Coroners Act 1996
[Section 26(1)]

Western *Australia*

RECORD OF INVESTIGATION INTO DEATH

Ref: 33/16

I, Barry Paul King, Coroner, having investigated the death of ***Tamika Patricia Carol Ullrich*** *with an inquest held at the* ***Perth Coroner's Court*** *on* ***19 September 2016*** *and* ***3 October 2016****, find that the identity of the deceased person was* ***Tamika Patricia Carol Ullrich*** *and that death occurred on* ***30 December 2012*** *at* ***York Hospital*** *from* ***chronic hydrocephalus with brain swelling*** *in the following circumstances:*

Counsel Appearing:

Ms K E Ellson assisting the Coroner
Ms R Young (State Solicitor's Office) appearing for the WA Country Health Service
Mr H C Quail and Ms K F Hawkins (instructed by Tottle Partners) appearing for Dr A Boyd
Ms B E Burke (ANF) appearing for V Morrison RN

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INTRODUCTION

1. Tamika Patricia Carol Ullrich (**the deceased**) was a 23 year old registered nurse who lived on her own in York. At the time of her death she worked at the Narrogin Hospital.

2. In late December 2012 the deceased had been experiencing an increase in neck pain which she had suffered for some months. On 27 December 2012 she saw her general practitioner (**GP**), who referred her to a physiotherapist. She went back to her GP the next day, and he prescribed the non-steroidal anti-inflammatory drug celecoxib.

3. At about 1.00 pm on 29 December 2012 the deceased presented at the emergency department at Northam Hospital (**the ED**) with her mother after she had vomited several times that morning and had severe pain in her neck and head. At the hospital she was triaged by a nurse who then took her into the ED ward.

4. The GP on duty at Northam Hospital, Dr Anthony Boyd, arranged for the nurse to give the deceased an anti-inflammatory and a muscle relaxant. Dr Boyd then left the ED to have lunch.

5. At 1.50 pm the deceased vomited. Dr Boyd was told about the deceased's vomiting, but he was not concerned because he considered that the cause of the vomiting was the celcoxib that the deceased had taken that morning.

6. At 2.20 pm that afternoon the deceased left the ED after telling the nurse that she felt better. She went to her mother's house in York and went to bed, but she was unable to lie down and vomited green liquid several times. He mother stayed with her most of the night, rubbing her back and giving her water.

7. At about 6.15 am on 30 December 2012 the deceased's mother found her in her bed without any obvious signs of life. Ambulance officers took the deceased to York Hospital, but she could not be revived.

8. Chief Forensic Pathologist Dr C T Cooke conducted a post mortem examination and, with the assistance of a

neuropathological examination by Dr R Junckerstorff, concluded that the cause of death was chronic hydrocephalus with brain swelling.

9. In May 2014 the Northam coroner referred the investigation into the deceased's death to the Office of the State Coroner for a possible inquest. Following a protracted period in which the investigation was beset by delays in obtaining expert reports, on 1 July 2016 an inquest was listed to be held from 3 to 5 October 2016. Due to the unavailability of two key witnesses on those days, an additional day was necessary.

10. The purpose of the inquest was originally intended to be to clarify the cause of the deceased's death; however, the quality of Dr Boyd's care of the deceased and the possibility that a failure on his part contributed to her death were also investigated.

11. On 19 September 2016 I convened the inquest in order to obtain the evidence of neurosurgeon Professor Neville W Knuckey and that of Dr Boyd. Also adduced was documentary evidence in the form of the coronial brief, histology and microbiology reports, an executive summary of events at the ED, a diagram of the brain, a number of articles or extracts from texts relating to hydrocephaly, and a bundle of photographs of the deceased's neuropathology.

12. The inquest then formally commenced on 3 October 2016, when the oral evidence of Vicky Morrison RN, Dr Junckerstorff and Dr Cooke was adduced. Also adduced were: the relevant Northam District Hospital medical records for the deceased; a letter from Dr Boyd's lawyers with attached findings of reviews into Dr Boyd's care of the deceased; a letter with attachments from Dr Peter Barratt, Director Medical Services, WA Country Health Service, Wheatbelt; a disc containing CCTV records of the ED; and a bundle of documents obtained from the Australian Health Practitioner Regulation Agency, including records pertaining to Dr Boyd's care of the deceased at the ED.

13. Following the oral evidence, counsel provided brief but helpful oral submissions.

THE DECEASED

14. The deceased was born in Subiaco, presumably at King Edward Hospital, on 7 November 1989. She was premature, at 28 weeks gestation with a very low birth weight.

15. According to the notes from York General Practice,[1] the deceased developed inter-ventricular haemorrhage with ventricular dilatation. This led to macrocephaly and frontal bossing. She was assessed by a consultant paediatrician at 20 months, who found her to be showing satisfactory development.

16. When the deceased was three and a half years old she was again seen by the paediatrician. She showed persisting macrocephaly but it was not considered to be of concern. She was assessed to be in the high average to superior range of ability, with advanced physical and mental development. No arrangements were made for her to be reviewed.

17. The deceased completed a nursing degree at Curtin University in 2010 and a graduate certificate in clinical nursing at Notre Dame University in 2011. She bought a house in York and then worked at several hospitals in Western Australia as part of a 12 month placement program.[2] She commenced working as a registered nurse at Narrogin Hospital in October 2012 on a three-month country rotation. She was an efficient and reliable nurse, so much so that her ward manager discussed with her the possibility of her staying at Narrogin Hospital when her rotation finished in January 2013.

18. At the time of her death the deceased lived alone in York. Her mother, Lorraine Thomas, and her elder sister, Natalie Ullrich, also lived in York with their respective husbands.

[1] Exhibit 1, Volume 2, Tab 2
[2] Exhibit 1, Volume 1, Tab 15

THE DECEASED DEVELOPS A SORE NECK

19. Starting in about July 2012 the deceased began to complain about stiffness and pain in her neck. Her mother's husband, Lance Thomas, attempted to treat her with massage and trigger point therapy. She appeared to get some relief from that, but the symptoms persisted.

20. On 25 October 2012 the deceased was assessed by an optometrist in Northam for a complaint of blurring distance vision for six months. The optometrist found reduced acuity for distance of 6/9 in the right eye and 6/24 in the left, and recommended distance spectacles to give equal visual acuity. The deceased did not obtain the recommended spectacles. It is unclear whether this evidence had any significance.

21. On 24 August 2012 and 26 October 2012 the deceased attended an accredited myofascial therapist, initially with complaints of a sore right shoulder with pain starting in the back of the shoulder blade, referring to the top of the shoulder and sometimes causing a sore neck and right-sided headache. She told the therapist that she had the problem for about two years and that it may have resulted from a fall from a horse when she was a teenager. On the second visit, the deceased's right side was pain-free, but she asked for treatment to the left side.[3]

22. It seems that following the myofascial treatment the deceased did not experience further symptoms until about mid-November 2012 when a patient leaned on her neck and the pain returned.[4] She continued to have the pain intermittently and complained about it to Ms Thomas about once a week, but it did not affect her ability to work.

23. In early December 2012 the deceased complained more frequently about neck pain and headaches. She told a colleague that her lower neck was the worst.[5] On one occasion around 14 December 2012 she complained about the neck pain to her ward manager, but the pain then abated within 20 minutes.[6]

[3] Exhibit 1, Volume 1, Tab 14
[4] Exhibit 1, Volume 1, Tab 9
[5] Exhibit 1, Volume 1, Tab 15
[6] Exhibit 1, Volume 1, Tab 16

24. During the week before Christmas, the deceased was experiencing daily headaches. She told her sister that she was going to bed with a headache and waking up with one.[7] She continued to work her regular shifts at Narrogin Hospital but complained increasingly about neck pain and headaches. She attempted to see a doctor at the emergency department at that hospital, but it was always too busy.[8]

25. On 23 December 2012 the deceased finished her last shift before Christmas. Ms Thomas visited her and saw that she was baking and making candles. She did not complain of any pain or discomfort in her neck that day. On Christmas Day the deceased spent the day with her family without any of her troubling symptoms. The next afternoon, her family came to her house. She was more quiet than usual, but she did not complain of any neck pain.[9]

THE DECEASED ATTENDS HER GP

26. On 27 December 2012 the deceased called in at her mother's house to say that she was not going to go to work because her neck was hurting.[10] She called Narrogin Hospital and arranged to be booked off work until 2 January 2013.[11]

27. On the afternoon of 27 December 2012 she saw her GP, Dr Duncan Steed, in York and told him about the ongoing neck pain. Dr Steed examined her and found a full range of painless neck movements but some muscle tenderness in the right trapezius muscle. He applied trigger point pressure to that area, which gave immediate relief of the pain. He considered that her neck pain was mechanical in nature and gave her a referral to a physiologist, to be used if the neck pain persisted.[12]

28. The deceased returned to Dr Steed the next day, 28 December 2012, because the neck pain had recurred and was travelling up into her head. Dr Steed again found

[7] Exhibit 1, Volume 1, Tab 10
[8] Exhibit 1, Volume 1, Tab 15
[9] Exhibit 1, Volume 1, Tab 8
[10] Exhibit 1, Volume 1, Tab 8
[11] Exhibit 1, Volume 1, Tab 15
[12] Exhibit 1, Volume 1, Tab 18

a full range of neck movements, but he also noted some muscle spasm in the deceased's erector spine muscles corresponding to the right C1 and C2 vertebrae. He again concluded that the deceased's neck pain was mechanical in origin and gave her a sample box of celecoxib, a non-steroidal anti-inflammatory drug, and doxylamine, a sedative. He also provided her with a medical certificate for taking time off work.[13]

29. The deceased spent the afternoon of 28 December 2012 at Ms Thomas' house. She was very quiet and uncomfortable, holding her neck with her hand and turning her head. She stayed for dinner and ate some chicken and rice, but she later vomited that up.[14]

THE DECEASED ATTENDS THE ED

30. On the morning of 29 December 2012 the deceased again vomited and she did not eat breakfast. She experienced neck spasms with pain going up and down her head. She went to Ms Thomas' house with her sister and lay on the couch until she vomited green liquid several times. By midday she was crying from the pain, so Ms Thomas took her to the ED.

31. The ED was not particularly busy when the deceased arrived with Ms Thomas at about 1.00 pm. The deceased was initially seen by Vicky Morrison RN for the triage process. Ms Morrison was an experienced nurse who had worked on and off at Northam Hospital for 12 or 13 years.[15]

32. The deceased completed her own patient registration form. She told Ms Morrison that her pain score was 2/10 but that her pain level had been severe that morning and that she had vomited.[16] The deceased's mother recalled the deceased telling Ms Morrison that her pain score had been 8/10.

[13] Exhibit 1, Volume 1, Tab 18
[14] Exhibit 1, Volume 1, Tab 8
[15] Exhibit 1, Volume 1, Tab 8
[16] Exhibit 1, Volume 1, Tab 26

33. At about 1.10 pm Ms Morrison admitted the deceased into the ED ward and had her lay on a trolley bed in an examination bay.

34. The deceased did not appear to Ms Morrison to have any difficulties in walking the five metres or so into the ED ward,[17] and I note that a CCTV recording of the deceased walking the short distance into the ward does not indicate that she had any problems with mobility at that time.[18]

35. Ms Morrison then conducted a primary assessment. The observations she took were all, essentially, normal. The deceased told her that she had a slight headache to the right side but no blurring of vision. She said that she had taken 200mg of celecoxib that morning and that she had taken doxylamine about half an hour before attending the ED. Ms Morrison assessed the deceased's range of movement and noted that, on rotation of the neck, the deceased complained of pain and grimaced. The deceased did not complain of limb parathesia, and she denied any recent injury.[19]

36. Ms Morrison thought that the deceased presented as a well person with a sore neck. The deceased was fully coordinated, clearly spoken and articulate with no signs of vagueness or confusion. Ms Morrison gave the deceased a triage score of 4, meaning that she needed to be seen within an hour. Ms Morrison also identified the deceased as a fast-track patient, being a patient with uncomplicated presentations who had limited clinical management requirements and who was likely to be discharged home after brief care in the ED.[20]

37. After she had taken the deceased's observations, Ms Morrison approached the GP on duty in the ED, Dr Boyd, about the deceased.[21]

[17] Exhibit 1, Volume 1, Tab 26
[18] Exhibit 14
[19] Exhibit 1, Volume 1, Tab 26
[20] Exhibit 1, Volume 1, Tab 26
[21] Exhibit 1, Volume 1, Tab 26

DR BOYD

38. Dr Boyd was an experienced GP who had a practice in Northam with two partners and who also worked at the Northam Hospital on 24 hour shifts on a regular basis. When he was on those shifts, he would be responsible for the hospital as the only doctor present. He and Ms Morrison, whom he held in high regard as a nurse, had worked together at the Northam Hospital for many years.[22]

39. Around the time that Ms Morrison admitted the deceased into the ED ward and examined her, Dr Boyd was working at or near the ward's reception desk a few metres away. As he was passing near the deceased's bed, Ms Morrison went up to him to discuss the deceased's condition. She showed him the triage record and asked whether the deceased could be given something.

40. Dr Boyd and Ms Morrison went to the foot of the deceased's bed where they had a brief chat. Dr Boyd decided to prescribe the deceased an injection of the anti-inflammatory agent ketorolac and oral diazepam. He and Ms Morrison then went to the reception desk where, it appears, he completed the medication chart. He instructed Ms Morrison to give the deceased a take-home pack of 10 tablets of 5mg diazepam. He also completed a medical certificate for the deceased to show that she was not fit for work. Ms Morrison then prepared the ketorolac injection and administered it to the deceased.

41. Dr Boyd said that his plan was to keep the deceased in the ED ward in order to assess her after the medication had been administered. It seems that he indicated to Ms Morrison that he anticipated that the deceased would be able to go home if the medication improved her condition. He did not make an entry in the ED notes for the deceased apart from stating: 'neck pain/spasm. No injury.'[23]

42. Sometime later, Dr Boyd left the ED ward and went into the medical ward of the hospital. He then went for lunch and afterwards went to the ED to provide a nurse with a medical certificate.

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[22] ts 40 per Boyd, A
[23] Exhibit 1, Volume 1, Tab 27

43. At 1.50 pm the deceased vomited 400mls of dark green liquid. A nurse informed Dr Boyd, who was in the ED at the time, about the deceased's vomiting. He was not concerned as he thought the vomiting was probably due to the celecoxib that she had taken that morning.[24]

THE DECEASED LEAVES THE ED

44. At about 2.10 pm Ms Morrison returned to the ED ward from her lunch break and learned about the deceased vomiting. She spoke to the deceased, who said that she was no longer nauseous. As Ms Morrison had understood from Dr Boyd's previous actions that he had effectively discharged the deceased, she asked her how she felt about going home. The deceased was initially uncertain, but once she got off the bed she said that her neck did feel a bit better and that she felt all right to go home.[25]

45. The deceased left the ED with Ms Thomas at about 2.20 pm. The deceased's mother thought that the deceased was a bit wobbly on her feet, which appears to me to be reflected on the CCTV record.[26] Ms Morrison thought that she looked tired from the diazepam and doxylamine and from the relief of pain.[27]

EVENTS LEADING UP TO DEATH

46. From the hospital, the deceased went back to Ms Thomas' home where she tried to lay on a bed in the spare room, but she could not get comfortable. At about 5.00 pm she vomited green liquid and complained of severe pain and spasms in her neck. At about 7.00 pm Ms Thomas helped the deceased to get into the bath, where she stayed for 40 minutes.[28]

47. When the deceased got out of the bath she was unsteady on her feet. Ms Thomas dressed her and sat her on the bed. She stayed with her, rubbing her neck and giving her sips of

[24] Exhibit 1, Volume 1, Tabs 27 and 28; ts 50 per Boyd, A
[25] Exhibit 1, Volume 1, Tab 26
[26] Exhibit 14
[27] Exhibit 1, Volume 1, Tab 26
[28] Exhibit 1, Volume 1, Tab 8

water. The deceased sat up in the bed with her knees bent and her head on her knees. She only spoke when she needed to vomit.[29]

48. At about 3.00 am Ms Thomas gave the deceased a diazepam tablet and went to the bathroom to run a shower for her. While she was there, the deceased fell to the floor in the bedroom. Ms Thomas helped her into the bathroom to have a shower and afterwards took her back into the bedroom where the deceased again vomited.[30]

49. Ms Thomas rubbed the deceased's neck with a liniment, which appeared to help. She stayed with her until 4.30 am, by which time she seemed quite settled. The deceased lay down on her side and told Ms Thomas that she was the best nurse and that she loved her.[31]

50. Ms Thomas then went to her own bedroom to sleep. She awoke at around 6.00 am when Mr Thomas put on the kettle. She went into the spare bedroom expecting to find that the deceased was much better, but found her unresponsive on her back in the middle of the bed with open eyes and blue extremities. She called for Mr Thomas, who ran into the room and commenced cardiopulmonary resuscitation (**CPR**).

51. Ms Thomas called for an ambulance and called the deceased's sister Natalie, who arrived and helped Mr Thomas administer CPR until ambulance officers and a paramedic arrived.

52. Ambulance officers attended and continued to attempt to revive the deceased with CPR and an automated external defibrillator. They took the deceased to York Hospital. Dr Steed attended and assisted in the resuscitation attempt, but the deceased could not be revived. Dr Steed completed a life extinct certification at 7.33 am that morning.

[29] Exhibit 1, Volume 1, Tab 8
[30] Exhibit 1, Volume 1, Tab 8
[31] Exhibit 1, Volume 1, Tab 8

CAUSE OF DEATH

53. On 2 January 2013 Chief Forensic Pathologist Dr C T Cooke conducted a post mortem examination and found hydrocephalus (fluid on the brain) with enlarged lateral ventricles and congestion of the lungs, a non-specific finding. There was no other significant finding. Dr Cooke recommended that a neuropathological examination be done.

54. On 8 January 2013 neuropathologist Dr R C Junckerstorff examined the deceased's brain and found dilatation of the lateral and third ventricles and cerebral swelling. Following a microscopic examination, Dr Junckerstorff concluded that the deceased had long-standing (chronic) hydrocephalus and cerebral swelling with an unclear aetiology, as well as small, old border-zone ischaemic necrosis (stroke) in the left cerebral hemisphere.

55. Importantly, while Dr Junckerstorff found evidence of brain swelling with likely raised intracranial pressure, he found no transtentorial or transforaminal herniation and no brainstem haemorrhages.

56. With the assistance of Dr Junckerstorff's findings, Dr Cooke formed the opinion that the cause of death was chronic hydrocephalus with brain swelling.[32]

57. Dr Cooke was unable to be certain about the precise mechanism of death, but he was aware of a journal article by Rickert C H, F Grabellus, K Varchmin-Schultheib, H Stob and W Paulus (**the Rickert article**)[33] in which the authors postulated that sudden unexpected death of young people with chronic hydrocephalus can be caused by relatively minor changes of intracranial pressure that affect neural pathways in the brain stem and medulla which control heart and lung function. Dr Cooke thought that a conclusion that the mechanism identified in the Rickert article caused the deceased's death was speculative, but that it made sense.[34]

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[32] ts 108 per Cooke, C T
[33] Rickert C H, F Grabellus, K Varchmin-Schultheib, H Stob and W Paulus, 'Sudden unexpected death in young adults with chronic hydrocephalus' Int J Legal Med (2001) 114, 331-337; Exhibit 1, Volume 1, Tab 5
[34] ts 111 per Cooke, C T

58. Dr Cooke said that he was very comfortable with the cause of death as he expressed it. He said that there was really nothing else to explain the death.[35]

59. Following the hearing of the inquest, Dr Cooke arranged for toxicological analysis of samples which he had previously obtained from the deceased for that purpose. That analysis detected celecoxib and ketorolac and showed paracetamol, diazepam and doxylamine at therapeutic or sub-therapeutic levels. No drugs were found that could have contributed to the deceased's death.[36]

60. In oral evidence, Dr Junckerstorff said that he considered that the explanation provided in the Rickert article was a theoretical application of neurophysiology. He said that he was not a neurophysiologist, but it did seem a reasonably proposed mechanism.[37] He said that vomiting was a recognised cause of raising intracranial pressure, and that it was possible that the vomiting experienced by the deceased caused a rise in intracranial pressure which led to dysfunction of the cardiorespiratory centre in the brainstem and cardiac arrest.

61. Both Dr Cooke and Dr Junckerstorff said that chronic hydrocephalus was a very rare cause of death. Dr Cooke said that the deceased's case was the only one he had seen in the 15,000 post mortem examinations he had conducted.[38] Dr Junckerstorff said that he was surprised that there was no evidence of herniation because, classically, in acute obstructive hydrocephalus (where the build-up of fluid is caused by a blockage in the cerebral aquaduct) one would expect to see herniation.[39] He had not seen a case of chronic hydrocephaly before.[40]

62. Professor Knuckey is an eminent neurosurgeon with extensive clinical and academic experience, and is widely published.[41] After reviewing the documents that now make up most of Exhibit 1, he provided a report in which he commented on the quality of assessment and care of the

[35] ts 111 per Cooke, C T
[36] Exhibit 16
[37] ts 102 and 104 per Junckerstorff, R
[38] ts 107 per Cooke, C T
[39] ts 97 per Junckerstorff, R
[40] ts 94 and 105 per Junckerstorff, R
[41] Exhibit 1, Volume 1, Tab 7

deceased at Northam Hospital and related details, including the likely cause of death.[42]

63. In oral evidence Professor Knuckey said that it was not reasonable to think that chronic hydrocephaly itself caused the deceased's death. However, he said that the hypothesis in the Rickert article, namely that a patient with chronic hydrocephalus develops instability in the cardio-respiratory system precipitated by a mild event which triggers a small rise in pressure and upsets the delicate balance in the central nervous system without leaving evidence of raised intracranial pressure, is often thought to be what may happen to people with chronic hydrocephalus who die suddenly. He pointed out that it was a hypothesis which could not be proved.[43]

64. Based on what he knew of the deceased's case, Professor Knuckey said that he was not able to proffer an alternative hypothesis for the cause of death,[44] and that the mechanism described in the hypothesis in the Rickert article was probably the cause of death.[45]

65. As to the issue of identifying an event which may have precipitated the deceased's cardio-respiratory instability, Professor Knuckey said that people with chronic hydrocephaly often live with a very low intracranial pressure, but they may be susceptible to small changes in pressure such as that which may be triggered by a minor head injury or vomiting.[46]

66. Professor Knuckey considered that the neck pain, headaches and vomiting which the deceased experienced prior to her death were not the result of her hydrocephalus in the sense of raised intracranial pressure.[47] Instead, he thought that the neck pain and vomiting would have likely upset the delicate balance in her central nervous system, which resulted in a fatal effect from a cardiorespiratory event.[48]

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[42] Exhibit 1, Volume 1, Tab 7
[43] ts 11-13 per Knuckey, N W
[44] ts 13 per Knuckey, N W
[45] ts 19 per Knuckey, N W
[46] ts 21 per Knuckey, N W
[47] ts 20 per Knuckey, N W
[48] ts 22 per Knuckey, N W

67. Given the foregoing, I am satisfied that the precise mechanism of death was likely as described by Professor Knuckey. For the purposes of finding the cause of death under s25(1)(c) of the Act, I am satisfied that it was as expressed by Dr Cooke: chronic hydrocephalus with brain swelling.

QUALITY OF CARE AND ASSESSMENT OF THE DECEASED

68. There is no evidence to suggest that the care provided to the deceased by Dr Steed was anything other than appropriate.

69. The role of Dr Boyd in caring for the deceased at the ED was the subject of three independent reviews.

70. The first review was conducted in early 2013 by the Chief Medical Officer for the Department of Health, Professor Gary Geelhoed, as part of his investigation into the circumstances of the deceased's death and five other cases at Northam Hospital from August 2010 to June 2012. He found that Dr Boyd's failures to take an adequate history, to physically examine the deceased and to make adequate notes did not give the best chance to detect a potentially treatable condition. He found that Dr Boyd's management of the deceased was not consistent with best medical practice.[49]

71. The second review was conducted by a conduct review panel (**the panel**) convened by the Western Australian Country Health Service in April 2013. The panel reviewed the deceased's case and 11 randomly selected recent cases managed by Dr Boyd.

72. In a report dated 31 August 2014 the panel concluded that the documentation in Dr Boyd's cases did not meet the standard expected in the ED but that clinical care in all of the cases was adequate. The panel considered that Dr Boyd would have benefited from a comprehensive orientation to emergency department work and the standards of documentation expected.[50]

[49] Exhibit 4
[50] Exhibit 12

73. The panel noted that Dr Boyd's service to Northam was long and was recognised as exemplary by his colleagues. The panel considered that Dr Boyd was capable of continuing to work in emergency care provided he undertake further training with regard to contemporary standards of history taking, clinical examination and documentation.[51]

74. The third review was initiated by the Australian Health Practitioner Regulation Agency (**AHPRA**) on behalf of the Medical Board of Australia (**the Medical Board**). AHPRA obtained an opinion from a Western Australian GP, Dr Ian Leggett, to the effect that Dr Boyd did not adequately assess the deceased and did not make clinical records of an adequate standard.[52]

75. On 24 November 2014 the Performance and Professional Standards Panel of the Medical Board (**the PPS Panel**) held a hearing into Dr Boyd's care of the deceased. It found that Dr Boyd behaved in a way that constituted unsatisfactory professional performance by failing to obtain an adequate history, failing to adequately assess or examine the deceased, providing Ms Morrison with discharge medicine and a medical certificate to provide to the deceased without assessing the deceased and failing to maintain adequate records.[53]

76. The PPS Panel expressly did not find that Dr Boyd failed to admit the deceased to the hospital where it was clinically appropriate to do so, or that he failed to reassess the deceased when it was clinically appropriate to do so after learning that she had vomited at 1.50 pm, or that he failed to adequately communicate to nursing staff that he wanted to see the effect of medication on the deceased before reviewing and/or discharging her.[54]

77. The PPS Panel noted that Dr Boyd's apparent failure to reassess the deceased after learning that she had vomited did not constitute unsatisfactory professional performance.[55]

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[51] Exhibit 12
[52] Exhibit 15
[53] Exhibit 15
[54] Exhibit 15
[55] Exhibit 15

78. The PPS Panel decided to reprimand Dr Boyd and to impose conditions on his registration.[56]

79. In oral evidence, Dr Boyd agreed that it would have been better if he had examined the deceased, but he doubted whether there would have been a different outcome.

80. In my view, while the criticisms of Dr Boyd may have been justified, his professional performance with respect to his care of the deceased appeared to be a function of the clinical environment in place at Northam Hospital at the time. It is important to note that Professor Geelhoed commented that two broad areas of concern arose from the six cases he investigated: lack of medical leadership in the ED and poor communication and uncertain roles within and between the medical and nursing disciplines.[57]

81. Professor Geelhoed noted that those areas of concern arose in the context of, and were related to, the ED having evolved in a short period of time from a nurse-led, quiet country hospital to a busier regional centre without the necessary implementation of medical leadership. There were changes to the system of doctors' availability at Northam Hospital and the ED, but the pre-existing model of reliance by doctors on nursing assessments continued, as appeared to have occurred in relation to the deceased.[58]

82. Professor Geelhoed made six recommendations aimed at addressing the areas of concern, one of which was to support medical and nursing staff with access to ongoing education and training, as well as comprehensive clinical protocols and guidelines.[59] I note that Dr Boyd had not received any supplementary training as an emergency doctor when the changes noted above were made.[60]

83. Another recommendation made by Professor Geelhoed was the appointment of an emergency medicine specialist to the ED.[61] That recommendation has since been implemented.[62] Ms Morrison, who still worked at Northam Hospital at the

[56] Exhibit 15
[57] Exhibit 4
[58] Exhibit 4
[59] Exhibit 4
[60] ts 42 per Boyd, A
[61] Exhibit 4
[62] Exhibit 13

time of the inquest, said that the introduction of emergency medicine specialists has benefited the ED because their organisational process was so different from GPs, with rapid assessment, decision-making and clear clinical pathways.[63]

84. It is also important to note that none of the reviews of Dr Boyd's care of the deceased found that his care of the deceased contributed to her death.

85. Professor Knuckey considered that the overall care and assessment of the deceased at Northam Hospital was clinically appropriate. He was unequivocal in his evidence that Dr Boyd could not have known that the deceased had hydrocephalus.[64]

86. Professor Knuckey said that the deceased showed no symptoms of raised intracranial pressure. The relevant symptoms are cognitive dysfunction, urinary incontinence and gait ataxia.[65] The evidence indicates that the deceased was unsteady on her feet when she left the ED, but there were other possible causes for that. There was no evidence to suggest that she experienced cognitive dysfunction or urinary incontinence.

87. There was no reason in Professor Knuckey's view to think that Dr Boyd should have arranged for a CT scan or a lumbar puncture.[66] If Dr Boyd had done a plain neck X-ray, it is unlikely that it would have shown anything which would have led to further actions.[67]

88. Professor Knuckey said that, if Dr Boyd had referred the deceased to him, he would have assessed her in due course and, if he thought she had neck pain and he was not convinced that the hydrocephalus was symptomatic, he would not have intervened. He said that he sees lots of patients who have large ventricles, and that he does not do anything unless the patients are symptomatic.[68]

[63] ts 71 per Morrison, V A
[64] ts 17 per Knuckey, N W
[65] ts 10 per Knuckey, N W
[66] ts 14-15 per Knuckey, N W
[67] ts 14-15 per Knuckey, N W
[68] ts 16-17 per Knuckey, N W

89. In the foregoing circumstances, I am satisfied that, in objective terms, the deceased was provided with adequate care and treatment while at the ED. I am satisfied that any justifiable criticisms of Dr Boyd's professional conduct related to procedural practices rather than to the treatment which the deceased received.

90. I am satisfied that the changes implemented to the ED since the deceased's death have rectified the structural and cultural deficiencies which developed when the situation at Northam Hospital changed from that of a quiet country hospital to that of a busy regional centre.

HOW DEATH OCCURRED

91. The evidence establishes that the deceased had a rare condition of chronic hydrocephalus. That condition made her susceptible to instability of her cardio-respiratory system resulting from relatively mild events which raised her intracranial pressure. Examples of such events included minor head injury and vomiting.

92. In the absence of an alternative explanation, I am satisfied that the deceased experienced a rise in her intracranial pressure, probably from vomiting due to pain associated with neck pain and headache, which led to her death from cardiorespiratory failure.

93. I find that death occurred by way of natural causes.

CONCLUSION

94. The deceased was a young woman with a close family and a promising life in front of her when she died suddenly from a rare, asymptomatic condition following a brief admission to an emergency department at a country hospital.

95. In such circumstances it is tempting to use hindsight to attribute blame on hospital staff for failing to have taken the steps necessary to have saved her life.

96. However, it is clear in my view that the care the deceased received at the hospital was adequate given her presentation, and that her sudden and tragic death was not reasonably predictable.

B P King
Coroner
20 January 2017