IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2010 3710

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)

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

Inquest into the Death of: Stephen Liat Kai LIM

Delivered On:	2 August 2016
Delivered At:	Coroners Court of Victoria 65 Kavanagh Street Southbank Victoria 3006
Hearing Dates:	Directions Hearing - 24 May 2012 Inquest – 13, 14, 15, 16, 17, 21 and 22 May 2013
Findings of:	Coroner Paresa Antoniadis SPANOS
Representation:	Mr J. LANGMEAD S.C. of Counsel, instructed by Ms HUBBLE-MARRIOT of Russell Kennedy appeared on behalf of Ambulance Victoria. Mr P. ROZEN of Counsel, instructed by Mr Fatmir BADALI of Gadens Lawyers appeared on behalf of Emergency Services Telecommunications Authority.
Police Coronial Support Unit	Leading Senior Constable Amanda MAYBURY assisting the Coroner

I, PARESA ANTONIADIS SPANOS, Coroner,
having investigated the death of STEPHEN LIAT KAI LIM

and having held an inquest in relation to this death at Melbourne

on 13, 14, 15, 16, 17, 21 and 22 May 2013:

find that the identity of the deceased was STEPHEN LIAT KAI LIM

born on 5 October 1953, aged 56

and that the death occurred on 26 September 2010

at 8 Lincoln Street, Burwood East, Victoria 3151

from: I (a) BENZALKONIUM CHLORIDE TOXICITY

in the following circumstances:

BACKGROUND & PERSONAL CIRCUMSTANCES[1]

1. Mr Lim was born in Malaysia and came to Australia in 1970 where he completed his secondary education and then obtained a Bachelor of Commerce degree in 1976. Shortly after, his parents purchased 8 Lincoln Street, Burwood East, for him to live in. Mr Lim's brother migrated to Australia in 1980 and their parents arrived in 1981. They lived with Mr Lim in Lincoln Street.

2. Mr Lim was described by those who knew him as a very pleasant, courteous and diligent person. According to his brother, Mr Lim had never been known to have an intimate relationship and devoted himself to their parents. Mr Lim's parents moved to a retirement home in 2002 and Mr Lim lived alone thereafter. Mr Lim's mother died in 2004 and his father in 2007.

3. Initially, Mr Lim worked as a chartered accountant before moving to the IT industry. He worked for Telstra shortly after his graduation and for the National Australia Bank [NAB] for 22 years from 1986 until his retrenchment in 2008. According to his brother, Mr Lim loved his work and was disappointed to be retrenched from NAB. He was trying to re-educate himself in case he could not find employment in IT and appeared to be coping financially. Mr Lim always appeared happy. When last seen by his brother and his family about one month

[1] This section is a summary of facts that were uncontentious, and provide a context for those circumstances that were contentious and will be discussed in some detail below.

before his death, Mr Lim was happy to have lost two kilos, said he was still studying book-keeping and was still sending out his resume, albeit without success.

MEDICAL HISTORY

4. Mr Lim had been a patient of Dr Tin Bo Wong, at Burwood Health Care, since 1996. His medical history included diabetes, hypertension and hypercholesterolaemia, all treated with prescription medications, and obesity.[2] In response to some symptoms suggestive of cardiac illness or deterioration, Dr Wong arranged cardiac investigations of Mr Lim in August-September 2010. Dr Wong was unaware of Mr Lim having any history of suicidal thoughts or ideation or of suicide attempts.

5. Ms Irene Yeung was a former NAB colleague and good friend of Mr Lim. She was aware that he had some cardiac investigations in August-September 2010. He told her he had an ECG that was reported as abnormal and an angiogram that showed enlarged coronary arteries. Mr Yeung realised that Mr Lim was worried about his heart condition but did not realise just how anxious he was until the evening of 21 September 2010 when they caught up. As a result, Ms Yeung took to calling him every day, sometimes a few times a day to 'ensure he was getting on fine'.[3]

6. Significantly, Mr Lim attended Burwood Health Care on 23 September 2010 and consulted with a colleague of Dr Wong, Dr Peter Demaio, who had treated him intermittently over the years. Mr Lim reported vague symptoms of concern about the cardiac investigations he had recently undergone[4], and incidentally mentioned that he was stressed, suffered from a lack of self-confidence and was constantly concerned about offending people.

7. Dr Demaio suggested some counselling and behaviour modification which Mr Lim resisted at first but agreed to after further discussion. Dr Demaio assessed Mr Lim as anxious and depressed, commenced him on a low dose antidepressant and referred him to a nearby

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[2] According to Dr Wong's statement at pages 62-65 of the coronial brief, Exhibit X, Mr Lim's regular medications were "Actos" (a brand name for pioglitazone, used in diabetes), "Diaformin" (a brand name for metformin, an oral drug used in diabetes), "Diamicron" (a brand name of glicazide, an oral drug used in diabetes), "Avapro" (irbesartan, an angiotensin II receptor block vasodilator and antihypertensive drug), "Coversyl" (a brand name for perindopril and ACE inhibitor vasodilator and antihypertensive drug), "Astrix" (a brand name for low dose aspirin, used as an antiplatelet drug in cardiac disease, *inter alia*) and "Lipitor" (a brand name for atorvastatin, a lipid lowering drug used in hypercholesterolaemia).

[3] According to Ms Yeung's statement at pages 58-61 of the coronial brief, Exhibit X, she contacted Mr Lim's brother on 21 September 2010 to make sure he was aware of Mr Lim's situation and the following day, Mr Lim told her that his brother had asked him to go to the doctor to get some medication for his anxiety.

[4] Also referred to in the statement of Ms Irene Yeung at pages 58-61 of the coronial brief, Exhibit X.

psychologist. He also prepared a Mental Health Care Plan pursuant to which Mr Lim could have counselling paid for by Medicare.[5]

8. Investigations after Mr Lim's death indicate that he contacted Nexus Psychology on the number provided by Dr Demaio on 24 September 2010 and left two messages. A receptionist returned Mr Lim's calls and advised that someone would probably call him on Monday (27 September 2010) to discuss his needs and arrange an appointment with a suitable psychologist.[6]

EVENTS OF 25-26 SEPTEMBER 2010

9. The 25 September 2010 was AFL Grand Final Day. Mr Lim was an avid Collingwood supporter and they were playing in the final. When Ms Yeung spoke to Mr Lim on the telephone early that day, he sounded fine. Later, at 1500 hours he sent her a text message saying "Go Pies". Nothing else is known of Mr Lim's activities or mood on the day[7] until 2328 hours when he placed his first call to emergency services/000.

10. Some time prior to making that call, Mr Lim ingested two bottles of a domestic disinfectant ("Pine-O-Cleen"), apparently in an act of deliberate self-harm. The precise quantity ingested is unclear, as is the time over which he had ingested it, except that he told the 000 call-taker that he had drunk it 'just now'. Mr Lim requested an ambulance but did not say what symptoms he was suffering from. Nor were any symptoms elicited by the 000 call-taker. He was advised not to eat or drink, asked to unlock the door and turn on the lights and to 'call back on 000 straight away if anything changes or he got worse before the ambulance arrived'.[8]

11. The current paradigm for emergency services response, the priority accorded Mr Lim's request for an ambulance and the unprecedented high demand for ambulances on the night will be discussed in some detail below. Suffice to say that pending arrival of an ambulance over the next three and a half hours, Mr Lim made eight further calls to 000. Most of his calls were characterised by call-takers as requests for the estimated arrival time of the ambulance

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[5] Statement of Dr Peter Demaio at page 66 of the coronial brief, Exhibit X. Nexus Psychology is located across the road from Burwood Health Care at the Burwood Specialist Centre. Dr Demaio prescribed "Efexor XR" (a brand name of the antidepressant venlafaxine in extended release form) 37.5mg/1 tablet to be taken at night for one month.

[6] Statement from Dori Kabillo, Director/Psychologist at page 67 of the coronial brief, Exhibit X.

[7] Collingwood and St Kilda drew – an unusual though not unprecedented outcome in AFL football. It is entirely possible that the result lowered Mr Lim's mood. Collingwood went on to win the re-match one week later.

[8] A transcript of the call appears as Attachment 6 to the statement of Mr Craig William Fechner dated 18 August 2011/Exhibit J.

with no change in Mr Lim's condition elicited. However, during calls 5, 6 and 7 Mr Lim complained of pain/stomach pain, and during calls 8 and 9 said that he could not breathe and could not breathe properly, respectively.[9]

12. An ambulance was finally dispatched at 0238 hours on 26 September 2010 and arrived at Mr Lim's home at 0250 hours. This ambulance was crewed by a Qualified Ambulance Paramedic Sarah Richardson and Graduate Ambulance Paramedic Tegwyn McManamny [the Hartwell crew]. They parked the ambulance across the driveway, relying on its lights to illuminate the driveway so they could walk to the front door. They knocked on the front door and announced their presence.

13. A short time later, Mr Lim came to the front door. He was naked from the waist down, breathing noisily and accompanied by a strong pine scent. When asked what he had ingested, Mr Lim said two bottles of Pine-O-Cleen. He was encouraged to continue walking to the ambulance and, once there, helped onto the stretcher in the back.[10]

14. As soon as she saw him at the front door, Ms Richardson recognised that Mr Lim was time critical and called dispatch via her portable radio for MICA assistance. The initial plan was for a rendezvous between the two ambulances on Middleborough Road.

15. However, once on the ambulance stretcher Mr Lim became unresponsive and went into cardiac arrest. Dispatch was updated accordingly, and cardiopulmonary resuscitation [CPR] commenced with Ms Richardson performing compressions and Ms McManamny managing Mr Lim's airway. CPR was complicated by the need to suction copious amounts of pine-smelling liquid being passively regurgitated from Mr Lim's mouth and nose. The first cardiac rhythm check showed that Mr Lim was in a pulseless electrical activity [PEA] arrest. CPR continued with Ms Richardson and Ms McManamny swapping between two minute cycles of compressions and ventilation, with rhythm checks in between.[11]

16. Glenn Fairall was the Qualified Mobile Intensive Care Ambulance [MICA] Single Responder Paramedic who was dispatched from the Elgar Road/Box Hill branch dispatched Code 1 in response to the Hartwell crew's request for assistance. Mr Fairall arrived at 0305 hours and

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[9] Statement of Mr Fechner/Exhibit J at paragraphs 32 and following.

[10] Statement of Sarah Richardson dated 3 May 2011/Exhibit F and statement of Tegwyn McManamny made October 2010 (see transcript page 160)/Exhibit H. I note that in her statement Ms Richardson described Mr Lim as "time critical due to his noisy breathing" while Ms McManamny described him as "tachypnoeic" or breathing rapidly.

[11] Exhibits F and H and Exhibit J Attachments 13 and 14.

found the Hartwell crew undertaking CPR. He asked them to continue while he prepared to intubate Mr Lim.

17. Mr Fairrall's first attempt at intubation was blind as he could not visualise Mr Lim's vocal cords. Post intubation checks indicated the tube was incorrectly positioned - in the oesophagus rather than the trachea. The tube was removed and Mr Lim ventilated with intermittent positive pressure ventilation through an oropharyngeal airway and bag valve and mask. Prior to attempting intubation a second time, copious amounts of Pine-O-Cleen were suctioned. Mr Fairall used a bougie to assist intubation but this attempt also failed.

18. A second MICA paramedic arrived at 0318 hours to assist. It was becoming increasingly difficult to ventilate Mr Lim due to ongoing passive regurgitation. The second MICA paramedic made a third attempt to intubate Mr Lim using a smaller than normal laryngeal mask airway due to inflammation of Mr Lim's airway. This attempt also failed.

19. At this point an oropharyngeal airway was inserted and ventilation attempted but the paramedics were unable to ventilate Mr Lim at all. One of the paramedics tried to perform a cricothyroidotomy, however, Mr Lim's short bull neck made it difficult to locate the appropriate site.

20. By this time, Mr Lim had been in cardiac arrest for 30 minutes. All four paramedics agreed to cease resuscitation due to the prolonged down time, Mr Lim being in asystole for an extended period and due to their inability to ventilate him further. Mr Lim was pronounced deceased at 0338 hours on 26 September 2010.

INVESTIGATION & SOURCES OF EVIDENCE

21. This finding is based on the totality of the material the product of the coronial investigation of Mr Lim's death. That is, the brief of evidence compiled by Senior Constable Kate Fincher from Nunawading Police, additional statements and reports obtained by my assistant Leading Senior Constable Amanda Maybury from 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. All of this material, together with the inquest transcript, will remain on the coronial file.[12] In writing this finding, I do not purport

[12] 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. Unless otherwise stipulated, all references to legislation that follow are to provisions of the Act.

to summarise all the material and evidence, but will refer to it only in such detail as is warranted by its forensic significance and in the interests of narrative clarity.

22. It is appropriate to note that the coronial investigation of Mr Lim's death was also informed and enriched by a number of internal reviews and/or reports of other investigative agencies, to use the term at its broadest. These were tendered in evidence and provided invaluable insights into how the circumstances in which Mr Lim died were assessed and seen from other perspectives.[13] I have taken these materials into account, in accordance with the obligation in section 7 of the Act to avoid unnecessary duplication of enquiries or investigations.[14] That said, none of the internal reviews and/or reports of other investigative agencies were on all fours with a coronial investigation[15] where the focus is on circumstances that either caused or contributed to death and or "prevention" as that term is used in the Act.[16]

23. However, the existence of these prior investigations facilitated a systemic approach to the coronial investigation of Mr Lim's death, for example by obviating the need to call each call-taker to give evidence at the inquest, and focusing the investigation on the current paradigm for (optimal) emergency response; how the emergency response system responded to Mr Lim's calls and why; and whether there is scope for improvement in that system.

PURPOSE OF A CORONIAL INVESTIGATION

24. The purpose of a coronial investigation of a *reportable death*[17] is to ascertain, if possible, the identity of the deceased person, the cause of death and the circumstances in which death

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[13] An example is the statement of MICA Paramedic Stephen Charles Murphy dated 14 May 2013, Exhibit A, which is in part an internal review from the Ambulance Victoria perspective. Other more obvious internal reviews or reports are the statement of Mr John Edward Chatfield dated 2 April 2012 containing the investigation by the Office of the Emergency Services Commissioner [OESC], Exhibit O; the Clinical Case Review Report of Mr Ken Bailey, Exhibit Q; the Call Taking Dispatch Review report, Exhibit R; and the Root Cause Analysis, Exhibit S.

[14] "It is the intention of Parliament that a coroner should liaise with other investigative authorities official bodies or statutory officers – (a) to avoid unnecessary duplication of inquiries and investigations; and (b) to expedite the investigation of deaths and fires."

[15] Succinctly encapsulated in Mr Langmead's final submissions at pages 625-626: *"This squarely raises the issue of review of reviews, which I know Your Honour is not conducting...brings out in stark relief the difference between the reviews by agencies as to their own conduct, by agencies as to the conduct of others and by independent third party agencies as being for different purposes...also a further reason why these reviews by others are a bit of a peril in a Coronial inquest and that is that they are made for such a difference purpose that they contain biases that this court is free from. It can be a bias in either directions...a bias towards being too harsh on their own...a level of scrutiny that everyone would wilt under or it can be a bias, a self-serving bias, a glossing over...there can be an element of tit for tat or of a what about them sort of approach..."*

[16] See footnote 19 below and the Preamble and Purposes of the Act: The making of findings and (query comments) and recommendations that contribute to a reduction in the number of preventable deaths.

[17] The term is exhaustively defined in section 4. Apart from a jurisdictional nexus with the State of Victoria (see section 4(1)), reportable death includes *"a death that appears to have been unexpected, unnatural of violent or to have*

occurred.[18] The *cause* of death refers to the *medical* cause of death, incorporating where possible the *mode* or *mechanism* of death. For coronial purposes, the *circumstances* in which 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 all those circumstances which might form part of a narrative culminating in death.[19]

25. The broader purpose of any coronial investigations is to contribute to the reduction of 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.[20] 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 or safety or the administration of justice.[21] These are effectively the vehicles by which the coroner's prevention role can be advanced.[22]

26. 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.[23]

FINDINGS AS TO UNCONTENTIOUS MATTERS

27. In relation to Mr Lim's death, most of the matters I am required to ascertain, if possible, were uncontentious from the outset. His identity and the date and place of death were not at issue.

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resulted, directly or indirectly, from an accident or injury" (see section 4(2)(a)). Note that a special status is afforded involuntary psychiatric patients, whose deaths are always reportable, irrespective of the cause of death (see section 4(2)(d)).

[18] Section 67(1).

[19] 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.)

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

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

[22] See also sections 73(1) and 72(5) which requires 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.

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

I find, as a matter of formality, that Stephen Liat Kai Lim, born on 5 October 1953, aged 56, died at home at 8 Lincoln Street, Burwood East, at about 0330 hours on 26 September 2010.

CONTENTIOUS MATTERS – THE FOCUS OF THE CORONIAL INVESTIGATION/INQUEST

28. While there was no contention about the medical cause of Mr Lim's death, the mechanism of death was contentious, critical to determination of the threshold issue of whether or not Mr Lim's death was preventable and therefore critical to appraisal of the adequacy of the emergency response system to Mr Lim's calls to 000 and evaluation of the need for improvement in that system.

29. I note for completeness that there was some criticism at inquest of the clinical management and care provided by the Hartwell crew to Mr Lim in the moments immediately preceding his cardiac arrest.[24] As I foreshadowed during final submissions, I find no basis for a criticism of the Hartwell crew. Absent hindsight, they responded in a cautious and reasonable manner recognising that he was time-critical but lucid and already walking. The decision to allow him and to assist him to walk to the ambulance rather than return to the ambulance themselves to retrieve a conveyance for him, represented a reasonable judgement call given the known circumstances at the time.[25]

30. Forensic Pathologist Dr Linda Iles (as she then was, now Head of Pathology) from the Victorian Institute of Forensic Medicine [VIFM] reviewed the circumstances as reported by the police to the coroner and post-mortem CT scanning of the whole body and performed an autopsy. Dr Iles provided an autopsy report detailing findings pertinent both to the cause, and of particular significance in this case, to the mechanism of Mr Lim's of death. Dr Ile's attributed Mr Lim's death to benzalkonium toxicity.[26]

31. Dr Iles' anatomical findings include sloughing of the pharyngeal, oesophageal and gastric mucosa; pungent smelling gastric and small bowel contents; four stab wounds to the neck none of which penetrate major vessels or the chest cavity, associated with up to ten surrounding superficial skin punctures; areas of linear abrasion on the right side of the neck

[24] See the AV's Clinical Case Review Report, Exhibit Q and Mr Rozen's final submissions at transcript pages 662-3.

[25] I note that Mr Lim decided to return into the house under his own steam to retrieve house keys, likely to

[26] Exhibit D, Dr Iles thirteen page autopsy report dated 28 September 2010, amended 15 May 2013 includes her formal qualifications and experience.

and patchy early bronchopneumonia/acute lung injury within both lobes of the lung.[27] In her opinion, the superficial wounds to Mr Lim's neck and chest were not inconsistent with self-infliction.[28]

32. In concluding comments in her autopsy report, Dr Iles advised that the autopsy demonstrated irritant dermatological changes to the skin around the mouth and nose and similar changes to the pharyngeal, oesophageal and gastric mucosa, as well as early changes of acute lung injury suggestive of aspiration of irritant gastric contents.[29]

33. Dr Iles noted that post-mortem toxicological analysis showed benzalkonium chloride (the active ingredient in Pine-O-Cleen) within both gastric contents and blood. She advised that according to the literature, benzalkonium chloride is not considered particularly hazardous on inadvertent oral consumption, but opined that in Mr Lim's case, the large volume consumed has precipitated death. As regards the mechanism of death, Dr Iles advised that benzalkonium toxicity was thought to cause systemic toxicity due to central nervous system stimulation and muscle weakness.[30]

34. At inquest, Dr Iles reiterated that she saw evidence of acute lung injury at autopsy which suggested that Mr Lim aspirated irritant gastric contents but as to the potential for metabolic acidosis or other mechanism of death in benzalkonium toxicity, she deferred to the opinion of a clinical toxicologist or clinical pharmacologist.[31]

35. When asked about the stress that benzalkonium toxicity might place on the heart, Dr Iles stated that aspiration and acute lung injury would render someone hypoxic, so that would put extra stress on the heart. Subject to the opinion of a clinical toxicologist/pharmacologist as to the likelihood of a metabolic acidosis, she also testified that that could put extra stress on the heart. According to Dr Iles, the scenario was very multifactorial. She referred in this respect

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[27] Exhibit D page 11-12. Other findings were mild macrovesicular steatosis of the liver and a 1.5cm un-encapsulated papillary carcinoma of the thyroid gland, incidental to Mr Lim's death. Transcript pages 101-102. Dr Iles also noted an element of cardiomegaly by reference to his height but not his weight of unclear significance to his death given the rarity of deaths associated with benzalkonium chloride consumption – the active ingredient in Pine-O-Cleen. Transcript pages 91, 96.

[28] Transcript page 101.

[29] Exhibit D page 12. Transcript pages 92-95.

[30] Ibid.

[31] Transcript pages 91-94.

to the emotional distress of Mr Lim stabbing himself and drinking two and a half litres of Pine-O-Cleen as likely additional cardiac stressors.[32]

36. Dr Iles was also cross-examined about the difficulties experienced by the paramedics in attempting to intubate Mr Lim. She testified that she was not at all surprised that he would have been difficult to intubate and she imagined it would have been extraordinarily difficult to do so, due to his obesity and very short neck, particularly in light of intermittent regurgitation.[33]

37. Dr Iles' evidence was also relevant to the fundamental question of whether or not, and if so until what point in time Mr Lim's death was preventable. She maintained that while aspiration and the acute injury that it caused was significant she could not say on pathological grounds *when* Mr Lim aspirated. If he aspirated early and accessed appropriate medical assistance early, the outcome may have been different. However, an irritant can produce very florid acute lung injury that may not be treatable. Dr Iles added that the opportunity to be treated early could at least potentially have changed the outcome for Mr Lim.[34]

38. The audio recordings of Mr Lim's call to 000 were played during the inquest and Dr Iles was asked to comment on any apparent deterioration in Mr Lim's functioning and/or any pathological findings to which it might be attributed.[35] Dr Iles testified that there didn't appear to be any change in Mr Lim's conscious state from the first call to the last call.[36] She identified a breathiness in the early calls (particularly the first) that was consistent with the breathing of an obese person. Overall, Dr Iles testified that she could hear a clear progression from upper airways sounds in the early calls, to sounds indicating possible fluid on the lungs from 0134 hours onwards, and more pronounced from 0200 hours. As regards the last call at about 0244, Dr Iles heard sounds indicative of a degree of significant respiratory distress.[37]

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[32] Transcript pages 97-98. While it seems intuitive that the stabbing preceded the ingestion of the Pine-O-Cleen, it is not necessarily the case. See also footnote 21 above.

[33] Transcript pages 99-100.

[34] Transcript page 102.

[35] Transcript pages 106 and following.

[36] Transcript pages 108-109. "Well, it seems to me that in terms of being centrally obtunded, so, you know, his conscious state, it doesn't' appear to me to change from the first call to the last call...I'll just reiterate he does not sound like he is confused or – anymore confused form the first fall to the second – to the – last call to me.

[37] Transcript page 113.

39. Apart from detection of benzalkonium chloride in gastric contents and femoral blood, routine post-mortem toxicological analysis was undertaken on samples removed from Mr Lim's body. Analysis of femoral blood revealed gliclazide[38], a drug used to treat diabetes, at a concentration of ~0.8mg/L, a trace only of the antidepressant venlafaxine[39] and no alcohol or other commonly encountered drugs or poisons.[40] These results suggest that Mr Lim was not taking all his prescription medication, at least in the period immediately preceding his death.[41]

40. Ms Kerryn Crump, Senior Toxicologist at VIFM, was the case reporting officer in relation to the routine post-mortem toxicological analysis undertaken in Mr Lim's case.[42] At inquest she explained that benzalkonium chloride is not routinely tested for but the information that Mr Lim had ingested Pine-O-Cleen caused her to use mass spectrometry to identify the substance as well as other ingredients of the disinfectant. These were identified in both post-mortem blood samples and gastric contents.[43]

41. Ms Crump gave evidence that there is limited literature about benzalkonium chloride toxicity and the main authority relied on deals with nine documented fatalities after the ingestion of significantly smaller quantities of less concentrated preparations of benzalkonium chloride.[44] Most of the nine deaths occurred within 24 hours of ingestion.

42. In light of those deaths, Ms Crump likened Mr Lim's case to drinking a slab of light beer compared to two bottles of heavy beer.[45] She was unable to say whether early intervention would have assisted, after drinking a volume in the order of 2.5 litres.[46] The paucity of literature did not allow Ms Crump to comment about the timeframe over which Mr Lim likely

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[38] Gliclazide is an anti-diabetic drug that restores the diminished first-phase of insulin secretion noted in non-insulin dependent diabetes mellitus. It is available in Australia as "Diamicron" 80 mg tablets. See Exhibit E the toxicology report authored by Ms Kerryn Crump, Senior Toxicologist, 8 November 2010.

[39] Venlafaxine is available in Australia as "Efexor" and "Efexor XR" extended release and is indicated for the treatment of depression. Therapeutic concentrations range up to approximately 0.5mg/L in post-mortem peripheral blood. See Exhibit E. The mere detection of venlafaxine here indicates a sub-therapeutic level and suggests that Mr Lim was not taking the antidepressant as prescribed.

[40] Exhibit E contains a list of the drugs routinely tested for.

[41] See footnote 2 above for a list of the various medications prescribed to Mr Lim by his GP.

[42] Her six page toxicology report dated 8 November 2010 is Exhibit E.

[43] Transcript pages 121-124.

[44] The nine fatalities involved solutions of 10-20% and the ingestion of around 5-300mls. Transcript page 119.

[45] Ibid. See also transcript page 132.

[46] Transcript page 120.

ingested the benzalkonium chloride, as absorption rates of the substance were not well known as they are for example with alcohol.[47]

43. For all the limitations in the literature, Ms Crump supported the assumption that benzalkonium chloride contributed to Mr Lim's death. As regards the preventability of his death, Ms Crump was questioned about the total quantity of benzalkonium chloride he ingested, in comparison with a fatal human dose on oral consumption of 100-400mls per kilogram of the weight of an adult suggested in literature.[48]

44. While in the witness box, Ms Crump calculated that if Mr Lim ingested the entire contents of the two empty bottles of Pine-O-Cleen found at the scene, he would have ingested 37.5 grams of benzalkonium chloride. Given his weight at autopsy was 136 kilograms and the fatal range according to the particular article was 13.6 to 54.4 grams, at 37.5 grams, he fell squarely within that range.[49] While through her researches Ms Crump was aware of people surviving after ingesting smaller volumes of benzalkonium chloride, she was not aware of another case of someone surviving after ingesting a dose of similar quantity or potency to that ingested by Mr Lim.[50]

45. Dr Shaun Lawrence Greene is an Emergency Physician, a Clinical Toxicologist, the Medical Director of the Victorian Poisons Information Centre from 2009 and a consultant clinical toxicologist providing expert medical support to poisons information centres throughout Australia. He was engaged to provide an independent expert opinion regarding the death of Mr Lim.[51]

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[47] Transcript pages 121 and following.

[48] The article about quarternary ammonium was produced by Mr Rozen on behalf of ESTA but was not ultimately tendered. Ms Crump was not familiar with the article but confirmed that benzalkonium chloride is one of the chemical compounds in the quarternary ammonium group. Transcript pages 125 and following, especially 133.

[49] Cross-examination proceeded on the assumption that Mr Lim had ingested the contents of the two empty bottles – that is, 2.5 litres at 1.5%. How much was absorbed by Mr Lim and how much was vomited etc., was canvassed during her evidence but is arguably irrelevant as other nine cases appear to have been reported by reference to the total quantity ingested and the concentration of benzalkonium chloride in the solution ingested. Presumably, how much was absorbed and how much was vomited by those people was also not apparent.

[50] Transcript page 134. *"...you're not aware from the research that you've done of a single case where anyone has even survived a dose of the potency that Mr Lim took are you?---Well, that's correct. As I said, there's limited information. We had nine cases of lethal dose. We actually had a few that had lower dosages that had survived."*

[51] Exhibit N, Dr Greene's eleven page expert opinion dated 30 July 2012 includes his formal qualifications and experience, as well as the documents (including the autopsy report and toxicology report) that he referred to in coming to his conclusions.

46. According to Dr Greene's report, there is a distinction between the expected effects of benzalkonium chloride ingestion at concentrations greater than 10% and those less than 10%, as in Mr Lim's case. The former have been documented to cause corrosive damage to the mouth, pharynx, oesophagus and stomach,[52] hypotension and collapse of the circulatory system and central nervous system depression. In sufficient quantities, ingestion can cause respiratory muscle paralysis.[53]

47. Concentrations less than 10% are considered to cause an irritant rather than corrosive effect to the gastrointestinal tract which can lead to vomiting, diarrhoea and foaming at the mouth. The combination of vomiting and foaming at the mouth carries a risk of aspiration into the lungs and may, in turn, cause direct bronchoconstriction producing a clinical effect similar to asthma with severe constriction of the lung airways. The combination of aspiration of benzalkonium chloride and acidic gastric contents, together with this bronchoconstriction, may lead to acute lung injury with secondary leakage of fluid into the lung spaces or pulmonary oedema and ultimately impairment of oxygen delivery to the body. As with higher concentrations, systemic absorption can also produce paralysis of the muscles of respiration and in severe cases, the cumulative effects of these insults may lead to death.[54]

48. At inquest, Dr Greene maintained that Mr Lim suffered (and succumbed to) the effects of aspiration of benzalkonium chloride on his lungs and from increasing hypoxia, rather than the systemic effects of ingestion of the substance. He testified that while the sheer quantity of benzalkonium chloride would cause stomach pain and or vomiting, not necessarily in that order, with early access to appropriate medical treatment, Mr Lim would probably have survived. Dr Greene's best estimate of the window of opportunity for saving Mr Lim was 30 to 60 minutes after ingestion and within that range, the earlier the better, and ideally before any aspiration into the lungs.[55] Dr Greene's evidence was that there would have been significant vomiting and/or aspiration in the first hours after ingestion by Mr Lim.[56]

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[52] I note that this is entirely consistent with Dr Iles' autopsy findings – see paragraphs 28 and 29 above.

[53] Exhibit N, page 5, paragraph 33.

[54] Ibid, paragraph 34. It is tolerably clear from Dr Greene's statement that he places Mr Lim in the second category as regards symptoms and mechanism of the poisoning and this is clarified at transcript page 395-396.

[55] Transcript pages 382-383, 386, 396-397, 400.

[56] Transcript page 409.

49. Assuming that maximum possible exposure was to something like 2.5 litres of Pine-O-Cleen and that when he first called 000 and said he had ingested it 'just now' Mr Lim was telling the truth, there was nothing in the available evidence to enable Dr Greene to say when Mr Lim started ingesting, the rate of ingestion, whether the volume ingested was linear over time or in fits and starts or otherwise, the time over which the total volume was ingested and the time when Mr Lim stopped ingesting, at least not with the requisite degree of certainty.[57]

50. Dr Greene did testify that 2.5 litres of Pine-O-Cleen could have been ingested by Mr Lim in as little as five to ten minutes or over as long as two hours, but not over the period of 12 hours or so as, if that were the case, ingestion would not have produced the acute clinical effects seen in Mr Lim.[58]

51. Applying the standard of proof[59] to the available evidence, I find that:

    a. Mr Lim ingested approximately 2.5 litres of Pine-O-Cleen containing 37.5 grams of benzalkonium chloride on the evening of 25 September 2010 as an act of deliberate self-harm.

    b. The medical cause of Mr Lim's death was benzalkonium chloride toxicity.

    c. The likely mechanism of death was hypoxia resulting from acute lung injury due to the irritant effects of the aspiration of benzalkonium chloride and gastric contents, in turn due to vomiting.

    d. Mr Lim's death was theoretically preventable in the sense that the quantity and concentration of benzalkonium chloride ingested were not necessarily lethal and were amenable to timely and appropriate medical treatment.

    e. I am unable to determine the time when Mr Lim commenced ingesting, the time over which he ingested and the time he first aspirated benzalkonium chloride and therefore the time when he sustained acute lung injury.

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[57] Transcript pages 397, 404-406.

[58] Transcript page 406.

[59] *Briginshaw v Briginshaw*

f. While the possibility remains open, the evidence does not support a finding that Mr Lim's death was (probably) preventable when he first called 000 at 2328 hours on 25 September 2010, or at any particular time thereafter.

THE EMERGENCY RESPONSE SYSTEM

52. In order to understand the emergency response to Mr Lim's calls to 000 on 25 to 26 September 2010 and to evaluate the apparently "delayed" dispatch of an ambulance to him, it is necessary to understand the current paradigm for emergency response in Victoria, including the entities involved and their inter-relationships.

53. The Emergency Services Telecommunications Authority [ESTA] was established as a statutory authority on 1 July 2005 and is vested with responsibility for the provision of multi-agency emergency services communications across Victoria. These communications include call taking, dispatch and related information transfer services to emergency services including Victoria Police, Ambulance Victoria [AV], the Metropolitan Fire Brigade, the Country Fire Authority and State Emergency Services. To give some sense of the scale of operations, in 2009-2010, ESTA managed over 1.8 million emergency 000 and non-emergency calls, leading to more than 1.4 million dispatches requiring an emergency services agency response.[60]

54. In this finding I will focus on ESTA's call handling and dispatch of emergency ambulances, however, analogous relationships and processes are in place with respect to each emergency service. ESTA call takers receive calls via Telstra's 000 service, and once triaged by Telstra as a request for an emergency ambulance, the call is answered by a dedicated pool of ambulance call takers at ESTA's Tally Ho and Ballarat State Emergency Communications Centres.[61]

55. ESTA call takers are not medically trained. They undergo a six week full-time training course during which covers the Computer Assisted Dispatch system [CAD], expected

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[60] Statement of Craig William Fechner dated 18 August 2011/Exhibit J at paragraphs 7-8. These service were previously delivered by "Intergraph" and prior to 1995 by AV clinicians.

[61] Ibid paragraphs 9 and 11. Although call takers are based in two separate geographical locations (Tally Ho and Ballarat) they operate from the same telephone queue and use CAD system – see transcript page 274. As it turned out, only Mr Lim's first call was handled by a call taker at Ballarat, all others were handled out of the Tally Ho centre.

workflows, basic CPR[62] and the ProQA[63] program and then undergo some on the job training. ESTA call takers are specialised to the extent that they are trained specifically for one of the emergency services, in this case call taking and dispatch for AV.[64]

56. Calls are processed in accordance with administrative arrangements between ESTA and AV made pursuant to the *Emergency Service Telecommunications Authority Act 2004* in the form of Service Delivery Requirements [SDRs] which comprise Communications Standard Operating Procedures [CSOPs] and other supporting documents. From these source documents, ESTA derives its Standard Operating Procedures [SOPs] which are intended to provide clear and concise instructions to guide call taking and dispatch of emergency ambulances.[65]

57. Ambulance Victoria's SDRs require ESTA to employ a formal, structured question and answer methodology set down by the International Academy of Emergency Medical Dispatch (USA) known as the Medical Priority Dispatch System, the software version of which is known as ProQA. Call takers are provided with key scripted questions in respect of different event types that are designed to elicit relevant information from the caller. The questions are to be asked verbatim with some scope for call takers to ask further questions in order to elucidate or clarify the information provided, in the event a caller (or the call taker) appears not to understand.[66]

58. The information elicited by the call taker using ProQA is entered in the computer assisted dispatch system [CAD] and determines an event type for dispatch. The event type in turn determines the priority to be ascribed to an event in accordance with a response grid determined by AV. Depending on the event type, ProQA also provides post-dispatch and pre-arrival instructions for ESTA Call takers to pass on to the caller.[67]

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[62] Transcript page 265-266.

[63] See footnote 56 below and following for a description of the ProQA system.

[64] Transcript pages 252-254.

[65] Ibid paragraphs 11-13 and transcript pages 314 where the relationship between ESTA and AV is described. The SOP for AV emergency call taking current as at 25 September 2010 is Attachment 3 to Exhibit J. The SOP for AV emergency dispatching current as at 25 September 2010 is Attachment 4 to Exhibit J.

[66] Transcript page 257, 270.

[67] Ibid paragraph 16. An example is the advice given to Mr Lim not to eat or drink, to unlock the front door and turn on the lights etc., as outlined in paragraph 10 above.

59. Once an event is entered into the CAD by a call taker, an ESTA dispatcher will manage dispatch in accordance with the priority assigned to the event, priority 1 being the highest and most urgent and priority 4 being the least urgent.

60. While events are normally dispatched directly by the dispatcher to an AV unit, they may be referred to a Duty Manager, Customer Support Paramedic and by them to a Clinician for a dispatch solution in certain agreed circumstances. All three are AV personnel who are qualified to make medical assessments and can alter event priority and response requirements, with the caveat that only the Clinician can alter event priority on the basis of their clinical judgement alone. Duty Managers and Customer Support Paramedics can only do so on the basis of additional information elicited from the caller by free form questioning, unlike call takers whose questioning is prescribed and pre-scripted by ProQA.[68]

THE RESPONSE TO MR LIM'S FIRST CALL @ 23:28 HOURS

61. As a result of the arrangements outlined above, the call taker followed the applicable ESTA SOP, asked the relevant ProQA questions for an overdose/poisoning arriving at a coding of 23B1I denoting an intentional overdose without priority symptoms,[69] "creating" the event on the CAD system and sending it to a dispatcher. The 23B1I coding attracted a priority 2 dispatch priority or 'lights and no sirens' response in accordance with the AV grid provided to ESTA.[70] At about 23:31, the ESTA dispatcher attempted to dispatch an ambulance by selecting the 'Recommend Closest Unit' function on the CAD. As no nearby units were available, the dispatcher referred the event to the AV Duty Team Leader to provide a back-up solution.[71]

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[68] Ibid paragraph 17 and transcript page 296-297.

[69] Transcript pages 328 and following and Exhibit J - Attachment 5 is the hard copy/card version of the relevant questions while Attachment 6 is a transcript of the call.

[70] Exhibit T is an extract of the AV Dispatch Grid for card 23 (overdose/poisoning) events. Note that according to the grid a code/priority 2 response is an urgent response, with an expectation of arrival within 25 minutes in 90% of cases, which can be upgraded to a code 1 response by the AV crew responders if they experience obstruction, such as heavy traffic. A code/priority 1 response is the next highest priority or 'lights and sirens' and would have been ascribed to a case such as Mr Lim's if he had complained of (or there had been evidence of) abnormal breathing (23C3I) or severe respiratory distress (23D2I). An AV crew is expected to respond to a code/priority 1 event within 15 minutes in 90% of cases. The other dispatch requirement set by the grid is that the primary response for a 23C3I coded event is a Qualified Ambulance Paramedic whereas for a 23D2I coded event the primary response is a Mobile Intensive Care Ambulance (MICA).

[71] Exhibit J Attachment 1 "Event Chronology." At time 23:31:03 and 23:31:12.

62. It is apparent from both the audio of Mr Lim's first call to 000 and the transcript used at the inquest that the first call taker had some difficulty understanding Mr Lim, likely due to his heavy accent.[72] However, it was the call taker's apparent failure to comply strictly with the ProQA questions for an overdose/poisoning that was the subject of some scrutiny at inquest,[73] specifically the failure to ask Mr Lim if he was breathing normally, one of the mandated questions.

63. Mr Fechner did not consider this a failure on the call taker's part. His evidence was that this was consistent with the training of call takers and good practice as at September 2010.[74] Mr McGennisken, Manager of Communications and Referral Service for AV, also provided a statement and gave evidence at inquest to the same effect.[75]

64. Similar evidence was given by Mr Pickering, employed by ESTA as a ProQA Auditor. He explained that as at September 2010[76], call takers were permitted to take a common sense approach when deciding whether a caller was in respiratory distress based upon what they

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[72] The call taker was not required to give evidence at the inquest. It is also possible that she could not hear Mr Lim, whether due to the ambient noise in her workplace or otherwise. A CD containing the audio recording of all Mr Lim's calls to 000 on 25 – 26 September 2010 was provided with Mr Fechner's statement Exhibit J but not referred to as an attachment in that statement. The CD was played during the course of the inquest and some witnesses (notably Dr Iles and Dr Greene) were invited to comment on any deterioration in Mr Lim over the course of the calls. See transcript pages 106 and following and 367 and following respectively.

[73] Compare the ProQA scripted questions for an overdose/poisoning with the transcript of this call which appears as Attachment 5 to Exhibit J. While the "Are you breathing normally?" question was the focus of evidence at the inquest, it was not the only departure from the script. Arguably, the call taker was entitled to infer that ingestion was intentional and *a fortiori* that Mr Lim was "completely awake". See transcript at pages 532 and following from Mr Pickering's explanation of what is required of call takers in this regard.

[74] Exhibit J and transcript page

[75] Exhibit P is the 16 page statement of Mr Daniel McGennisken and his evidence is at transcript pages 424-519. The view that the "Are you breathing normally?" question need not be asked of first party callers, is also accepted by those involved in the Root Cause Analysis. Exhibit S page 3 – *"The callers [sic] breathing state appeared noisy, rapid and the caller was having difficulty speaking in full sentences. The event was created as "Overdose/Poisoning, Overdose (without priority symptoms)" for ambulance response within one hour. The question is usually reserved for third party callers. The structured call taking system was not used fully by the call taker to ask required questions and some questions were asked in a modified manner. The "breathing normally" question was not asked by the call taker, which if asked in this case would have resulted in a lights and sirens response as an "Overdose/Poisoning, Abnormal Breathing (Intentional)". This question is usually reserved for third party callers."* Interestingly, the RCA assumes that Mr Lim's answer would have been "no" equating to abnormal breathing and a coding of higher acuity.

[76] In fact prior to amendment of ESTA's call taking SOPs on 1 November 2011. Statement of Jim Pickering dated 7 August 2012, Exhibit U paragraph 42 (c).

were hearing or told during the course of a call. Mr Pickering described this as a "gentlemen's agreement" between ESTA and AV.[77]

65. The example he gave in his statement was that if a caller was clearly not having difficulty speaking, the call taker would not be required to ask them if they were breathing normally and the answer would be scored on audit as being obvious. This was indeed his response on initial audit of Mr Lim's first call to 000.[78] However, upon reflection, Mr Pickering changed his view, finding that as it was not entirely clear whether Mr Lim was breathing normally or was in respiratory distress, the "Are you breathing normally?" question should have been asked.[79]

66. As seen in the demonstration of the ProQA software undertaken by Mr Pickering during the inquest, the question appears on the call taker's screen in the third person, namely "Is he/she breathing normally?" and not in the first person "Are you breathing normally?" In final submissions, Mr Rozen argued that it is not surprising that the practice of gentlemen's agreement described by Mr Fechner and Mr Pickering developed.

67. The rationale underlying the practice is the belief that if a caller can converse with a call taker, they are self-evidently breathing normally and/or not in respiratory distress, although the concepts should not be conflated. The audio recording of Mr Lim's first call, gives no support to the notion that he was breathing normally. His answers are at best stilted, almost monosyllabic. While it may represent normal breathing *for him* the audio recording does not support an assessment on the part of the call taker that he was breathing normally and that the question therefore did not need to be asked, whether pursuant to a gentlemen's agreement, common sense or otherwise.[80]

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[77] Transcript page 534-535. *"Since this event we've just made a blanket rule you ask it every time, just take what they give you."*

[78] Ibid.

[79] Ibid and transcript pages 530-538.

[80] I note that, having listened to the audio recording of Mr Lim's calls, both Dr Iles and Dr Greene accepted that Mr Lim's breathing was consistent with the normal breathing of a morbidly obese man. Transcript pages 110 and 366 respectively. See paragraphs 78 and following below for a discussion between the "mismatch" between the ProQA approach to overdose/poisoning and the clinical approach that might be taken by say a toxicologist. I note this exchange of particular relevance to the "Are you breathing normally?" question at transcript page 398 - "[Mr Rozen]...you'd accept though that in an emergency call situation there's a balance to be struck between asking open ended questions and asking leading questions, in other words, the leading questions might elicit responses which might not be elicited if the questions were asked in an open ended way?---[Dr Greene] I think that in this case I would have liked a leading question, "Are you having trouble breathing?" So I understand where you're coming from in terms of

68. In any event, it is the answer given to the question by Mr Lim if it had been asked that is germane, not the mere asking of the question. There is no sound evidentiary basis for a finding that the answer given by Mr Lim would have been to the effect that he was not breathing normally, or that he was in respiratory distress, such as would result in the event being coded 23C3I (overdose/poisoning, abnormal breathing, intentional) or 23D2I (overdose/poisoning, severe respiratory distress, intentional) and attracting a priority 1 dispatch priority or 'lights and sirens' response.[81]

MR LIM'S SUBSEQUENT CALLS TO 000

69. ESTA call takers took a further eight calls from Mr Lim before an ambulance was dispatched to his house shortly after the last call at 0245 hours on 26 September 2010.[82] The second call was answered at 0028 hours. Mr Lim indicated that there had been no change in his condition and the call was treated as a call requesting an estimated time of arrival of the ambulance [ETA].[83] The third call at 0100 hours[84] and the fourth at 0114[85] hours were also treated as ETA calls with no change in the patient's condition.

70. The fifth call made by Mr Lim at about 0134 hours[86] was coincidentally answered by the same call taker as the third call. This call, again documented as an ETA call, was then transferred to the Duty Manager who spoke to Mr Lim, told him that they were very busy and having trouble getting an ambulance to him. Mr Lim said he felt sick in the stomach, that it was very painful and asked them to hurry. The Duty Manager updated the CAD accordingly and referred the event to the Clinician who called Mr Lim back at 0141 hours. Mr Lim told the Clinician that he had ingested Pine-O-Cleen and that he was in pain. The Clinician

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some people will say perhaps, yes, to any question or any leading question but – and I concede that at the time and in the system that we have at the moment it was not possible to have the knowledge to know what leading question to ask. If he'd called me I would have thought that the leading question "Are you having any difficulty breathing?" would have been beneficial in this case."

[81] Exhibit T. Although both codes attract a "lights and sirens" dispatch response, there is a difference between them in that the primary response to a 23C3I event is a Qualified Ambulance Paramedic while the primary response to a 23D2I event is a Mobile Intensive Care Ambulance Paramedic.

[82] The transcripts of the calls are Attachments to Exhibit J.

[83] Exhibit J at paragraphs 32-33 and Attachment 7.

[84] Exhibit J at paragraphs 34-36 and Attachment 8.

[85] Exhibit J at paragraphs 37-39 and Attachment 9.

[86] Exhibit J at paragraphs 40-45 and Attachments 10 (and 11).

advised him that they were very busy and that they would be there soon and updated the CAD accordingly.[87]

71. Mr Lim's sixth call was answered at 0203 hours and again characterised as an ETA call. Other than to indicate that he was in pain, Mr Lim did not advise the call taker of any change in his condition.[88] Similarly, the seventh call at 0219 hours[89], coincidentally taken by the same call taker as the sixth, was characterised as an ETA call with the call taker noting that Mr Lim was experiencing stomach pain.

72. The eighth call was answered at 0234 hours,[90] and on confirming that Mr Lim had called earlier, and recognising that he had made several ETA calls[91] the call taker transferred the call to the Duty Manager. The Duty Manager was the same person who had spoken to Mr Lim about one hour earlier in response to his fifth call. On this occasion, Mr Lim asked where the ambulance was and volunteered that *he couldn't breathe.* The Duty Manager advised him that they were still trying to get an ambulance to him. He asked her to *hurry please* and repeated that *he couldn't breathe.* The Duty Manager updated the CAD and asked the dispatcher to dispatch the Hartwell crew (unit HL090) then some 7.76km from Mr Lim's address. The dispatcher dispatched the event via a radio transmission and the Hartwell crew updated its status via the ambulance's mobile data terminal [MDT] to indicate that they were en route.[92] The dispatcher did not, as was open to him, change the event coding to 23C31 (overdose/poisoning, abnormal breathing, intentional) as was open to him.

73. Mr Lim's ninth call was answered at about 0244 hours[93] when the Hartwell crew were still en route. The call taker who answered this call was the same call taker who had answered Mr Lim's fourth call one and a half hours earlier. When asked if his condition had changed, Mr Lim said "I can't breathe. I can't breathe properly." The call taker updated the CAD at about

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[87] Exhibit J at paragraphs 46-47 and Attachment 11.

[88] Exhibit J at paragraphs 48-50 and Attachment 12.

[89] Exhibit J at paragraphs 51-53 and Attachment 13.

[90] Exhibit J at paragraphs 54-59 and Attachment 14.

[91] Attachment 14 at 0234 hours, the ESTA call taker tells the AV Clinician that it's about Mr Lim's 'third call re ETA, if not more, maybe four'. In fact it was the seventh time he called back after his first call!

[92] Exhibit J at paragraphs 60-65 and Attachments 14 and 15. The event was not but probably should have been re-coded as 23C3I at this point, although given the event was (finally) dispatched as a result of this call, the failure to re-code is unlikely to have made any difference.

[93] Exhibit J at paragraphs 66 and following and Attachment 16.

0245 hours by adding, inter alia, a notation "states trouble breathing", then changing the event type to 23C3I (overdose/poisoning, abnormal breathing, intentional) and thereby (automatically) escalating the priority for the event from a priority 2 to priority 1.[94] However, this escalation was of no practical significance, as the Hartwell crew had already been dispatched and arrived at Mr Lim's home at about 0250 hours.[95]

74. During the inquest, a number of aspects of the handling of Mr Lim's calls were scrutinised.[96] One such aspect was the practice on subsequent calls of asking whether anything had changed since the first call, requiring the caller to remember what was said during the first call and assess his current condition by reference to what he said about it earlier.[97] This can be a tall order for a person in emergent circumstances. Moreover, in the absence of a fulsome clinical baseline, what can one make of the caller's answer to such a question?[98] Answering in the negative to a question along the lines of "Has anything changed since your first call?" is entirely consistent with Mr Lim still being in pain, still having difficulty breathing and still vomiting and experiencing diarrhoea as was evident at the scene.[99]

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[94] Exhibit J at paragraphs 67-68

[95] Exhibit J at paragraphs 70-71. According to the event chronology, HL090 [the Hartwell crew] were still en route at 0247 hours and updated its status via the MDT at 0250 to indicate arrival at 8 Lincoln Street, Burwood. See also Exhibit F statement of Paramedic Sarah Richardson – *"We were en route at 0239 hours on a Code 2 and were upgraded to a code 1 shortly before we arrived at 0250 hours."* Exhibit H statement of Paramedic Tegwyn McManamny is in similar terms.

[96] Among other issues, each time Mr Lim called he had to repeat his address so that the ESTA call taker (and it could potentially be a different call taker each time) could confirm that were dealing with the same "event", the address being the universal identifier.

[97] Call 2 @ Exhibit J Attachment 7 "What's changes since you called us? Nothing. I'm...I just really need ambulance."

Call 3 @ Exhibit J Attachment 8 "Has anything changed since you first called? No."

Call 4 @ Exhibit J Attachment 9 "Has anything changed at all since you called. No. Nothing's changed? Er. It has or it hasn't? No. When is it coming?"

Call 5 @ Exhibit J Attachment 10 "Has anything changed since the first time you rang? No...Ambulance urgent. Where's the ambulance?"

Call 6 @ Exhibit J Attachment 12 "Okay, is there any change at all, umm, in your condition? I drank poison. Very painful.

Call 7 @ Exhibit J Attachment 13 "Is there any changes in your condition? Very painful. Where's your pain? My stomach."

[98] Dr Greene was critical of the failure to elicit clinically significant information from Mr Lim. Even though he modified his criticism to some extent once he appreciated that call takers were not performing a "clinical triage" role. Exhibit N at paragraph 39.

[99] Call 5 is particularly instructional in this regard. While Mr Lim answered no to the call taker's question "Has anything changed since the first time you rang?", when the call was transferred to the Duty Manager and she asked him

75. Mr Fechner gave evidence about changes made by ESTA to its requirements of call takers in relation to subsequent calls or call backs. As at the 25-26 September 2010, on receipt of a call back on an active event, the call taker was required to ask the caller if the patient's condition had changed since the previous call and, where a change was identified, to update the event and recode it to ensure an appropriate response was generated.[100] Following Mr Lim's death,[101] revised procedures were incorporated into the ESTA's SOPs for AV call taking required somewhat more nuanced questions to be asked on every occasion when a call back is made – "1. Has the patient's condition changed since the previous call? 2. Are they breathing normally? (or appropriate alternative if original call was for shortness of breath...such as 'has their breathing worsened?') 3. Are they completely awake? (or appropriate alternative if original call was for altered conscious state...such as 'are they unconscious now?) 4. Is there any serious bleeding? (only to be used for trauma or haemorrhage events)."[102]

76. It was conceded by ESTA at inquest, that the second ETA call (that is the third call) and every call thereafter, should have been referred to the Duty Manager, as required by the SOPs in place at the time.[103] As it was, only calls 5 and 8 were referred to the Duty Manager. On neither occasion was the event upgraded, despite the Duty Manager being told twice during call 5 at 0136 hours that Mr Lim felt sick and that his condition was very painful, and despite being told twice during call 8 that he couldn't breathe. Although ESTA conceded the call takers' departures from the SOPs, Mr Rozen submitted that it cannot be concluded that additional referrals to the Duty Manager would have led to an upgrading of the event or changed the ultimate outcome for Mr Lim.[104]

77. Another departure from the script concerns post-dispatch instructions. ProQA card 23 requires call takers to end by telling the caller "I'm organising the paramedics (ambulance) to help you now."[105] The relevant ESTA/AV SOP in place as at September 2010 specified a

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"How are you feeling?" he answered "Very bad". When then asked "Do you feel sick in the stomach?" he answered "Yeah. Very painful."

[100] Exhibit K, statement of Mr Fechner dated 7 August 2012 at paragraph 10.

[101] It is not clear to me whether this was entirely in response to Mr Lim's death or part of a broader review.

[102] Exhibit K and Attachment 19 at paragraph 6.8.2 "Subsequent calls and Calls for ETA."

[103] Exhibit J paragraphs 18-21.

[104] Final submissions of Mr Rozen dated 22 May 2013 and transcript page 658.

[105] Exhibit J Attachment 5.

slight variation in the form of "I am organising an ambulance now."[106] It is apparent from the transcripts of the various calls (and the audio recordings played during the inquest) that the call takers who answered Mr Lim's first seven calls departed from the prescribed exit script, employing phrases such "the ambulance is on its way", "they're on their way to help you", "the ambulance has been organised for you" and "the ambulance has been organised mate".[107]

78. While it is not difficult to accept that, in departing from the script, each call taker was attempting to comfort Mr Lim, the impression that an ambulance had already been dispatched was unfortunate and *potentially* dissuaded him from looking for alternatives such as trying to get himself to hospital or calling a friend to drive him to hospital. Clearly, Mr Lim continued to call 000 despite these false reassurances and the available evidence does not allow me to determine what impact the exit script or false reassurances actually had on him. Nonetheless, the practice cannot be ignored and should not be encouraged.[108]

FAILURE TO ELICIT CLINICALLY RELEVANT POISONS INFORMATION

79. ProQA is the software version of the Medical Priority Dispatch System, itself a protocol of the National Academy of Emergency Medical Dispatch, a USA based organisation, that maintains control of the content of the protocol. The uncontested evidence at inquest is that the protocol is widely used across the world and is widely accepted. While the protocol can be modified, the process for doing so is rigorous and involves many parties across the globe. The protocol adopts a symptoms based approach to the allocation of emergency ambulance resources to the myriad of patient presentations. The symptoms that elicit the most urgent response are the obvious life-threatening symptoms of cardiorespiratory arrest, altered conscious state and major trauma. As articulated by Mr McGennisken at inquest, it is a system that it fundamentally utilitarian, directed to the "greatest good for the greatest number

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[106] Exhibit J Attachment 3 paragraph 5.7. See transcript page 258 and following for Mr Fechner's evidence in this regard, especially from page 260 where he describes a "trial" of alternative exit scripts undertaken by ESTA.

[107] Calls 1, 2, 3and 6 and 7 respectively. Compare with calls 4 and 5 where the departure from the exit script was at least factual – "Okay, well they shouldn't be too much longer. I will let them known that you've called again." And "...we're very busy tonight. But we'll get someone there as soon as we can, okay? I'm sorry."

[108] Transcript pages 663-4, 665.

of people".[109] And that is achieved by prioritisation of emergency ambulance dispatch so as to get the most critically ill patients to hospital by reference to their presenting symptoms.[110]

80. As is evident from Dr Greene's evidence, such a system ill-suited to poisonings or overdoses, whether intentional or not, and the systemic response in such a paradigm is likely to be inadequate, and/or untimely. Unlike other pathologies where symptoms may be more florid or overt, in poisoning or overdose, the patient can be completely well at the time of exposure, may not be experiencing any symptoms or exhibiting any signs for a period of time, but may well be on a trajectory leading inexorably to death if the appropriate treatment is not administered.[111]

81. Dr Greene illustrated his point that a symptoms based approach to dispatch is flawed for poisonings by reference to paracetamol toxicity which accounts for about half the cases of poisoning in Australia annually. His evidence was that paracetamol poisoning causes very few symptoms initially, and if treated within eight hours of ingestion with the antidote, patients do well. However, every hour after the first eight hours, the patient's chance of survival is significantly lessened. Such a patient calling 000 ten hours after ingestion, may say they feel well, but may in fact require urgent dispatch of an ambulance in order to have any chance of survival.[112]

82. According to Dr Greene, in adopting an ideal clinical approach to poisoning it is important to elicit the nature of the poison involved, the quantity ingested, the patient's past medical history and co-morbidities as well as any other substances ingested and their current clinical state. It is important to note in this regard that Mr Lim showed no signs of a deteriorating mental state over the time that he was calling 000 and there is nothing to suggest that he could not have provided the clinically relevant information asked of him.[113]

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[109] See discussion at transcript page 392 and following.

[110] See discussion at transcript page 370 and following.

[111] Dr Greene used the term "exposure" in his evidence, as I understood it to encompass all manner of ingestion of toxic substances or contact with them. See for example transcript page 374 – "Poisoning is time dependent in terms of treatment but the patient can be completely well at the time of exposure...this is one illness where making that risk assessment of knowing what is going to happen in the coming hours in a currently well patient is just pivotal to knowing – because it all is time dependent in term of providing treatment and it's slightly different than most illnesses."

[112] Transcript page 395, but see series of questions from Mr Rozen commencing at transcript page 390.

[113] Transcript pages 365 and following.

83. In post-dispatch instructions and actions, ProQA envisages referral to a Poisons Information Centre [PIC] for all overdoses or poisonings. However, as at the time of Mr Lim's death, this aspect of ProQA was not incorporated into the arrangements between ESTA and AV.[114] The transfer of all calls involving overdose or poisonings to the PIC has obvious resource ramifications. Dr Greene did not think that either the PIC or AV had the resources to operate in this manner.[115] Although AV clinicians are available to assist call takers and dispatchers, they are generally qualified paramedics who would be expected to have some familiarity with the more commonly encountered drugs or poisons, such as street drugs, opiates and paracetamol, but could not be expected to have specialist knowledge or expertise with respect to the whole gamut of possible drugs, poisons or substances that might be abused.[116]

84. Given that it is unlikely that ProQA will be modified by incorporating questions designed to elicit more clinically relevant information,[117] other solutions are called for in order to address Dr Greene's concerns. The involvement of the Victorian PIC at an early stage in the call taking process is an established practice of ESTA and AV, since before Mr Lim's death.[118] Between Mr Lim's death and the inquest, and as I understand it in response to his death, AV introduced a number of measures under the auspices of their service improvement system in relation to utilisation of Victorian PIC resources in cases of overdoses or poisoning, including the introducing of a dedicated priority telephone line to the Victorian PIC in the communications room.[119]

DEMAND OUTSTRIPS SUPPLY

85. There is a body of evidence from a number of sources that supports a finding that Mr Lim could not have picked a worst night to call 000 seeking an emergency ambulance response. Certainly by the end of the inquest, it was a given that the demand for AV emergency

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[114] See paragraph 55 above.

[115] Transcript page 392. According to Mr McGennisken, overdose or poisoning cases made up 4.4% of the total ambulance cases in 2011-2012.

[116] Transcript page 361.

[117] See discussion at transcript pages 390 and following.

[118] Exhibit P, paragraphs 17-19, where Mr McGennisken indicates that AV called the Victorian PIC 417 times in 2009, 474 times in 2010 and 450 times in 2011, and that these calls generally take the form of a "three-way" conversation between communications centres staff, caller or patient, and PIC staff. Transcript page 30-31 where Mr Murphy indicates how PIC can be contacted by staff in the communications centre.

[119] These are set out in Exhibit A at paragraphs 51 and following and in Exhibit P at paragraphs 33 and following. They are also mentioned under COMMENTS below.

ambulance resources on the night was particularly high and that AV resources were stretched to an extraordinary extent.[120]

86. Historically, New Year's Eve is a busy night for ESTA and AV, as is Grand Final night, so the expectation was that 25 September 2010 would be a busy night for all those rostered on to work either at ESTA or AV. But demand on the night was beyond all expectations. Ms McManamny was relatively inexperienced on the night but was still working as a full-time paramedic as at the date of the inquest. She testified that she remembered how busy it was, describing the night as 'horrendous' and 'the worst night she had ever worked, hands down' before or since.[121]

87. Mr Fechner from ESTA provided statistics which bore out the anecdotal evidence of other witnesses. His evidence was that this was the busiest night for AV in the previous three years. A total of 1193 calls were received between 1800 hours on 25 September and 0600 hours on 26 September 2010 compared with 641 calls for the same period on Grand Final night 2009 and 974 on New Year's Eve 2009-2010.[122]

88. Mr Murphy a MICA paramedic of some 20 years' experience, working in the communications centre on Grand Final night 2010, adopted Mr Fechner's statistics and testified that in his experience over many years this was an excessive and unbelievable demand.[123] More specific to the period Mr Lim was calling 000, between 2300 hours on 25 September and 0200 hours on 26 September 2010, there were 170 calls to ESTA for emergency ambulance assistance.[124] Mr Murphy further testified that there was an unusually high number of high priority cases, including priority 1 cases, pending dispatch on the night for significant periods.

89. The high demand for AV resources was compounded by diminished AV resources on the night making delays in ambulance dispatch inevitable. There was a suggestion at inquest that this occurred within a particular industrial context but I did not investigate this aspect, confining my investigation to matters of fact rather than possible motives.

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[120] Recognised in the final submissions of both Mr Langmead SC on behalf of AV and Mr Rozen on behalf of ESTA.

[121] Transcript page 164.

[122] Exhibit J, Attachment 18.

[123] Exhibit J, Attachment 18, and Exhibit A paragraph 26. Transcript page 47.

[124] Exhibit A, paragraph 27.

90. According to AV records, 91 ambulance paramedics of a total of some 290 rostered on,[125] called in sick on 25 September 2010 and although AV called a number of staff in on short notice to provide cover, it was not possible to cover this much sick leave.[126] AV was also obliged to provide ambulance paramedics with two meal breaks during 14 hour night shifts during designated meal break 'windows' so as to comply with the relevant Enterprise Bargaining Agreement [EBA]. Paramedics who could not take a meal break by a designated time were placed on a 'priority 1 warning' meaning they could only to be dispatched to priority 1 cases and those who did not get a meal break by the end of the first window were placed on a 'priority zero warning' meaning they could only be dispatched to a priority zero case.[127]

91. AV provided evidence of a steady increase in its resources in terms of the number of metropolitan ambulances from 109 in June 2005 to 147 as at June 2009 and June 2010 and 164 in June 2013. However, a further confounding factor is the move to single responder MICA units in late 2010. While the overall effect of this change was to increase the number of paramedic units that are available to respond to an event, a person requiring a MICA (single responder) paramedic to say restore cardiac function, might then require transportation to a tertiary hospital by an AV emergency ambulance thus potentially occupying three paramedics and two vehicles at a minimum.[128]

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[125] Transcript page 450.

[126] Exhibit P paragraph 60 according to which the relevant Enterprise Bargaining Agreement provides that ambulance paramedics need only give one hour's notice when rostered on night shift and allows for three sick days per year without a medical certificate.

[127] Exhibit P paragraphs 61-63. See also paragraphs 64-65 where Mr Murphy outlines AV efforts since 2010 to work with internal and external stake-holders to improve meal break management and transcript pages 48 and following.

[128] Transcript page 41 and following, page 448 and following. Exhibit P paragraphs 66-68 where these changes to AV's service delivery model is set out. Not that "Prior to the re-allocation of MICA resources there were 12 stretcher MICA ambulances, which were equipped to transport patients, plus 4 Single Responder Units (SRU). SRUs are sedan based response resources, which were not equipped to transport patients. The changes resulted in there being 8 stretcher MICA ambulances operated 24 hours per day, 7 days per week, plus 4 peak period stretcher MICA ambulances and 14 SRUs. Although the re-allocation of MICA resources was intended to occur simultaneously to the increase in ALS teams, ultimately the reallocation of MICA resources did not occur until late 2010. Nevertheless, the reallocation of MICA resources occurred in the context of the additional ALS resources that were introduced in 2008/2009 as part of the planned change to the Ambulance Victoria service delivery models."

CONCLUSIONS

92. Applying the standard of proof to the available evidence, I find that:

a. To the extent that it relied on reported or evident symptoms to determine the appropriate prioritisation of requests for an emergency ambulance, the emergency response system operating in Victoria at the time of Mr Lim's death was flawed in its inception as regards cases of overdose or poisoning.

b. The first call taker should have ascertained if Mr Lim was breathing normally. If he answered in the negative then a priority 1 lights and sirens response would have been ascribed and it is *possible* that a fatal outcome could have been avoided. The available evidence does not support a finding that this is probable.

c. Mr Lim's second and subsequent calls to ask about an estimated time of arrival of an ambulance should have been escalated by the call takers to the duty manager. It is *possible but not probable* that this would have changed the fatal outcome.

d. The Duty Manager to whom Mr Lim's eighth call was transferred by the call taker, should have changed the event coding to reflect Mr Lim's complaint of abnormal breathing. This would have resulted in escalation of the event to a priority 1 lights and sirens response. As the Hartwell crew were dispatched in response to this call, it is *possible* that they might have arrived a few minutes earlier and *possible but not probable* that the escalation would have changed the outcome for Mr Lim.

e. Limited AV resources and high demand for those resources on the night were critical to the fatal outcome for Mr Lim. Even as a priority 2 lights but no sirens response, on almost any other night Mr Lim would have had a chance of accessing timely medical treatment and survival.

COMMENTS

Pursuant to section 67(3) of the *Coroners Act 2008,* I make the following comment/s connected with the death:

1. It would be utopian rather than realistic to expect any publicly funded system to cope with both the high level of demand and limited resources available to AV on the night in

question, and it should provide some comfort to the public that it was only in the perfect storm of grand final eve 2010 that Mr Lim's calls to 000 met with such a poor response.

2. The circumstances surrounding Mr Lim's death indicate that whatever can be said for the global efficacy of the emergency response system at the time, even operating optimally, a timely and adequate response to a case of overdose or poisoning was likely to owe more to happenstance than is acceptable from a public safety perspective.

3. Since Mr Lim's death, AV has implemented a number of changes to assist with the workload of the clinicians in the communication centres so as to ensure appropriate assessment and prioritisation of cases involving ingestion of substances including:

    a. Clinician recalls to duty during periods of high work load;

    b. Increase in Clinician rostered hours at the Communications Centre;

    c. A dedicated priority telephone line to the Victorian Poisons Information Centre;

    d. Raising awareness among AV staff of the risk of ingested substances and the need to contact the VPIC though an internal AV Memorandum dated 29 November 2011.

    e. The current Clinician training program now addresses poisons as a specific category necessitating a call back from the Clinician;

    f. A new work instruction entitled "Communications: Overdose Poisons Event" was created on 31 August 2012 and distributed to all AV communications staff;

    g. The work instruction "Communications: Altering Event Priority" dated 1 March 2010 was amended on 14 September 2010 to reinforce situations where the Clinician may review the initial case prioritisation and potentially escalate the response.[129]

4. ESTA has also learnt from Mr Lim's death and implemented the following changes:

[129] These are quoted as they appear in Exhibit A at paragraph 51 and expanded on in paragraph 52 and following.

a. In December 2010, ESTA circulated a bulletin to staff about the correct approach to breathing problems, emphasising the importance of always asking the "Are you breathing normally?" question.

b. ESTA has expanded the range of questions to be asked on call backs beyond merely asking if anything has changed, including a requirement that call takers are now directed to ask about breathing and consciousness each time.

c. As well as the standard ProQA auditing of first calls, ESTA now audits call backs against compliance with the Standard Operating Procedure requirements, including the requirement to refer calls to the AV Duty Manager, after a second call seeking an estimated time of arrival (of an ambulance).

5. All the above changes made by AV and ESTA bear the potential for improvement in public safety and each organisation is to be commended for their responsiveness to the circumstances surrounding Mr Lim's death.

RECOMMENDATIONS

Pursuant to section 72(2) of the *Coroners Act 2008,* I make the following recommendation connected with the death:

1. That ESTA and AV consider the circumstances surrounding Mr Lim's death, reflecting in particular on the evidence of Dr Greene, and craft as clear and seamless an arrangement as possible between them to ensure that cases of overdose or poisoning are appropriately prioritised for emergency ambulance response, bearing in mind the occult nature of the pathology, the need for timely specialist toxicological input particularly as to unusual substances, and the risk to public safety inherent in waiting for overt symptoms to present. Whether this is achieved by an amended or a new Standard Operating Procedure or otherwise, is a matter for ESTA and AV to resolve between them but it would be sensible to consult with the Victorian Poisons Information Centre.

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

The family of Mr Lim

Dr Shaune Greene

Emergency Services Telecommunications Authority c/o Mr Fatmir Badali, Gadens Lawyers

Ambulance Victoria

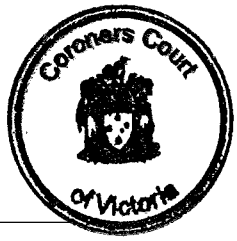
Office of the Emergency Services Commissioner

Minister for Emergency Services

Poisons Information Centre

Senior Constable Kate Mountain (#32844) c/o O.I.C. Forest Hill Police/Uniform

Signature:



PARESA ANTONIADIS SPANOS

Coroner

Date: 2 August 2016

Cc: Leading Senior Constable Amanda Maybury, P.C.S.U.