IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2014 5867

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 60(2)
Section 67 of the ***Coroners Act 2008***

I, PETER WHITE, Coroner having investigated the death of NOAH CHERON-DUNCAN without holding an inquest:
find that the identity of the deceased was NOAH CHERON-DUNCAN
born on 19 November 2014
and the death occurred on 19 November 2014
at the Sandringham Hospital, 193 Bluff Road, Sandringham, Victoria
from:

1 (a) PERINATAL ASPHYXIA

Pursuant to section 67(1) of the *Coroners Act 2008* I make findings with respect to the following circumstances:

Circumstances leading up to Noah's death

1. Baby Noah Cheron-Duncan was the second child of Lucie Cheron and Brad Duncan. During her pregnancy, Ms Cheron received ante natal care at the Sandringham Memorial Hospital (SMH). She had no significant medical history but took vitamin D and iron supplements during her pregnancy. Her previous pregnancy was uncomplicated and her pregnancy with Noah was similarly uncomplicated.
2. On the night of 18 November 2014, Ms Cheron went into spontaneous labour. At approximately 5.20am on 19 November 2014, she and her husband presented to the SMH after having been in contact with the hospital during the night.
3. Leonie Mayes, the Midwife in Charge at the time, allocated student midwife Shterna Glick to Ms Cheron's care. Ms Mayes explained that she allocated Ms Glick as she noted that Ms Cheron had no complications with her pregnancy and had a normal scan at 36 weeks. Ms Glick only had two further deliveries to attend and assist with to complete her normal vaginal delivery requirements for registration as a midwife.

4. On initial assessment by her midwife, she was noted to be having four contractions every 10 minutes, with each lasting 50 to 60 seconds. The auscultated foetal heart rate (FHR) was 120 beats per minute.[1] Ms Cheron was started on nitrous oxide for analgesia.

5. At approximately 5.40am, Ms Glick spoke to Ms Mayes to inform her that she could not perform a thorough palpitation as Ms Cheron was very distressed and sensitive to touch. Feeling for the exact position of the foetus was too painful. Mr Duncan reportedly indicated that she had been very sensitive to touch. Ms Mayes did not perform an assessment of Ms Cheron herself. She asked another midwife to assist in Birth Suite 2 but that midwife had to go to the antenatal ward to attend to another patient.

6. Ms Glick reported that she continued to listen to the foetal heart rate with a Doppler every 30 minutes, during and after contractions and it remained present without irregularities.

7. The recorded FHR over the next 90 minutes were between 120 and 146 beats per minute and were said to have been reassuring. At 7am Ms Glick and Ms Mayes handed care over to midwife Lisa Corrigan.

8. The last documented FHR was at 7.15am. At 7.17am there was spontaneous rupture of membranes and the liquor was noted to be clear.

9. At 7.22am Ms Corrigan noted "unable to obtain foetal heart rate between contractions".

10. Noah was delivered at 7.37am weighing 4090 grams. At birth he was white, flat and floppy. Apgar scores were recorded as 0 at 1 minute and 0 at 5 minutes. Full neonatal resuscitation was instituted at birth including cardiac massage and intermittent positive pressure ventilation via the neopuff. The special care nursery and the paediatrician were called at 7.38am. A neonatal code blue was called at 7.39am. The code team arrived at 7.40am. Noah was intubated 9 minutes after delivery by Dr Coulson, the anaesthetic registrar. Some respiratory effort was noted at 13 minutes post-delivery. An umbilical vein catheter was attempted at 13 minutes post-delivery. Adrenaline was administered at 14 minutes post-delivery and again at 17 minutes post-delivery.

11. The paediatrician, Dr Gideon Lurie, arrived 22 minutes after delivery. The anaesthetic consultant, Dr John Luke, also attended around this time. A third dose of adrenaline was administered at 25 minutes. At this point the documented Apgar score was 1. The neonatal emergency transport service was called at 26 minutes. A normal saline fluid bolus was administered. A fourth dose of adrenaline was administered at 33 minutes and this was followed by a further normal saline bolus. A heart rate of 80 beats per minute was noted at 35 minutes. CPR was ceased at 37 minutes and Noah was transferred to the special care nursery (SCN).

12. Noah arrived at the SCN at 8.20am, 43 minutes after delivery. At 8.23am he was noted to have a heart rate of 110 beats per minute and oxygen saturation of 99 per cent. Over the next hour Noah struggled to maintain an adequate heart rate, blood pressure and oxygen saturation despite on-going mechanical ventilation and further extra cardiac massage. Staff in the SCN remained in constant contact with NETS. At 8.28am he was given a further bolus of IV fluid.

13. At 8.43am Noah became asystolic and CPR was recommenced. Without further cardiac massage he was unable to maintain a heart rate greater than 60 beats per minute. A further dose of adrenaline was given at 8.50am. The NETS team arrived at 9.10am. At 9.12am

[1] Auscultation is the most appropriate form of foetal heart monitoring for the low risk mother and foetus. The normal foetal heart rate term is between 110 and 160 beats per minute.

Noah was noted to have fixed dilated pupils, no spontaneous breathing, no peripheral pulses and an unsupported heart rate of 65 beats per minute. CPR was continued until discussion with his parents by Dr Lurie and the NETS team. CPR was ceased at 10.10am. Noah passed away at 10.17am.

Medical investigations

14. Forensic Pathologist Dr Yeliena Baber of the Victorian Institute of Forensic Medicine performed a post mortem medical examination. Dr Baber provided me with a report of her findings at autopsy. I note that Dr Baber's report incorporated the Neuropathological findings made by Dr Lina Isles and radiological findings made by Dr Padma Rao, Consultant Paediatric Radiologist.

15. Dr Baber noted that at autopsy, there was no evidence of natural or congenital disease on either external or internal examination. Histological findings in the placenta were suggestive of severe uteroplacental hypoxia, including immature placental development for gestational age and the presence of immature haemotapoietic cells. There were no features consistent with placental abruption or foeto-maternal haemorrhage, although it would be impossible to completely exclude placental abruption as acute retroplacental haemorrhage occurring within one hour of delivery can be indistinguishable from normal post-partum blood loss.

16. Neuropathology showed no significant abnormality and other ancillary investigations were non-contributory.

17. Based on the material available to Dr Baber, she formed the opinion that Noah's death was due to perinatal asphyxia. Dr Baber explained in her report that that term encompasses the severe hypoxic features seen in the placenta. I adopt Dr Baber's findings in relation to the cause of death.

Coronial Investigation

18. In the course of my investigation, Noah's parents expressed concerns to the hospital about the circumstances of his birth. As a result, I requested that the Coroners Prevention Unit's Health and Medical Investigation Team review the material provided in order to assist me in establishing whether the care provided at SMH was adequate.

19. Statements were received from the following health practitioners who were involved in Noah's birth:

    a. Lisa Corrigan, Registered Midwife
    b. Dr Peyman Mazidi, Obstetric Registrar
    c. Jenny Ryan, Director of Maternity Services
    d. Dr Nicola Yuen, Consultant Obstetrician and Gynaecologist
    e. Shterna Glick, student Midwife at the time of Noah's birth; and
    f. Leonie Mayes, Registered Midwife.

20. I also received the following policies form the Royal Women's Hospital.

    a. Pre-registration Health Professional Student Placement
    b. Cardiotocograph (CTG) Interpretation and Response
    c. Labour and Birth and Early Puerperium- Care During
    d. Intra-partum Risk Factor Identification and Response

e. Care in Labour Decision Aids

f. Observation in Labour (including Complex Care) Summary

g. CIS Flowcharts

21. I note that the Royal Women's Hospital (RWH) oversees obstetric and gynaecological services at Sandringham Hospital. All other services at that hospital are provided by Alfred Health.

22. The following issues were identified as areas of concern by Noah's parents

    a. Staffing at SMH after hours, including clarification of which staff are on site and which staff are on call.

    b. Difficulties detecting the FHR and failing to escalate to senior staff.

    c. Escalation to code blue following Noah's delivery; and

    d. Review of the neonatal resuscitation.

Staffing at the SMH

23. Jenny Ryan, Director of Maternity Services provided two statements to the Court. Ms Ryan stated that the night shift staff comprised of five midwives (three midwives and one student midwife in the birth centre and two in the post natal ward). The morning shift comprised of seven midwives and a service manager. There were two obstetric doctors on call over the night shift. Ms Ryan stated that the birth suite was adequately staffed by midwives on the night and morning shifts covering the period of Ms Cheron's labour and delivery. I am satisfied that there was adequate staff to care for Ms Cheron and Noah.

Difficulties detecting FHR and failure to escalate to senior staff

24. I was provided with the Royal Woman's protocol guiding FHR monitoring. This guideline follows the Royal Australian and New Zealand College of Obstetricians and Gynaecologists Intrapartum Foetal Surveillance Guidelines. The guideline suggests that FHR monitoring by intermittent auscultation with a hand held Doppler should occur every 15 – 30 minutes in the absence of active pushing and after each contraction with active pushing or at least every five minutes. If the FHR is abnormal or not detectable the guidelines mandate escalation to the senior midwife and the medical officer.

25. Ms Ryan noted in her statement the Root Cause Analysis process conducted the hospital noted the following issues:

    a. When Ms Glick informed Ms Mayes at approximately 5.45am that Ms Cheron's abdomen was tender, which may be suggestive of concealed Antepartum Haemorrhage in the absence of vaginal bleeding, Ms Mayes did not assess Ms Cheron.

    b. After spontaneous rupture of membranes, the foetal heart rate could not be heard but there was not escalation to any clinician.

26. Ms Corrigan provided me with a statement in relation to the care she provided to Ms Cheron. She noted that she took over Ms Cheron's care at approximately 7.10am. Ms Corrigan outlined that the reason she believed that she could not detect the FHR was due to Ms Cheron's position. At that stage of the labour, Ms Cheron was in the "all fours" position

that makes detecting FHR difficult. Ms Corrigan did not believe that there were any matters that would indicate concern for the FHR.

27. From 7.22am, the labour progressed rapidly. Ms Corrigan stated that she attempted to take a FHR after every contraction but this was not documented in real time because she could not psychically document this information while attending to Ms Cheron's care. Noah's head was on view and the baby's birth was imminent. Further, due to the imminent nature of the birth, it was not an option to reposition Ms Cheron to facilitate obtaining a FHR. Ms Corrigan stated that there was no time to discuss with a senior midwife of the obstetric team as the labour progressed too quickly and she held no concerns for the baby.
28. I note that subsequent to Noah's death, Ms Corrigan was subject to a review arising out of these events. Ms Mayes was also counselled about her responsibilities as a student supervisor.

Escalation to Code Blue and neonatal resuscitation

29. After reviewing the medical record, it appears that the standard guideline for neonatal resuscitation was followed. The escalation to a neonatal code blue occurred in a timely manner. There were no actions or inactions identified during the resuscitation that would have contributed to Noah's death.
30. Noah's death was unexpected in light of the uncomplicated pregnancy and labour. The 22 minutes between the last recorded FHR and delivery represent a critical point in the management of Ms Cheron's labour. On the evidence before me, I cannot say whether earlier recognition of Noah's clinical state at this time would have altered the eventual outcome. Accordingly I make no finding in regard to that matter. The RWH review of Noah's death has conceded that there were failings during this period and have addressed the issue of recognition and escalation through further staff education.

Pursuant to section 73(1A) of the Coroners Act 2008 I order that this finding be published on the Internet in accordance with the rules.

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

Noah's family

Ms Karen Cusak, Royal Women's Hospital

The Chairman, Consultative Council of Obstetric and Paediatric Mortality and Morbidity

Signature:

PETER WHITE
CORONER
Date: **19 April 2016**