IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

COR 2019 3297

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 63(2)

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

Findings of:	Coroner Leveasque Peterson
Deceased:	Phillip John Sealey
Date of birth:	28 March 1957
Date of death:	27 June 2019
Cause of death:	1(a) Diabetic ketoacidosis in a man with coronary atherosclerosis and cardiomegaly
Place of death:	54 Middle Road, Bromley, Victoria, 3472

INTRODUCTION

1. Phillip John Sealey (**Phillip**) was 62 years old at the time of his death and lived in Bromley, Victoria with his wife Debra.

2. Phillip had a medical history of chronic pain, neuropathic pruritus syndrome and reduced mobility due to work-related bilateral shoulder and injuries for which he was prescribed opioid analgesics. Phillip had a familial history of diabetes and ischaemic heart disease but had not himself been diagnosed with diabetes.

3. On 27 June 2019, Phillip died at his home from diabetic ketoacidosis.

THE CORONIAL INVESTIGATION

4. Phillip'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.

5. 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.

6. 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.

7. In view of concerns regarding Phillip's medical management, I referred the matter to the Health and Medical Investigation Team within the Coroners Prevention Unit (**CPU**)[1] for review of the treatment and care provided to Phillip. The CPU provided advice which has guided my investigation.

[1] 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.

8. After considering all the material obtained during the coronial investigation, including a statement from GP Dr Benjamin Ganesan, medical records from Amstel Medical Clinic and Nightingale Clinic, I determined that I had sufficient information to complete my tasks as coroner and that further investigation was not required.

9. This finding draws on the totality of the coronial investigation into the death of Phillip John Sealey. 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.[2]

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

Circumstances in which the death occurred

10. On the morning of Thursday 27 June 2019, Phillip attended Nightingale Clinic, Maryborough due to feeling unwell for several days, where he saw General Practitioner (**GP**) Dr Benjamin Ganesan.

11. Phillip's regular GP was Dr Vito Spina at Amstel Medical Centre, Cranbourne. However, he felt too unwell to travel the distance (approximately 2.5-3 hours journey by car) so had arranged an appointment at Nightingale Clinic, a medical centre closer to his home which he had previously attended on multiple occasions, including most recently on 8 May 2019 for an unrelated condition.

12. Phillip's wife Debra took him to Nightingale Clinic. She stated that on the way to the clinic, they had to stop about three times so that Phillip could vomit. She noted that Phillip was also unable to quench his thirst. She states that Phillip had with him a list of his symptoms, which stated *"blurred vision, dizzy, often sick, shaky, toileting"*. Debra was not present during Phillip's consultation with Dr Ganesan.

13. Dr Ganesan states that during the consultation, Phillip described thirst over the past three weeks with symptoms of urinary frequency and nocturia[3]. There was no reference made in Dr Ganesan's notes to blurred vision, dizziness or vomiting. However, Dr Ganesan recorded that he examined Phillip's abdomen, which he recorded was soft and non-tender, with present

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[2] 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.

[3] Nocturia is waking at night one or more times to urinate.

bowel sounds and with no bowel issues or pain. He also made note of a plan for Phillip to see an optometrist. Dr Ganesan recorded that Phillip's sitting blood pressure was 160/90 mmHg, his pulse was 90 beats per minute (regular) and his oxygen saturation was at 99%.

14. Dr Ganesan diagnosed Phillip with hypertension, for which he prescribed perindopril[4] 5mg. He formed the impression that Phillip was experiencing anxiety and made a differential diagnosis[5] of diabetes mellitus due to Phillip's reported symptoms of thirst, nocturia and urinary frequency. He ordered blood tests, including a fasting blood glucose test and noted in the referral form for the blood tests that Phillip had nocturia, polydipsia (extreme thirstiness) and hypertension. Phillip was to be reviewed in a week, following the blood tests.

15. Debra stated that Phillip was not initially given anything for his nausea or vomiting, and she had to return to the clinic for him to request something for his stomach after being advised to do so by a pharmacist. Phillip was subsequently prescribed maxolon[6] 10mg, a medication used to treat nausea and vomiting.

16. Debra states that the blood tests could not be performed until the following day, and Phillip returned home with her. He spent the rest of the day in the lounge room but had to get up regularly to vomit despite the medication. In the early evening, Phillip went to bed but called out to his wife and began to speak *"jibberish"*.

17. Concerned about Phillip's declining condition, Debra called for an ambulance at about 7.30pm. Ambulance paramedics attended a short while later, but Phillip's condition deteriorated rapidly, and he became unresponsive. Despite the efforts of attending paramedics, Phillip was unable to be revived and was pronounced deceased at 8.31pm.

Identity of the deceased

18. On 27 June 2019, Phillip John Sealey, born 28 March 1957, was visually identified by his wife, Debra Sealey.

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

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[4] Perindopril is a medication used to treat high blood pressure, heart failure or stable coronary artery disease.

[5] In healthcare, a differential diagnosis is a method of analysis of a patient's history and physical examination to arrive at the correct diagnosis. It involves distinguishing a particular disease or condition from others that present with similar clinical features.

[6] Maloxon contains metoclopramide hydrochloride.

Medical cause of death

20. Forensic Pathologist Dr Victoria Francis from the Victorian Institute of Forensic Medicine (**VIFM**), conducted an autopsy on the body of Phillip John Sealey on 4 July 2019. Dr Francis also reviewed the Victoria Police Report of Death for the Coroner (Form 83), post-mortem computed tomography (**CT**) scan, and medical records from Amstel Medical Centre and Nightingale Clinic. She provided a written report of her findings dated 5 December 2019.

21. The post-mortem examination revealed foamy cytoplasmic change in the renal tubules with some non-specific changes in the kidneys in keeping with a chronic hypertension, but no pathognomonic changes of diabetes mellitus were identified. Phillip's heart was enlarged and there was significant coronary atherosclerosis.

22. Dr Francis explained that coronary artery atherosclerosis occurs when there is a build-up of cholesterol and other material in the blood vessels supplying oxygen and other nutrients to the heart. When the narrowing of the vessel becomes significant, this can cause the supplied area of heart muscle to die (a myocardial infarction) or it may cause arrhythmias (disturbance in the nervous system regulating the heart beat). These can both result in sudden death. Dr Francis noted that there was a short time interval between the onset of arrhythmia and death, then ischaemic changes may not be identifiable at autopsy. Risk factors for coronary atherosclerosis include increasing age, smoking, hypertension, family history, diabetes mellitus, obesity, male sex and other factors such as hyperlipidaemia (high cholesterol).

23. Toxicological analysis of post-mortem samples identified the presence of fentanyl[7], mirtazapine, metoclopramide, chlorpromazine and amlodipine[8], consistent with medical treatment.

24. Post-mortem biochemistry showed a significantly elevated vitreous glucose level (84.2 mmol/L) which was consistent with severe hyperglycaemia. There was also an elevated hydroxy-butyrate in keeping with ketoacidosis and significantly elevated creatinine and mild increase in urea in keeping with renal insufficiency. Troponin, a molecule that elevates in the blood stream in the setting of myocardial damage, was not significantly elevated.

25. Dr Francis explained that diabetic ketoacidosis is a catastrophic metabolic event in which there is insufficient insulin in the body and the body is unable to store glucose leading to a

[7] Fentanyl is a powerful opioid analgesic used for pain relief.
[8] Amlodipine is a prescription medication used to treat high blood pressure and coronary artery disease.

build-up of glucose within the blood. Ketones such as acetone, are produced when the body needs to burn fatty acids. The symptoms of diabetic ketoacidosis usually evolve over approximately 24 hours and include nausea, vomiting, excessive urine production and abdominal pain, that can sometimes be severe and resemble an 'acute abdomen'. If the ketoacidosis progresses, the individual becomes dehydrated, hypotensive (low blood pressure) and tachycardic (rapid heart beat). Cerebral oedema and coma can develop in severe cases.

26. Dr Francis noted that it is very rare for someone in Phillip's age group to present with diabetic ketoacidosis. There is usually another factor such as infection or myocardial infarction that precipitates the onset of diabetic ketoacidosis. In this case, no obvious precipitating factor was able to be identified.

27. Dr Francis provided an opinion that the medical cause of death was '1(a) Diabetic ketoacidosis in a man with coronary atherosclerosis and cardiomegaly'.

28. I accept and adopt Dr Francis' opinion.

REVIEW OF CARE

29. Phillip's wife Debra wrote to the court expressing concerns about care provided to Phillip at Nightingale Clinic. In light of these concerns, I referred the matter to the Health and Medical Investigation Team of the Coroners Prevention Unit for review of Phillip's care. On the advice of CPU, I obtained a statement from Dr Ganesan to address various matters including the history of presenting complaint obtained and whether Dr Ganesan had performed a fingerprick glucose (blood sugar level) during the consultation.

30. Dr Ganesan explained that during the consultation, Phillip described thirst over the past three weeks, with symptoms of urinary frequency and nocturia. Given these symptoms, Dr Ganesan considered a differential diagnosis of diabetes mellitus.

31. Dr Ganesan reported that he did not perform a fingerprick glucose test as he deemed it appropriate to conduct formal pathology testing to obtain an accurate diagnosis and explained that there was a pathology laboratory on the same grounds as the clinic, with pathology staff who are able to notify doctors of urgent pathology directly. However, the blood tests could not be performed until the following day.

32. Dr Ganesan explained that he did not feel it was necessary to conduct a blood sugar level test during the consultation as Phillip did not present as grossly unwell. He also states that Phillip

did not present with symptoms such as dizziness, which appears at odds with the list of symptoms Debra reports that Phillip had with him. I am unable to reconcile the difference between these histories. It appears likely that Phillip gave a history of vision problems, given the recorded plan to see an optometrist, but I am unable to make any conclusive findings as to the extent to which any symptoms of dizziness were reported to Dr Ganesan.

33. Dr Ganesan commented that he was surprised to note that the cause of death was found to be diabetes ketoacidosis given that Phillip did not have a formal or documented diagnosis of diabetes mellitus. Dr Ganesan stated that Phillip did not appear confused and did not present with an 'acute abdomen' during the consultation. The recorded notes confirm that on examination, Phillip's abdomen was soft and non-tender, with bowel sounds present and no bowel issues or pain reported.

34. Dr Ganesan noted that it was rare for someone of Phillip's age to have diabetic ketoacidosis, and as Phillip was not known to be diabetic, diabetic ketoacidosis was not a leading differential in his presentation. Dr Ganesan noted that Phillip was hypertensive with a normal heart rate, as opposed to being hypotensive and tachycardic, and did not present with factors including infection or myocardial infarction during the consultation.

35. Dr Ganesan extended his condolences to Phillip's family. He explained that from this experience, he has learnt to be even more vigilant in assessing patients without a diagnosis of diabetes but with symptoms of it. Should a similar scenario present to himself in the future, he would try to utilise what equipment was available if clinically indicated, including fingerprick blood sugar level test and urinalysis to expedite diagnosis and appropriate care. I commend him for this acknowledgement and practice improvements.

FINDINGS AND CONCLUSION

36. I convey my sincere condolences to Phillip's family. I acknowledge the grief and devastation that you have endured as a result of your loss.

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

    a) the identity of the deceased was Phillip John Sealey, born 28 March 1957;

    b) the death occurred on 27 June 2019 at 54 Middle Road, Bromley, Victoria, 3472 from diabetic ketoacidosis in a man with coronary atherosclerosis; and

    c) the death occurred in the circumstances described above.

38. 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.[9] 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.

39. Having considered all of the evidence, I am satisfied that identification of markedly elevated blood glucose at the time of Phillip's consultation with Dr Ganesan might have prompted testing for ketones and conceivably led to the earlier identification of Phillip's evolving ketoacidosis and referral for further testing and management in a hospital setting.

40. Based on the history he obtained, and his clinical examination, Dr Ganesan did not consider Phillip to be in any immediate danger at the time of his consultation as Phillip did not present as grossly unwell and did not have abdominal pain, tachycardia or hypotension. Dr Ganesan considered the possibility of diabetes mellitus given the symptoms of polyuria and polydipsia, and accordingly elected to refer Phillip for blood tests including fasting glucose tests to obtain an accurate diagnosis. However, these investigations were unable to be performed until the following day.

41. I note that Dr Ganesan has learnt from this experience and has indicated he is now more vigilant when assessing patients who present with such symptoms and where clinically appropriate, will undertake fingerprick blood sugar level test and urinalysis using available equipment to expedite diagnosis and appropriate care. In these circumstances, I do not propose to make any adverse comments about Dr Ganesan's care.

42. I acknowledge the concerns raised by Debra regarding Dr Ganesan's clinical performance and her interactions with Nightingale Clinic staff on the day of Phillip's death. I note that it is open to Phillip's family to raise these concerns directly with the medical clinic, or with appropriate investigatory bodies such as the Australian Health Practitioner Regulation Agency (**AHPRA**) or the Health Complaints Commissioner.

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[9] *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…'.

COMMENTS

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

43. In recent years, Coroners have raised concerns regarding the management of diabetic ketoacidosis and missed diagnoses of diabetes by primary and emergency care providers.[10] Notably, in his Finding into the death of Benjamin Hodgson, Coroner White made recommendations to the Royal Australian College of General Practitioners (**RACGP**) to:

    a) provide a clinical update to GPs to highlight the importance of recognising hyperglycaemia and ketosis in adult diabetic patients, as an uncommon but potentially serious complication of type 2 diabetes, or indication of newly recognised adult-onset type 1 diabetes; and

    b) advise GPs that although uncommon in adults and clinically subtle in its earliest states, evolving diabetic ketoacidosis may produce a dangerous metabolic decompensation and require escalation of care to a hospital setting for further assessment and management.[11]

44. In response to these recommendations, the RACGP released a Clinical Pearl on 'Recognising the signs of diabetes ketoacidosis in type 2 diabetes patients' on 12 February 2016 via their *In Practice* newsletter.[12] The RACGP also met with the Australian Diabetes Society (**ADS**) on the issue of diagnosis of glycaemic emergencies in the community and agreed that more needed to be done to increase awareness of diagnosing diabetic emergencies. Subsequently, in May 2018, RACGP and ADS produced a joint clinical position statement on *'Emergency management of hyperglycaemia in primary care'* (**Joint Statement**).[13]

45. The Joint Statement notes that hyperglycaemic emergencies may occur as the first presentation of undiagnosed diabetes and that they require urgent assessment and management to reduce preventable morbidity and mortality. The Joint Statement details the symptoms suggestive of emerging metabolic crisis associated with diabetic ketoacidosis, which includes

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[10] See for example: Finding into Death without Inquest into the death of Benjamin Hodgson (COR 2014 0477) dated 16 January 2016; Finding into Death without Inquest into the death of Caleb Pearson (COR 2015 2601) dated 1 August 2019.

[11] Finding into Death without Inquest into the death of Benjamin Hodgson (COR 2014 0477) dated 16 January 2016

[12] Clinical Pearl, 'Recognising the signs of diabetes ketoacidosis in type 2 diabetes patients' dated 12 February 2016.

[13] *Emergency management of hyperglycaemia in primary care*, RACGP and ADS joint clinical position statement published in May 2018.

symptoms of polyuria (frequent urination), polydipsia (extreme thirst), nausea, vomiting, abdominal pain and/or weight loss.

46. The Joint Statement outlines the importance of urgent point-of-care assessment for potential hyperglycaemic crises and sets out the best practice standards of care and preferred methods of assessing blood glucose and ketone including capillary (finger prick) blood glucose and capillary blood ketones. It also includes action flow charts for GPs to assist them in recognising and managing hyperglycaemic emergencies (see **Attachment A** below).

47. I commend the efforts of RACGP and ADS to raise awareness about diagnosing and best practice management of diabetic emergencies, including where they occur as a first presentation of undiagnosed diabetes. However, the circumstances of Phillip's tragic death, which occurred after the Joint Statement was published, indicate that further education in this area is warranted to ensure GPs are aware of and better able to recognise and manage hyperglycaemic emergencies in primary care, particularly for undiagnosed diabetic patients who present with some, but not all, of the signs of an emerging metabolic crisis.

48. I also consider that further education ought to be provided to patients who are suspected to have or are under investigation for diabetes to alert them as to the risks, signs and symptoms of glycaemic emergencies and the need to seek urgent medical assessment. Consequently, I have made a recommendation consistent with this.

RECOMMENDATIONS

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

1. I recommend that the Royal Australian College of General Practitioners liaise with the Australian Diabetes Society with a view to identifying further opportunities to educate and raise awareness amongst primary care providers about:
    a. hyperglycaemia emergencies occurring as the first presentation of undiagnosed diabetes;
    b. identifying and recognising signs and symptoms of an emerging metabolic crises, particularly in patients not known to have diabetes;
    c. undertaking urgent point-of-care assessment using preferred methods of capillary (finger prick) blood glucose level and capillary blood ketones tests where there are symptoms suggestive of diabetes and/or an emerging metabolic crises;

d. adopting best practice standards of care and ensuring they have access to capillary blood glucose and ketone monitoring meters and strips to undertake urgent point-of-care assessment; and
e. providing education to patients who are under investigation for or suspected to have diabetes (and their families or carers), about the risk factors, signs and symptoms of glycaemic emergencies and the need to obtain urgent medical assessment and management if such symptoms develop.

ORDERS AND DIRECTIONS

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:

Mrs Debra Sealey, Senior Next of Kin c/ Daniel Opare, Shine Lawyers
Dr Benjamin Ganesan, Nightingale Clinic
Royal Australian College of General Practitioners
Australian Diabetes Society
Mrs Judith Jacobs
Leading Senior Constable Barry Taylor, Coroner's Investigator

Signature:

Coroner Leveasque Peterson

Date : 16 August 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.

ATTACHMENT A

Box 1. Symptoms suggestive of emerging metabolic crisis associated with DKA[2]

Symptoms	Signs
Polyuria/polydipsia/thirst	Altered conscious state
Nausea/vomiting	Kussmaul breathing, rapid respiratory rate
Abdominal pain	Ketotic breath – smells like acetone
Weight loss	Dehydration*

*Clinical signs of dehydration include poor skin turgor, tachycardia, hypotension, dry mouth and tongue, oliguria or anuria. Atypical symptoms (eg pain, fever) related to the aetiology, such as sepsis, may be present. Resources to assist in assessing dehydration in children[5] and adults[6,7] are provided in the reference list.

Figure 1. People not known to have diabetes