IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2018 005744

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 63(2)
*Section 67 of the **Coroners Act 2008***

Findings of:	Coroner Audrey Jamieson
Deceased:	Carlene Margaret Salveson
Date of birth:	27 April 1938
Date of death:	14 November 2018
Cause of death:	1(a) PULMONARY THROMBOEMBOLISM IN THE SETTING OF DEEP LEG VEIN THROMBOSIS 2 SQUAMOUS CELL CARCINOMA OF THE LEFT PYRIFORM FOSSA (TREATED)
Place of death:	Alfred Health, the Alfred Hospital, 55 Commercial Road, Melbourne, Victoria, 3004

CONTENTS PAGE

INTRODUCTION

1. Mrs Carlene Margaret Salveson was 80 years of age at the time of her death. She lived with her husband Maxwell Salveson in Malvern East. Mrs Salveson's medical history included: hysterectomy[1], hypertension[2], anxiety, removal of basal cell skin cancers[3] from her back and squamous cell biopsy[4] from her arm in 2017.

2. In August 2018, medical investigation identified that Mrs Salveson had skin cancer growth in her left sinus passage.[5] She commenced chemotherapy and radiation therapy. On 2 November 2018, Mrs Salveson was admitted to the Alfred Hospital after feeling generally unwell and being unable to eat or drink. She remained in hospital receiving various treatments.

3. On 14 November 2018 at about 5.40am, Mrs Salveson was found unresponsive in her hospital bed. She was unable to be revived, despite resuscitative measures. Mrs Salveson was pronounced deceased at 6.00am.

4. Medical practitioners were not able to provide a death certificate as the medical cause of Mrs Salveson's death was unknown.

THE CORONIAL INVESTIGATION

5. Mrs Salveson'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.

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

[1] The surgical removal of the womb (uterus), with or without the removal of the ovaries.
[2] High blood pressure.
[3] A slow growing, non-melanoma type of skin cancer that originates in the basal cells of the epidermis.
[4] Squamous cell carcinoma is one of the most common forms of skin cancer. Squamous cell carcinoma (SCC) develops when the flat cells in the top layer of skin (called squamous cells) grow and divide in an uncontrolled way.
[5] Mrs Salveson's cancer growth was to her pyriform fossa, part of the hypopharynx (bottom part of the pharynx/throat) that lie partly to each side of the larynx (voice box).

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 Mrs Salveson'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 Carlene Margaret Salveson 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.[6]

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

Circumstances in which the death occurred

10. On Friday 2 November 2018, Mrs Salveson presented to the Alfred Hospital feeling unwell, with decreased oral intake and malnutrition due to oral pain. She was admitted with an acute kidney injury,[7] urinary tract infection and postural dizziness. Intravenous (IV) fluids and oral antibiotics were administered.

11. On Monday 5 November 2018, medical practitioners attempted to insert a naso-gastric tube (**NGT**).[8] After two failed attempts of each nostril, Mrs Salveson declined further insertion attempts. After discussion with her family and a dietician review, an NGT was inserted under light sedation on Friday 9 November 2018.

12. During admission, Mrs Salveson had an episode of per-rectum bleeding. Her haemoglobin[9] remained stable, no abnormalities were noted, and no further episodes were identified.

[6] 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.
[7] Acute kidney injury and acute renal failure are frequently used interchangeably. The serum creatinine concentration represents a balance between its production in the body (from muscle) and its excretion by the kidneys. Creatinine was 176 umol/L, normal reference range 45-90 umol/L.
[8] This tube is inserted through the nose and into the stomach and can be used to provide nutrition and fluids.
[9] A protein that is responsible for transporting oxygen in the blood.

13. On Monday 12 November 2018, Mrs Salveson was independently mobilising and attending her own personal needs. Her family submitted a request that she attend a private clinic for rehabilitation.

14. On 14 November 2018 at 3.30am, Mrs Salveson had transient tachycardia (heart rate of 120 beats per minute)[10] and hypoxia[11] (oxygen saturations decreased to 89 per cent)[12] after mobilisation to the toilet.

15. House Medical Officer (HMO) Dr Batchelor was asked to review Mrs Salveson's condition, whose observations improved after a period of rest. However, nursing staff noted that Mrs Salveson appeared '*to be progressively more unwell looking over last three nights*'.[13]

16. Mrs Salveson was medically reviewed and after rest, her observations returned to normal. At approximately 5.40am, Mrs Salveson was found unresponsive and cardiopulmonary resuscitation was commenced, with no return of circulation. At 6.00am, Mrs Salveson was pronounced deceased.

Identity of the deceased

17. On 14 November 2018, Carlene Margaret Salveson, born 27 April 1938, was visually identified by her daughter, Jane Salveson.

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

Medical cause of death

19. Forensic Pathologist Dr Victoria Christabel Mary Francis from the Victorian Institute of Forensic Medicine (**VIFM**), conducted an autopsy on 20 November 2018 and provided a written report of her findings dated 28 November 2018.

20. Dr Francis summarised her autopsy findings:

    a. Pulmonary thromboembolism;

    b. Bilateral deep leg vein thromboses;

[10] Heart rate is usually between 60 and 100 beats per minute.
[11] Reduction of oxygen supply to a tissue below physiological levels despite adequate perfusion of the tissue by blood.
[12] Oxygen saturation is an indicator of the percentage of haemoglobin saturated with oxygen at the time of the measurement. Usually levels are between 94 and 100 percent with no lung disease.
[13]

c. Cardiomegaly with mild myocardial fibrosis;

d. Diverticular disease;

e. Faecal loading;

f. Hysterectomy;

g. Reactive mucosal changes in both pyriform fossa with focal, microscopic foci of residual squamous cell carcinoma in the left pyriform fossa, and

h. Sternal body and anterior rib fractures with some associated intercostal muscle haemorrhage with alveolar haemorrhage and fat emboli in the small pulmonary vessels.

21. Dr Francis stated that finding "h" was typical where a person had received cardiopulmonary resuscitation prior to their death. Dr Francis also noted Mrs Salveson's history of abdominal pain. Dr Francis stated that diverticular disease and faecal loading were identified as potential causes of her abdominal pain.

22. Dr Francis commented that the post mortem examination revealed organising thromboembolism in the pulmonary trunk and pulmonary arteries and deep vein thromboses were in both lower legs. Dr Francis stated that large pulmonary emboli can cause instantaneous death and warning symptoms may include shortness of breath, chest pain, and fever. She noted that risk factors for deep vein thrombosis and pulmonary thromboembolism included hypercoagulable states which may be primary or secondary. Primary causes include hereditary alterations to the blood factors responsible for forming and destroying blood clots. Secondary causes include recent surgery, dehydration, prolonged immobility, cancer, pregnancy and use of the oral contraceptive pill.

23. Dr Francis provided an opinion that the medical cause of Mrs Salveson's death was:

1(a) pulmonary thromboembolism in the setting of deep leg vein thrombosis.

2 squamous cell carcinoma of the left pyriform fossa (treated).

THE FAMILY'S CONCERNS

24. Mrs Salveson's family raised concerns about the quality of health care and treatment that was provided by medical practitioners. The following issues or concerns of care, were identified

in the family's correspondence: hydration, mobility, risk of communication, and risk of developing deep vein thrombosis.

CPU REVIEW ONE

25. In light of the issues raised by my investigation, I requested that the Coroner's Prevention Unit (CPU) review Mrs Salveson's medical records and seek statements from her medical care providers.[14] I also directed that the CPU address the concerns raised by Mrs Salveson's family.

26. In completing the review of Mrs Salveson's medical care and treatment, the CPU perused the following sources of evidence:

    a. Victoria Police Report of Death for the Coroner;

    b. Victorian Institute of Forensic Medicine Medical Examiner's Report;

    c. E- Medical deposition form;

    d. Medical Records (Kerrie Road Family Medical Centre, Glen Waverley);

    e. Medical Records (Alfred Health UR 7154507);

    f. Family letter of concern dated 14 January 2019;

    g. Statement of Dr Sidney Davis, Radiation Oncologist, Alfred Health date 16 September 2019, and

    h. Letter of Professor Harshal Nandurkar, Program Director, Alfred Cancer, Alfred Health to Mr Max Salveson dated 29 November 2019.

Family Concerns: Response of Alfred Health

27. The CPU considered Associate Professor (A/Prof) Dr Sidney Davis' detailed statement in the context of the general themes within the family letter of concerns.

[14] 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.

Hydration

28. A/Professor Davis stated;

Mrs Salveson completed the course of radiotherapy on the 2 November 2018. […] Mrs Salveson's blood tests suggested pre-renal renal failure due to inadequate hydration and she was admitted for rehydration and symptom management on the same day

[…]

Mrs Salveson had poor oral intake during the course of her radiotherapy; this was primarily related to poor appetite and mucosal toxicity (which were side effects of the radiotherapy).

29. The CPU reported that Alfred Health practitioners escalated treatment of Mrs Salveson's poor oral intake from "encouragement" to "maintain oral intake" with IV hydration and finally NGT insertion.

Mobility

30. Nursing staff reported Mrs Salveson had been very inactive. Throughout Mrs Salveson's 12-day admission to Alfred Health, her mobility was limited due to her shortness of breath and physical weakness. It was also documented that Mrs Salveson was often withdrawn, flat and anxious. On 12 November 2018, Mrs Salveson was reviewed by a physiotherapist who recommended that she sit out of bed for 30 minutes each day and to encourage mobilisation.

31. A/Prof Davis stated;

From review of the medical records it is noted that Mrs Salveson was less than ideally mobile. Even without the acute illnesses requiring her admission, this is not unusual following an intense course of anti-cancer radiation therapy. Patients frequently take some time and a lot of encouragement to resume their previous levels of mobility.

32. The CPU concurred with A/Prof Davis that Mrs Salveson's mobility was poor and variable throughout her admission. The poor mobility had been documented in the medical notes and allied health input had been sought.

Communication

33. Mrs Salveson's family stated that her medical records were unavailable, the medical team were not present when the family were present to review Mrs Salveson, and they raised concerns in relation to the manner of care provided by staff.

34. A/Professor Davis stated that:

a. *The outpatient radiotherapy notes are stored on a separate IT system. However, the treating medical team had access to all Mrs Salveson's notes.*

b. *Radiation Oncology staff are often busy in clinics, rather than on the ward (given their service is largely outpatient based). The radiation Oncology Unit is in the process of reviewing modes of better keeping in contact with families.*

c. *Alfred Health strives for the highest level of care and has apologised to the family for this impression. The Nurse Unit Manager has recognised this concern, with a view for the nursing team to learn and improve from it.*

Risk of developing deep vein thrombosis

35. A/Professor Davis stated that Mrs Salveson was at a higher risk of developing a DVT and PE.[15] He also confirmed that Alfred Health had a management plan for DVT prophylaxis and, according to that plan, *'Mrs Salveson should according to that plan, have been placed on pharmacological DVT prophylaxis, but was not'...*

36. The CPU also confirmed that several factors placed Mrs Salveson in the higher-risk-category of acquiring a DVT, including: her age, cancer treatment, dehydration, reduced mobility, and hospitalisation.

Review Conducted by Alfred Health

37. A/Professor Davis stated that an in-depth case review was conducted at the hospital. The findings presented at a Clinical Outcome Review Committee (CORC) on 19 July 2019. The CORC nominated the following as contributing factors leading to the failure to administer DVT prophylaxis:

a. Introduction of the new Electronic Medical Record (EMR) system on 16 October 2018 including an electronic medication administration system and subsequent staff familiarity with this system. The 'go-live' on Mrs Salveson's ward occurred on 19 October 2018.

b. At 'go-live', the EMR did not provide a prompt for VTE prophylaxis risk assessment.

15 Paragraph 23, 24 and 42.

38. Recommendations from this review included:

    a. Review and improve the VTE risk assessment tools, and

    b. Activation of the VTE prophylaxis alert in the electronic medication chart which will continue until an appropriate prescription is completed.

CPU Review One Outcomes

39. A/Professor Davis provided a frank and comprehensive statement. However, there were unanswered concerns related to the failure to administer VTE prophylaxis in the context of an active EMR. Consequently, the CPU indicated that I could seek a further statement in relation to the implementation of various EMR systems across Victoria. The unit suggested that the statement questions be about the general risks of transferring hospital records onto EMRs, as well as specific queries in relation to mitigating the risks of transferring the traditional "National Paper Charts" for high risk medications such as VTE prophylaxis, warfarin, and insulin.

CPU REVIEW TWO

40. At my request, the CPU sought the two suggested statements. Firstly, the unit requested a statement from Dr Lee Hamley, Director of Medical Services at Alfred Health. She was asked questions in relation to the implementation of the EMR at Alfred Health, as well as prescribing of anticoagulation for Deep Vein Thrombosis. Secondly, the CPU sought a statement from Mr Neville Board, Chief Digital Health Officer, Department of Health and Human Services regarding the associated risks of implementing EMRs in hospital.

Dr Lee Hamley, Executive Director of Medical Services and Chief Medical Officer at Alfred Health

41. Dr Hamley provided an extensive response to the statement questions answered. She indicated that input was sought from various Alfred Health including the chief pharmacy information officer, as well as the clinical informatics and change manager.

42. Dr Hamley stated that

    The 'go-live' for Ward 4W (i.e. Mrs Salveson's ward) was on 19 October 2018. […] The compliance rate with VTE prophylaxis prior to EMR implementation was between 90%-100% […] After go-live, the compliance rate with VTE prophylaxis reduced […] After the

implementation of the VTE prophylaxis alert, the compliance rate increased and was established to >90%.

[…]

Following the EMR go-live, as part of the optimization of the EMR system, it was determined that due to an identified reduced compliance in VTE prophylaxis documentation when using EMR, (compared to pre-EMR/go-live) additional decision supports needed to be developed to assist Medical and Pharmacy staff.

43. In response to whether Alfred Health has performed a review of the implementation of the EMR and medication administration system since Mrs Salveson's death, Dr Hamley stated;

Alfred Health has taken an ongoing approach to reviewing the implementation of the EMR to monitor any potential adverse events […]. There is also a 'patient safety dashboard' which includes a medication safety indicator. This is reviewed at a monthly Benefits Realisation Committee meeting […]. Medication incidents reported through Riskman system are all reviewed to determine if EMR use may have contributed to the incident […].

44. Dr Hamley also stated that in October 2019, Alfred Health had an external review conducted of its medication management as part of its regular National Safety and Quality Health Service Standards accreditation cycle.

45. In relation to EMR "pop ups" or "alerts" and the risk of alarm fatigue, Dr Hamley stated that VTE alerts had been consolidated into one "pop up". Furthermore, all alerts are suppressed for the first 24 hours after admission. Dr Hamley also said that there were few alerts for VTE prophylaxis due to the '*high baseline rate of VTE prophylaxis documentation across Alfred Health, which is presently >90%*'.

46. Dr Hamley also re-iterated the contributing factors related to the lack of DVT prophylaxis administration provided in Professor Sidney Davis' statement.

Mr Neville Board, Chief Digital Health Officer of the Department of Health and Human Services

47. Mr Board provided detail of the devolved governance of the public health sector which are accountable and responsible, through their Boards, for deploying ICT and digital health technology. Mr Board stated, '*there is potential clinical risk whilst go-live is occurring, when*

both paper and electronic systems may be in operation and workflows are new' and provided information on several EMR medication projects.

48. The paper base National Medication Chart has specific areas for VTE prophylaxis, warfarin, and insulin. The CPU asked Mr Board how have these and all high-risk medications been integrated into EMR across Victoria to minimise risk and prevent harm? Mr Board stated;

I am unable to comment on how presentation, prescribing, administration and dispensing of high-risk medicines is configured in each EMR implementation in Victoria.

49. The CPU asked Mr Board, if he had any additional comments. Mr Board stated that it was appropriate to treat EMR and electronic medication management systems (EMMs), in the same way as other safety incidents. Mr Board further stated;

We would be amenable to working with clinical and safety leaders in Victoria and nationally, to review how EMRs and EMMs present and mange high risk medicines, including but not limited to anticoagulants including warfarin, the heparins and novel oral anticoagulants therapies.

COMMENTS

Pursuant to section 67(3) of the Act, I make the following comments connected with the death.

1. I accept Mrs Salveson's family's evidence that there were times where it seemed that medical staff were unavailable. It is clear that a lack of communication and a perceived lack of care for Mrs Salveson exacerbated her family's distress. However, I am informed and satisfied that her medical team had access to Mrs Salveson's medical record at all relevant times. I also accept that Alfred Health held a meeting with Mrs Salveson's family after her death and I endorse the health services' intention to review modes of communication in the radiation Oncology unit. I also commend the Nurse Unit Manager's initiative to educate nursing staff by referencing the issues raised by Mrs Salveson's family.

2. I accept that Alfred Health has reviewed there EMR and implemented appropriate changes in relation to, *inter alia*, alerts for drug administration. However, the review identified that additional decision-making supports for medical and pharmacy staff still ought to be developed. The Chief Digital Health Officer of Victoria indicated the Department of Health's willingness to work with clinical safety and health leaders to review the risks posed by the implementation EMRs and EMMS. A pertinent public health and safety recommendation will follow.

3. Alfred Health has conceded that the failure to provide Mrs Salveson VTE prophylaxis was a breach of standard practice and management planning, as well as a deviation from an acceptable standard of care. The CPU informed me that the appropriate course of treatment may have altered her short-term outcomes.

RECOMMENDATIONS

Pursuant to section 72(2) of the Act, I make the following recommendations:

1. In the interests of public health and safety and to prevent like deaths, I recommend that the Chief Digital Health Officer of Victoria coordinate with clinical and safety leaders in Victoria and nationally, including Safer Care Victoria, the Australian Commission on Safety and Quality in Health Care and Therapeutic Goods Administration, to review how Electronic Medical Records and Electronic Medication Management systems present and manage high risk medicines.

FINDINGS

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

    a. the identity of the deceased was Carlene Margaret Salveson, born 27 April 1938;

    b. Carlene Margaret Salveson's death occurred on 14 November 2018 at Alfred Health, the Alfred Hospital, 55 Commercial Road, Melbourne, Victoria, 3004

    c. I accept and adopt the medical cause of death, as formulated by Dr Victoria Christabel Mary Francis and I find that Carlene Margaret Salveson died from:

    1(a) pulmonary thromboembolism in the setting of deep leg vein thrombosis.

    2 squamous cell carcinoma of the left pyriform fossa (treated).

    d. I find that Carlene Margaret Salveson was not provided VTE prophylaxis during her final admission to Alfred Health,

    e. AND I find that the recent transition to an Electronic Medical Record and Electronic Medication Management system contributed to this failure.

    f. I further find that Alfred Health's failure to administer VTE prophylaxis to Carlene Margaret Salveson represents a missed opportunity to intervene in the clinical course leading to her death.

g. I am unable to find whether or not Carlene Margaret Salveson's death was preventable.

Pursuant to section 73(1B) 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:

Maxwell Salveson

Penny Corns, Legal Counsel & Coroner's Liaison of Alfred Health

Mr Neville Board, Chief Digital Officer of the Department of Health and Human Services

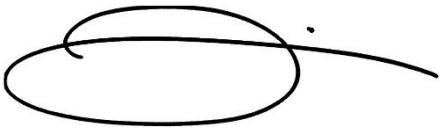
Safer Care Victoria

Australian Commission on Safety and Quality in Health Care

Therapeutic Goods Administration

Coroner's Investigator Constable Dominic Lovell

Signature:



AUDREY JAMIESON

CORONER

Date: 10 June 2021

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.