IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2016 0318

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 60(2)

Section 67 of the Coroners Act 2008

Amended pursuant to *Section 76 of the Coroners Act 2008* on 6 February 2020[1]

Findings of:	Caitlin English, Deputy State Coroner
Deceased:	Maddox Garry Wheeler
Date of birth:	9 November 2015
Date of death:	22 January 2016
Cause of death:	1(a) Unascertained
Place of death:	Lorne Community Hospital, Albert Street, Lorne, Victoria

[1] This document is an amended version of the Inquest Finding into Maddox Garry Wheeler's death dated 11 December 2019. A correction to the recommendation has been made pursuant to Section 76 of the *Coroners Act 2008* (Vic). In an email dated 4 February 2020, Erica Capuzza, Principal Lawyer and Manager at the Department of Education and Training, advised the Court that the Department of Education and Training does not have ownership of and responsibility for the Safe Infant Sleeping Guideline. The recommendation has been amended to reflect this correction.

HER HONOUR:

Background

1. Baby Maddox Garry Wheeler was born at 35 weeks gestation on 9 November 2015. He was 10 weeks and 4 days old when he died on 22 January 2016 from an unascertained cause of death in the context of co-sleeping.

2. Baby Maddox lived in Lorne with his parents, Alana Coy and Michael Wheeler, and older sister, Indigo.

The coronial investigation

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

4. Coroners independently investigate reportable deaths to find, if possible, identity, medical cause of death and with some exceptions, surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. Coroners make findings on the balance of probabilities, not proof beyond reasonable doubt.[2]

5. The law is clear that coroners establish facts; they do not cast blame, or determine criminal or civil liability.

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

7. Coroner Rosemary Carlin initially had carriage of this investigation. Victoria Police assigned an officer to be the Coroner's Investigator for the investigation into Baby

[2] In the coronial jurisdiction facts must be established on the balance of probabilities subject to the principles enunciated in *Briginshaw v Briginshaw* (1938) 60 CLR 336. The effect of this and similar authorities is that coroners should not make adverse findings against, or comments about, individuals unless the evidence provides a comfortable level of satisfaction as to those matters taking into account the consequences of such findings or comments.

Maddox's death. The Coroner's Investigator investigated the matter on Coroner Carlin's behalf and submitted a coronial brief of evidence.

8. Coroner Carlin also obtained statements from Ms Coy's general practitioner, the Maternal and Child Health Nurse, and Barwon Health. I reviewed these documents in addition to Ms Coy's antenatal records, Baby Maddox's medical records, and the coronial brief with the assistance of the Coroners Prevention Unit.

9. After considering all the material obtained during the coronial investigation, Coroner Carlin determined that she had sufficient information to complete her task as coroner and that further investigation was not required.

10. In September 2019, Coroner Carlin was appointed to the County Court and I took over carriage of this matter for the purposes of finalising this finding.

11. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity.

Identity of the deceased

12. Baby Maddox was visually identified by his father, Michael Wheeler, on 22 January 2016. Identity was not in issue and required no further investigation.

Circumstances in which the death occurred

Medical history

13. Indigo was born in September 2014 following premature spontaneous labour and an instrumental birth at nearly 36 weeks. At the assessment for substance use during this pregnancy, Ms Coy disclosed smoking cigarettes and cannabis use prior to becoming pregnant and cannabis use during the pregnancy.

14. Indigo was admitted to University Hospital Geelong Special Care Nursery for five days with prematurity, suspected sepsis, hypoglycaemia (low blood sugar), and jaundice, before rooming in with Ms Coy prior to discharge home.

15. Whist Indigo was admitted to the Special Care Nursery, Ms Coy was reviewed by the Chemical Dependency Unit midwife. In this review, Ms Coy reported her cannabis use and

was provided with advice on babies and smoking exposure, along with the associated risks of Sudden Infant Death Syndrome (**SIDS**).

16. Ms Coy was still breastfeeding Indigo when a blood test on 11 June 2015 confirmed an unplanned pregnancy, estimated by ultrasound to be 11 weeks gestation. The initial antenatal investigations were normal,[3] although nuchal testing[4] was not performed despite several attempts by Dr David Mullen, general practitioner at Lorne Medical Centre, to contact Ms Coy to arrange this.[5]

17. On 23 July 2015, Ms Coy was referred by Dr Mullen to University Hospital Geelong for shared pregnancy care. The referral form did not identify any obstetric risk factors and noted that Ms Coy was not taking any medication and had recently ceased 'smoking' – it is unknown if this referred to cannabis and/or tobacco smoking.

18. An ultrasound performed in Colac[6] estimated that the baby was due on 29 December 2015. An ultrasound at 17 weeks further indicated normal fetal morphology with the placenta clear of the cervix.

19. Ms Coy first attended University Hospital Geelong on 3 September 2015 at 23 weeks gestation. At this visit, Ms Coy was negative for substance use and although the reasons were not recorded, a history of a premature birth was assumed to increase her obstetric risks, which were also not detailed. As a result, Ms Coy was assigned to obstetric-led care.

20. Ms Coy irregularly attended pregnancy care appointments. She did not attend the following three scheduled hospital antenatal appointments and did not attend a scheduled appointment with her general practitioner. Additionally, staff from University Hospital Geelong had ongoing difficulty contacting Ms Coy by telephone to reschedule appointments. A review by her general practitioner on 23 September 2015 at 26 weeks gestation was the last pregnancy review before early labour started at 32 weeks and six days.[7]

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[3] Routine tests to monitor the health of the mother and baby may include blood tests at different stages of the pregnancy, such as blood group, iron levels, checks for maternal diabetes and infections.
[4] A nuchal translucency ultrasound performed between 11.5 and 13 weeks six days gestation, measures the collection of fluid under the skin at the back of the baby's neck. It is a part of combined first trimester screening for chromosomal abnormalities.
[5] Routine combined first trimester screening.
[6] A first trimester is performed to confirm singleton pregnancy and to calculate the date due to give birth.
[7] Preterm labour and birth refers to a baby who is less than 37 weeks gestation in age. The risk factors for premature labour and birth include a shortened cervix and infection.

21. On 9 November 2015, Ms Coy arrived at University Hospital Geelong in labour and with her cervix already three centimetres dilated. Uterine contractions were slowed by nifedipine[8] to allow time for corticosteroid loading.[9]

22. A prolonged fetal bradycardia resulted in an emergency caesarean section[10] under general anaesthesia following the administration of terbutaline.[11] The uterus contained blood-stained liquor, indicative of a placental abruption.[12] Uterine atony was treated by the administration of Syntocinon, misoprostol, and ergometrine drugs.[13] The placenta was adherent to the uterine fundus with an area of separation.[14] The estimated blood loss was 400mls.

23. Ms Coy was febrile following the birth, with the placental histology consistent with chorioamnionitis.[15] The infection was treated by intravenous antibiotics for 24 hours and a course of oral antibiotics.

Baby Maddox's birth

24. Baby Maddox was born on 9 November 2015 weighing 1958 grams. The Apgars[16] were 4, 6 and 8 requiring initial resuscitation with intermittent positive pressure ventilation and continuous positive airway pressure.[17]

25. At birth, Baby Maddox's head circumference and body length was slightly greater than the 10th percentile and body weight slightly greater than the 90th percentile.

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[8] A calcium channel blocker used to suppress preterm labour.
[9] Celelstone is a corticosteroid which is given to women in threatened premature labour to mature the baby's lungs.
[10] Category 1 Emergency Caesarean Section under a general anaesthetic.
[11] A uterine tocolytic.
[12] During pregnancy, the placenta provides the growing baby with oxygen and nutrients from the mother's bloodstream. In a placental abruption, the placenta detaches from the uterus and was diagnosed at the caesarean section with blood stained liquor.
[13] All oxytocic agents used for post-partum haemorrhage.
[14] There was no evidence of placenta accreta on placental histology. Placenta accreta occurs when the placenta attaches too deep in the uterine wall but does not penetrate the uterine muscle.
[15] Inflammation in the placental membranes is usually caused by infection in the amniotic fluid.
[16] The Apgar score was designed to standardise the way caregivers evaluated a baby's physical wellbeing at birth, helping to provide a general understanding of how well each baby makes the physical transition to independent life from their mother. The Apgar score utilises five physical signs of a baby at birth, with the score usually given by the caregiver when the baby is one minute old and again when they are five minutes old. However, if the baby takes longer to fully breathe and respond, the scoring may continue and be given again at seven minutes and possibly also at 10 minutes of age.
[17] Continuous positive airway pressure is a mode of delivering non-invasive ventilation.

26. Baby Maddox was presumed to have sepsis; he was commenced on empirical antibiotics (benzylpenicillin and gentamicin) intravenously. A chest x-ray confirmed respiratory distress of the newborn.[18]

27. Ms Coy was discharged home, with Baby Maddox remaining in the Special Care Nursery for 40 days.

28. At birth, Baby Maddox had apnoea and bradycardia.[19] These conditions were initially believed to be secondary to gastro oesophageal reflux and were thus treated by caffeine and thickened feeds. As apnoea and bradycardic episodes continued, a cranial ultrasound and sleep study was performed to explore a central cause of hypoventilation. Both the ultrasound and sleep study tests were normal, along with a normal electroencephalography.[20]

29. The apnoea and bradycardic episodes eventually resolved over a 40-day stay in the Special Care Nursery, with Baby Maddox's behaviour consistent with that of a growing premature baby. At this time, there was no indication that there was a need to assess for neonatal withdrawal symptoms.[21]

30. Whilst Baby Maddox was admitted to the Special Care Nursery, Ms Coy was referred to a hospital social worker and provided with financial assistance and fuel vouchers. It is unknown if the standard social work intake assessment was conducted.[22]

31. Prior to discharge, Ms Coy was assessed by staff at the Special Care Nursery to be competent in her ability to perform cardiopulmonary resuscitation.[23] The plan for discharge included a six-week post-partum assessment by her general practitioner[24] and a telephone call by a local Maternal and Child Health Nurse, Kaye Batson, on 16 December 2015 to arrange a home visit.

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[18] Respiratory distress syndrome (**RDS**) is when the neonate has difficulty breathing due to surfactant deficiency at birth. RDS is the dominant clinical problem faced by preterm infants and is directly related to structurally immature and surfactant deficient lungs. The greatest risk factor is low gestational age and the development of the disease begins with the impaired synthesis of pulmonary surfactant associated with prematurity.

[19] In neonates, apnoea and bradycardia are defined as no effective respiratory effort for greater than or equal to 20 seconds or for greater than 10 seconds if associated with bradycardia (greater than 100 beats per minute), oxygen desaturation, cyanosis or pallor. In an infant under 34 weeks gestation, apnoea of prematurity is a diagnosis of exclusion.

[20] A medical test used to measure the electrical activity of the brain, via electrodes applied to the patient's scalp.

[21] Neonatal Abstinence Scoring System is a validated assessment scoring system that identifies signs of opioid withdrawal. Infants at risk of narcotic withdrawal are assessed for signs of withdrawal half to one hour after each feed.

[22] A standardised approach for identifying risk factors that indicate the need for referral for service intervention.

[23] Standard education provided to parents whose baby is born prematurely.

[24] To physically assess the mother's recovery from childbirth and discuss feeding, emotional changes and check contraception.

32. Ms Coy was readmitted for rooming in prior to Baby Maddox's discharge from hospital.[25] At discharge on 22 December 2015, Baby Maddox was a corrected age of 39 weeks and weighed 2710 grams.

33. On 23 December 2015, Ms Batson visited the family home, completing a safe sleeping checklist and smoking in the home assessment.[26] The other assessments conducted during this visit included weight, growth, feeding, and a physical review of the hips, given a family history of hip dysplasia.

34. In accordance with the Commonwealth immunisation schedule, Baby Maddox was immunised against pneumococcus, diphtheria, tetanus, Pertussis, and poliomyelitis, haemophilus influenza type B (Hib), hepatitis B, and rotavirus.[27] Therefore, he was immunised according to the schedule at birth and two months.

35. A home visit by the Maternal and Child Health Nurse on 6 January 2016 found Baby Maddox settled, gaining weight, and to have a normal audiology screening test. A lengthy consultation on 20 January 2016 with both Ms Coy and Mr Wheeler covered potential issues of parental fatigue, newborn behaviour, and family adjustment to a new baby.

Circumstances of Baby Maddox's death

36. In the evening of 21 January 2016 and the early hours of the next morning, Baby Maddox was difficult to settle. He finally settled at 2.30am at which time he was placed in his bassinet, which was wheeled to his parents' bedroom.

37. At approximately 4.00am, Baby Maddox awoke and started crying. Ms Coy wheeled the bassinet to the lounge-room to feed him.

38. Baby Maddox was breastfed on the couch at approximately 4.30am, with the feed believed to have finished at 5.30am.[28] After the feed, Ms Coy stood up and burped Baby Maddox. He thereafter settled on her chest and shoulder area; Ms Coy sat back down on the couch before falling asleep. When Ms Coy fell asleep, Baby Maddox's chest was resting on the left side of Ms Coy's chest.

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[25] A period of rooming in with the mother to ensure breastfeeding is established prior to discharge.
[26] Mr Wheeler reported smoking cigarettes outside the house. Ms Coy advised that she did not smoke.
[27] Ms Coy took baby Wheeler to the Lorne Medical Centre for his immunisations.
[28] Documents record various waking times, 4.15am, 4.00am and 4.30am. The Ambulance Victoria electronic patient care report established the last breastfeed was at 5.30am.

39. When Ms Coy awoke sometime between 6.30am and 7.30am, she found that Baby Maddox had slipped down between her arm and body. At this time, his face was positioned towards her body and he was pale.

40. Ms Coy contacted emergency services at 7.40am while Mr Wheeler commenced cardiopulmonary resuscitation.

41. An ambulance arrived at 7.47am, with the paramedics describing Baby Maddox to be waxen, very white, and cold to touch. Intubation[29] was attempted, but with his tongue swollen and rigid they were unable to insert the endotracheal tube past the tongue. The attending paramedics continued cardiopulmonary recitation, with an intravenous cannula insertion attempted unsuccessfully. The paramedics moved Baby Maddox to the ambulance with the view to insertion of an intraosseus cannula[30] when further information on the down time became available.

42. Baby Maddox arrived at the Lorne Community Hospital at 8.11am. Despite treatment, Baby Maddox was pronounced deceased at 8.35am.

Medical cause of death

43. On 27 January 2016, Dr Jacqueline Lee, Forensic Pathologist at the Victorian Institute of Forensic Medicine, conducted an autopsy upon Baby Maddox's body and reviewed a post mortem computed tomography (CT) scan.

44. The autopsy revealed focal organising extradural haemorrhage, the cause of which was not identified at autopsy but did not cause or contribute to death. There were no microbiological findings and no significant metabolic abnormality was detected.

45. Toxicological analysis of post mortem specimens taken from Baby Maddox identified methylamphetamine[31] in blood and head hair. Cannabis, pethidine,[32] norpethidine, and fentanyl[33] was also found in head hair.

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[29] Insertion of a tube through the mouth or the nose and into a patient's trachea to help them breath.
[30] Intraosseus cannulation involves placement of a needle and cannula through the bone into the bone marrow for the provision of emergency medication when IV access is unable to be obtained.
[31] Amphetamines is a collective word to describe central nervous system stimulants structurally related to dexamphetamine. One of these, methamphetamine, is often known as 'speed' or 'ice'. Amphetamine is also a metabolite of methamphetamine. Amphetamines stimulate the central nervous system, causing persons to become hyperactive and more aroused. Blood pressure and heart rate are also increased.

46. The presence of methylamphetamine in post mortem cavity blood and within the head hair is indicative of exposure during life. However, the association between methylamphetamine and Baby Maddox's death was unclear and could not be determined at autopsy.

47. Dr Lee explained that multiple factors may have caused or contributed to Baby Maddox's death. These include the presence of methylamphetamine, the unsafe sleeping environment, and prematurity.

48. Baby Maddox was born prematurely as a consequence of placental abruption. Placental abruption, small for gestational age, and low birth weight infants may be associated with maternal methamphetamine use. However, all of these conditions may also occur in the absence of methylamphetamine use. At birth Maddox was slightly greater than 10th percentile head circumference and body length. He was slightly greater than 90th percentile body weight. The existence of maternal methylamphetamine was not documented and unknown.

49. Death was associated with Baby Maddox being found between his mother's arm and body. Therefore, Dr Lee could not exclude suffocation as a cause of death.

50. Prematurity and Baby Maddox's small size also increased his risk of sudden unexpected death.

51. Dr Lee could not identify which of the above factors was the most significant or contributed to death at autopsy.

52. After reviewing toxicology results, Dr Lee completed a report, dated 29 July 2016, in which she formulated the cause of death as *"1(a) Unascertained"*. I accept Dr Lee's opinion as to the medical cause of death.

Findings

Pursuant to section 67(1) of the *Coroners Act 2008* I find as follows:

(a) the identity of the deceased was Maddox Garry Wheeler, born 9 November 2015;

[32] Pethidine is a synthetic narcotic analgesic.
[33] Fentanyl is a narcotic (opioid analgesic).

(b) Baby Maddox died on 22 January 2016 at Lorne Community Hospital, Albert Street, Lorne, Victoria, from an unascertained cause of death; and

(c) the death occurred in the circumstances described above.

Comments

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

1. As noted above, Dr Lee concluded that there were multiple factors that may have caused or contributed to Baby Maddox's death. These included the presence of methylamphetamine, the unsafe sleeping environment, and his prematurity. The significance of each factor contributing to death was unable to be determined by the forensic pathologist. For this reason, the forensic pathologist concluded the cause of death to be unascertained.

2. Given Baby Maddox's unsafe sleeping environment and the traces of methamphetamine and cannabis detected in his post mortem samples, I referred this case to the Coroners Prevention Unit (**CPU**) to identify whether there were any prevention opportunities. The role of the CPU is to assist coroners investigating deaths, particularly deaths that occur in a healthcare setting. It is staffed by practising physicians and nurses (including paediatric), who are independent of the health professionals and institutions under consideration.

3. To assist the investigation, additional information on the parents' substance use and their knowledge on a safe sleeping environment were sought from the health care providers who were in contact with Ms Coy and Mr Wheeler.

4. The CPU also obtained additional information on the various issues relating to a co-sleeping environment, pre-natal illicit substance use, and the impact of methamphetamine and cannabis ingestion.

Co-sleeping

5. Baby Maddox was home for just over three weeks and was fully breastfed approximately every three to four hours. Ms Coy described herself as tired,[34] finding it difficult to get enough sleep. It is normal for mothers to feel fatigued from sleep deprivation and the

[34] According to the Maternal and Child Health Nurse records.

constant care of a newborn. For Ms Coy, her fatigue was likely compounded by expressing and breastfeeding, along with caring for an active two-year-old whose sleep pattern was out of sync with the baby's pattern. Ms Coy had commented that when the baby was asleep, her older child was awake, and vice versa.

6. The first home visit by the Maternal and Child Health Nurse, Ms Batson, following Baby Maddox's discharge home was on 23 December 2015. There were two subsequent routine visits by Ms Batson on 6 and 20 January 2016. The focus of the home visits was on the family's adjustment to a new baby, along with feeding, weight gain, safe sleeping practices, smoke free environment, and presence of family violence.

7. Ms Batson asked the parents about their knowledge and understanding of the safe sleeping guidelines for babies and noted that the parents indicated familiarity with these. Ms Batson explained the importance of placing their baby on his back with his face uncovered as the safest sleeping position. The sleeping arrangements of Baby Maddox appeared safe, apart from the bassinet being on wheels. Ms Batson discussed bassinet safety, emphasising the importance of not leaving the baby unsupervised given the potential for Indigo to pull the bassinet over. Ms Batson also gave the parents written resources, including a safe sleeping checklist and the *Safe Sleeping Practices for Newborn* pamphlet. The parents reported Baby Maddox was sleeping in their bedroom at night. They denied that they smoked, and there was no evidence of smoking in the house.

8. Ms Coy stated that she read the pamphlet on co-sleeping, which advised against co-sleeping on the bed or couch. However, she said both of her children settled better when they were snuggled up to her.

9. On the night of Baby Maddox's death, Ms Coy explained he was unsettled during the evening until 2.30am. Then, when he finally went to sleep in the bassinet in their bedroom, she was unable to sleep. When Baby Maddox woke at 4.00am, Ms Coy brought the bassinet into the lounge-room and sat on the couch to breastfeed. Ms Coy notes that she was tired and closed her eyes and believes that she then must have fallen asleep on the couch.

10. An assessment of the home safe sleeping environment and education was provided by both the Maternal and Child Health Nurse and the Special Care Nursery nurses. In this assessment, the topic of safe sleeping practices for newborns appeared to be adequately covered.

Education about co-sleeping available to new parents

11. 'Co-sleeping' describes when a parent, sibling and/or other person or pet is asleep on the same sleep surface as an infant (a child aged between seven and 365 days). A sleep surface is any surface – a bed, couch, air mattress, blanket, armchair or so on – on which a person sleeps. Co-sleeping is generally discouraged as it is associated with an increased risk of sudden unexpected death in infancy, including SIDS.

12. I do not intend to make extensive comments or recommendations about the risks of co-sleeping given this Court had made a number of previous findings[35] discussing this issue and I do not want to exacerbate Ms Coy's grief by attributing Baby Maddox's death to her actions. I acknowledge she was sleep deprived with two young children and innocently closed her eyes for a rest before falling asleep. In addition, and as explained above, the cause of Baby Maddox's death is unascertained and the significance of him falling asleep on his mother's chest is unknown. However, I make the following general comments about co-sleeping.

13. The CPU identified 107 Victorian co-sleeping deaths of infants (aged between seven and 365 days) between 2008 and 2018. Most of the deaths (75.7%) occurred while the infant was sleeping with an adult or adults in an adult bed (including 20 deaths where at child or children were also present). The next most prevalent sleep surface was a couch or armchair with an adult. The majority of deaths (69.8%) occurred in infants aged 91 days or younger.

14. At the time of writing this finding, which is sometime after Baby Maddox's death, Red Nose,[36] the leading Australian non-government organisation involved in safe sleeping research and education and advocacy, recommends that the safest place for a baby to sleep is in a cot next to the parents' bed for the first six to 12 months of life as this has been shown to reduce the risk of sudden unexpected death, including SIDS, and fatal sleeping accidents.[37]

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[35] For example *Finding into Death Without Inquest into the death of Roman Kilvington-Williams* COR 2016 3669, finalised in May 2018 and unpublished.
[36] Formerly Sids and Kids.
[37] Red Nose Limited, *Sharing a Sleep Surface with a Baby* (27 February 2018) Red Nose Saving Little Lives <https://rednose.org.au/article/sharing-a-sleep-surface-with-a-baby/

15. However, acknowledging that some parents choose to sleep with their baby, the Red Nose *Safe Sleep Guide for Parents* advises parents not to share a bed or lie down holding a baby if:[38]

(a) the sleeping parent is overly tired or unwell;

(b) either parent has recently consumed alcohol;

(c) either parent smokes, even if they do not smoke in the bedroom;

(d) either parent has taken any drugs that make them feel sleepy or less aware; and

(e) the baby was premature or is small for their gestational age.

16. Red Nose also warns that falling asleep holding baby on a couch or chair is always unsafe.

17. This advice is reflected in the Victorian Department of Education and Training's *Maternal and Child Health Service Guidelines*[39] and *Safe Sleeping Checklist*,[40] which advise that a baby should be put to sleep in their own safe sleeping place in the same room as an adult caregiver for the first six to 12 months, and that sharing a sleep surface can increase risk of SIDS and fatal sleep accidents in some circumstances, but there is no absolute prohibition against co-sleeping.[41]

18. Although it appears that new parents receive adequate and comprehensive advice regarding the risks of co-sleeping and SIDS-related education, it is my understanding that despite previous initiatives for implementation the Victorian government does not have an overarching guideline to ensure consistent safe infant sleeping messages. I note that South Australia, Western Australia, and New South Wales all have overarching guidelines and policy frameworks for delivering safe sleeping messages and education to new parents. I will therefore distribute my finding to the Department of Education and Training, the

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[38] Red Nose Limited, *Safe Sleep Guide for Parents* (2019) Red Nose Saving Little Lives <https://rednose.org.au/downloads/RA794a_RedNose_DangersOfCoSleeping_v6.pdf>

[39] Department of Education and Training, *Maternal and Child Health service Guidelines* (2011) <https://www.education.vic.gov.au/Documents/childhood/professionals/health/mchsguidelines.pdf>.

[40] Department of Education and Training, *Maternal and Child Health Service: Safe Sleeping Checklist* (August 2017), <https://www.education.vic.gov.au/Documents/childhood/parents/mch/safesleepchecklist.pdf>.

[41] The *Maternal and Child Health Service: Key Ages and Stages Framework* (available at https://www.education.vic.gov.au/Documents/childhood/professionals/health/mchkasframework.pdf) includes the safe sleeping checklist that is conducted at the first home visit. SIDS risk factors are also discussed with the parents at the eight-week visit to a maternal and child health nurse.

Department of Health and Human Services, and Safer Care Victoria to maintain the momentum to introduce state-wide guidelines.

Substance use risk assessment

19. The forensic pathologist commented that the presence of methamphetamine in post mortem cavity blood and within the head hair was indicative of exposure during life. In particular, Dr Lee noted that the association between methamphetamine and death is unclear and could not be determined at autopsy.

20. The *Sleep-Related Sudden Unexpected Death of an Infant or Child Investigative Checklist*[42] completed by a Victoria Police member on 22 January 2016 stated that Ms Coy did not consume drugs or alcohol during pregnancy or after the birth. In accordance with the Victoria Police Sudden Unexpected Death of an Infant investigation protocol, at the time of Baby Maddox's death there was no sample collection and testing of Ms Coy or Mr Wheeler's saliva or blood for cannabis or methamphetamine. Nor did Ms Coy's breastmilk undergo toxicological testing. Therefore, the timing and route of the methamphetamine ingestion and cannabis use remains unknown.

21. I note that Ms Coy attended the Lorne Medical Centre for both pregnancies, seeing several different doctors. During both pregnancies she was referred by Lorne Medical Centre to University Hospital Geelong for shared antenatal care. Her general practitioner was unaware of current substance use by Ms Coy or any substance use during her second pregnancy.

22. Dr Mullen noted that he followed the standard maternal screening questioning on alcohol and drug use in pregnancy. Dr Mullen commented that Ms Coy disclosed cannabis use in her first pregnancy but denied any substance use in her second pregnancy. Following the birth of Indigo and Special Care Nursery admission, Dr Mullen was informed of Ms Coy's regular cannabis use by the University Hospital Geelong discharge summary.[43] Since that time and during the second pregnancy, Ms Coy did not disclose substance use to Dr Mullen, nor did he believe he had reason to suspect it.

[42] An investigative checklist used by Victoria Police that provides a structure for gathering relevant death scene information.
[43] University Hospital Geelong correspondence in a hospital discharge summary to Lorne Medical Centre dated 6 October 2014.

23. During her first pregnancy, Ms Coy was a minimal marijuana user and was not using alcohol. An assessment performed by a Chemical Dependency Unit midwife in 2014 at the time Indigo was admitted to the Special Care Nursery, described Ms Coy as a consistent cannabis user. However, this assessment did not appear to require a referral to support services.

24. Ms Fiona Nelson, the University Hospital Geelong Medico Legal Manager, also confirmed that Ms Coy did not disclose substance use during her second pregnancy. As no alcohol or substance issues were divulged, Ms Nelson believed that there was no requirement for a further assessment during her pregnancy of substance use.

25. Ms Nelson did not elaborate as to whether University Hospital Geelong now has a clinical guideline for the screening and assessment of current and past substance use, but she believed the hospital process at the time of her letter to be adequate, as a positive screen prompts a referral to the specialist Chemical Dependency Unit unit.

26. Ms Nelson confirmed that the death of Baby Maddox was not reviewed by the hospital given that they believed there were no issues with the pregnancy, birth management, or neonatal care.

27. In relation to substance use, Ms Batson outlined her assessment of the physical home environment, emphasising that there was no evidence of drug use and that standard education was provided on the safe sleeping environment. Although Ms Batson indicated that she had no previous knowledge of a history of substance use by either parent, there was a note of cannabis use[44] in the Maternal and Child Health Nurse records dated 15 October 2014.

28. Ms Batson wrote that she did not observe any environmental evidence of substance use by the parents during her home visits, such as the presence of bottles, drug paraphernalia, or evidence of chaos. During the home visits, both parents were appropriately dressed. The house was reported as being untidy, but not excessively.

29. Ms Batson last saw Baby Maddox on 20 January 2016 for a consultation at the Maternal and Child Health Nurse centre. At this visit, Baby Maddox had again gained weight and grown since the last consultation with Ms Coy now fully breastfeeding. Ms Batson reported that

[44] Although unsigned, it is likely this entry was made by another Maternal and Child Health Nurse.

Baby Maddox was beginning to settle more easily, smile, and respond to voice. At this visit, Ms Coy did report feeling fatigued and looked tired, but she was otherwise well.

Methamphetamine use

30. The clinical presentation of infants with in-utero drug exposure is variable and is dependent on the last maternal use of drug(s), timing, and amount, along with maternal and infant metabolism and excretion.

31. Methamphetamine is a member of the amphetamine group of drugs which include speed and ecstasy. 'Ice' or 'crystal meth' is the purest form of methamphetamine and therefore has a high potential for resulting in mental and physical issues and for dependence.

32. Anecdotally, in an email dated 9 December 2016 the head of VIFM forensic pathology, Dr Linda Iles, opined breastfeeding following maternal consumption was the most likely source of the methamphetamine in blood, aside from Baby Maddox directly being given the drugs. According to Dr Iles, methamphetamine and cannabis detected in the hair could indicate in-utero exposure, or that Baby Maddox had been in an environment in which methamphetamine and cannabis were present.

33. A statement by Ms Coy provided additional information on her illicit substance use. Before her pregnancies, Ms Coy reported using 'white powder,' which she presumed was amphetamine, about once a month when partying. The last self-reported amphetamine consumed by Ms Coy was an ecstasy tablet on New Year's Eve, 20 days before Baby Maddox's death. Ms Coy reported that Mr Wheeler smoked ice approximately once a fortnight when she was pregnant, and when Baby Maddox was home on two occasions. Ms Coy described how Mr Wheeler would smoke ice at the other end of the house by himself, and never in the presence of the children.

34. Ms Coy confirmed she smoking cannabis during both pregnancies. She decreased her cannabis intake during pregnancy but found it effective in helping morning sickness. She also smoked cannabis for relaxation after Baby Maddox returned home.

35. According to the available documents,[45] Ms Coy was asked directly about her substance use during both pregnancies, with no substance use during her second pregnancy ever disclosed. As Ms Coy did not disclose substance use, she was not given information about its health effects, nor referred to the appropriate support service. Unwillingness to self-report[46] drug use is not an uncommon occurrence.

36. Methamphetamine exposure during pregnancy has been associated with maternal and neonatal morbidity and mortality. In adults, methamphetamine also has the potential to cause ischemic infarcts, myocardial or cerebral, subarachnoid haemorrhage, memory loss, and psychosis. Use in pregnancy can cause cardiovascular collapse and seizures.[47] Methamphetamine exposure is associated with an increase in risk of fetal growth restriction, gestational hypertension, preeclampsia, placental abruption, preterm birth, intrauterine fetal demise, neonatal death, and infant death.[48]

37. It is unclear whether methamphetamine exposure in-utero causes withdrawal symptoms, with the majority of effects in neonates due to toxicity[49] rather than withdrawal. There are some reports of neonatal withdrawal, but they are limited by the inability to separate the effect of amphetamine alone from the effect of other drugs used in utero, and by the small number of reported patients. Reported symptoms include shrill cry, irritability, jerkiness, diaphoresis, and sneezing.

38. Neonatal abstinence syndrome is a validated system for describing and scoring (**NAS**) neonatal signs occurring after in-utero exposure to opioids such as heroin, methadone, and buprenorphine, and use or misuse of prescription opioids containing medications such as hydrocodone or oxycodone.[50] While neonatal abstinence syndrome typically refers to withdrawal symptoms in the neonate of a mother who has been treated with opiates (methadone or buprenorphine) in pregnancy, it can also apply to neonates withdrawing from

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[45] University Hospital Geelong Victorian Maternity record and neonatal home visit safety risk assessment. Records from her general practitioner and Maternal and Child Health Nurse records. Sleep-Related Sudden Unexpected Death of an Infant or Child checklist. Additional information contained in the coronial brief and statements.

[46] Self-reported substance use data is an indirect method to assess drug prevalence.

[47] VA Catanzarite and DA Stein, *'Crystal' and pregnancy – Methamphetamine-associated maternal deaths* (1995) Western Journal of Medicine, 162(5), 454-457.

[48] Grace Chang, *Substance misuse in pregnant women* (22 July 2019) UpToDate <https://www.uptodate.com/contents/substance-use-by-pregnant-women>.

[49] Edward Boyer, Steven Seifert and Christina Hemon, *Methamphetamine: Acute Toxication* (10 April 2019) UpToDate <https://www.uptodate.com/contents/methamphetamine-acute-intoxication>.

[50] Safer Care Victoria, *Substance Use During Pregnancy – Care of the Mother and Newborn* (6 February 2019) <https://www.bettersafercare.vic.gov.au/resources/clinical-guidance/maternity-and-newborn/substance-use-during-pregnancy-care-of-the-mother-and-newborn>.

methamphetamine.[51] During the Special Care Nursery admission, Baby Maddox was not monitored using the NAS scoring system.

39. Many drugs of substance misuse are excreted into breast milk and if present can have negative effects on breastfeeding infants.[52] Women breastfeeding and who use methamphetamines are advised to not breastfeed for 48 hours after occasional use and those dependent are advised to not breastfeed.[53] At the time of her baby's death, Ms Coy was fully breastfeeding, with no prescribed medications listed in the Lorne Medical Centre record.

Cannabis use

40. There is limited evidence on the harmful effects of cannabis as an independent risk factor for poor neonatal outcomes such as pre-term delivery, low birth weight, or congenital anomalies. However, due to concerns regarding the potential neurodevelopmental impact on the developing fetus and child,[54] women are advised to avoid marijuana use during pregnancy and breastfeeding.

41. According to the Royal Women's Hospital Melbourne Alcohol and Drug guide,[55] there is a risk of excessive sedation when the mother consumes cannabis and breastfeeds. Due to the sedating nature of cannabis, women are informed of the dangers of smoking cannabis and sharing a sleep surface with the baby. Cannabis has a relatively long half-life of 20 to 57 hours and passes into breastmilk. The effects on the infant include sedation, growth delay, poor muscle tone, and poor sucking.

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[51] The Royal Women's Hospital, *Drug and Alcohol – Management of Methamphetamine Dependency in Pregnancy Guideline* (16 May 2017) <https://www.thewomens.org.au/images/uploads/downloadable-records/clinical-guidelines/drug-and-alcohol-management-methamphetamine-dependence-in-pregnancy_160517.pdf>.
[52] Ibid.
[53] Safer Care Victoria, *Substance Use During Pregnancy – Care of the Mother and Newborn* (6 February 2019) <https://www.bettersafercare.vic.gov.au/resources/clinical-guidance/maternity-and-newborn/substance-use-during-pregnancy-care-of-the-mother-and-newborn>.
[54] Nancy Day, Sharon Leech and Lidush Goldschmidt, 'The effects of prenatal marijuana exposure on delinquent behaviour are mediated by measures of neurocognitive functioning' (2011) *Neurotoxicology and Teratology* 33(1), 129-136.
[55] Women's Alcohol and Drugs (WADS) is a state-wide service that provides expert advice on drug and alcohol dependency in pregnancy.

Conclusion

42. The diagnosis of prenatal and pregnancy substance exposure is usually based on a positive maternal history or risk screening, and more rarely by the presence of a drug or its metabolites in a urine specimen.[56]

43. According to current guidelines, all pregnant women should be asked about substance use on at least two occasions during their pregnancy and more frequent assessments should be made when there is a history of drug use.[57]

44. All pregnant women should also receive comprehensive information about the risks of alcohol and tobacco use in pregnancy. Guidelines also advise that if a woman is currently using drugs or has a recent history of drug use, she should receive information about the effects of the relevant drugs on the health of the pregnancy and be referred to an appropriate support service.[58]

45. Maternal screening of substance use in pregnancy is often complicated by fear of stigmatisation, of being identified as a substance user, and/or initiation of children's protective services intervention. However, pregnancy offers an opportunity for women to be asked of their substance use and can be a catalyst for behavioural change.

46. The risk assessment of harm ideally involves the use of validated screening tools to screen all pregnant women. This needs to be approached in a manner which is non-judgemental, using open-ended questions and one that allows adequate time to gain trust for a full history to be gathered.[59]

47. Ms Coy self-reported cannabis use prior to and during her first pregnancy, with this information known by University Hospital Geelong, her general practitioner, and the Maternal and Child Health Nurse. The disclosure at this time prompted a hospital Chemical Dependency Unit midwife review following the birth of Indigo.

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[56] A supervised urine drug screen when commencing medications for acute agitation.
[57] Safer Care Victoria, *Substance Use During Pregnancy – Care of the Mother and Newborn* (6 February 2019) <https://www.bettersafercare.vic.gov.au/resources/clinical-guidance/maternity-and-newborn/substance-use-during-pregnancy-care-of-the-mother-and-newborn>.
[58] Safer Care Victoria, *Substance Use During Pregnancy – Care of the Mother and Newborn* (6 February 2019) <https://www.bettersafercare.vic.gov.au/resources/clinical-guidance/maternity-and-newborn/substance-use-during-pregnancy-care-of-the-mother-and-newborn>.
[59] Grace Chang, *Substance misuse in pregnant women* (22 July 2019) UpToDate <https://www.uptodate.com/contents/substance-use-by-pregnant-women>.

48. However, during Ms Coy's second pregnancy and following the birth she did not reveal any substance use. Ms Coy was directly asked by hospital staff during her pregnancy and following birth when the neonatal nurses visited the home. In addition, Ms Coy was asked about substance use by the police when completing the *Sudden Infant Death Investigation* checklist. As Ms Coy never disclosed substance use, she was not given information about the health effects, nor referred to the appropriate support service.

49. The clinical presentation of infants with in-utero drug exposure is variable and is dependent on the drug(s), timing, amount of the last maternal use, genetic factors, and maternal and infant metabolism and excretion. During the Special Care Nursery admission, Baby Maddox was not noted to require NAS scoring, however did have apnoea and bradycardia that required investigation. These conditions were initially believed to be secondary to gastro oesophageal reflux and treated by caffeine and thickened feeds. As the apnoea and bradycardic episodes continued, a cranial ultrasound and sleep study were performed to explore a central cause of hypoventilation. Both the ultrasound and sleep study tests were normal, along with a normal electroencephalogram.

50. The post-mortem toxicology results provided the first indication of Baby Maddox's exposure to methamphetamine and cannabis.

51. In the absence of maternal and paternal drug testing at the time of Baby Maddox's death, the relative contribution of substance use and sleeping position cannot to be determined.

52. A disclosure of substance use during pregnancy is a trigger for maternity service carers to initiate specialised multi-disciplinary care, with assertive follow up. The mother is ideally provided with comprehensive information about the risks of substance use in pregnancy, advice on breastfeeding and a safe home environment. Although the hospital, general practitioner, and Maternal and Child Health Nurse appeared unaware of substance use, in relation to a safe sleeping environment, the Maternal and Child Health Nurse considered the home setting was safe with Ms Coy receiving appropriate and adequate education. Whilst it appeared the appropriate advice was given, Ms Coy unintentionally fell asleep on a couch whilst holding her baby.

RECOMMENDATION

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

To the Department of Health and Human Services

1. That within six months from the date of this Finding, the Department of Health and Human Services finalise and release the Victorian Safe Infant Sleeping Guideline.

I convey my sincere condolences to Baby Maddox's family.

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

Alana Coy, Senior Next of Kin
Michael Wheeler, Senior Next of Kin
University Hospital Geelong, Barwon Health
Colac Area Health Child First (care of DLA Piper Australia)
Dr David Mullen, Lorne Medical Centre
Surf Coast Shire Maternal and Child Health
Chairman, Consultative Council on Obstetric and Paediatric Mortality and Morbidity
Clinical Councils Unit
Safer Care Victoria
Secretary, Department of Education and Training
Secretary, Department of Health and Human Services
Commissioner for Children and Young People
The Women's Alcohol and Drugs Service
Sergeant Peter Chamberlain, Coroner's Investigator, Victoria Police

Signature:

CAITLIN ENGLISH
DEPUTY STATE CORONER
Date: 11 December 2019