, if appropriate, incorporate the principles in Professor Rogers' guide into the knowledge content of the training they deliver with respect to providing first aid for hyperthermia.**

113. It also appears to me that a regular upgrading of that training in relation to hyperthermia would be appropriate, in the same way that CPR training is refreshed each year for reaccreditation. However, I do not make a formal recommendation in relation to such upgrading since it was not canvassed on the evidence.

114. I shall arrange for a copy of this record of investigation to be provided to the Department of Training which, I understand, audits registered training providers in their delivery of nationally recognised training courses.

CONCLUSION

115. A healthy, happy 15 year old boy should not die from heat stroke by participating in sports training in conditions that are not uncommon during a Perth summer evening.

116. The adults responsible for the deceased's welfare acted responsibly in the circumstances but, due to the training they had received, they were not equipped with the means of readily recognising and appropriately treating heat

stroke. It is possible that the deceased would have survived had they been so equipped.

117. The evidence established that the training provided to sports trainers and other first responders should be altered to incorporate recent approaches to treating heat-related illness. Heat stroke is a rare condition, but the fact that it is potentially fatal means that first responders need to be alert to it and to be able to deal with it appropriately.

118. If, as a result of the deceased's death, changes to the training provided to first responders saves others affected by heat stroke, the deceased's family may gain some solace for their terrible loss.

B P King
Coroner
6 February 2019

ATTACHMENT A

Exhibit 7

Heat Stroke Advice For Sports Trainers & Coaches

Background

Heat stroke is an uncommon but life threatening complication of grossly elevated body temperature with exercise in heat stressed settings. Whilst heat stroke risk can be minimised by the use of predictive tools (eg *insert reference here to relevant tools such as the SMA/NRL heat guideline*), the risk cannot be fully eliminated.

Risk is highest with: high temperatures and/or high humidity and/or vigorous activity

Symptoms & Signs

In a heat stressed setting always suspect heat stroke if an athlete becomes acutely unwell or collapses, especially if they don't recover promptly on lying flat with the legs elevated. Whilst there are many possible causes of such an acute illness or collapse, heat stroke is one of the most important.

The first signs of heat stroke show in the function of the brain and the nervous system.

Look for any of: confusion, incoherent speech, abnormal walking, coma or seizures

The athlete's skin may feel dry & hot, or sweaty – so the feel of the skin is not a useful sign. Similarly on-field temperature measurement is unreliable, so don't use this to rule in or rule out heat stroke.

First Aid

In the ill athlete in a heat stressed setting who hasn't rapidly responded to lying flat in the shade there is no down side to assuming heat stroke is the problem and starting first aid.

Early recognition and rapid first aid cooling are the keys to recovery from heat stroke

Actions to take in this order are:

- **STRIP** the athlete of as much clothing as possible
- **SOAK** with any available water
- **FAN** vigorously by whatever means possible – improvise eg use a clipboard, bin lid

When available cool or ice water immersion is the most effective cooling means possible

- IMMERSE the athlete up to the neck in an cool or ice bath OR
- COVER all of the body with ice water soaked towels that are changed frequently as an alternative if a bath isn't available but ice is
- CALL 000 to summon emergency services, but do so once you are certain first aid cooling is being implemented

Remember it is early recognition and first aid in heat stroke that is critical to save a life

Professor Ian Rogers FACEM 4/11/18