IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

COR 2021 002666

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 63(2)

*Section 67 of the **Coroners Act 2008***

Findings of:	Coroner Simon McGregor
Deceased:	Susan Mary Royals
Date of birth:	8 August 1946
Date of death:	22 May 2021
Cause of death:	1(a) Complications of carotid artery injury from central line insertion in the setting of surgery for metastatic carcinoma.
Place of death:	Northern Health, The Northern Hospital, 185 Cooper Street, Epping, Victoria, 3076
Key words:	Northern Hospital, colon cancer, Whipple procedure, pancreaticoduodenectomy, hemicolectomy, central venous catheter, CVC

INTRODUCTION

1. On 22 May 2021, Susan Mary Royals was 74 years old when she died at the Northern Hospital in Epping (**the Northern**). At the time of her death, Susan lived at 56 Ripplebrook Drive, Broadmeadows.

2. Susan's medical history included ischaemic heart disease, chronic obstructive pulmonary disease, hypothyroidism, and hypertension.[1]

3. On 10 April 2021, Susan was referred to the Northern following a four-month history of malaise, anorexia, and functional decline. A computed tomography (**CT**) scan showed multiple lesions in her colon, duodenum, and liver, which cumulated in a diagnosis of metastatic colon cancer on 12 April.[2]

4. On 3 May 2021, Susan was reviewed at the Northern to discuss the management of condition. A Whipple procedure (also known as a pancreaticoduodenectomy) and right hemicolectomy was discussed with her, including its related risks and complications. Susan was also made aware of alternative treatment, such as chemotherapy. An anaesthetic review occurred on 11 May where further procedure risks were discussed and consented to by Susan.[3]

THE CORONIAL INVESTIGATION

5. Susan's death was reported to the Coroner as it fell within the definition of a reportable death in the *Coroners Act 2008* (the Act). Reportable deaths include deaths that are unexpected, unnatural or violent or result from accident or injury.

6. The role of a coroner is to independently investigate reportable deaths to establish, if possible, identity, medical cause of death, and surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability.

[1] Northern Health Medical E-Deposition dated 22 May 2021, page 1.
[2] Northern Health Medical E-Deposition dated 22 May 2021, page 1.
[3] Northern Health Medical E-Deposition dated 22 May 2021, page 1.

7. Under the Act, coroners also have the important functions of helping to prevent deaths and promoting public health and safety and the administration of justice through the making of comments or recommendations in appropriate cases about any matter connected to the death under investigation.

8. Victoria Police assigned an officer to be the Coroner's Investigator for the investigation of Susan's death. The Coroner's Investigator conducted inquiries on my behalf, including taking statements from witnesses – such as family, the forensic pathologist, treating clinicians and investigating officers – and submitted a coronial brief of evidence.

9. This finding draws on the totality of the coronial investigation into the death of Susan Mary Royals including evidence contained in the coronial brief. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity. In the coronial jurisdiction, facts must be established on the balance of probabilities.[4]

10. In considering the issues associated with this finding, I have been mindful of Susan's basic human rights to dignity and wellbeing, as espoused in the *Charter of Human Rights and Responsibilities Act 2006* (Vic), in particular sections 8, 9 and 10.

MATTERS IN RELATION TO WHICH A FINDING MUST, IF POSSIBLE, BE MADE

Circumstances in which the death occurred

11. On 18 May 2021 at 8.15am, Susan was admitted to the Norther to undergo the Whipple Procedure and right hemicolectomy.[5] During the procedure, a central venous catheter (**CVC**) was inserted.[6]

12. Following the procedure, she was admitted to the Intensive Care Unit (**ICU**) for haemodynamic support in the context of significant hypotension and ventilation.[7] Her CVC

[4] Subject to the principles enunciated in *Briginshaw v Briginshaw* (1938) 60 CLR 336. The effect of this and similar authorities is that coroners should not make adverse findings against, or comments about, individuals unless the evidence provides a comfortable level of satisfaction as to those matters taking into account the consequences of such findings or comments.
[5] Northern Health Medical E-Deposition dated 22 May 2021, page 1.
[6] Northern Health Medical E-Deposition dated 22 May 2021, page 2.
[7] Northern Health Medical E-Deposition dated 22 May 2021, page 2.

was assessed and was found to have entered the right carotid artery. Following this discovery, she was reviewed by a vascular surgeon who suggested surgical repair of the carotid.[8]

13. On 19 May 2021, Susan underwent surgical repair and removal of the CVC. Due to concerns about a possible stroke from her right carotid injury, she underwent a CT scan which indicated right cerebral hemisphere watershed ischaemia. Susan was reviewed by the Neurology team who advised that she was too risky for thrombolysis or thrombectomy and was planned for a repeat CT of her brain on 20 May to monitor her cerebral perfusion.[9]

14. Throughout her time in the ICU, Susan continued to require inotropic support[10] and was eventually diagnosed with multi-organ failure. Her condition continued to deteriorate despite intensive support.[11]

15. On 22 May 2021, Susan suffered a cardiac arrest. Cardiopulmonary resuscitation was not attempted in deference to her goals of care, and she passed away 1.45am.[12]

Identity of the deceased

16. On 22 May 2021, Susan Mary Royals, born 8 August 1946, was visually identified by her son, Wayne Royals.

17. Identity is not in dispute and requires no further investigation.

Medical cause of death

18. Forensic Pathologist Dr Sarah Parsons from the Victorian Institute of Forensic Medicine (**VIFM**) conducted an examination on 24 May 2021 and provided a written report of her findings dated 27 May 2021.

19. The post-mortem CT scan revealed liver steatosis, coronary artery calcification, and interstitial markings.

20. Toxicological analysis was not indicated and was not performed.

[8] Northern Health Medical E-Deposition dated 22 May 2021, page 2.
[9] Northern Health Medical E-Deposition dated 22 May 2021, page 2.
[10] Administration of medications that assist to stabilise circulation.
[11] Northern Health Medical E-Deposition dated 22 May 2021, page 2.
[12] Northern Health Medical E-Deposition dated 22 May 2021, page 2.

21. Dr Parsons provided an opinion that the medical cause of death was 1 (a) complications of carotid artery injury from central line insertion in the setting of surgery for metastatic carcinoma.

22. I accept Dr Parsons' opinion.

FAMILY CONCERNS

23. On 22 May 2021, Tracey Ashby, Susan's daughter, communicated concerns to the Court regarding her mother's management at the Northern, including whether her mother's diagnosis had been delayed, and whether the CVC had been misplaced.

CPU REVIEW

24. To assist with my investigation into Susan's death, I requested that the Coroners Prevention Unit (**CPU**)[13] review Susan's care in the context of Tracey's concerns and advise whether any prevention opportunities could be identified.

The procedure

25. The CPU reviewed Susan's medical records from the Northern and advised that the pre-operative preparation and consent was appropriate, including many potential complications communicated to Susan including (but not limited to) those risks related to CVC insertion.

26. The CPU noted that Susan's surgery was extensive and complicated, with the CVC inserted late during the procedure when it was determined that additional monitoring was required. When the CVC's placement in the right carotid artery was discovered in the ICU, appropriate consultation with relevant specialists took place, as well as open disclosure with Tracey.

27. The CPU further noted that the use of ultrasound guidance during the insertion of Susan's CVC was not mentioned in the Northern's subsequent investigation and report following her death. A subsequent statement obtained from the Northern confirmed that ultrasound guidance was used during Susan's procedure, despite its omission from her medical record.[14]

[13] The Coroners Prevention Unit (CPU) was established in 2008 to strengthen the prevention role of the coroner. The unit assists the Coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations. The CPU also reviews medical care and treatment in cases referred by the coroner. The CPU is comprised of health professionals with training in a range of areas including medicine, nursing, public health and mental health.

[14] Statement of Richard Laufer dated 26 May 2022.

28. Arterial puncture is a well-recognised complication of CVC insertion, occurring in between six and nine per cent of cases. The CPU advised that ultrasound guidance should be standard practice when inserting CVCs and assists in the reduction of arterial punctures.

Northern Health investigation

29. Following Susan's death, a review by Northern Health's Serious Incident and Oversight Advisory Committee took place, as well as a Root Cause Analysis (**RCA**). Several issues and remedial actions were identified and implemented, including:

    a) Limited safety barriers in place to confirm correct CVC placement. A number of minimum mandatory steps are now required to be confirmed during insertion and prior to use of a CVC. This new preventative measure has been communicated to all staff using CVCs and is audited for compliance;

    b) Limited documentation of the CVC insertion on the anaesthetic chart. A standard Vascular Device Insertion form has now been implemented at the Northern;

    c) It was acknowledged that ultrasound guidance has become the gold-standard for CVC insertion, and the Northern's CVC procedure has been updated to include a requirement that ultrasound must be used when inserting central lines, for vein localisation, and confirmation of the wire being in the vein prior to dilation. It is also recommended that ultrasound-guided real-time needle insertion is performed; and

    d) Delayed insertion of the CVC due to uncertainty regarding the progression of Susan's procedure. It was identified that clinician fatigue may have contributed to the incorrect placement. Formal processes have been implemented including multi-disciplinary intra-operative planning where a more complex procedure is anticipated. This will include a requirement for additional monitoring/line insertion, staff, and resources.

FINDINGS AND CONCLUSION

30. The standard of proof for coronial findings of fact is the civil standard of proof on the balance of probabilities, with the *Briginshaw* gloss or explications.[15] Adverse findings or comments against individuals in their professional capacity, or against institutions, are not to be made with the benefit of hindsight but only on the basis of what was known or should reasonably have been known or done at the time, and only where the evidence supports a finding that they departed materially from the standards of their profession and, in so doing, caused or contributed to the death under investigation.

31. I note the deficits identified during the course of the Northern Health's investigation into Susan's death, however I am confident that the remedial actions undertaken following the procedure and subsequent investigation will assist in reducing the likelihood of a similar incident in the future. I commend Northern Health for their positive actions and willingness to engage with the court throughout this investigation.

32. Pursuant to section 67(1) of the *Coroners Act 2008* I make the following findings:

    a) the identity of the deceased was Susan Mary Royals, born 8 August 1946;

    b) the death occurred on 22 May 2021 at Northern Health, The Northern Hospital, 185 Cooper Street, Epping, Victoria, 3076, from *complications of carotid artery injury from central line insertion in the setting of surgery for metastatic carcinoma.*; and

    c) the death occurred in the circumstances described above.

RECOMMENDATIONS

33. In consideration of the advice received from the CPU regarding the use of ultrasound guidance during the insertion of CVCs, I sought the assistance of Safer Care Victoria (**SCV**) in developing a recommendation for the development of a standardised approach for CVC insertion to reduce the likelihood of instances of arterial puncture.

[15] *Briginshaw v Briginshaw* (1938) 60 CLR 336 at 362-363: 'The seriousness of an allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of the consequences flowing from a particular finding, are considerations which must affect the answer to the question whether the issues had been proved to the reasonable satisfaction of the tribunal. In such matters "reasonable satisfaction" should not be produced by inexact proofs, indefinite testimony, or indirect inferences…'.

34. SCV concurred that there was value in developing a guideline given that CVC placement is a skill that covers several operators and training pathways from Emergency Medicine, Anaesthesia, Critical Care Medicine, Radiology, Cardiology and Surgery.

35. SCV cautioned that mandating the use of ultrasound in CVC insertion could hinder some cohorts of patients receiving a CVC in a timely manner however, and that reliance on ultrasound alone is not infallible and other methods of confirming venous placement should be used.

36. Therefore, pursuant to section 72(2) of the Act, I make the following recommendation:

Safer Care Victoria develops a standardised approach for CVC insertion which encourages the use of ultrasound guided insertion (and other methods of confirming venous placement) to reduce the likelihood of instances of arterial puncture.

I convey my sincere condolences to Susan's family for their loss.

Pursuant to section 73(1A) of the Act, I order that this finding be published on the Coroners Court of Victoria website in accordance with the rules.

I direct that a copy of this finding be provided to the following:

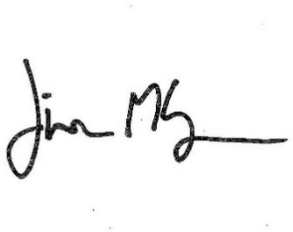
Tracy Ashby, Senior Next of Kin

Richard Laufer, Northern Health

Jordyanne See, Safer Care Victoria

Constable A. John, Victoria Police, Reporting Member

Signature:



CORONER SIMON McGREGOR

CORONER

Date: 26 July 2022

NOTE: Under section 83 of the ***Coroners Act 2008*** ('the Act'), a person with sufficient interest in an investigation may appeal to the Trial Division of the Supreme Court against the findings of a coroner in respect of a death after an investigation. An appeal must be made within 6 months after the day on which the determination is made, unless the Supreme Court grants leave to appeal out of time under section 86 of the Act.