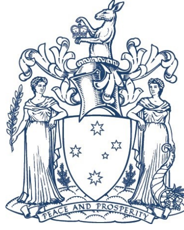

IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2015 1830

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1) of the Coroners Act 2008

Deceased:	Serafina PIRROTTINA
Delivered on:	5 December 2019
Delivered at:	Coroners Court of Victoria, 65 Kavanagh Street, Southbank
Hearing dates:	Inquest: 27 – 29 November 2017
Findings of:	Coroner Paresa Antoniadis SPANOS
Counsel assisting the Coroner:	Leading Senior Constable Duncan McKENZIE from the Police Coronial Support Unit
Representation:	Mr C. GRANT appeared on behalf of Ambulance Victoria Mr D. WALLIS, instructed by Adam Stevens of Minter Ellison, appeared on behalf of Austin Health Mr R. HARPER, instructed by Bethany Wellington of K&L Gates, appeared on behalf of Yooralla Society of Victoria
Catchwords:	Muscular Dystrophy (MD), natural death in care, Ventilator Accommodation Support Service (VASS), ventilator-dependence, Ambulance transfer to hospital without ventilator, Protocol

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I, PARESA ANTONIADIS SPANOS, Coroner, having investigated the death of SERAFINA PIRROTTINA and having held an inquest in relation to this death at Melbourne on 27-29 November 2017:

find that the identity of the deceased was SERAFINA PIRROTTINA

born on 3 August 1957, aged 57 years

and that the death occurred on 15 April 2015

at the Austin Hospital, 145 Studley Road, Heidelberg, Victoria 3084

from:

I (a) COMPLICATIONS OF MUSCULAR DYSTROPHY

in the following circumstances:

INTRODUCTION[1]

1. Serafina Pirrottina (**Sera**)[2], was a 57-year old single woman. At the age of about seven years, she was diagnosed with muscular dystrophy (**MD**), a genetic neuromuscular condition that causes progressive deterioration of muscle strength and function.[3] Two of Sera's four siblings were also diagnosed with MD.[4]

2. Sera became wheelchair-dependent within three years of her diagnosis. By her early 30s, in 1989, Sera required nocturnal non-invasive mechanical ventilation for the treatment of symptomatic nocturnal hypoventilation related to respiratory muscle weakness due to MD. Sera required assistance to apply and remove her nasal mask and start and stop her ventilator as her upper-limb mobility was limited to the use of her hands.[5]

3. Between 1989 and 1996, Sera was a part-time resident of Fairfield Hospital's Long Term Ventilation Unit (**Fairfield**) and spent weekends at her parents' home. When Fairfield amalgamated with the Department of Respiratory Medicine at the Austin Hospital (**Austin**) in 1995 and was thereafter known as the Victorian Respiratory Support Service (**VRSS**), Sera became a client of VRSS. Between 1996 and 2007, Sera was a respite client at the Austin while living at her parents' home with family and paid attendant care support.[6]

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[1] This section is a summary of background and personal circumstances and uncontentious circumstances that provide a context for those circumstances in which the death occurred.

[2] At her family's request, Ms Pirrottina will be referred to as 'Sera' throughout this finding.

[3] Inquest Brief (IB) pages 38-41.

[4] Exhibit E.

[5] IB pages 16-18.

[6] Ibid.

4. Sera became increasingly dependent on her ventilator as her muscle weakness progressed and was fully ventilator-dependent by 1999.[7] She experienced long-standing and ongoing issues with mouth leak[8] and activation of low-pressure alarms on her ventilator overnight indicating inadequate ventilation. She was advised by VRSS to wear a chin restraint with her nasal mask at night to minimise mouth leak but by about 2007 this measure was considered insufficient to ensure adequate ventilation.

5. In 2007-2008, a full-face mask (**FFM**) was recommended and fitted to address mouth leak, low pressure alarms and under-ventilation, but Sera elected to continue using the nasal mask and chin restraint.[9]

6. In April 2007, Sera became a resident of the newly-established Ventilator Accommodation Support Service (**VASS**) in Clarendon Street, Thornbury. VASS, operated by the Yooralla Society of Victoria (**Yooralla**) with funding provided by the Department of Health and Human Services (**DHHS**), is a purpose-built long-term and respite accommodation service for individuals dependent on mechanical ventilation. Accommodation is provided across four separate houses, each with capacity for five residents.[10]

7. Given that VASS residents are ventilator-dependent, the houses have an uninterruptible power supply, with hospital-grade back-up generators to protect ventilator systems from power failures.[11] In addition, ventilator alarms are audible throughout each house and alert directly, with a location identifier, to handsets issued to staff members on duty,[12] and each bedroom is fitted with a call button.[13]

8. VASS is staffed 24 hours each day. Although the staff-to-resident ratio fluctuates throughout the day, one Registered Nurse (**RN**) is present at all times to provide clinical assistance to all residents[14] and at least one Disability Support Worker (**DSW**) is based in each house to support residents in activities of daily life.[15] Yooralla employs DSWs to staff VASS, though it occasionally uses agency staff as well.[16] Yooralla DSWs are provided role-specific theoretical and practical training, including

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[7] IB pages 16-18.
[8] 'Mouth leak' refers to the leakage of ventilator-delivered air from the mouth due to it falling open during sleep.
[9] Ibid.
[10] Exhibit B.
[11] https://www.yooralla.com.au/__data/assets/pdf_file/0009/35739/Ventilator-Accommodation-Support-Service-2pp_web_20181029.pdf.
[12] Transcript page 67.
[13] Transcript page 19.
[14] Transcript page 10.
[15] Ibid.
[16] Ibid.

the operation of mechanical ventilators and instruction in the use of manual bag valve mask (**BVM**) ventilation devices in emergencies, with competence authorised by a RN.[17]

9. At VASS, a Client Support Plan was developed to maximise Sera's health and wellbeing and the plan was last revised on 31 October 2014.[18] Due to her limited mobility, Sera required staff assistance with most activities of daily life. She was able to direct staff to attend to her care and support needs[19] and was a confident self-advocate.[20] Staff administered prescribed medications at Sera's direction. She was provided full mealtime assistance and required a soft pureed diet.[21] DSWs assisted transfers, some of which occurred by hoist,[22] and with use of her mechanical ventilators. Though Sera adeptly operated her electric wheelchair independently,[23] staff assisted her to access the community.

10. VRSS assessed Sera's ventilation requirements and reviewed ventilator settings, supplied and annually serviced her ventilators, and provided advice and support to Sera and her carers.[24] Sera used two ventilators, one attached to her wheelchair (**day ventilator**) and the other at her bedside (**night ventilator**).[25] Sera used nasal prongs with her day ventilator and, with her night ventilator, a mask that covered her nose and chin,[26] though a FFM was recommended.

11. The type of mechanical ventilator(s) and its settings are dependent on the needs of the user.[27] Ventilators ordinarily operate using room air, unless supplementary oxygen is clinically indicated. Sera did not require oxygen.[28] Sera's ResMed VSIII ventilators were supplied by VRSS. Two ventilators were exchanged for newly serviced machines – tested and recommissioned by a VRSS Bio-Medical Engineer – annually, and most recently, on 9 February 2015.[29]

12. Sera's ventilator settings were fixed by a VRSS clinician and could only be adjusted by an appropriately qualified person such as a VRSS medical practitioner,

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[17] Transcript page 12.
[18] Exhibit A.
[19] Ibid.
[20] Transcript page 61.
[21] Exhibit A.
[22] Exhibit A.
[23] Transcript page 63.
[24] IB pages 16-18.
[25] IB pages 19-21.
[26] Transcript page 64.
[27] IB pages 16-18.
[28] IB pages 19-21.
[29] IB pages 19-21.

physiotherapist or nurse. However, the VASS RN could adjust the settings in consultation with a VRSS staff member.[30]

13. Sera's day and night ventilator settings differed slightly with the higher breath rate and lower pressure limit settings on her night ventilator designed to improve Sera's comfort and breathing overnight and to accommodate the naturally occurring increase in thoracic pressure and mouth leak consequent upon lying in bed.[31]

14. Sera was regularly reviewed by VRSS, particularly by its Outreach Service. Most of Sera's telephone and face-to-face contacts in the 12 months prior to her death involved pressure areas on the bridge of her nose; mouth leak, mask fittings and repeated recommendations that she use a FFM at night; as well as reports of abdominal pain.

15. However, in December 2014 Sera complained of tachycardia when she presented to the VRSS Outreach Clinic (at VASS) and was referred for cardiology review. She was referred for further assessment of her cardiac symptoms in February 2015 following the results of holter monitoring in January.[32]

16. General Practitioner [**GP**] Dr Wendy Lee of Wingrove Medical Clinic coordinated Sera's medical care, with the last Management Plan prepared in June 2014.[33] Sera usually attended the clinic but sometimes Dr Lee attended upon her at VASS. Sera had normal blood pressures, cholesterol and glucose levels but was prone to pneumonia and recurrent urinary tract infections secondary to an indwelling catheter, and constipation. She also experienced pain due to gallstones and spinal osteoarthritis.[34]

17. Dr Lee regularly prescribed medications for bowel management and, following a hospital admission on 19 March 2015 during which bi-basal lung collapse with pleural effusions was diagnosed, commenced her on a diuretic. However, by the end of that month, the GP was concerned that Sera was no longer taking the diuretic.[35]

18. On 4 April 2015, Sera experienced chest pain and increased breathlessness.[36] When assessed by the VASS RN, she was found to be drowsy, disoriented and pale and so

[30] IB pages 19-21.
[31] IB pages 19-21.
[32] IB pages 16-18.
[33] IB pages 38-40.
[34] Ibid.
[35] Ibid.
[36] Exhibit A.

she was transferred by ambulance to the Austin for further assessment.[37] Sera was admitted and underwent cardiac and other investigations.

19. Although blood tests ruled out myocardial infarction,[38] a Sestamibi[39] myocardial perfusion study showed moderate to severe systolic dysfunction[40] leading to a diagnosis of cardiomyopathy or heart failure.[41] Though cardiomyopathy may be caused by ischaemic heart disease, it was considered likely that Sera's was due to MD.[42] She was also diagnosed with pleural effusions, commonly associated with heart failure.[43]

20. Sera remained at the Austin and was commenced on rosuvastatin[44] and rampiril[45] for cardiac management.[46] Diuretics for management of pleural effusions,[47] and fluid retention more generally, were already among Sera's prescribed medications. She was discharged on 10 April 2015 with a plan for outpatient cardiology follow-up.[48]

21. At VRSS' request, a meeting was convened to discuss concerns about Sera's health. Sera would have attended this meeting, but she was still in hospital when it took place on 8 April 2015. In attendance were the VRSS Outreach Coordinator Anne Duncan, Yooralla's Manager of Residential and Respite Support Services, Bonnie Paverd, VASS' RN and several members of Sera's family, including her brother Vincent Pirrottina, also diagnosed with MD, and his wife Rosanne Pirrottina whom Sera had appointed one of her attorneys-in-fact[49] for medical matters.

22. Among the matters discussed were Sera's 'chronic nocturnal respiratory failure due to inadequate ventilation', which was attributed to Sera not using a FFM.[50] Sera's family communicated their awareness of Sera's reluctance and anxiety about using a FFM overnight because of concerns she may vomit and aspirate,[51] and because it impeded

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[37] Exhibit A.
[38] Transcript page 131 (myocardial infarction is the medical term for what is colloquially known as a 'heart attack').
[39] A Sestamibi, or 'mibi', scan shows how well blood flows through or perfuses the heart. It can show both the areas of the heart muscle that are receiving insufficient blood flow and how well the heart is pumping.
[40] Systolic dysfunction refers to impaired ventricular contraction.
[41] Transcript page 131-132; also IB pages 42-44.
[42] Transcript paged 131-132.
[43] Ibid.
[44] Rosuvastatin is used in the management of heart disease by the treatment of abnormal lipids.
[45] Rampiril is used to treat hypertension/high blood pressure.
[46] E-Medical Deposition prepared by Dr Reyes on 15 April 2015.
[47] Transcript page 133.
[48] E-Medical Deposition prepared by Dr Reyes on 15 April 2015.
[49] Also known as 'Medical Enduring Power of Attorney' in Victoria. See Transcript page 37.
[50] Transcript page 21 and Exhibit C.
[51] Rosanne Pirrottina considered her sister-in-law's anxiety about aspiration well-founded given that Sera suffered from reflux/nausea and found it difficult to swallow saliva when laying down: Transcript page 42.

her ability to communicate.[52] Ms Duncan indicated that she would reiterate to Sera VRSS' recommendation about nocturnal use of the FFM and Sera's family agreed to reinforce this advice by encouraging Sera to use it.[53]

23. Following her discharge from the Austin, on 11 April 2015, Sera told her sister-in-law that she had been unable to leave her bedroom that day due to pain producing a poor night's sleep.[54]

24. The next day, Mrs Pirrottina received a call from VASS to advise that Sera was experiencing pain and was 'not very alert'.[55] The Austin's Respiratory Registrar was contacted and had, in turn, contacted a locum GP who attended VASS and prescribed pain relief medication.[56]

25. Later on 12 April 2015, when Mrs Pirrottina spoke to Sera by telephone, she found Sera 'difficult to understand' because she was 'slurring her words'.[57] Sera reported another night of poor sleep.[58] Her sister-in-law encouraged Sera to try sleeping with the FFM; she was reluctant to use the FFM but said she would do so.[59] When Sera telephoned Mrs Pirrottina several hours later – after she had slept using the FFM – Sera 'sounded like a completely different person … [she had] clear speech, [and] sounded happier'.[60] Mrs Pirrottina attributed Sera's improvement to better oxygenation due to use of the FFM.[61]

26. Sera reported using the FFM and sleeping for about six hours overnight on 12-13 April 2015, to her sister-in-law. She also used it the following night, 13-14 April 2015, and slept well for about nine hours.[62] Due to 'feeling better' on 14 April 2015, Sera was able to leave home to go shopping and telephone a number of friends.[63]

CIRCUMSTANCES PROXIMATE TO DEATH

27. The circumstances in which Sera died will be discussed in some detail below. Suffice for present purposes to say that shortly before 2am on 15 April 2015 an ambulance was called to VASS because Sera, who had experienced difficulty breathing

[52] Transcript pages 20 (Paverd) and 42 (R. Pirrottina) and Exhibit C.
[53] Transcript pages 19 (Paverd) and 42 (R. Pirrottina) and Exhibit C
[54] Exhibit E.
[55] Exhibit E.
[56] Ibid.
[57] Transcript page 44.
[58] Exhibit E.
[59] Transcript page 44.
[60] Transcript page 44.
[61] Transcript page 45.
[62] Exhibit E.
[63] Exhibit E.

intermittently in the previous couple of hours and had lost consciousness despite staff providing manual ventilation via BVM and supplementary oxygen.

28. Ambulance Victoria (**AV**) paramedics arrived within minutes and found Sera semi-recumbent in bed being effectively ventilated by BVM. She was transported to the Austin and on arrival at the emergency department (**ED**) was commenced on bi-level positive airway pressure (**BPAP**) ventilation with supplementary oxygen. Sera's condition fluctuated over the next several hours until she went into cardiac arrest. Cardiopulmonary resuscitation was unsuccessful, and Sera died at 8.06am on 15 April 2015.[64]

INVESTIGATION AND SOURCES OF EVIDENCE

29. This finding is based on the totality of the material the product of the coronial investigation of Sera's death. That is, the brief of evidence compiled by Senior Constable Rachel Hazeldene of Mill Park Divisional Response Unit and reconfigured for the inquest by Leading Senior Constable Duncan McKenzie of the Police Coronial Support Unit, the statements, reports and testimony of those witnesses who testified at inquest and any documents tendered through them, and the final submissions of counsel.

30. All of this material, together with the inquest transcript, will remain on the coronial file.[65] In writing this finding, I do not purport to summarise all the material and evidence; rather, I will refer to the evidence only in such detail as is warranted by its forensic significance and the interests of narrative clarity.

PURPOSE OF A CORONIAL INVESTIGATION

31. The purpose of a coronial investigation of a *reportable death*[66] is to ascertain, if possible, the identity of the deceased person, the cause of death and the circumstances in which the death occurred.[67] Sera's death was reportable because of her status as a person placed in custody or care.[68] That is, immediately before her death, Sera lived in

[64] E-Medical Deposition completed by Dr Reyes on 15 April 2015.
[65] From the commencement of the *Coroners Act* 2008 (the Act), that is 1 November 2009, access to documents held by the Coroners Court of Victoria is governed by section 115 of the Act.
[66] The term is exhaustively defined in section 4 of the Act. Apart from a jurisdictional nexus with the State of Victoria (s 4(1)), reportable death includes "a death that appears to have been unexpected, unnatural of violent or to have resulted, directly or indirectly, from an accident or injury" (section 4(2)(a)).
[67] Section 67(1) of the Act.
[68] Section 4(2)(c) of the Act.

supported accommodation funded by DHHS and was therefore a person in control, care or custody of the Secretary to the Department of Health and Human Services.[69]

32. The term 'cause of death' refers to the *medical* cause of death, incorporating where possible the mode or mechanism of death.

33. For coronial purposes, the term 'circumstances in which the death occurred' refers to the context or background and surrounding circumstances but is confined to those circumstances sufficiently proximate and causally relevant to the death, and not merely all circumstances which might form part of a narrative culminating in death.[70]

34. The broader purpose of any coronial investigations is to contribute to a reduction in the number of preventable deaths, through the findings of the investigation and the making of recommendations by coroners, generally referred to as the 'prevention role.'[71]

35. Coroners are empowered to report to the Attorney-General in relation to a death; to comment on any matter connected with the death they have investigated, including matters of public health or safety and the administration of justice; and to make recommendations to any Minister or public statutory authority on any matter connected with the death, including public health and safety or the administration of justice.[72] These are effectively the vehicles by which the Coroner's prevention role can be advanced.[73]

36. It is important to stress that coroners are not empowered to determine the civil or criminal liability arising from the investigation of a reportable death and are specifically prohibited from including in a finding or comment any statement that a person is, or may be, guilty of an offence.[74]

MEDICAL CAUSE OF DEATH

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[69] See section 3 of the Act for the definition of a "person placed in custody or care" and section 4 for the definition of "reportable death", especially section 4(2)(c).

[70] This is the effect of the authorities – see for example Harmsworth v The State Coroner [1989] VR 989; Clancy v West (Unreported 17/08/1994, Supreme Court of Victoria, Harper J).

[71] The 'prevention' role is now explicitly articulated in the Preamble and purposes of the Act, compared with the *Coroners Act* 1985 where this role was generally accepted as 'implicit'.

[72] See sections 72(1), 67(3) and 72(2) of the Act regarding reports, comments and recommendations respectively.

[73] See also sections 73(1) and 72(5) of the Act which require publication of coronial findings, comments and recommendations and responses respectively; section 72(3) and (4) which oblige the recipient of a coronial recommendation to respond within three months, specifying a statement of action which has or will be taken in relation to the recommendation.

[74] However, a coroner may include a statement relating to a notification to the Director of Public Prosecutions, if the coroner believes an indictable offence may have been committed in connection with the death. Section 69(1) of the Act. See also, Sections 69(2) and 49(1) of the Act.

37. Forensic Pathologist Dr Heinrich Bouwer of the Victorian Institute of Forensic Medicine (**VIFM**), reviewed the circumstances of Sera's death as reported by police to the coroner,[75] Austin medical records and e-Medical Deposition and post-mortem computerised tomography (**PMCT**) scanning of the whole body, and performed an external examination.[76]

38. Among Dr Bouwer's findings were signs of medical intervention and wasting of the muscles of the upper and lower limbs bilaterally on physical examination and, on PMCT, markedly increased bilateral lung markings suggestive of pneumonia. These findings were consistent with the reported circumstances.[77]

39. Routine toxicological analysis of post-mortem specimens detected a sub-therapeutic level of paracetamol and traces of lignocaine, an anaesthetic often administered during resuscitation.[78]

40. On the basis of the information available to him and in the absence of a full autopsy, Dr Bouwer concluded that the cause of Sera's death was due to natural causes, namely, complications of muscular dystrophy.[79]

41. I accept the cause of death proposed by Dr Bouwer and find that the cause of Sera's death is complications of muscular dystrophy.

IDENTITY & NON-CONTENTIOUS FINDINGS AS TO CIRCUMSTANCES

42. Sera's identity was not in issue. On 15 April 2015, Maria Field visually identified Sera's body as that of her aunt and completed a Statement of Identification.[80]

43. Nor was there any contention around the date and place where Sera died. Accordingly, I find, as a matter of formality, that Serafina Pirrottina, late of Clarendon Street in Thronbury, died at the Austin Hospital, 145 Studley Road, Heidelberg, Victoria on 15 April 2015.

FOCUS OF THE CORONIAL INVESTIGATION

44. As is often the case in this jurisdiction, the focus of the coronial investigation and inquest into Sera's death was on the circumstances in which the death occurred.

45. The focus of the inquest was threefold:

[75] Police Report of Death to the Coroner (Police Form 83) prepared by Senior Constable R. Hazeldene on 15 April 2015.
[76] IB pages 2-6.
[77] Ibid.
[78] IB pages 7-10.
[79] IB pages 2-6.
[80] IB page 1.

(a) The adequacy of Sera's clinical management when she became acutely unwell on 15 April 2015, including the responses of her carers at VASS, AV paramedics and clinicians at the Austin ED;

(b) Whether Sera's death was preventable or the result of the expected deterioration of MD;

(c) The status and efficacy of a 2007 Protocol between the Austin/VRSS, VASS and AV and its revision since Sera's death.

I have endeavoured as far as possible to identify the evidence relevant to each issue under the appropriate heading in the paragraphs that follow.

ADEQUACY OF SERA'S CLINICAL MANAGEMENT OVERNIGHT ON 14-15 APRIL 2015

46. On 14 April 2015, Sera was already in bed, with her night ventilator providing respiratory support via a FFM, when the VASS nightshift commenced at around 10.30pm.[81] Ordinarily, VASS is staffed overnight by one DSW for each house, one RN providing clinical care across all four houses and the nightshift supervisor, a DSW, 'floating' to provide backup as needed.[82] However, when Jean-Anne Cotter arrived to commence that night shift as supervisor, she was informed that the DSW for House 3 – where Sera lived – had called in sick and had not been replaced.[83] Consequently, Ms Cotter replaced the absent DSW for House 3 and the RN, Genevieve Fitzgerald, functioned as the nurse on duty and 'floater'.[84]

47. Ms Cotter had been employed by Yooralla as a DSW since March 2007 and had known and cared for Sera since her arrival at VASS.[85] She was very familiar with Sera's needs, her anxiety about using a FFM, the ongoing challenge of hypoventilation overnight and knew Sera was a 'confident, determined lady who made up her own mind about her care'.[86]

48. Ms Cotter had also been on night shift for several nights prior to 14-15 April 2015 and over that period had formed the view that Sera 'wasn't well'[87] and had been 'very

[81] Exhibit G.
[82] Transcript page 72.
[83] Transcript page 73.
[84] Exhibit G.
[85] Exhibit G.
[86] Transcript page 70.
[87] Transcript page 94.

unsettled'[88] overnight. After her last shift, Ms Cotter had handed-over that staff should use 'any excuse you can … to get Sera to hospital'.[89]

VASS Clinical Management and Care

49. DSWs routinely check on residents hourly overnight and attend in response to ventilator alarms or when a call button was activated.[90] While a staff member can cancel a call button alarm, ventilator alarms only cease when the reason for its activation has resolved.[91]

50. At about 11.45pm, Ms Cotter observed that Sera appeared to be struggling to breathe. She attached a BVM to Sera's FFM to provide manual ventilation.[92] Ms Cotter summoned RN Fitzgerald who checked the night ventilator to ensure that it was not contributing to Sera's difficulty breathing.[93] The ventilator appeared to be functioning properly.[94] After about three or four minutes of manual ventilation, Sera's condition improved.[95] Sera was able to speak, which was facilitated by a portion of the FFM being unclipped and opened when the ventilator is assisting exhalation (and closed again for inhalation).[96] Though she was now breathing more easily, Sera thought something was wrong with the ventilator but was reassured by Ms Cotter telling her that she could feel air coming out of it.[97]

51. Ms Cotter tried to convince Sera that an ambulance should be called because she 'didn't sound great' and the DSW was concerned Sera 'had fluid on the lungs'.[98] However, Sera told Ms Cotter she was 'fine' and did not want to go to hospital.[99] The DSW knew it would be futile to call an ambulance without Sera's consent, for if she did and when paramedics arrived Sera declined to be transported, the paramedics would leave without her.[100]

52. At about 12.45am on 15 April 2015, Sera activated her call button and when Ms Cotter attended, she asked to see the RN. RN Fitzgerald attended promptly and was

[88] Transcript page 92.
[89] Transcript pages 94-95.
[90] Transcript page 71.
[91] Transcript page 67.
[92] Transcript page 76 and Exhibit G.
[93] Transcript page 77.
[94] Exhibit G and Transcript page 77.
[95] Transcript page 76.
[96] Transcript page 74. The portion of the FFM opened for communication must be closed in time with ventilator-supported inhalation to avoid hypoventilation (Transcript page 74)..
[97] Transcript page 77.
[98] Transcript page 77.
[99] Transcript page 77.
[100] Transcript page 77.

asked to provide a saline nebuliser to moisten Sera's airways to assist breathing.[101] While the RN provided the nebuliser, Ms Cotter attended upon another resident.[102] When she returned, RN Fitzgerald had measured Sera's oxygen saturation level and found it to be 88%.[103] The RN asked Sera whether that level was normal for her; Ms Cotter 'knew damn well it wasn't'.[104]

53. Having both formed the view that Sera 'definitely needs to go to hospital,'[105] the RN and DSW attempted to convince Sera that an ambulance should be called. Sera again refused. As part of their strategy to obtain Sera's consent to call an ambulance, the DSW and RN agreed to transfer Sera to her day ventilator.[106] Their rationale was to eliminate the possibility that the night ventilator had malfunctioned – though there was nothing to suggest it had – and in all likelihood when Sera's breathing difficulty persisted with the day ventilator, demonstrate to her that they had now done all they could at home, and an ambulance should be called.[107]

54. Before Ms Cotter had an opportunity to disconnect the day ventilator from Sera's wheelchair, she was called away to assist another resident: this task took precedence over the 'secondary task'[108] of disconnecting the day ventilator. RN Fitzgerald remained with Sera.[109]

55. When Ms Cotter returned to Sera's room a short time later, she found RN Fitzgerald manually ventilating Sera using a BVM attached to the FFM.[110] Sera was alert and asked that supplementary oxygen be provided.[111] As the oxygen cylinder was stored in House 4, Ms Cotter left to retrieve it while the RN continued manual ventilation.[112] Ms Cotter estimated that she returned with the supplementary oxygen within two or three minutes.[113]

56. Sera's FFM was removed and an oropharyngeal airway was placed by the RN, with oxygen administered using the mask accompanying the cylinder. Ms Cotter followed RN Fitzgerald's direction to hold the mask in place over Sera's nose and mouth to

[101] Exhibit G.
[102] Ibid.
[103] Transcript page 79.
[104] Transcript page 79.
[105] Transcript page 79.
[106] Exhibit G.
[107] Transcript page 96 and Exhibit G.
[108] Transcript page 79.
[109] Exhibit G.
[110] Exhibit G.
[111] Transcript page 81 and Exhibit G.
[112] Transcript page 81.
[113] Transcript page 81.

ensure a 'good seal'.[114] BVM ventilation was continued by the RN. Sera was, by this stage, unconscious.[115] As Sera's night ventilator remained on but was not connected to her it was 'triggering alarms constantly'.[116]

57. Ms Cotter stepped away, for about 30 seconds,[117] to retrieve a telephone from which she could call for an ambulance because if she used her handset the call would be interrupted by alerts triggered by Sera's ventilator, and those of other residents' ventilators or call buttons.[118] Ms Cotter's Triple Zero call was received at 1.53am[119] and she then used her own mobile telephone to contact her colleague in House 4, closest to the front of VASS, to facilitate the paramedics' entry to the property.[120]

AV Paramedic Management

58. Ms Cotter's emergency services call was coded by the Emergency Services Telecommunications Authority (**ESTA**) Operator as 'Cardiac or Resp[iratory] Arrest/Death : ? [query] Workable Arrest, Not Breathing at all'.[121] A Mobile Intensive Care Ambulance (**MICA**) paramedic, single responder Paul Fellicetti and an AV ambulance crewed by two Advanced Life Support (**ALS**) paramedics were dispatched at 1.53am on 15 April 2015 as 'Code 1 – Time Critical'.[122]

59. Although Mr Felliciti was not aware of it at the time of dispatch, given that his priority was on prompt arrival at the scene,[123] a 'Location of Interest Request' (**LOI**) had been established by AV in relation to VASS in April 2007.[124] The information contained in the LOI indicated that residents at VASS 'are all ventilated … [and require] transport to [the] Austin … regardless of … bypass'.[125] The LOI also stipulates that AV crews are 'to follow directions of Yooralla staff regarding 02 [oxygen] requirements' and that each resident 'will have a small portable ventilator for transport … [to] be secured behind head of the stretcher'.[126]

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[114] Exhibit G.
[115] Exhibit G.
[116] Transcript page 83.
[117] Transcript page 83.
[118] Transcript page 82.
[119] IB pages 85-90.
[120] Transcript page 84.
[121] IB pages 85-90.
[122] IB pages 85-90 and Exhibit J. The key difference in MICA and ALS paramedic skill sets with relevance to the investigation of Sera's death is that MICA paramedics are trained in the operation of mechanical ventilators (Transcript page 203).
[123] Transcript pages 172-173.
[124] IB pages 102-103.
[125] IB pages 102-103.
[126] Ibid.

60. AV Team Manager Robert Searle gave evidence at inquest that ESTA Operators 'usually'[127] communicate LOI information to MICA responders and that the LOI is also available on AV crews' mobile data terminal.[128]

61. Mr Fellicetti arrived at VASS at 1.59am, a couple of minutes in advance of the AV ambulance crew.[129] Upon entering Sera's room, he observed that Sera did not appear to be in cardiac arrest as her skin appeared to be well-perfused and pink, and that her chest rose and fell in response to the successful[130] BVM ventilation provided by RN Fitzgerald.[131]

62. Mr Fellicetti also observed Ms Cotter doing something with one of Sera's ventilators which he perceived to be 'fault-finding'. In contrast, Ms Cotter recalled that when the MICA paramedic arrived, she was still holding the mask in place while the RN was ventilating Sera and that it was after Mr Fellicetti took over Sera's care that she moved to the ventilator.[132] At inquest, she disputed that she was 'fault-finding' with the machine as she did not believe that Sera's night ventilator was faulty. It was working and providing air, but [Sera's] body wasn't utilising it'.[133] Ms Cotter gave evidence that she was preparing the ventilator to be transported with Sera to hospital in accordance with 'protocol'.[134] For his part, Mr Fellicetti conceded that it was possible he had misinterpreted what Ms Cotter was doing with the ventilator.[135]

63. When Mr Fellicetti examined Sera he found her to have an irregular pulse, with a heart rate of 76 and blood pressures of 150/110.[136] She was conscious and blinking on direction, but pale.[137] Sera's oxygen saturation level was 85% with supplementary oxygen, her upper airway was clear and, on auscultation, air entry to both lungs was diminished.[138] The MICA paramedic thought the overall picture suggested Sera had fluid on her lungs,[139] and was critically unwell.[140]

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[127] Transcript page 211.
[128] Transcript page 212.
[129] Exhibit J.
[130] Exhibit J.
[131] Transcript pages 174-176.
[132] Transcript page 90.
[133] Transcript page 86.
[134] Transcript pages 80, 85 and 86.
[135] Transcript pages 184-185.
[136] Transcript page 177.
[137] Exhibit J and IB pages 85-90.
[138] Transcript page 177.
[139] Transcript page 179.
[140] Transcript page 188.

64. Mr Fellicetti recalled that he was told, probably by Ms Cotter,[141] that Sera's ventilators should accompany her to hospital.[142] Mr Fellicetti gave evidence that he told 'Yooralla staff' that it was not feasible to take Sera's ventilators, that her condition was critical and they had all the equipment required in the ambulance.[143] The MICA paramedic also stated that even if the ventilators had been transported, he would not have used them because he was not familiar with their operation. In any event, there was no purpose to taking them because in his clinical assessment Sera required BVM ventilation not a ventilator.[144]

65. While en route to the Austin with lights and sirens activated, the ED was notified of Sera's imminent arrival and a handover was given by radio at 2.33am.[145]

Austin ED Medical Management

66. On arrival at the Austin at 2.41am on 15 April 2015, Sera was conscious and remained ventilated via BVM. Her oxygen saturation level had improved to 99% with supplementary oxygen. Sera was tachycardic with a heart rate of 115 and blood pressure of 140/110.[146] A verbal handover was provided to the Austin's medical and nursing staff at 2.45am[147] and Sera was immediately placed in a resuscitation cubicle.

67. Sera was immediately commenced on BPAP ventilation – capable of delivering higher air flows than domiciliary ventilators[148] – and supplementary oxygen.[149] Pleural effusions, lung consolidations and interstitial oedema were evident on chest x-ray. Sera's initial blood gas analysis showed severe respiratory acidosis. Ventilator settings were optimised, and antibiotics administered for the treatment of probable pneumonia. Repeat blood gas analysis showed a decrease in respiratory acidosis and this, in turn, led to improvement in Sera's conscious state. Given Sera's clinical improvement, it was anticipated that she would be transferred to the ward for further management.[150]

68. As the BPAP ventilator used in the ED was not portable and was used with a mask of a different type to that used by Sera, the plan was to substitute a portable ventilator for

[141] Transcript page 85.
[142] Transcript page 179.
[143] Transcript page 179. Mr Fellicetti also suggested that space in the ambulance was at a premium because he took a large amount of MICA-specific equipment with him in case it was needed in transit (Transcript page 180 and Exhibit J).
[144] Transcript page 189.
[145] Exhibit J.
[146] Exhibit J.
[147] Ibid.
[148] Transcript page 135.
[149] IB pages 42-44.
[150] Supplementary statement of Dr Yvonne Ng dated 28 November 2017.

the BPAP and use it with an appropriate mask. A VRSS Registrar, familiar with portable ventilators used at VASS and in the Austin's respiratory ward, was on hand to assist ED staff.[151]

69. At about 4am, Ms Cotter received a telephone call from a VRSS Registrar at the Austin who was enquiring about the type of mask Sera usually used with her ventilator.[152] The enquiry surprised Ms Cotter and she was 'horrified' when, upon returning to Sera's room, she saw that both ventilators and the FFM had not been transported to the Austin with Sera.[153] I note the evidence of VRSS that a patient's clinical record, including the ventilator model, its settings and the type of mask used, can be accessed quickly to inform clinical decision-making.[154]

70. When a portable ventilator was applied to Sera in the ED, it did not maintain sufficient tidal volumes and her oxygen saturation level fell to around 63% rendering her profoundly hypoxic.[155]

71. At inquest, Dr Mark Howard, Director of VRSS and a respiratory specialist, explained the significance of low tidal volumes and poor oxygenation. Tidal volume refers to the volume of air delivered to the lungs on inhalation, which in mechanical ventilation is fixed by the ventilator settings. Ventilators also estimate the volume of exhaled air.[156] Allowing for some air leak on inhalation, a reasonable correspondence between input and output volumes, should produce adequate ventilation and normal blood oxygenation.[157] However, if the volume of air delivered and/or exhaled is low, the ventilated individual may be poorly oxygenated and/or carbon dioxide may accumulate, producing respiratory acidosis.[158] Respiratory acidosis has adverse consequences for an individual's conscious state and cardiac function[159]. In Sera's case, cardiac failure combined with pulmonary oedema and pleural effusions to impair the exchange of oxygen from the lungs to her blood.[160]

72. Sera was provided manual BVM ventilation prior to being recommenced on the BPAP ventilator. Despite this, further oxygen desaturation was noted along with

[151] Transcript page 136.
[152] Transcript page 87.
[153] Transcript page 87.
[154] Transcript page 121.
[155] IB pages 107-111.
[156] Transcript page 137.
[157] Either from leak around a mask where one is used or within the upper airways which do not provide oxygen or carbon dioxide exchange (Transcript page 138).
[158] Transcript page 138.
[159] Transcript page 140.
[160] Transcript page 144.

deterioration of Sera's conscious state. Manual BVM was resumed but repeat blood gas analysis demonstrated worsening respiratory acidosis.[161]

73. In discussion with Sera's attorneys-in-fact, her wish for full medical management was confirmed. Following consultation with a respiratory physician and the attendance of anaesthetic and ear, nose and throat surgical specialists, clinicians attempted to intubate Sera. Fibreoptic intubation was attempted but was ultimately unsuccessful and so clinicians reverted to the introduction of a laryngeal mask airway.[162]

74. At about 7.33am, Sera became hypotensive and so vassopressors[163] were administered.[164] She remained hypotensive and at 7.44am went into cardiac arrest with pulseless electrical activity. Cardiopulmonary resuscitation (**CPR**) was commenced and adrenaline was administered. Spontaneous circulation returned at 7.54am, however, cardiac arrest recurred five minutes later. CPR was recommenced, with the further administration of adrenaline and amiodarone,[165] without response. In consultation with Sera's family, CPR was discontinued, and she was pronounced dead at 8.06am on 15 April 2015.[166]

WHETHER SERA'S DEATH WAS PREVENTABLE

75. During his evidence at inquest, Dr Howard commented on several aspect of the adequacy of Sera's care and her ultimate clinical course on 15 April 2015.

76. Dr Howard testified that after Sera's death, her day and night ventilators were examined by a VRSS Bio-medical Engineer. Both ventilators were found to be functioning.[167] The only anomaly was that when examined, a remote alarm connection on one ventilator was found to be faulty, such that the alarm would only have been audible in proximity to the ventilator rather than being transmitted throughout VASS.[168]

77. Dr Howard stated that use of manual BVM ventilation – either at VASS or in the ED – was designed to provide adequate ventilation support in situations where an individual's standard ventilator (or another ventilator) is not providing effective

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[161] IB pages 42-44.
[162] Ibid.
[163] Vassopressors are antihypotensive agents.
[164] IB pages 107-111.
[165] Amiodarone is an antiarrhythmia medication.
[166] IB pages 42-44.
[167] Transcript page 114 and 116; see also IB pages 23-27.
[168] Transcript page 115.

ventilation.[169] Dr Howard observed that if oxygen saturation could not be maintained with effective BVM ventilation, it was likely that low oxygen levels were due to an underlying physical condition.[170] In Sera's case, he noted that the combined effects of cardiac failure, infection (suspected pneumonia) and the associated pulmonary consolidation would have impaired ventilation and oxygenation of the blood.[171]

78. Dr Howard opined that the delay of two or three minutes during which Ms Cotter retrieved supplementary oxygen from House 4 would have had minimal or no impact on Sera's clinical course.[172]

79. In relation to the transportation of ventilators with ventilator-dependent individuals to hospital, the VRSS Director drew a distinction between individuals who are clinically stable from a respiratory perspective and those who are not. He considered it 'helpful … but not essential' for ventilators to be transported with their clinically-stable users given the expectation that the machines would continue to be used in the hospital setting.[173] However, in situations of acute respiratory failure such as was the case when Sera was transported to the Austin on 15 April 2015, Dr Howard conceded that it was 'very unlikely that [her ventilators] would end up being used directly' on arrival.[174] Accordingly, paramedic – and ED – staff had to manage respiratory support as they see fit.[175]

80. Dr Howard observed that MD can remain stable for a long time. When asked about the 'inevitability' of Sera's deterioration, Dr Howard commented that the 'key thing that changed' for Sera was the addition of a moderate to severe cardiac condition.[176] In his view, this was the factor that changed Sera's life expectancy and that she died as a 'direct result' of developing cardiomyopathy due to MD.[177]

2007 PROTOCOL AND THE 2017 GUIDELINE

81. One of the concerns raised by the Pirrottina family early in my investigation of Sera's death was the apparent non-compliance with a Protocol established between VASS, AV and Austin/VRSS in 2007 to ensure, among other things, that VASS residents'

[169] Transcript page 141.
[170] Transcript page 142.
[171] Transcript pages 143-144.
[172] Transcript page 142.
[173] Transcript page 129.
[174] Transcript pages 120-121.
[175] Transcript page 120.
[176] Transcript page 145.
[177] Transcript page 145.

ventilator(s) are transported by ambulance with them to hospital.[178] Through his membership of the VASS Steering Committee and the Australian Ventilator Users Network, Mr Pirrottina was aware of the original Protocol and its finalisation, as well as proposals for periodic review of its terms.[179]

82. I received correspondence and several statements from representatives of VASS, Austin/VRSS and AV in 2016 and 2017 demonstrating a lack of clarity between the parties about the status of the 2007 Protocol;[180] that is, whether a protocol existed in draft form or had been finalised. While Austin/VRSS asserted from the outset the 2007 Protocol had been finalised,[181] at first and for some time after, VASS and AV contended that this protocol – all the parties referred to the same document[182] – existed as a draft only.[183]

83. By the commencement of the inquest, however, it was common ground that the 2007 Protocol had been finalised and remained in operation at the time of Sera's death.[184] It need hardly be stated that such uncertainty provides little reassurance about organisational governance within VASS and AV, and little assurance that the parties' intentions in developing a protocol would be realised.

84. The 2007 Protocol delineated the responsibilities of VASS, AV and Austin/VRSS to ensure appropriate emergency responses to residents and respite users of VASS given their dependence on mechanical ventilation.[185] The key components of the protocol, according to Dr Howard, were to ensure paramedics attending VASS were appropriately skilled to manage ventilator-dependent patients; to ensure appropriate information and equipment was transferred with patients; and to ensure VASS residents and respite users were conveyed to the Austin rather than any other hospital emergency department.[186]

85. Mr Seale produced a statistical analysis of AV records of attendances at VASS between 2007 and 2017, generally, and specifically relating to Sera. The records show

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[178] This concern was first raised by the Pirrottina family in their communications with the Coronial Admissions and Enquiries staff on 16 April 2015 and was re-iterated by Mrs Pirrottina in the statement she later provided (Exhibit E).
[179] Transcript pages 45-46.
[180] Among these are the following: Exhibits B (Paverd/VASS), G (Cotter/VASS) and Exhibit H (VASS), IB pages 47-48, 96-97 and Exhibits K and L (AV), Exhibit I (Howard/VRSS) and IB page 52 (Austin/VRSS).
[181] IB Page 52.
[182] Though the text of the document was the same, the dates of the documents produced by each of the parties ranged from April to June 2007.
[183] Exhibits B (Paverd/VASS), G (Cotter/VASS) and Exhibit H (VASS), IB pages 47-48, 96-97 and Exhibits K and L (AV).
[184] IB page 52, and Exhibits H and L.
[185] IB pages 53-55.
[186] Transcript page 117.

that overall, nearly all ventilated patients were transferred to the Austin from VASS,[187] 77% of ventilated patients were transported with their ventilator(s)[188] and that MICA paramedics comprised 27% of attendances on ventilator-dependent patients.[189] In addition, an ambulance had attended upon Sera at VASS on 13 occasions and she was transferred to hospital 12 times. Of those 12 times, Sera was accompanied by her ventilators on nine occasions.[190]

86. As noted above, the only component of the protocol not adhered to when Sera was transferred by ambulance from VASS to the Austin on 15 April 2015 was that her ventilators did not accompany her. However, I am satisfied on the basis of the evidence provided by Dr Howard and Mr Fellicetti, that non-compliance with the 2007 Protocol did not materially alter Sera's clinical course and/or outcome.

87. Following Sera's death, the Austin/VRSS, AV and VASS engaged in further discussion about the terms of the 2007 Protocol and a revised version was circulated in September 2015 though it does not appear to have been adopted.[191]

88. Since then, in about August 2017, a new 'Guideline'[192] was adopted by Yooralla on behalf of VASS and AV to manage ambulance transfers to hospital of ventilator-dependent residents and respite users of VASS.[193] This document includes each of the key components identified by Dr Howard and has been distributed among VASS staff[194] and AV crews likely to be dispatched to the address[195] and is posted in resident bedrooms within VASS.[196] The LOI also remains in place.

FINDINGS/CONCLUSIONS

89. 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.[197]

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[187] Exhibit L, 239 or 258 or 92% of patients were transported from VASS to the Austin.
[188] Exhibit L, I note that for 33 attendances (22%) data about whether a ventilator was transported with a patient was missing.
[189] Exhibit L.
[190] Exhibit L, I note that on three (of the 12) occasions when Sera was transported for hospital, including on 15 April 2015, information about whether her ventilators accompanied her is missing.
[191] IB pages 35-37.
[192] Exhibit D.
[193] VASS residents are also identified as 'Special Patients' on the AV database (Exhibit K).
[194] Transcript page 27.
[195] Transcript page 206.
[196] Transcript page 206.
[197] *Briginshaw v Briginshaw* (1938) 60 C.L.R. 336, especially 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…*"

90. Moreover, the effect of the authorities is that Coroners should not make adverse comments or findings against individuals in their professional capacity unless the evidence provides a comfortable level of satisfaction that they departed materially from the standards of their profession and in so doing caused or contributed to the death.

91. Having applied the applicable standard of proof to the available evidence, I find that:

a) Sera had contended with the progressive functional decline associated with muscular dystrophy for most of her life and her condition was further complicated by a diagnosis of cardiomyopathy in April 2015;

b) Notwithstanding that VASS was staffed at a suboptimal level overnight on 14-15 April 2015 due to a DSW calling in sick at short notice, the clinical management and care provided to Sera by VASS staff who were on duty was reasonable and appropriate;

c) Sera's night ventilator was functioning as intended overnight on 14-15 April 2015;

d) The efforts of VASS staff to facilitate Sera's transfer to hospital with her consent were appropriate in the circumstances;

e) A delay of between two and three minutes during which Ms Cotter retrieved a supplementary oxygen cylinder from House 4 did not materially affect Sera's clinical course. That said, I am perplexed that supplementary oxygen was not readily available in each of the VASS houses;

f) AV paramedics arrived promptly and Sera's management by them, despite their failure to transport her ventilators to the Austin in accordance with the 2007 Protocol, was reasonable and appropriate in the circumstances;

g) Sera's medical management at the Austin ED was reasonable and appropriate;

h) Sera's death could not have been prevented and was due to complications of muscular distrophy.

PUBLICATION OF FINDING

92. Pursuant to section 73(1) of the Act, I order that this Finding be published on the internet.

DISTRIBUTION OF FINDING

93. I direct that a copy of this finding be provided to:

Mr V. and Mrs R. Pirrottina

Ventilator Accommodation Support Service, Yooralla

Victorian Respiratory Support Service, Austin Health

Ambulance Victoria

SC R. Hazeldene, Coroner's Investigator, Victoria Police and

LSC D. McKenzie, Police Coronial Support Unit

Signature:

PARESA ANTONIADIS SPANOS
CORONER
Date: 3 December 2019