Coroners Act 1996

[Section 26(1)]

Western ***Australia***

RECORD OF INVESTIGATION OF DEATH

Ref No: 31/13

I, Barry Paul King, Coroner, having investigated the death of ***Craig James Doherty*** *with an inquest held at the* ***Perth Coroner's Court, Court 51, CLC Building, 501 Hay Street, Perth,*** *on* ***15 to 17 July 2013****, find the identity of the deceased person was* ***Craig James Doherty*** *and that death occurred* ***between 4 June 2010 and 7 June 2010*** *at* ***Unit 7/ 71 Parry Street, East Perth****, from* ***propofol toxicity*** *in the following circumstances:*

Counsel Appearing:

Marco Tedeschi assisting the Coroner
Stephanie Teoh on behalf of Royal Perth Hospital and the Department of Health

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INTRODUCTION

1. Craig James Doherty (**the deceased**) was a clinical theatre nurse at Royal Perth Hospital (**RPH**). He lived in a unit in East Perth.

2. He failed to show up for night shift on 6 June 2010, so a colleague went to his unit the next day to check on him and, after getting no response, contacted police to seek assistance.

3. Police officers attended, entered the unit and found the deceased lying in the main bedroom, dead from an apparent over-dose of drugs. Large quantities of drugs and medical items were located in the unit.

4. A toxicology analysis of the deceased's blood revealed propofol at a fatal level as well as lower levels of lignocaine and other drugs.

5. Propofol and the other drugs were readily available to the deceased in his role as a clinical theatre nurse.

6. From 15 to 17 July 2013 an inquest was held into the deceased's death with a view primarily to consider whether steps could be taken at hospitals that could reduce the potential for similar deaths to occur. The focus of the inquiry was on RPH's management of propofol under the policies of the Western Australian Department of Health (**the Department**).

7. The evidence adduced at the inquest comprised an investigation brief compiled by a police investigator, Sergeant R J Stevens, together with statements and oral evidence from employees of RPH and the Department.

8. The inquest was held together with an inquest into the death of Hayley Bree Fisher, a registered mid-wife at King Edward Memorial Hospital who died from an overdose of fentanyl which she had apparently obtained at work.

THE DECEASED

9. The deceased was born in Northern Ireland on 26 January 1971. He immigrated to Australia in 1973 with his family and settled in Perth.

10. After leaving high school the deceased attended university where he obtained a degree in nursing. He then worked at the Osborne Park Hospital for five years before obtaining a position at RPH in April 1995. He began working in the operating theatre area in 2001 and was promoted to Clinical Nurse – Night Duty in June 2005.

11. In 1999 the deceased was diagnosed with epilepsy, which may have been related to an episode of meningitis he suffered in late 1996. The epilepsy was treated and he was free of seizure activity in December 2000. At around the same time, the deceased was also prescribed medication for depression.

12. The deceased continued to receive prescriptions for anti-depression medication from his doctor until 2004. For several years he suffered from migraines for which he was also prescribed medications.

13. Early on 3 March 2008, the deceased took an overdose of drugs in an apparent suicide attempt following a crisis with a relationship. He contacted family members by SMS to say goodbye, and they arranged for emergency medical intervention in time to ensure that he survived. The deceased was taken to Sir Charles Gairdner Hospital for treatment because he was well-known at RPH.

14. At the time, the deceased informed his family that he had taken morphine, and he told the treating medical personnel at Sir Charles Gairdner Hospital emergency department that he had consumed temazepam, morphine, fentanyl and alcohol. It appears, for reasons which remain unexplained, that toxicology analysis was conducted only in relation to alcohol and paracetamol.[1]

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[1] Exhibit 2 Volume 1 Tab 25

15. The deceased was apparently ashamed at his act of self-harm and was discharged with no further suicidal ideation. However, a crushed glass morphine ampoule was found by ambulance officers in the deceased's bag, and that discovery led to an investigation by the Department's corporate governance directorate and by the Nurses and Midwives Board of Western Australia, both of which investigations resulted in conclusions that there was no evidence to substantiate an allegation that the deceased had stolen the ampoule.[2]

16. In late August 2009 the deceased saw his doctor with depression precipitated by his father's recent suicide. His doctor prescribed medication for insomnia. A colleague and friend who regularly worked with the deceased, Cora Pierce, noted that after his father's death, the deceased seemed extremely upset but appeared to cope.

17. Around February 2010 Ms Pierce noticed what appeared to be puncture marks on the deceased's inner arms. The deceased gave her the seemingly reasonable explanation that he had allowed phlebotomy students to take his blood for blood tests.[3]

18. As a clinical nurse, the deceased competently managed all other theatre area nurses on night shift.

19. Ms Pierce considered the deceased to be a capable professional with a good knowledge base, and was sociable, reliable and enjoyable to work with. He was well respected by his colleagues and, if he had personal issues, his work was not affected.[4]

20. The deceased's manager, Carmel McCormack, told the inquest that in her view the deceased was good clinically, was a good manager and was a good person.

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[2] Exhibit 2 Volume 1 Tab 25
[3] ts.113
[4] ts.125

21. It seems that, unbeknownst to his colleagues at RPH and contrary to RPH or departmental policy, the deceased had been supplementing his income by working as an 'agency nurse' while being employed at RPH. Evidence indicated that he had been doing shifts in recovery at St John of God Hospital, but there was no evidence of the type of work he was doing. He had also been taking medicines home without authorisation.

6 JUNE 2010

22. On Thursday 3 June 2010 the deceased worked the night shift at RPH as rostered.

23. On the afternoon of Sunday 6 June 2010, Ms Pierce sent the deceased an email but, uncharacteristically for the deceased, he did not reply to her. She went onto his Facebook page and noticed that he had made no entries since the preceding Friday, which was also unusual.

24. That Sunday evening at 10.45pm, RPH staff contacted Ms Pierce to inform her that the deceased had not shown up for the shift that night. As the deceased was normally punctual and reliable, Ms Pierce became concerned for him. She made a number of phone calls to try to locate him, but to no avail.

25. The next morning, Ms Pierce went to the deceased's first floor unit where she rang his doorbell and again tried his phone without any response. She then contacted police who attended and entered the unit through the unlocked balcony sliding door.[5]

26. The deceased's body was found behind the door into the main bedroom. Around the upper right arm was a medical tourniquet, and a syringe was inserted in the arm attached to a winged infusion kit.[6]

[5] Exhibit 2 Volume 1Tab 7
[6] Exhibit 2 Volume 1Tab 4

27. On a bedside table was an opened vial of Provive 1%, a solution containing the anaesthetic drug propofol. A small plastic vial of the local anaesthetic lignocaine was on a set of drawers.

28. Around the kitchen bench area in the unit were several types of prescription drugs and medical paraphernalia. The drugs were all of a nature and form consistent with having been taken from a hospital and all were available from RPH. One of the drugs, a topical adrenaline used for the treatment of burns, was available only from RPH.

29. Of the drugs found in the deceased's unit, at least six medications were classified under the *Poisons Act 1964* as Schedule 4 substances, being prescription only medicines. Those six drugs included propofol and lignocaine. They were drugs which would have been easily accessible to the deceased in his role as clinical nurse, and RPH's stocks of those drugs were not monitored or audited closely.[7]

30. Police found no evidence of forced entry or the involvement of another person.

POST MORTEM EXAMINATION AND TOXICOLOGY

31. Forensic pathologist Dr Judith McCreath made a post-mortem examination of the deceased on 9 June 2010.[8]

32. Dr McCreath found multiple old and fresh puncture sites within the front of both elbows and on the outer aspects of both wrists. A microscopic examination showed an acute haemorrhage in the soft tissue of the right elbow.

33. Toxicological analysis of the deceased's blood and urine detected propofol, lignocaine, promethazine, codeine and alcohol. The syringe found with the deceased was also analysed, showing the presence of propofol and lignocaine.

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[7] ts.114-120
[8] Exhibit 2 Volume 1 Tab 16

34. The level of propofol in the deceased's blood was analysed to be approximately 0.63 mg/L, which was at the lower end of a range of concentrations known to have led to death attributable to propofol abuse. The lignocaine was detected at a sub-therapeutic level. Promethazine, which is used as a pre-operative sedative, was at a therapeutic level.[9]

35. Dr McCreath determined that the cause of death was propofol toxicity.

PROPOFOL

36. Propofol is widely used for the induction and maintenance of general anaesthesia and for procedural sedation. It rose to notoriety following the death in 2009 of entertainer Michael Jackson who was found to have died from a propofol overdose. Wikipedia cites a search warrant affidavit which apparently stated that Mr Jackson's doctor 'administered 25 milligrams of propofol diluted with lidocaine (lignocaine) shortly before Jackson's death'.

37. Two witnesses at the inquest stated that, after the deceased was found to have died from propofol toxicity, they each did some research on-line and discovered that propofol is considered a drug of abuse of choice of some professionals[10] and 'a night shift worker's drug.'[11]

38. For what it is worth, my own researches on-line revealed evidence of both long-term and recreational use of propofol by anaesthetists who have access to it. The short-term effects of its use are said to be mild euphoria, hallucinations and disinhibition. According to the information I found, recreational use of propofol is relatively rare due to the level of monitoring necessary to take it safely. Three deaths from self-administration are identified in the research (not including the deceased's),

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[9] Exhibit 2 Volume 1 Tab 17
[10] ts.123 per C Pierce
[11] ts.152 per C McCormack

as is a proposal in the US state of Missouri to use propofol for executions by lethal injection.[12]

39. Whether the on-line information is accurate or not is less important than the fact that the information is available publicly and may lead some people to attempt to acquire propofol in order to abuse it. Ms McCormack told the inquest about a person who, without authorisation, entered the RPH theatre area in 2012 dressed as medical staff and stole propofol from an anaesthetic trolley.[13]

40. There appears to be no doubt, as is evidenced by the cause of death of the deceased, that self-administration of propofol is dangerous. In my view, the potential for propofol to be used recreationally and the inherent dangers of such use provide good reasons for its storage and management to be strictly controlled.

41. Following the inquest, the Corruption and Crime Commission (**CCC**) provided to this Court statistics of Schedule 8 and restricted Schedule 4 drug discrepancies reported by the WA public health system to the CCC from March 2011 to December 2012. Of the discrepancies that have been investigated and explained, only a small percentage of them have involved misconduct. However, the vast majority of discrepancies have remained unexplained.

42. Counsel for RPH, Ms Teoh, responded to the statistics by submitting that propofol was not reported in the list of top 10 drug discrepancies and is therefore less likely to go missing, so the evidence does not support the imposition of stricter controls.[14]

43. Ms Teoh also submitted that the amount of medication misplaced (or misappropriated) in light of the total number of transactions is minimal.

44. Those submissions appear to be misconceived with respect to propofol. The evidence of Ms McCormack and

[12] Wikipedia 'Propofol'
[13] ts.152
[14] The submission also related to fentanyl, being relevant to the death of Hayley Bree Fisher.

Mr Keen established that, as an unrestricted Schedule 4 medicine, propofol was not audited or monitored closely enough for any discrepancies to be picked up.[15] The quantity of propofol in the deceased's possession was stark evidence of that fact.

CONTROL OF DRUGS IN THE OPERATING THEATRE AREA AT RPH

45. Under the *Poisons Regulations 1965* a person may not sell or supply a Schedule 4 drug like propofol or lignocaine to another person unless the person is satisfied that the sale or supply is authorised by, among other things, a prescription issued by a medical practitioner or an authorisation on a hospital medication chart.[16]

46. Unlike the requirements that apply to the possession of controlled drugs covered by Schedule 8 of the *Poisons Act 1964*, there is no requirement to keep a register or make regular inventories of Schedule 4 drugs.

47. However, as well as the requirements and restrictions under the *Poisons Act 1964* and *Poisons Regulations 1965*, the management of medications in public hospitals in Western Australia is governed by operational directives issued by the Department and by policies specific to each hospital or each area. Operational directives provide minimum standards to be applied across all public hospitals; individual hospitals may apply more stringent standards as seen to be appropriate.[17]

48. At RPH the policy for management of medications at the time of the deceased's death was found in the Nursing Practice Standard for Medications Version 2.1 which was in general conformity with Operational Directive OD 0141/08. That practice standard required two staff members, one of whom being a registered nurse, to be

[15] ts.164, 182
[16] Regulations 36(1), 38AA *Poisons Regulations 1965*
[17] Exhibit 2, Volume 2, Tab 23

responsible for each Schedule 8 drug transaction, and for all Schedule 8 drugs to be checked each shift and entered into the relevant register.

49. While no similar requirements applied to Schedule 4 drug transactions as a whole, in August 2009 the Department had issued Operational Directive OD 0215/09 which identified a range of Schedule 4 drugs that were liable to abuse and therefore required heightened storage and recording procedures. That operational directive classified 16 medicines as 'restricted Schedule 4 medicines' and set out the storage and recording procedures applicable to them.[18]

50. The storage and recording procedures for restricted Schedule 4 medicines mirrored those pertaining to Schedule 8 drugs in OD 0141/08 except that the administration of a restricted Schedule 4 medicine to a patient required the presence and signature of only one nurse.[19]

51. The procedures relating to restricted Schedule 4 medicines were included in the Nursing Practice Standard for Medications with the requirement for two nurses to be responsible for the administration of those medicines to patients. Exceptions were provided to the ED Assessment Area, the OT (which I assume to be the operating theatre area) and the Gastroenterology Unit, where in each case only one nurse was required.

52. In order to provide a practical means of overcoming the burden of these requirements when administering restricted Schedule 4 medicines that are used frequently, the Standard suggested that consideration be given to allocating a designated page in the relevant register.

53. As mentioned, propofol was not a restricted Schedule 4 medicine under the operational directives. No storage or recording requirements applied to propofol under the Nursing Practice Standard.

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[18] Exhibit 2, Volume 2, Tab 23, Annexure NJK2
[19] Exhibit 2, Volume 2, Tab 23, Annexure NJK2

54. Ms McCormack, who is the Nursing Director of Operating Theatres at RPH, noted that, in the theatre area of RPH at the time of the deceased's death, propofol was kept with other drugs in unlocked cupboards in the central preparation area and in a trolley in each theatre.[20] Propofol is still kept in an unlocked cupboard in the preparation area in the centre of two blocks of theatres.[21] It appears that hospitals do not monitor the amounts of propofol used. [22]

INCREASED CONTROL OF PROPOFOL

55. From June 2007 to 2009 an investigation into misconduct handling procedures at the Department was carried out by the Corruption and Crime Commission. The investigation led to a report (**the CCC report**) that was tabled in Parliament on 22 April 2010.

56. The CCC report contains a section in which a review of the 'handling and management of Schedule 8 and Schedule 4 drugs within WA health' (**the CCC review**) is described. The review was completed in January 2009 following wide consultation with managerial level employees from ten metropolitan and country hospitals, not including RPH.

57. In blunt terms, the CCC review found that the security of Schedule 8 drugs was generally well-managed, but that the security of Schedule 4 drugs, particularly Schedule 4 drugs 'of interest' such as panadeine forte and benzodiazepine, was much less rigorous than it should have been. The CCC review contained specific reference to a need for a strategy for managing drug-related misconduct.

58. In the CCC review, and reproduced in the CCC report, was a series of 8 recommendations made by the CCC to the Department with a view to the Department improving

[20] ts.149
[21] ts.151
[22] ts.164, 182

its drug management and its management of drug-related misconduct.

59. After the commencement of the review process, the Department increased its focus on drug-related matters, as may be the background for the timing of the operational directives and other initiatives. The Department agreed with all the recommendations in the CCC review.

60. The Assistant Director of the Ethical Standards Branch of the Department's Corporate Governance Directorate, Shayne Sherman, provided evidence about a number of initiatives related to possible misconduct by staff in relation to the management of drugs. The Department has instituted ongoing staff training to raise awareness of the Department's expectations.[23]

61. The Department's Chief Pharmacist, Neil Keen, provided a statement and gave oral evidence about the Department's current policies relevant to Schedule 8 medicines and restricted Schedule 4 medicines.

62. In relation to the possibility of including propofol in the list of restricted Schedule 4 medicines, Mr Keen noted that a discussion was held in 2013 amongst chief pharmacists of public hospitals, but no consensus was reached. He pointed out, consistent with the evidence of Ms McCormack, that propofol is used frequently in operating theatres and ready accessibility in emergency situations may be necessary. He suggested in his statement that a balance needs to be found between the need for legitimate urgent access and the prevention of unauthorised access.[24]

63. Ms McCormack said in her statement that some enhanced security of drugs has been introduced into the theatre area at RPH by way of swipe card access, the locking of theatre drug trolleys overnight and the use of small drug safes in theatres. She stated that she had recently met with the Director of Nursing, Nursing

[23] Exhibit 2, Volume 2, Tab 23, Annexure SDS3.
[24] Exhibit 2, Volume 2, Tab 23

Director – Critical Care areas, the Head of Department – Anaesthesia and the Chief Pharmacist, and they discussed plans to lock up propofol more securely, but at this stage no major changes have been made, and the implementation of locking up propofol is a work in progress.[25]

64. The stores officer in the pharmacy at RPH, Michael Jeps, told the inquest that in the intensive care unit at RPH propofol is kept in syringes, and that they (I infer that he meant the staff at the pharmacy) were proactive in making propofol a restricted drug by requiring it to be ordered by requisition rather than its stock levels being maintained by imprest.[26]

65. Mr Keen stated that the Department would consider further what steps if any to take with respect to the control of propofol following any findings or recommendations that may be made as a result of this inquest. If the Department was moved to place greater levels of control on propofol, extensive consultation with the numerous stakeholders would be undertaken to arrive at the best approach.

66. One of the possible approaches would be for the Department to list propofol as a restricted Schedule 4 medicine, but doing so would in Ms McCormack's view result in very laborious and time consuming duties on nurses in the theatre area, potentially compromising patient care.[27]

67. In her view, more staff resources, ideally by way of pharmacy assistants, would offer a solution.[28] She suggested that another alternative would be to keep propofol in locked cupboards and carry out audits at the end of each shift; that way, the persons with the keys to the cupboards would also be kept accountable.[29]

[25] Exhibit 2, Volume 2, Tab 24
[26] ts.128
[27] ts.156
[28] ts.158
[29] ts.175

68. Mr Keen considered that it would be possible for the Department to place appropriate requirements on the storage and handling of propofol either by way of a classification as a restricted Schedule 4 medicine subject to exceptions relating to specified areas or circumstances, or by way of a combination of different procedures, possibly tailored for individual circumstances in each hospital.[30]

69. I note that, on the face of it, the 2013 Nursing Practice Standard for Medication Administration at RPH already identifies propofol as a drug to be managed as a restricted Schedule 4 medicine. However, the statement of Barry Jenkins, the Chief Pharmacist at RPH, indicates that the reference to propofol in the 2013 nursing practice standard is an error that is not followed at RPH or any other hospital.[31]

70. The 2013 nursing practice standard does include requirements for restricted Schedule 4 medicines that can be subject to exceptions, suggesting that a practical balance to the competing considerations identified by Mr Keen is possible with respect to medicines like propofol which may be required urgently.

71. The evidence at the inquest demonstrated that another means of placing a higher level of security on medicines in hospital is the more widespread use of technological solutions. For example, Mr Jenkins mentioned automated medicine units (**AMU's**) which control access to drugs through biometric identification and passwords.

72. One major benefit of AMU's, in addition to a heightened security of medicines, is an ongoing electronic record of all medicine transactions, including those related to unrestricted Schedule 4 medicines, without the need for time-consuming manual recording.

73. One detriment of AMU's is their cost, estimated by Mr Jenkins to be up to $5million for a hospital such as RPH.

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[30] ts. 185-186, 190-192
[31] Exhibit 2, Volume 2, Tab 26

74. Both Ms McCormack and Mr Jenkins point out that AMU's do not record whether or not the medicine was administered to the patient, so a large gap in the control of medicines would still remain notwithstanding the use of a higher level of technology.

RECOMMENDATION

75. Taking the foregoing into account, and given the potential danger associated with unauthorised use of propofol and the evidence that it is a medicine that is subject to abuse, and given the likelihood that a practical means of restricting unauthorised access to it without jeopardising emergency access to it can be found, I make the following recommendation.

> I recommend that, if reasonably practicable, the Department and all hospitals in the Western Australian health system implement a means of restricting the unauthorised use of propofol without placing patients at risk.

CAUSE OF DEATH

76. In accordance with the determination of Dr McCreath, I find that the cause of death was propofol toxicity.

MANNER OF DEATH

77. The deceased was a highly experienced and competent theatre nurse, who might have been expected to be aware of the dangers of self-administration of propofol.

78. Because of that, it might reasonably be thought that he would have been aware that the amount of propofol and other drugs he used leading to his death was likely to be lethal.

79. The question then arises of whether the evidence establishes that the deceased intended to take his own life.

80. Counsel Assisting pointed out, and I accept, that there was no evidence to suggest that the deceased intended to harm himself and the concentration of propofol found in the deceased's blood was at the lower range of the known fatal range.

81. Ms McCormack testified that nurses learned from experience about the effects of drugs such as propofol used on patients, but they do not necessarily learn about the *misuse* of these drugs.

82. It is relevant in my view that the deceased was in possession of a large quantity of propofol and that his arms had multiple old puncture sites, indicating a likelihood that he had used propofol in the past. When that likelihood is taken into account together with the fact that the concentration in the deceased's blood was not extreme, it leads to the conclusion that the deceased did not have an intention to take his life.

83. From a common sense point of view, if the deceased had intended to take his life, he might be expected to have used a much greater amount of propofol.

84. In addition to those considerations, the deceased's mother provided a statement in which she stated without reservation her view that the deceased had not intended to take his own life. She based that conclusion on the undignified way in which the deceased was found, and the fact that the deceased had not left a message concerning his death. Both facts were highly uncharacteristic of the deceased.[32] Relevant to the lack of a message, it is worth noting that, when the deceased attempted serious self-harm in 2008, he contacted family members to apologise and to say goodbye.

85. In these circumstances, I find that the manner of death was accident.

[32] Exhibit 2 Volume 1 Tab 6

CONCLUSION

86. I am satisfied that, as a night duty theatre nurse, the deceased had unrestricted access to propofol which he misappropriated in order to use recreationally.

87. At some time between 4 June 2010 and 7 June 2010 the deceased accidently injected an excessive amount of propofol into himself, causing his death.

B P KING
CORONER

5 September 2013