IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

**COR 2022 003455**

# FINDING INTO DEATH WITHOUT INQUEST

*Form 38 Rule 63(2)*

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

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| Findings of: | Coroner Ingrid Giles |
| Deceased: | Baby XR[1] |
| Date of birth: | 23 June 2022 |
| Date of death: | 24 June 2022 |
| Cause of death: | 1(a) Pneumonia |
| Place of death: | Monash Health - Casey Hospital 62-70 Kangan Drive, Berwick, Victoria, 3806 |
| Keywords: | PNEUMONIA; JAUNDICE; PHOTOTHERAPY; RESUSCITATION COT; NEONATAL |

[1] This Finding has been de-identified by order of Coroner Ingrid Giles which includes an order to replace the name of deceased, and the names of other person related to or associated with the deceased, with a pseudonym of a randomly generated letter sequence for the purposes of publication.

## INTRODUCTION

1. Baby XR died on 24 June 2022 at Casey Hospital in Berwick. He was one day old at the time of his death. Baby XR was the second child to Ms IR and Mr ZR.

2. Baby XR was born by vaginal delivery following a short, spontaneous labour at 37 weeks gestation.

### Obstetric history

3. Ms IR received antenatal care through Monash Health Casey Hospital. She experienced per-vaginal bleeding at 9 weeks. A mass was found in Ms IR's left kidney on ultrasound imaging at 9 weeks gestation, which was diagnosed as a benign oncocytoma, with a plan for partial nephrectomy after delivery. Ms IR was diagnosed with low ferritin and treated with ferrograd C tablets. Gestational diabetes mellitus (**GDM**) was diagnosed on 8 April 2022, and managed by exercise and dietary modification. Ms IR was also found to be a carrier of a delta globin gene variant.[2] Ms IR's pregnancy was further complicated by polyhydramnios and a positive screen for Group B Streptococcus (**GBS**).[3]

4. Antenatal investigations showed Ms IR's blood group was A positive, she had low immunity to rubella, but her serology was otherwise negative. Foetal morphology scan at 20+6 weeks gestation showed no anatomical abnormality. The anticipated date of birth was 9 July 2022.

5. On 17 May 2022, Ms IR presented to Casey Hospital Emergency Department with abdominal and back pain. Cardiotocography (**CTG**)[4] was completed for 3.5 hours, with reassuring features. Blood tests showed mildly deranged liver function tests which were to be repeated in the community. Ms IR was treated with oral oxycodone, heat packs, and a five-day course of oral cephalexin antibiotics for a possible urinary tract infection. She was discharged home later the same night.

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[2] Ms IR was found to be heterozygous for this variant (one of her two genes was affected, and she had no clinical manifestations). Mr ZR underwent partner testing which was normal. This is not likely to have caused any clinical concern for Baby XR.

[3] GBS positive status detected on urine samples collected on 30 May 2022 and 7 June 2022. GBS is a gram-positive bacteria that colonises the gastrointestinal and genital tracts of 15-40% of pregnant women and is usually asymptomatic. GBS can cause infection in neonates and young infants. GBS is an important cause of serious infections such as sepsis and meningitis in neonates. In the event that GBS is detected, mothers in labour are given intravenous antibiotics. This has been demonstrated to reduce the risk of GBS-related disease in the neonate.

[4] CTG is used in pregnancy to monitor fetal heart rate and uterine contractions. It is most commonly used in the third trimester and its purpose is to monitor fetal wellbeing and allow early detection of fetal distress.

**Labour and delivery**

6. On 22 June 2022, at 37+4 weeks gestation, Ms IR's membranes ruptured spontaneously with clear liquor. She presented to Casey Hospital at about 11:30pm.

7. At the time of admission, Ms IR's blood group and antibodies were checked. The result showed Ms IR's blood type was A. She was positive for the Rhesus D antigen, making her blood type A+. Maternal anti-E red cell antibodies were present, and additional red cell phenotyping was positive for Rhesus groups C and E. Anti-E antibodies may be associated with clinical Haemolytic Disease of the fetus and newborn, however typically at a higher titre level. It was confirmed that these results were not known to the medical teams.

8. The prophylactic antibiotic benzylpenicillin (3g intravenously) was ordered at 12:36am, in accordance with guidelines,[5] for the prevention of neonatal early onset GBS disease, given Ms IR's positive result for GBS colonisation. Antibiotics were administered at 12:50am.

9. Ms IR's vital parameters including temperature were within normal limits throughout her labour and delivery. A vaginal examination was completed at 1:00am which showed her cervix was 2cm dilated, 2cm effaced, and the presenting part was 2cm above spines. It showed a normal baseline of 130-135bpm, with overall reduced variability with periods of normal variability, no accelerations, and occasional variable decelerations down to 110bpm lasting 15 seconds. Ms IR began involuntary pushing at 2:40am.

**Postnatal period**

10. Baby XR was born at 3:17am on 23 June 2022 with a birthweight of 3150g. He was born by unassisted vaginal delivery in good condition with Apgar scores of 9 at 1 minute and 9 at 5 minutes.[6] No neonatal resuscitation was required. The birth summary shows that the umbilical cord snapped at delivery and was calcified with three vessels and eccentric insertion on examination. Cord blood samples could not be obtained, and no neonatal blood group or indirect antigen test was completed.

11. Ms IR commenced breastfeeding Baby XR at 4:20am. Neonatal blood glucose levels were checked three times in accordance with guidelines for the management of babies of diabetic mothers and were all within the normal parameters. Newborn observations were performed

[5] Optimal intrapartum antibiotic prophylaxis requires that antibiotics be given at least four hours prior to delivery.
[6] The Apgar score is a standard evaluation of a baby's physical wellbeing at birth, helping to provide a general understanding on extra uterine physical transition.

hourly for the first four hours, according to Monash Health guidelines. During this four-hour period, Baby XR's respiratory rate and heart rate were within normal range. He had no increased respiratory effort and his temperature was normal. Baby XR received intramuscular vitamin K and hepatitis B vaccination at 5:23am.

12. A full newborn examination was completed at 5:30am which identified uneven thigh creases but no other abnormality. A referral to the paediatric team was made for hip examination. Ms IR's vital parameters were also consistently normal in the post-partum period.

13. At 6:12am, Baby XR's risk for developing neonatal early onset sepsis was calculated and estimated to be low. No blood culture or antibiotics were indicated based on the calculations.

14. A 7:07am, Baby XR was reviewed by the paediatric hospital medical officer. Aside from uneven thigh creases, the hip exam was normal, and a plan was made for follow-up by a hip ultrasound at 6 weeks of age.

15. Over the following 24 hours, Baby XR's vital signs were regularly checked and were consistently normal. He was breastfed and topped-up with expressed breastmilk approximately every three hours and had normal output of urine and stools.

16. Baby XR's bilirubin level was checked by transcutaneous bilirubinometry (**TCB**),[7] in accordance with the Monash Health Clinical Practice Guideline (**CPG**) for Neonatal Jaundice. It is not clear from review of the medical records whether Baby XR had a jaundiced appearance at this time. The TCB returned a result of 127umol/L. No neonatal phototherapy chart is available in the medical records, however per the Neonatal Jaundice NICE Threshold Graph for 37 weeks gestation, this result is just above the phototherapy threshold for a baby aged 24 hours. According to the Monash Health CPG for Neonatal Jaundice, if a TCB is within 50umol/L of the gestation-specific phototherapy threshold, a serum bilirubin level check (**SBR**) should be performed. Baby XR's formal serum bilirubin level was checked at 3:51am, with a result of 115umol/L. This result falls on the phototherapy threshold line. Phototherapy was commenced at 6:00am.

17. According to the Structured Clinical Incident Review document that was later provided to the Court, there was a review note from the paediatric hospital medical officer at 4:44am on 26 June 2022 that includes clinical observations and a plan in relation to Baby XR, however it is

[7] A non-invasive screening technique used to determine the need for formal serum bilirubin (**SBR**) testing. The exact time this test was completed is not known.

unclear whether this note pertains to a 'chart review' or an in-person review, as it does not include details of an in-person assessment or examination by the paediatric team of Baby XR at the time of phototherapy commencement.

18. Baby XR remained in the *isolette* under phototherapy throughout the day, with interruptions for breastfeeding. At the commencement of phototherapy, Baby XR's cot temperature was set to 32.2 degrees Celsius. His vital signs were monitored approximately hourly for the first four hours, and every three to four hours after, as per the guidelines.

19. From 6:00am on 24 June 2022, until the final set of vital signs taken at 4:30pm, Baby XR's respiratory rate and heart rate were within the normal range, and he had no increased respiratory effort. His temperature was slightly elevated at 2:50pm but returned to normal when the cot temperature was reduced.

20. Baby XR was breastfed every three hours, and received additional top-up expressed breastmilk by syringe (around 5mL per feed). His output of urine and meconium was typical of a newborn baby. Ms IR experienced some back pain during breastfeeding, and some feeds were ceased due to this discomfort. Ms IR was encouraged to express milk, and this was subsequently fed to Baby XR. At 4:30pm, Baby XR was noted on the medical record to be *"not very interested"* in breastfeeding.

21. Baby XR was last observed by a midwife at 6:30pm, at which time the midwife assisted Ms IR in expressing breastmilk. Baby XR was observed to be *"pink in tone, laying supine in isolet* (sic)*, appropriately positioned".* All midwifery documentation in the electronic medical record from 1:50pm onwards was entered retrospectively at 10:55pm that night.

22. Baby XR was seen moving and crying by Mr ZR in the background of a video call at 6:50pm.

## THE CORONIAL INVESTIGATION

23. Baby XR'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.

24. The role of a coroner is to independently investigate reportable deaths to establish, if possible, identity, medical cause of death, and surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. The

purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability.

25. 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.

26. Then-Deputy State Coroner Jacqui Hawkins initially held carriage of this investigation until it came under my purview in October 2023 for the purposes of finalising the matter and handing down findings.

27. This finding draws on the totality of the coronial investigation into the death of Baby XR. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity. In the coronial jurisdiction, facts must be established on the balance of probabilities.[8]

## CIRCUMSTANCES IN WHICH THE DEATH OCCURRED

28. Ms IR called for a midwife's assistance at 7:00pm on 24 June 2022. Midwife Samantha Gourley (**Samantha**) attended her room. Ms IR requested Samantha's assistance changing Baby XR's nappy while she used the bathroom.

29. Samantha found Baby XR in the *isolette* to be unresponsive, apnoeic, floppy, pale in the abdomen and mottled purple legs. His lips were dark purple.

30. Baby XR was placed on the resuscitation cot, and a Neonatal Code Blue was called at 7:05pm. Intermittent positive pressure ventilation through a face mask was provided, and chest compressions were commenced. Initially there was no rise or fall in the chest despite reposition of the airway and face mask. Baby XR's airway was suctioned and supplementary oxygen was provided.

31. Two paediatric junior medical staff arrived at 7:06pm, along with a consultant anaesthetist. The first intubation attempt occurred at 7:09pm and was unsuccessful. There were secretions obscuring the airway which were able to be suctioned. Baby XR was then intubated on the

[8] 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.

second attempt at 7:11pm. A nasogastric tube was inserted to decompress the stomach. Two doses of adrenaline were administered via the endotracheal tube.

32. The paediatric consultant Dr Datta Joshi (**Dr Joshi**) arrived at 7:14pm. A peripheral cannulation attempt was unsuccessful at 7:17pm. At 7:20pm, the oxygen cannister in the resuscitaire ran out but was replaced within a minute.[9]

33. The Paediatric Infant Perinatal Emergency Retrieval (**PIPER**)[10] service was called at 7:24pm and provided telephone advice throughout the resuscitation. A further dose of adrenaline was administered at 7:25pm.

34. Intravenous access via umbilical vein catheterisation (**UVC**) was secured, but would not back nor flush, and so intraosseous (**IO**) access was obtained in the left tibia. Adrenaline was provided by IO at 7:27pm. The umbilical line then began to flush well. Saline and dextrose were provided, and Baby XR's peripheral perfusion was documented to be improving. His heart rate was 10-20bpm at 7:38pm. He was provided saline and adrenaline.

35. At 7:46pm, no cardiac output was detected, and Baby XR's oxygen saturations were between 48-55%.

36. At 7:49pm, a chest x-ray showed that the endotracheal tube tip was in the right main bronchus and required repositioning. The tip of the enteric tube was located in the stomach. The UVC tip was projecting over the right ventricle outflow and required repositioning. The lungs appeared hyperinflated. There was no other abnormality reported.

37. At 8:00pm, a second venous blood gas showed ongoing severe acidosis and metabolic derangement. Baby XR's resuscitation was paused at 8:02pm to reassess his cardiac activity. There was no heart rate on electronic monitoring or auscultation by Dr Joshi. Medical intervention was ceased, and Baby XR was confirmed to be deceased at 8:05pm.

## IDENTITY OF THE DECEASED

38. On 24 June 2022, Baby XR, born 23 June 2022, was visually identified by his father, Mr ZR, who signed a formal statement of identification to this effect.

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[9] A resuscitaire is a specific resuscitation cot device often used in neonatal resuscitation with inbuilt overhead heating, timer, suction, circuit for delivering oxygen and air flow with drawers underneath to contain equipment. These devices can be connected to wall oxygen/air supply or be supplied by portable cylinders. Ther require a power source.

[10] PIPER is a state-wide service coordinated through the Royal Children's Hospital (**RCH**), which provides 24/7 consultant advice and retrieval services for paediatric, neonatal, and perinatal patients.

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

**MEDICAL CAUSE OF DEATH**

40. On 28 June 2022 Forensic Pathologist Dr Yeliena Fay Baber from the Victorian Institute of Forensic Medicine (**VIFM**), conducted an autopsy and provided a written report of her findings. Dr Baber reviewed the following in preparation of her report:

    a) Victoria Police Report of Death Form 83
    b) Medical deposition and records of Casey Hospital
    c) Post-mortem computed-tomography (**CT**) scan
    d) VIFM contact log
    e) Parental concerns of care
    f) Neuropathology report
    g) Toxicology report
    h) Vitreous biochemistry report
    i) Microbiology report
    j) Radiology report
    k) Metabolic report

41. The autopsy and ancillary investigations suggested the cause of death to be early onset pneumonia. The presence of maternal Group B Streptococcus (**GBS**) in addition to the rapidity with which death occurred, indicates this was the causative organism.

42. Microscopic examination revealed intra-alveolar acute inflammatory cell infiltrates in both lungs, the most pronounced finding in the right lower lobe.

43. The section of umbilical cord stump showed funisitis and single vessel arteritis which is described as a Stage two foetal inflammatory response to ascending infection.

44. Early onset pneumonia reflects an ante- or intra-partum acquired organism. Symptoms can start a few hours after birth or be delayed up to 48 hours. Most bacterial infection produces a typic non-specific bronchopneumonia; GBS (normally an innocuous vaginal commensal) is a particularly virulent organism in the neonate and death may be very rapid following acute collapse. Early GBS infection is often associated with evidence of ascending infection (as there is here), and many of the cardiovascular effects may be mediated by tumour necrosis factor. Although usually sensitive to antibiotics, deterioration, and death from GBS may occur before effective control has been achieved.

45. Microbiology samples were all negative for bacteria and/or viral nucleic acid. Dr Baber noted that antibiotics were given during labour which would explain the negative post-mortem cultures.

46. Ancillary investigations (toxicology, vitreous biochemistry, radiology, metabolic) were all non-contributory.

47. Neuropathology showed reactive white matter changes which were non-diagnostic. The history of jaundice was noted, however the white matter changes observed were quite prominent and an underlying white matter abnormality could not be excluded.

48. There was no evidence of structural abnormality at autopsy. Weights and measurements were consistent with the 50$^{th}$ percentile for a 38/40 gestation neonate.

49. Toxicological analysis of post-mortem samples did not identify the presence of any alcohol or any common drugs or poisons.

50. Dr Baber provided an opinion that the medical cause of death was *1 (a) Pneumonia*. She noted that, having regard to the information provided to her, and as the result of her investigation into the death, in her opinion, on a medical basis, the manner of death was natural causes.

51. I accept Dr Baber's opinion.

**FAMILY CONCERNS**

52. Ms IR and Mr ZR provided concerns to the court by way of email and written statement. A summary of the concerns identified is as follows:

    a) Baby XR was placed in an incubator to receive phototherapy and the settings may have caused him to have an elevated temperature;
    b) Mr ZR and Ms IR were advised by their midwife and doctor that "*Baby XR was only able to come out of incubator for 30 minutes every 3 hours*." They queried whether this was correct information, and whether Baby XR could in fact have been comforted by them outside of the incubator, as he was crying and distressed. They wondered whether holding Baby XR and providing skin-to-skin would have reduced his stress;
    c) A paediatric doctor stated that a required post-natal check had been missed, possibly regarding Group B Streptococcal infection, and Mr ZR and Ms IR queried whether this was correct;

d) Baby XR's observations were not checked at 4:00pm on 24 June 2022 and routine observations and checks were not communicated to Mr ZR and Ms IR;

e) The hospital was understaffed and appeared to Ms IR to be rushed when delivering patient care, such as helping Ms IR to breastfeed Baby XR. Ms IR indicated she thought that she and Baby XR may have received less attention because Baby XR was her second child;

f) Hospital staff did not communicate what was happening with Ms IR and Mr ZR when Baby XR was found unresponsive, and resuscitation was commenced; and

g) The midwife who found Baby XR unresponsive was not available to take part in the follow-up family meeting per the family's request.

53. On 18 October 2024, a further set of concerns was provided to the Court by Baby XR's parents, including questions as to: (i) how Baby XR contracted pneumonia; and (ii) why Baby XR was not examined by a doctor after the umbilical cord was cut.

## CPU REVIEW

54. Following receipt of the family's concerns, and in the interests of a comprehensive coronial investigation, the Court requested a review by the Coroners Prevention Unit (**CPU**). The CPU was established in 2008 to strengthen the prevention role of the coroner. The CPU assists the coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations. CPU staff include health professionals with training in a range of areas including medicine, nursing, and mental health; as well as staff who support coroners through research, data and policy analysis.

### Consideration of family concerns

55. The CPU advised that phototherapy lights do not cause a temperature elevation intrinsically. Thermoregulation whilst a baby is being nursed in an incubator needs close monitoring and often requires a cot temperature to be set and adjusted as the baby is undressed, to allow maximum exposure of phototherapy lights. Midwives are also expected to review the guideline for thermoregulation in a neonate to adjust cot temperature accordingly.

56. The CPU noted that although the time required in the incubator versus time allowed outside is not strictly outlined in the phototherapy guidelines, the maximum time under lights should be aimed for in order to allow phototherapy treatment to be effective.

57. In a statement provided to the Court, Dr Alice Stewart from Monash Health (**Dr Stewart**) acknowledged the limitations an incubator has with skin-to-skin interaction. Monash Health has since implemented extra availability of phototherapy devices that do not require an incubator.

58. The CPU noted that Ms IR's GBS positive status was known, and prophylactic antibiotics were administered to Ms IR. The Neonatal Early-Onset Sepsis (**NEOS**) calculator was completed correctly.

59. On review of Baby XR's observation chart, the CPU identified that a set of vital signs were performed at 4:30pm which were within normal limits.

60. The CPU advised that the remainder of the concerns were regarding communication issues with the hospital and fall outside of the scope of the coronial investigation. Factors within scope are addressed in detail below.

**CPU consideration of contributing factors**

*Jaundice and phototherapy treatment*

61. The CPU noted that Baby XR was just over 24 hours of age at the time his jaundice was noted, with his bilirubin being on the threshold for requiring treatment.

62. Regarding the presence of anti-E antibodies, although the results were missed by the treating teams, given that the titre was low Baby XR was not considered to be at high-risk of jaundice with haemolytic disease.

63. At the time of commencement of phototherapy, no clinical examination of Baby XR occurred. A note by the paediatric Hospital Medical Officer (included in the hospital's Structured Clinical Incident Review) demonstrates that the paediatric team were aware that Baby XR had a bilirubin level meeting the threshold for treatment. They further were aware that he was not feeding adequately, and had a plan formulated to commence phototherapy and for Baby XR to remain on the postnatal ward with a view to consider complementary feeds. The presence of anti-E antibodies was not noted by the paediatric team. Of note, it does not appear that in-person paediatric review occurred. This absence of in-person assessment has been acknowledged in the statements from Monash Health.

64. Overall, it did not appear that Baby XR met the criteria for high-risk jaundice, so it was reasonable care to commence single light phototherapy on the post-natal ward rather than the paediatric ward or special care nursery.

65. In the statement provided, Ms IR described difficulty in bonding whilst Baby XR was in the *isolette*. When single light phototherapy is delivered through an *isolette* cot it limits mother-baby contact. Monash Health have acknowledged this issue and have taken steps to ensure that other devices such as a Bili blanket are available for use on the post-natal ward. This will also optimise incidental observation of babies.

66. The Monash Hospital guidelines regarding neonatal jaundice require a medical assessment to be performed prior to commencing phototherapy. The CPU is of the opinion that medical assessment should include an in-person review and clinical examination of the baby. This assessment should include excluding pathological causes of jaundice. Both maternal and neonate medical records and pathology tests should be reviewed in the assessment.

67. The CPU found that the lack of in-person review of Baby XR before commencement of phototherapy, as well as the medical teams not being aware of the anti-E antibodies, demonstrate areas for potential improvement in care.[11] However, given that Baby XR's cause of death was pneumonia, and he had normal vital signs prior to and after starting phototherapy, it is unlikely that these interventions would have prevented Baby XR's death.

*Recognising sepsis and pneumonia*

68. Baby XR's deterioration appears to have been sudden, as demonstrated by normal vital signs on the ViCTOR chart and visual checks. There were no clear early signs of an evolving lower respiratory tract infection with no change in oxygen saturation levels, tachypnoea, or increased work of breathing in the lead up to Baby XR's arrest.

69. Other signs of overt sepsis were also not present earlier, and Baby XR was considered at low risk of sepsis according to the NEOS calculator. CPU notes that the cot temperature was slowly being decreased in response to a rising temperature in Baby XR. Although there was

[11] For completeness, in response to Baby XR's parents' question as to why Baby XR was not examined by a doctor after the umbilical cord was cut, the CPU noted that it is not routine for a baby to be examined by a doctor at birth where the delivery is uneventful and the baby has appropriate Agpar scores. CPU was not of the view that a lack of review by a doctor at this stage (that is, at the point of the umbilical cord being cut) represented a missed opportunity in Baby XR's case.

no documented fever, this mild temperature instability may have been a subtle sign of evolving infection, however in isolation would not necessitate a treatment intervention.

70. The chest x-ray performed during the resuscitation identified hyperinflated lungs, but the lungs and pleural spaces were otherwise clear. This indicates that even at the time of resuscitation, there was no convincing radiological evidence of pneumonia.

71. It is difficult to say if an earlier medical review at the time of commencement of phototherapy (approximately 13 hours prior to Baby XR's arrest) or in the hours preceding would have allowed the medical team to recognise an evolving pneumonia as there do not appear to be clear signs of an unwell neonate from the observations that did occur by the parents and midwifery staff.

72. Finally, in response to his parents' question as to how he was able to contract pneumonia, the CPU noted that Baby XR would have been exposed to GBS bacteria whilst passing through the birth canal. GBS is a bacterium that is often found as part of the normal flora in a woman and does not typically cause any harm to adults, but can cause infections in newborn babies as their immune system is not yet as robust, which can lead to development of pneumonia. As noted by Dr Baber, Forensic Pathologist, although usually sensitive to antibiotics, deterioration and death from GBS may occur before effective control has been achieved.

*Neonatal resuscitation*

73. Overall, the CPU found that the medical care provided during the resuscitation was timely and in line with Australian guidelines. However, CPU considered that analysis is somewhat limited due to limited documentation of the resuscitation. The CPU noted this is understandable due to the acute nature of a resuscitation with focus on clinical care, however comprehensive retrospective documentation could have been optimised. For example, it is unclear what dose of adrenaline was used as it is documented in millilitres rather than the concentration of milligrams.

74. Monash Health advised that a contemporaneous record of the resuscitation was made on a paper record by a staff member acting as scribe as part of the Neonatal Code Blue response, and that the volume, but not concentration of adrenaline solution administered, was recorded on this contemporaneous paper record.

75. Monash Health further advised that it is more common in neonatal resuscitations for the 1:10,000 adrenaline solution that is stocked in Monash Health neonatal resuscitation trolleys to be calculated (based on patient weight) and documented in millilitres of solution

administered, and not milligrams or micrograms of adrenaline. Monash Health acknowledged that where the documentation of adrenaline is in millilitres of solution administered the concentration of the solution must be clearly documented.

76. Monash Health advised that individual retrospective documentation of the resuscitation was documented in the electronic medical record. This record contains the adrenaline solution volume administered in millilitres, as well as the concentration. Monash Health confirmed that review of the quality of newborn resuscitation documentation forms part of the monthly clinical review undertaken by the Monash Health Women's and Newborn Program, with an ongoing focus on feedback and education of medical, nursing and midwifery staff as to the importance of clinical documentation that is clear, contemporaneous and complete.

77. The CPU also noted that it is striking that the necessary equipment such as gas cylinders with adequate oxygen supply and intraosseous needles were not readily available and had to be sourced from other areas from the hospital. With regards to resuscitation equipment, Dr Stewart provided two copies of the Monash Health, 'Resuscitation Equipment (Neonatal, Monash Newborn, Maternity, ED) Procedure', one being the procedure in use at the time of the arrest, and the second being the revised version in response to this case. The original procedure does not include intraosseous access equipment in the checklist and the revised version has subsequently been amended to allow for this addition. This policy specifies that the equipment on the resuscitation trolley is checked daily.

78. Monash Health advised that this procedure was again revised in November 2023. Accordingly, the resuscitaire is now in an optimal location in the parentcraft room on the maternity ward, with a walled gas supply and is no longer reliant on gas cylinders. Under the new procedure, all resuscitaires are stocked with gas cylinders, regardless of the availability of a walled gas supply, and additional cylinders are stored in close proximity.

79. The CPU found that the delay caused by a lack of appropriate equipment on the resuscitation trolley was unlikely to have significantly contributed to the outcome for Baby XR. However, the CPU consider that every hospital ward should have appropriate resuscitation equipment and should be checked and restocked each shift.

80. Monash Health confirmed that the 'Resuscitation Equipment (Neonatal, Monash Newborn, Maternity, ED) Procedure' would be reviewed in light of the CPU's findings in this matter regarding the frequency that equipment should be checked and restocked.

81. Monash Health submitted further that the circumstances of Baby XR's death have been considered and reviewed by the Women's and Newborn Program and the Quality and Safety Unit. These reviews identified learnings in the care provided, and Monash Health submits these have been addressed. Monash Health is of the view that Baby XR's acute deterioration and death due to pneumonia could not have been prevented, as there was no indication on review of any missed opportunity which may have prevented the outcome. Monash Health expressed their sympathies to the family of Baby XR, on behalf of the service and staff who provided care to Ms IR and Baby XR.

## FINDINGS AND CONCLUSION

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

    h) the identity of the deceased was Baby XR, born 23 June 2022;

    i) the death occurred on 24 June 2022 at Monash Health - Casey Hospital 62-70 Kangan Drive, Berwick, Victoria, 3806, from pneumonia; and

    j) the death occurred in the circumstances described above.

83. Having considered all of the circumstances, I find that there were aspects of the care provided to Baby XR by Monash Health which could have been optimised. However, I consider that even if these had been optimised, it cannot be said with any certitude that Baby XR's death would have been prevented. I am satisfied that Monash Health has appropriately canvassed the systems improvements that will optimise care in the future for babies presenting as Baby XR did, and which obviates the need for any coronial recommendations. I have appreciated the comprehensive, helpful and frank approach of Monash Health to the coronial investigation.

84. While Monash Health has already progressed certain systems improvements, given that certain of these are ongoing, pertinent comments will follow.

## COMMENTS

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

To Monash Health:

1. This case has highlighted the importance of an in-person review being conducted by the paediatric team prior to or at commencement of phototherapy for any neonate who may require phototherapy for jaundice, with reviews at regular intervals as clinically indicated.

2. Further highlighted is the importance of age-appropriate resuscitation equipment being readily available and frequently checked by hospital staff.

I convey my sincere condolences to Baby XR's family for their immeasurable loss, who note that, following Baby XR's passing, their lives have changed forever. I am grateful for their contributions to my investigation through raising concerns of care, which has assisted in a thorough and considered coronial investigation into Baby XR's death, and has paved the way for critical systems improvements.

Pursuant to section 73(1A) of the Act, I order that this finding be published on the Coroners Court of Victoria website in accordance with the rules.

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

Mr ZR & Ms IR, Senior Next of Kin

Monash Health

Senior Constable Rachael May, Coroner's Investigator

Signature:


**Ingrid Giles**
**CORONER**

**Date: 13 November 2024**

NOTE: Under section 83 of the ***Coroners Act 2008*** ('the Act'), a person with sufficient interest in an investigation may appeal to the Trial Division of the Supreme Court against the findings of a coroner in respect of a death after an investigation. An appeal must be made within 6 months after the day on which the determination is made, unless the Supreme Court grants leave to appeal out of time under section 86 of the Act.