IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2011 002845

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)

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

Inquest into the Death of: Baby Emma FOLWELL KUNO

Delivered On:	30 January 2017
Delivered At:	Coroners Court of Victoria 65 Kavanagh Street Southbank Victoria 3006
Hearing Dates:	Mention: 6 September 2013 Inquest: 4-8 and 18 August 2014 Submissions: 20 February 2015
Findings of:	Coroner Paresa Antoniadis SPANOS
Representation:	Mr J. BRETT of Counsel, instructed by Anne Shortall of Salter and Gordon, appeared on behalf of the parents Linda Folwell and Brett Kuno. Ms F. ELLIS of Counsel, instructed by John Petts of TressCox Lawyers, appeared on behalf of Western Health. Mr D. O'CALLAGHAN, appeared on behalf of midwives, Susan Budge and Susan Currie.
Police Coronial Support Unit	Leading Senior Constable A. MAYBURY, assisting the Coroner

I, PARESA ANTONIADIS SPANOS, Coroner,

having investigated the death of Baby EMMA MAY FOLWELL-KUNO

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

on 4-8 and 18 August 2014 and 20 February 2015:

find that the identity of the deceased was EMMA MAY FOLWELL-KUNO

born on 26 July 2011

and that the death occurred on 30 July 2011

at the Royal Women's Hospital, 20 Flemington Road, Parkville, Victoria 3052

from:

I (a) HYPOXIC-ISCHAEMIC ENCEPHALOPATHY IN THE SETTING OF CHRONIC PLACENTAL INSUFFICIENCY

in the following circumstances:

BACKGROUND

1. Baby Emma Folwell-Kuno was the four-day old daughter of Linda Folwell and Brett Kuno. Ms Folwell was 38 years old when she was pregnant with Baby Emma.[1] Ms Folwell's obstetric history included ten previous pregnancies. Her seven sons were born by ordinary vaginal delivery between 1989 and 2008 with birth weights recorded at between 3175 and 4020 grams.[2]

2. In December 2010, Ms Folwell's general practitioner [GP] referred her to Western Health [WH] for antenatal care. When she first attended Sunshine Hospital on 2 February 2011, Ms Folwell was 15 weeks pregnant, based on a reported Last Normal Menstrual Period [LNMP] of 23 October 2010.[3] Her estimated delivery date, therefore, was 30 July 2011, which was consistent with the findings of an ultrasound performed in January 2011 during which Crown Rump Length was recorded as 5.8 centimetres [cm], indicating 12 weeks and two days' gestation.[4]

3. Ms Folwell's antenatal care was provided through Sunshine Hospital's Midwifery Group Practice [MGP]. This model of care involves a collaborative approach to maternal care by

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[1] Coronial Brief of Evidence [CB], page 74ff, Health Assessment Maternity History & Examination.

[2] CB, page 74ff, Health Assessment Maternity History & Examination.

[3] Ibid.

[4] CB, page 62, Ultrasound performed on 14 January 2011 [January 2011 ulstrasound].

midwives and obstetricians which aims to provide continuity of care for women through pregnancy, birth in a hospital setting and the post-natal period. The Australian College of Midwives' National Midwifery Guidelines for Consultation and Referral[5] [Midwifery Guidelines], WH's Essential Guide to Antenatal Clinic 2010[6] [WH Antenatal Clinic Guide] and Sunshine Hospital Antenatal Clinic – Pregnancy Appointment Checklist[7] [Antenatal Checklist] guided practice under this model of care.

4. In the MGP, midwives work with a caseload partner and within a small group practice of six midwives. Each caseload midwife has a caseload of about 40 women each year (three or four patients delivering per month) and is on call for 10 days and seven nights per fortnight, the other seven nights being covered by her[8] caseload partner. Midwives work within their expertise and are responsible for the care they provide, liaising with obstetricians, paediatricians and other clinicians as a patient's needs dictate. Where a patient has or develops medical or obstetric risk factors or complications, overall antenatal, perinatal and post-natal clinical decision-making is to be managed by the obstetric team.[9]

5. Susan Currie, a Registered Nurse and Midwife [RNM] of more than 25 years' experience, was Ms Folwell's caseload midwife and had, incidentally, provided ante- and peri-natal care during the birth of her last son.[10] RNM Currie's caseload partner was Susan Budge, a Registered Nurse and Midwife of about 30 years' experience.[11] Ms Folwell attended regular antenatal reviews[12] and, in addition to the routine ultrasound performed to assess foetal morphology at 20 weeks' gestation,[13] ultrasound examinations were performed at 28[14] and 33[15] weeks gestation to assess foetal growth given Ms Folwell's high body mass index [BMI].[16]

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[5] Second edition published in 2008 (appended to Exhibit F) and applicable at the time Ms Folwell was pregnant with Baby Emma.

[6] Exhibit N. The 2010 version was revised and replaced in 2014.

[7] Exhibit P.

[8] Although not all midwives are female, for convenience I have used the female pronoun to refer to 'midwives' in general, noting incidentally that in this case, all of the midwives who attended upon Ms Folwell in the material period were female.

[9] See generally exhibits E, F, N, O and V.

[10] Exhibit V.

[11] Exhibit O.

[12] Ms Folwell's WH Medical Records [MRs] confirm that she attended seven antenatal appointments with the Midwifery Group Practice on 2 February, 17 March, 19 April, 20 June, and 4, 18 and 25 July 2011.

[13] CB, pages 65-66, ultrasound performed on 10 March 2011.

6. At about 5pm on 26 July 2011, Ms Folwell presented to Sunshine Hospital after telephoning RNM Currie to report abdominal 'tightenings' and concern about reduced foetal movements [RFM].[17] She was admitted to the assessment centre of Sunshine Hospital's birthing suite by RNM Budge and a cardiotocograph [CTG] was commenced to monitor the foetal heart rate [FHR] and uterine contractions via two transducers placed on Ms Folwell's abdomen.[18] Interpretation of the features documented by the CTG trace as 'reassuring', 'non-reassuring' or 'abnormal' by midwifery and obstetric medical staff[19] allows early detection of foetal distress and so informs clinical management.[20]

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[14] CB, pages 67-70, ultrasound performed 10 May 2011 ['May ultrasound'].

[15] CB, pages 71-72, ultrasound performed 17 June 2011 ['June ultrasound'].

[16] Body Mass Index [BMI] is an approximate measure of whether an individual is under- or overweight, calculated by dividing their weight in kilograms by the square of their height in metres. BMI values of 18.5 or less indicate that a person is underweight, values between 18.5 and 24.9 indicate a normal/healthy weight, values between 25 and 29.9 indicate the individual is overweight and values greater than 30 indicate obesity. Ms Folwell's BMI was recorded as 37 in MRs.

[17] Coronial Brief of Evidence, page 101ff, WH Admission/Discharge Form Sunshine Hospital and Exhibits O and V.

[18] A CTG uses ultrasound to detect the foetal heartbeat and uterine contractions during pregnancy and/or labour. The transducers placed on the woman's abdomen are connected to a monitor that displays the FHR numerically and the FHR is also audible to those nearby. The CTG produces a printed record – or trace – that plots each captured measurement. However, hot all foetal heart beats or contractions will be recorded if there is suboptimal contact between the transducers and the woman's abdomen and so sometimes a scalp electrode may be applied to the foetus to more directly monitor the FHR. CTG transducers may be removed for short periods, such as to allow the labouring woman to take a toilet break, resulting in a gap in the CTG trace.

[19] Clinicians assess all aspects of the CTG to develop an overall impression (or clinical judgement) of its features as 'reassuring', 'non-reassuring' or 'abnormal'. The ability to correctly interpret a CTG trace is a core competency for both midwives and obstetricians.

[20] The CTG trace enables clinicians to 'see' key indices of foetal wellbeing and the progress of labour such as the baseline FHR, variations, accelerations and decelerations of the FHR and the frequency, duration and apparent intensity of uterine contractions. The *baseline FHR* is the average heart rate of the foetus in a ten-minute period. A normal foetal heart rate is between 110 and 150 bpm. A degree of *variability* (variation of the FHR form one beat to the next) is regarded as a good indicator of foetal wellbeing. The amount of variability from the baseline FHR and its duration may be interpreted as 'reassuring', 'non-reassuring' or 'abnormal'. *Accelerations* are an abrupt increase in baseline heart rate of more than 15 bpm for greater than 15 seconds. Accelerations are considered reassuring and when they occur alongside uterine contractions are seen as a sign of a healthy foetus. The absence of acceleration (in an otherwise normal CTG trace) is of uncertain clinical significance. *Decelerations* are an abrupt decrease in baseline heart rate of more than 15 bpm for greater than 15 seconds. There are a number of types of decelerations, each with varying significance. An 'early deceleration' starts when a uterine contraction begins and resolves when the contraction ends. This type of deceleration is considered physiological rather than pathological. 'Variable deceleration' is seen as a rapid fall in baseline heart rate with a variable recovery phase; they may be variable in duration and may be unrelated to uterine contractions. Variable decelerations are often seen during labour, in patients with reduced amniotic fluid volume and are often caused by umbilical cord compression. Accelerations before and after a variable deceleration are known as the 'shoulders of deceleration' indicating that a foetus is not yet hypoxic and is adapting to reduced blood flow. Variable decelerations can sometimes resolve if the mother changes her position. The presence of persistent variable decelerations should be closely monitored and variable decelerations without 'shoulders' is suggestive of foetal hypoxia. A 'late deceleration' begins at the peak of uterine contraction and should resolve after the contraction ends. This type of deceleration indicates there is insufficient blood flow through the uterus and placenta and may produce foetal hypoxia and acidosis. The presence of late decelerations may indicate further investigation (such as foetal blood

7. RNM Budge reviewed the first few minutes of the CTG trace and observed a deceleration of the FHR to 60 beats per minute [bpm], with quick recovery, associated with a mild contraction.[21] Unsure of its significance, she consulted RNM Currie who had just become available to take over Ms Folwell's care.[22] At about 5.15pm, RNM Currie performed a vaginal examination [VE] with Ms Folwell's consent to assess her status.[23] Ms Folwell's cervix was 3cm dilated and effaced, with bulging membranes.[24] The CTG trace showed that contractions were irregular, mild and occurring at a rate of one every 10 minutes.[25] RNM Currie concluded that Ms Folwell was not in established labour and birth was not imminent.[26]

8. The midwives continued to review the CTG trace for about five minutes after the VE before concluding that it appeared 'abnormal'[27] and 'ominous'.[28] RNM Currie indicated to her colleague that she would alert the obstetric team. At about 5.20pm, RNM Currie reported her concerns about the CTG trace to Consultant Obstetrician and Gynaecologist, Dr Reena Jacobs, and the Assistant Nurse Unit Manager [ANUM], Registered Nurse and Midwife Donna Kay.[29]

9. The management of Ms Folwell's labour was the primary focus of the inquest and will be discussed in some detail below. Suffice for present purposes to say that Baby Emma was born at 7.26pm[30] on 26 July 2011 by a precipitate but normal vaginal delivery.[31] At birth, Baby Emma weighed 2692 grams, was white and floppy with the umbilical cord looped twice around her

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sampling) to determine whether the foetus is hypoxic and/or there is a need for emergency caesarean delivery. 'Prolonged deceleration' is a deceleration of more than two minutes' duration. Decelerations of two-to-three minutes are considered 'non-reassuring' while decelerations lasting more than three minutes are considered 'abnormal' and may require clinical intervention.

[21] Exhibit O.

[22] Ibid.

[23] Exhibit V.

[24] Exhibit V and CB, page 115 (MRs).

[25] Exhibit V.

[26] Exhibits V and O.

[27] Exhibit V.

[28] Exhibit O.

[29] Exhibits V, E and K.

[30] I note that Ms Folwell disputed that Baby Emma was born at 7.26pm as was recorded in all medical records (Transcript pages 31 52, 54-55). She believed that her daughter was born at 7.22pm (Transcript pages 554-55). Ms Currie and Ms Kay were both also present at the birth. Ms Currie testified that she did not record the time of birth, but noted that the time of birth is an important detail given its relevance to Apgar scores and resuscitation (Transcript page 638). Ms Kay did record the time of Baby Emma's birth and gave categorical evidence that she was born at 7.26pm, in poor condition, and that the paediatrician was present one minute after birth by which time the midwives were already performing cardio-pulmonary resuscitation (Transcript page 93).

[31] CB pages 106-108, Birthing Clinical Summary printed at 9.48 on 26 July 2011.

neck.[32] The cord was cut, a neonatal 'Code Blue'[33] was called and active resuscitation commenced immediately, with oxygen delivered by continuous positive airway pressure [CPAP] prior to the arrival of a paediatrician at about 90 seconds after birth.[34]

BABY EMMA'S CONDITION AT BIRTH

10. Baby Emma's Apgar scores[35] were three at one and a half minutes, five at two-to-three minutes, seven at five minutes and eight at ten minutes after birth.[36] Her heart rate rose from 100bpm at one minute after birth to 160bpm four minutes later.[37] CPAP was continued and intermittent positive pressure ventilation [IPPV] was also used to support Baby Emma's intermittent breathing and improve her oxygen saturation from around 80 per cent to about 95 per cent.[38] Blood gas analysis and other tests were performed and intravenous access established prior to Baby Emma's transfer to the Special Care Nursery [SCN].[39]

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[32] Exhibit V and CB page 152, Baby Emma's NETS Medical Records, Perinatal History.

[33] The announcement of an emergency situation in a health care setting indicating the need for cardio-pulmonary resuscitation.

[34] Exhibit E and Baby Emma's WH progress notes.

[35] The Apgar score allows clinicians to quickly evaluate a newborn's physical condition. Five factors are each scored on a scale of 0 to 2 (with 2 being the best score) are used to evaluate the baby's condition: Appearance (skin colour), Pulse (heart rate), Grimace response (reflexes), Activity (muscle tone), Respiration (breathing rate and effort). The Apgar test is usually administered at one- and five- minutes after birth. Ten is the highest score possible, but is rarely obtained.

[36] I note that there are six different entries in MRs recording Baby Emma's Apgar scores and that the recorded scores are not consistent. I have preferred the scores noted in the text above on the basis that the record of lower scores may represent 'default' values in the Birthing Clinical Summary record, the expert opinion of Philip Henschke suggests that an Apgar of seven at one minute (recorded elsewhere in the notes) was inconsistent with Baby Emma's condition at birth and the contextual comments of Dr Bomban amending the Apgar scores she originally assigned on 26 July 2011 in a retrospective progress note made on 1 August 2011 upon return from sick leave. I note Dr Henschke's reservations, generally, about the accuracy of the Apgar scores assigned retrospectively six days after Baby Emma's birth. The various Apgar score notations are as follows: (1) Birthing Clinical Summary printed at 9.48 on 26 July 2011, recording Apgar scores of zero at one minute and zero at five minutes (CB pages 106-108); (2) Birthing Clinical Summary printed at 12.23pm on 30 July 2011, recording Apgar scores of seven at one minute and eight at five minutes (CB pages 109-111); (3) Birthing Clinical Summary printed at 9.48 on 26 July 2011, with an unsigned hand-written amendment of Apgar scores as seven at one minute and eight at five minutes and eight at ten minutes (CB pages 112-114); (4) Progress note written by Dr Bomban at 7.27pm on 26 July 2011 recording Apgar scores as seven at one minute and eight at two-to-three minutes (CB pages 133); (5) a further progress note written by Dr Bomban at 10.15pm on 26 July 2011 confirming the scores noted at 7.27pm (CB page 135); and, a retrospective note written by Dr Bomban on 1 August 2011 at 1.20pm 'correcting' the Apgars and recording the scores as three at one-and-a-half minutes, five at two-to-three minutes, seven at five minutes and eight at ten minutes after birth (CB page 139).

[37] CB page 133, Progress note made by Dr Bomban on 26 July 2011 at 7.27pm.

[38] CB page 139, Retrospective Progress note added by Dr Bomban on 28 July 2011 at 4.50pm.

[39] CB page 139, Retrospective Progress note added by Dr Bomban on 28 July 2011 at 4.50pm.

11. At one hour after birth, Baby Emma developed seizures and was provisionally diagnosed with mild hypoxic-ischaemic encephalopathy, neonatal convulsions, respiratory distress, and suspected sepsis. She was treated with ventilation and oxygen therapy, antibiotics, phenobarbitone and intravenous fluid therapy.[40]

12. On 27 July 2011, a consultation with the Newborn Emergency Transport Service [NETS] was made and therapeutic hypothermia was instituted prior to Baby Emma's transfer to the Royal Women's Hospital Neonatal Intensive Care Unit [RWH]. Upon examination at the RWH, Baby Emma seemed hypotonic, with small reactive pupils, a weak gag reflex and no suck reflex. Cerebral function monitoring by electroencephalogram [EEG] was commenced shortly after admission and was found to be severely abnormal, with depressed EEG activity and multiple seizures. Phenobarbitone was administered to control seizures with good effect. A cranial ultrasound showed severe cerebral oedema.[41]

13. Later that day, Baby Emma's oxygen requirements increased and so she was intubated and high frequency oscillation ventilation [HFOV] was administered. An echocardiogram at this time showed poor cardiac contractility and pulmonary hypertension, which were treated with nitric oxide and inotropes and dubotamine. Baby Emma responded well to these interventions, such that HFOV and nitric oxide were ceased the following day.[42]

14. A cranial magnetic resonance imaging [MRI] scan performed on 28 July 2011 showed extensive frontal, parietal, occipital lobe and para-sagittal cortical and white matter infarction associated with basal ganglia and thalamic infarction involving posterior limbs of internal capsule and splenium of corpus callosum consistent with severe global hypoxic-ischaemic injury.[43] Baby Emma was assessed by an independent Neonatal Neurologist, Dr Jeanie Cheong, who reviewed her history, current neurological status, MRI findings and EEG data, concluding that the infant had sustained a severe brain injury likely to result in either death or severe cognitive and motor impairment.[44]

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[40] Exhibit U.

[41] CB 151-3-151-7, Discharge Summary RWH.

[42] Ibid.

[43] CB 151-6-151-7, Neonatal MRI Report.

[44] Baby Emma's RWH Medical Records, Discharge Summary.

15. On 28 July 2011, following a discussion of Baby Emma's grave condition and poor prognosis between her RWH clinicians and her parents, the decision to withdraw treatment was made. Baby Emma died on the morning of 30 July 2011, aged four days.[45]

16. Initially, Baby Emma's death was not reported to the coroner by clinicians at the RWH who, incorrectly, did not consider the death to be a reportable death as defined in section 4 of the *Coroners Act* 2008.[46] However, on 2 August 2011, Associate Professor Glyn Teale, Clinical Services Director of Women's and Children's Services at Sunshine Hospital, took a different view and reported Baby Emma's death to the coroner. A coronial investigation including an inquest ensued.[47]

CORONIAL INVESTIGATION – SOURCES OF EVIDENCE

17. This finding is based on the totality of the material the product of the coronial investigation of Baby Emma's death. That is the brief of evidence compiled by LSC Amanda Maybury of the Police Coronial Support Unit, the statements, reports and testimony of those witnesses who testified at inquest and any documents tendered through them, and the final submissions of Counsel. All of this material, together with the inquest transcript, will remain on the coronial file.[48] In writing this finding, I do not purport to summarise all the material and evidence, but will refer to it only in such detail as is warranted by its forensic significance and in the interests of narrative clarity.

PURPOSE OF A CORONIAL INVESTIGATION

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

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[45] A Medical Certificate of Cause of Perinatal Death dated 30 July 2011 was completed by Dr Jennifer Sokol from the RWH.

[46] [46] The *Coroners Act* 2008, like its predecessor the Coroners Act 1985, requires certain deaths to be reported to the Coroner for investigation. Apart from a jurisdictional nexus with the State of Victoria, the definition of reportable death in section 4 includes deaths that appear to have been unexpected, unnatural or violent or to have resulted, directly or indirectly, from an accident or injury; and, deaths that occur during or following a medical procedures where the death is or may be causally related to the medical procedure and a registered medical practitioner would not, immediately before the procedure, have reasonably expected the death [see generally s. 4(2)(a)-(b)].

[47] Email dated 2 August 2011 from A/Prof Glyn Teale to the Initial Investigations Office of the Coroner's Court of Victoria.

[48] From the commencement of the *Coroners Act 2008* (the Act), that is 1 November 2009, access to documents held by the Coroners Court of Victoria is governed by section 115 of the Act.

occurred.[49] The *cause* of death refers to the *medical* cause of death, incorporating where possible the *mode* or *mechanism* of death. For coronial purposes, the *circumstances* in which death occurred refers to the context or background and surrounding circumstances, but is confined to those circumstances sufficiently proximate and causally relevant to the death, and not merely all circumstances which might form part of a narrative culminating in death.[50]

19. The broader purpose of any coronial investigations is to contribute to the reduction of the number of preventable deaths through the findings of the investigation and the making of recommendations by coroners, generally referred to as the *prevention* role.[51] Coroners are also empowered to report to the Attorney-General in relation to a death; to comment on any matter connected with the death they have investigated, including matters of public health or safety and the administration of justice; and to make recommendations to any Minister or public statutory authority on any matter connected with the death, including public health or safety or the administration of justice.[52] These are effectively the vehicles by which the prevention role may be advanced.[53]

20. It is important to stress that coroners are not empowered to determine the civil or criminal liability arising from the investigation of a reportable death, and are specifically prohibited from including in a finding or comment any statement that a person is, or maybe, guilty of an offence.[54]

FINDINGS AS TO UNCONTENTIOUS MATTERS

21. In relation to Baby Emma's death, most of the matters I am required to ascertain, if possible, were uncontentious from the outset. Her identity and the date and place of death were not at issue. I find, as a matter of formality, that Emma May Folwell-Kuno, born on 26 July 2011,

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[49] Section 67(1) of the *Coroners Act 2008*. All references which follow are to the provisions of this Act, unless otherwise stipulated.

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

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

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

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

[54] Section 69(1).

died at the Royal Women's Hospital, 20 Flemington Road, Parkville, on 30 July 2011, aged four days.

22. Nor was the cause of Baby Emma's death contentious. On 1 August 2011, a RWH's Pathologist, Dr Gayanie Ratnayake, reviewed Baby Emma's peri-natal history and post-natal clinical course and performed an autopsy on her body with her parents' consent.[55] Dr Ratanayake also examined the placenta and found evidence of chronic villitis and foetal thrombotic vasculopathy [FTV], with the features noted appearing to be 'at least two weeks or probably older'.[56]

23. Dr Ratnayake opined that chronic villitis and FTV impaired placental function such that the foetus received insufficient blood flow and nutrients, with short and long term effects inclusive of intrauterine foetal growth restriction [FGR], greater susceptibility to hypoxia at birth, blood clots and death.[57] The pathologist advised that chronic villitis is a non-infectious chronic inflammatory condition, while FTV is a condition associated with partial or complete occlusion of foetal vessels in the placenta which can result in embolus and thrombosis in foetal blood vessels. Dr Ratnayake observed that FTV has many potential causes including maternal or foetal coagulation disorders, infections and maternal diabetes mellitus, however, she was unable to determine the cause of FTV in respect of Baby Emma.[58]

24. On external examination, Baby Emma was an anatomically normal female infant showing symmetrical growth restriction with weights and parameters consistent with the fifth percentile of growth for a baby born at 40 weeks' gestation.[59]

25. Histological sections showed large organised thrombi in the left renal hilar vessels and near complete infarction of the left adrenal gland. These changes were characterised as visceral manifestations of FTV likely to be of up to several days' duration given that the thrombi had become fibrotic, a process that takes six-to-seven days to develop.[60]

26. The histological sections of Baby Emma's brain revealed extensive and diffuse hypoxic-ischaemic damage involving the brainstem, basal ganglia, thalami, hippocampus, cerebellum

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[55] Exhibit U.

[56] Exhibit U and Transcript page 556.

[57] Transcript pages 549-550.

[58] Exhibit U and Transcript page 553.

[59] Exhibit U.

[60] Exhibit U and Transcript pages 555-556.

and cerebral cortex, and which was most pronounced in the brainstem. Focal early confluent infarcts associated with gliosis and macrophage collections were seen in the pons, occipital and frontal cortex. Dr Ratanayake considered that the changes identified seemed to be of days' duration rather than weeks, and possibly occurred during the perinatal period.[61]

27. Dr Ratnayake's analysis of other histological samples revealed features of meconium aspiration in the lungs and thymic involution, both signs of foetal distress, although she was unable to comment on the timing of Baby Emma's distress.[62]

28. Dr Ratnayake concluded that chronic villitis and FTV in the placenta with resultant chronic placental insufficiency led to Baby Emma's symmetrical growth restriction and the thrombi in visceral blood vessels. These conditions rendered her more susceptible to hypoxia at birth.[63] Dr Ratanayake commented that the autopsy findings of hypoxic-ischemic changes to Baby Emma's brain were not so specific as to enable her to determine whether the injury occurred before, during or immediately after birth, though the changes observed were not a 'distant injury'.[64] The issue of the timing of Baby Emma's hypoxic injury is significant and will be addressed in some detail below.

29. At my request, Forensic Pathologist, Dr Paul Bedford, of the Victorian Institute of Forensic Medicine [VIFM], reviewed Dr Ratnayake's post-mortem report and provided advice about the medical cause of Baby Emma's death. Dr Bedford advised that it was reasonable to attribute the cause of Baby Emma's death to *hypoxic ischaemic encephalopathy in the setting of chronic placental insufficiency* without the need for a second autopsy.[65]

30. On the basis of the evidence and advice provided by Drs Ratnayake and Bedford, I find that the cause of Baby Emma's death was hypoxic ischaemic encephalopathy in the setting of chronic placental insufficiency.

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[61] Exhibit U and Transcript page 552.

[62] Exhibit U and Transcript pages 550-551.

[63] Exhibit U.

[64] Exhibit U.

[65] CB, pages 1-3, Medical Examination Report of Dr Paul Bedford dated 8 November 2011.

FOCUS OF THE CORONIAL INVESTIGATION AND INQUEST

31. In common with many other coronial investigations, the primary focus of the coronial investigation and inquest into Baby Emma's death was on the circumstances in which she died.
32. As no issues about the adequacy of her antenatal care prior to 33 weeks' gestation were raised by Ms Folwell or on her behalf during the investigation and inquest, this period was not the focus of my investigation.
33. Similarly, there were no issues raised about the adequacy of the clinical management and care provided to Baby Emma at either Sunshine Hospital or RWH between her birth on 26 July 2011 and her death on 30 July 2011, and this period was not the focus of the coronial investigation.
34. The focus of the coronial investigation and inquest into Baby Emma's death was threefold and, although interrelated to some extent, each will be examined separately below:
    a. the adequacy of Ms Folwell's antenatal care after 33 weeks' gestation and, in particular, whether there was any opportunity for earlier intervention in relation to foetal growth restriction [FGR] and/or reports of reduced foetal movement [RFM];
    b. the adequacy of the clinical management and care Ms Folwell received from the midwifery and medical staff at Sunshine Hospital from the onset of labour to Baby Emma's delivery; and,
    c. the likely timing of Baby Emma's hypoxic-ischaemic injury.

ADEQUACY OF MS FOLWELL'S ANTENATAL CARE AFTER 33 WEEKS' GESTATION

35. WH offers a range of pregnancy care models depending on the woman's medical needs and her wishes.[66] In broad terms, the MGP model is one where a community-based midwife is the pregnant woman's primary clinician and obstetric review and/or referral to other specialists or hospital occurs when there is a medical need to do so.[67] Weekly meetings between midwives

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[66] See generally Exhibit N.

[67] See generally the WH Antenatal Clinic Guidelines (Exhibit N) and Exhibits E, F, O and V. In the absence of particular concerns, the MGP anticipates about nine antenatal appointments over the course of a pregnancy, with consultations with a midwife occurring every six-to-eight weeks to 24 weeks' gestation, monthly until 34 weeks' gestation, fortnightly to term and weekly thereafter. A morphology ultrasound is ordinarily scheduled around 20 weeks' gestation. Additional ultrasound investigations and other tests are scheduled by the midwife when these are clinically indicated by the presence of pre-existing or emergent risk factors or other concerns. See generally Exhibits P and N.

and the MGP practice manager facilitate caseload review and provide an opportunity to 'workshop' any clinical or logistical issues.[68]

36. The purpose of antenatal care is to monitor the progress of the pregnancy, clinically assess maternal and foetal wellbeing, review the results of any antenatal investigations, plan for the birth and provide a forum for the clinician to impart relevant information and the pregnant woman to raise any concerns.[69] Thus, at booking, the pregnant woman's family and personal medical history and previous antenatal history and current health are assessed along with the results of any initial antenatal investigations, to guide ongoing pregnancy care.[70] From about 20 weeks' gestation, a particular focus of antenatal appointments is the assessment of foetal health and development as indicated by auscultation of the foetal heart,[71] measurement of fundal height [FHM][72] and, particularly after about 30 weeks' gestation, discussion of foetal movements.[73]

37. Guidelines developed nationally[74] and at the institutional level[75] support[76] midwives' clinical decision-making in their role as the primary carers for pregnant women, including decisions

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[68] Transcript 367. I note that after almost a three-year investigation, the first mention of weekly MGP meetings occurred on day three of the inquest.

[69] Exhibit N.

[70] Exhibits N and P.

[71] According to the WH Antenatal Clinic Guidelines (Exhibit N), auscultation of the foetal heart offers no known clinical benefit to midwives and doctors, but is considered of psychological benefit to mothers. Nonetheless, it appears that baby Emma's heart rate was recorded at each antenatal appointment (see CB pages 73-92, Ms Folwell's Victorian Maternity Record [VMR]).

[72] Fundal height measurement [FHM] is a measure of the size of the uterus used to indirectly assess foetal growth and development during pregnancy. Fundal height is measured from the top of the mother's uterus to the top of the mother's pubic symphysis (junction of the left and right pubic bones). A tape measure may be used to measure fundal height or the examiner may use his/her fingerbreadths and knowledge of where to expect the fundal height to be at various weeks' gestation in relation to the woman's pubic symphysis, umbilicus or xyphoid process (lower tip of the sternum). FHM roughly corresponds to gestational age in weeks between 16 and 36 weeks' gestation; regression of fundal height may be observed after 37 weeks' gestation. FHM is subject to an inherent degree of inaccuracy due to its reliance on the examiner's ability to correctly identify the top of the fundus (intra-observer error) and inaccuracy due to differences in observations made by more than one examiner (inter-observer error). Maternal body type may also impede the accuracy of FHM.

[73] Foetal movements are a sign of foetal wellbeing and may be detected by a primagravida (a woman pregnant for the first time) from around 20 weeks' gestation and by a multigravida woman as early as 16 weeks' gestation. Each woman's experience of foetal movements is unique. Foetal movements may be detected on palpation of the abdomen by clinicians. Pregnant women will be asked to monitor foetal movements (or patterns of movements) between antenatal visits and are/should be advised to report any reduction in foetal activity and discuss any concerns about foetal movements with their clinician.

[74] Midwifery Guidelines (appended to Exhibit F). After Baby Emma's death, statewide guidelines concerning the management of obese pregnant women were published, see Exhibit I, Maternity and Newborn Clinical Network Statewide Clinical Guideline – Care of the Obese Pregnant Woman and Weight Management in Pregnancy, August

about when a woman in their care may need medical attention during pregnancy, labour, birth or in the post-natal period.

38. Three levels of consultation and referral are recommended to midwives in the Midwifery Guidelines, to be used either singly or in combination, when a 'variance from normal' arises during a woman's care.[77] The nature of the 'variance from normal'[78] determines the mode of escalation recommended, which range from discussion with a colleague,[79] consultation with a medical or other health professional[80] to referral of the woman to a medical practitioner or hospital.[81] The Midwifery Guidelines recommend that variances from normal and discussions and actions taken in response to them are clearly documented in medical records.[82]

39. Of particular relevance to Ms Folwell's antenatal management is the Midwifery Guidelines' recommendation that the midwife discuss with a colleague or consult a medical practitioner a patient's status as a grand multiparous woman and consult a medical practitioner where a 'size/date' discrepancy of FHM greater or less than 3cm from gestational age in weeks is discovered during pregnancy.[83] I note that the WH Antenatal Clinic Guideline applicable in 2011 required 'further assessment by an experienced midwife and referral for a growth

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2011. I note A/Prof Teale's evidence that clinical management of pregnancy among obese women at the time of the inquest in 2014 was quite different to that occurring prior to the guideline, that is, when Ms Folwell was pregnant with Baby Emma. In particular, the potential problems of obesity during pregnancy – including identification of foetal growth restriction – are now better recognised and practice has developed whereby clinicians actively look for FGR, and the guidelines have been interpreted as recommending obstetric review at 36 weeks' gestation: Transcript pages 116-117.

[75] WH Antenatal Clinic Guide (Exhibit N).

[76] I note that the guidelines contain a disclaimer stipulating that they are not intended to be prescriptive.

[77] CB page 57-19, Midwifery Guidelines, page 14.

[78] CB page 57-19, Midwifery Guidelines, pages 19-28. Variances from normal encompass specified pre-existing medical conditions or gynaecological disorders of the pregnant woman, previous complicated/adverse obstetric history (including grand multiparity), indications arising or discovered during pregnancy affecting the pregnant woman or the foetus (including 'size/date discrepancy'), indications identified labour and birth (including meconium stained liquor and 'confirmed' non-reassuring foetal heart patterns) and post-partum complications affecting either the mother or infant.

[79] Category A level of consultation and referral is to discuss the situation with a colleague – midwife and/or with a medical colleague or other health care provider; CB page 57-19, Midwifery Guidelines pages 14 and 17.

[80] Category B level of consultation and referral is to consult with a medical or other health care provider; CB page 57-20, Midwifery Guidelines pages 15 and 17.

[81] Category C level of consultation and referral is to refer a woman or her infant to secondary care (responsibility for maternity rests with a medical practitioner) or tertiary care (responsibility for maternity care rest with a team of health care providers in a specialised hospital); CB page 57-21, Midwifery Guidelines pages 16 and 17.

[82] CB page 57-19, Midwifery Guidelines, page 14.

[83] CB page 57-29, Midwifery Guidelines, page 24.

ultrasound scan if required' when a size/date discrepancy of 2cm is detected.[84] The significance of a size/date discrepancy is that it may indicate FGR.

40. Following a positive experience with WH's MPG when pregnant with her seventh son, Ms Folwell asked to be assigned a caseload midwife when she attended her antenatal booking appointment on 2 February 2011.[85] At booking, the clinician noted in Ms Folwell's Victorian Maternal Record [VMR] her age, unremarkable family and personal medical history, obstetric history indicating grand multiparous status, increased BMI (of 37) and the estimated date of delivery based on LNMP and the January 2011 ultrasound performed at her GP's request.[86]

41. In 2011, WH was in the process of implementing an electronic medical records system for mobile midwives to supplement the VMR which was retained by the pregnant woman and was, in the absence of any WH inpatient or outpatient record or test result, the only record of the pregnancy.[87] This document system was controversial among midwives at the time[88] and led some midwives to retain their own informal notes about their caseload patients and about antenatal progress when 'something occurred to warrant noting'[89] so that any issues could be discussed in the MGP's regular meetings.

42. No informal notes were reportedly made by the midwives involved in Ms Folwell's antenatal care[90] and the only records maintained by WH in this period were the March, May and June 2011 obstetric ultrasound reports.[91] Thus, given the midwives' lack of any independent recollection of antenatal appointments with Ms Folwell,[92] the VMR provides the only (contemporaneous) record of what occurred.

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[84] WH Antenatal Clinic Guide (Exhibit N).

[85] Transcript pages 21 and 33.

[86] CB pages 73-76, Ms Folwell's VMR.

[87] Transcript pages 339, 340, 342 (Budge) and 567 (Currie).

[88] Transcript page 343 (Budge) and 567 (Currie).

[89] Transcript page 344 (Budge); this approach to note-keeping appears to be endorsed by Ms Currie at page 566 Compare this to Ms Currie's contrary account, at Transcript page 652, when questioned by me, namely, that her usual practice is to make a note to reflect a discussion about a maternal report of RFM even if she had reached the conclusion that there was no reason for concern or further action/investigation.

[90] Transcript page 340 (Budge). I note that Ms Currie made informal notes following Ms Folwell's labour and Baby Emma's delivery (about those events), the existence of which emerged while she was giving evidence at inquest (Transcript page 569) and the notes themselves were ultimately tendered as Exhibit W.

[91] CB pages 63-73, Ms Folwell's Western Health Medical Records for the antenatal period.

[92] Transcript pages 339 (Budge) and 568-589 (Currie).

43. Professor Susan McDonald, an independent expert in Midwifery, observed that she would expect a midwife to maintain her own clinical records,[93] particularly in a group practice model of care, where the need to handover clinical information to other practitioners involved in the patient's care could be anticipated.[94] She commented on the 'paucity'[95] of the notes in Ms Folwell's VMR generally and characterised them as lacking in useful information and providing little indication about what discussions had actually taken place.[96]

44. Prof McDonald noted that there was no evidence in medical records that any consultation with a doctor had occurred in relation to Ms Folwell's moderate obesity and grand multiparity as recommended in the Midwifery Guidelines.[97] She considered that Ms Folwell's increased risk of gestational diabetes due to her high BMI was an additional indication for consultation/comprehensive screening by Glucose Tolerance Test [GTT], though one outside the guidelines.[98]

45. Prof McDonald noted that none of these variances from normal of themselves suggested that a midwife should not continue to provide Ms Folwell primary antenatal care.[99] However, given the accumulation of conditions, a discussion with Ms Folwell, a medical practitioner and any other relevant members of the maternity services team, and evidence of a plan of pregnancy care, should have been documented as part of the decision-making framework.[100] Prof McDonald noted that there was no evidence that any such discussions occurred or that Ms Folwell's suitability for midwife care was considered.[101]

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[93] Transcript pages 324 and 325.

[94] Transcript pages 326

[95] Exhibit L.

[96] Transcript page 269.

[97] Exhibit L and Transcript page 276.

[98] Exhibit L. Prof McDonald was critical of the midwives' failure to follow-up on Ms Folwell missing a GTT after agreeing to a referral for this test. The lack of follow-up was explained by Ms Currie as arising from her assessment that Ms Folwell's risk of gestational diabetes was 'low' (a view Prof McDonald disputed: only a normal BMI would have indicated Ms Folwell was at low risk of gestational diabetes). Prof McDonald testified that Ms Folwell's weight/high BMI warranted closer observation throughout her antenatal care, including pursuit of a GTT. She advocated weight monitoring during pregnancy for women with increased BMI, to monitor the health of the mother (Transcript page 295). There was some disagreement, particularly between Prof McDonald and A/Prof Teale about the value of monitoring the mother's weight during pregnancy as 'one factor in many to be considered in predicting FGR' (Transcript pages 291-292 [McDonald]; compare with page 197 [Teale]).

[99] Exhibit L and Transcript page 276.

[100] Exhibit L and Transcript pages 272-273.

[101] Exhibit L.

46. Ms Folwell provided an account of the antenatal care she received after 33 weeks' gestation in two of her three letters to the Court raising concerns about the management of her pregnancy and Baby Emma's delivery, those written in June and August 2012.[102] Ms Folwell explained at inquest that the impetus for those letters, which were lengthier and more detailed than her first letter, was initially a meeting with one of the Court's counsellors who had recommended that she elaborate and commit her concerns to writing.[103] She also acknowledged a need to 'vent'[104] and, as she sought to come to terms with the tragedy of Baby Emma's death, quite understandably, had researched hypoxic-ischaemic encephalopathy[105] and discussed the relationship between RFM and FGR with her family doctor.[106]

47. Ms Folwell testified that she had no concerns about the pregnancy before 34 weeks' gestation.[107] However, after that, during antenatal appointments in June and July 2011,[108] she told her midwives of her concerns that Baby Emma felt 'smaller'[109] than other babies she had carried and that she was not as active, not a 'thrasher like the boys'.[110] Ms Folwell felt she 'wasn't heard'[111] by the midwives when she raised these concerns.[112]

48. While she knew that midwives took measurements (FHM) during antenatal appointments, Ms Folwell did not appreciate their significance at the time and confirmed being reassured when she was told that the results of the June 2011 ultrasound were good.[113] Ms Folwell said she

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[102] Ms Folwell wrote to the Court on three occasions: 7 October 2011 (Exhibit A), 28 June 2012 (Exhibit B) and [date received] 16 August 2012 (Exhibit C). The first letter related to her concerns that Baby Emma had not been delivered by Caesarean section. The two subsequent letters raise concerns about antenatal care and, specifically, concerns reportedly raised by Ms Folwell during appointments with midwives that Baby Emma was 'small' and RFM and a chronology of events occurring between 24 and 26 July 2011.

[103] Transcript page 15.

[104] Transcript page 19.

[105] Transcript page 15; Ms Folwell researched hypoxic ischaemic encephalopathy [HIE] and something else which was not transcribed due to being inaudible on the recording of the inquest.

[106] Transcript pages 15 and 61.

[107] Transcript page 37.

[108] That is, 34-39 weeks' gestation.

[109] Exhibit B and Transcript pages 17 and 37.

[110] Exhibit B and Transcript pages 63, 68 and 67.

[111] Transcript page 17.

[112] Ms Folwell said that had faith in the midwives (Transcript page 18) but also that she did not feel that she could have consulted another midwife or medical practitioner if she was not satisfied that her concerns had been considered (Transcript page 17).

[113] Transcript pages 17 and 45-46.

was somewhat reassured[114] by the midwives' attribution of Baby Emma's different or gentler movements to her sex[115] but continued to report after 34 weeks' gestation that Baby Emma was 'not as active' as her brothers had been.[116] When it was put to her at inquest that her recollection of events – in particular her report of RFM after 34 weeks' gestation – had been influenced by information she had learned from her GP, the coronial brief and independent research conducted after Baby Emma's death, Ms Folwell said she did not know how to respond to the question.[117]

49. For their part, both RNM Currie[118] and RNM Budge[119] denied that Ms Folwell had reported RFM prior to 26 July 2011 or that Baby Emma felt small. To corroborate their accounts they pointed to the absence of any relevant note in the VMR.[120] The midwives testified that asking a pregnant woman about foetal movements is fundamental and a standard component of antenatal appointments[121] and, in common with other witnesses,[122] confirmed the significance of the pregnant woman's perception of them[123] to antenatal and perinatal management. They indicated that their usual practice, an approach endorsed by the other clinical[124] and expert

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[114] Compare Transcript page 23 (Ms Folwell was reassured) and page 63 (she did not believe the different movements she perceived were attributable to Baby Emma's sex).

[115] Ms Folwell testified that both Ms Currie (Transcript page 23) and Ms Budge (Transcript page 69) attributed concerns about Baby Emma's size/movement to her sex. The midwives denied the comments.

[116] Transcript page 67. It is implicit in Ms Folwell's evidence that she perceived Baby Emma's movements to be no different to her other babies' prior to 34 weeks' gestation; thereafter, she perceived that Baby Emma was not as active as she (or they) had been.

[117] Transcript pages 61-62 but see generally Transcript pages 58-63.

[118] Transcript pages 565 and 625.

[119] Transcript page 339.

[120] Transcript pages 566 (Currie) and 339 (Budge). I note that a document entitled 'Woman's & Children's Investigation Report: Folwell UR**', was disclosed to the parties and to the Court but not tendered as evidence, which was authored by Susan Gannon, WH's Divisional Director, Women's & Children's Services, and dated August 2011. The document was reportedly prepared at A/Prof Teale's request to investigate the management of Baby Emma's birth and make any recommendations to improve the midwives' clinical practice. Little was known of the status of the document or how the investigation was conducted. Ms Gannon was not called to give evidence. Of relevance here are the comments attributed to the various clinicians involved in the management of Ms Folwell's labour which appear to contradict accounts provided later in sworn statements. I note that witnesses to whom contradictory accounts were put at inquest denied that they had made the early inconsistent statements attributed to them.

[121] Transcript pages 567 (Currie) and 338 (Budge).

[122] Transcript pages 105-106 (Kay), 127-129 (Teale), 262 (Jacobs), 509 (Irshad), 206, 210-211, 232-233 (Tippett), 285, 286, 307, (McDonald), 471-472 (Hyett), 423-425, 443, 451 (White).

[123] The importance of the pregnant woman's perception of foetal movements is also emphasised in the WH Antenatal Clinic Guide (Exhibit N).

[124] Transcript pages 105-106 (Kay), 127-129 (Teale), and 262 (Jacobs).

witnesses,[125] was that if RFM is reported by a pregnant woman, it would raise a 'flag' for the midwife and prompt further discussion and/or investigation through clinical examination and/or referral for CTG, which would, in turn, lead to obstetric review.[126]

50. The impression left by the evidence of RNM Currie and RNM Budge was that *any* report of RFM would be documented in the VMR whether or not the concern proved to be well founded.[127] However, somewhat inconsistently, at various point in their evidence, both midwives, stated that comments, concerns or discussion points would appear in notes *if they thought it was worrying*; that is, only matters considered clinically ominous would be documented.[128] The only references in Ms Folwell's VMR to foetal movements were that they had been felt by midwives on examination at each antenatal appointment and, a comment made at the final review on 25 July 2011, that Baby Emma was 'active',[129] a matter to which I will return later.

51. RNM Currie testified that there was no evidence to suggest that Baby Emma was growth restricted.[130] She acknowledged the need to 'keep an eye on the size of the baby' and that it is more difficult to ascertain foetal size in women with high BMI.[131] RNM Currie followed the WH protocol for high BMI women by referring Ms Folwell for a third trimester ultrasound to monitor foetal growth.[132] That ultrasound, in June 2011 or 33 weeks and six days' gestation, confirmed that Baby Emma was biophysically well, with measurements consistent with the 65th centile for growth. It followed the earlier May 2011 ultrasound at 28 weeks and three days' gestation, which had placed Baby Emma on the 55th centile for growth.[133] RNM Currie, and RNM Budge, had been reassured by the results of each ultrasound.[134]

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[125] Transcript pages 206, 210-211, 232-233 (Tippett), 278-279, 285-286, 307, (McDonald), 471-472 (Hyett), 423-425, 443, 451 (White).

[126] Transcript pages 565-567 (Currie) and 339 (Budge).

[127] Transcript pages 652 (Currie) and 339 (Budge).

[128] Transcript pages 566 [c//f page 652] (Currie) and 344-346 (Budge).

[129] Ms Folwell's VMR.

[130] Transcript page 585.

[131] Transcript page 563.

[132] Transcript page 562 and Exhibit V. Ms Currie also referred Ms Folwell for a GTT as recommended by guidelines for women with a high BMI.

[133] See CB 67-72 (May and June 2011 ultrasounds) and CB 41-44 (Independent expert report of Dr Amanda Sampson, Radiologist).

[134] Exhibit V, Transcript page 374 and M Folwell's VMR.

52. At each antenatal appointment RNM Currie, and on one occasion RNM Budge, recorded FHM as an indirect measure of Baby Emma's size.[135] Notably, at 34 weeks' gestation, the FHM was 34cm, at 36 weeks it was 37cm (performed by Ms Budge), at 38 weeks the FHM was 36cm and at 39 weeks' gestation it was 37cm.[136] Though none of these FHMs fell within the three centimetre size/date discrepancy parameter set by the Midwifery Guideline, some met the WH Antenatal Clinic Guideline's two centimetre parameter, which recommends peer consultation or ultrasound investigation of possible FGR.

53. RNM Currie testified that she considered WH's more conservative guideline to refer to a discrepancy of two centimetres 'or greater'[137] and so did not consider there to be any indication for medical or other review.[138] Moreover, despite there being only a FHM increase of one centimetre in the three weeks' between 4 and 25 July 2011, RNM Currie insisted that she had not been concerned that Baby Emma's growth had plateaued because 'when [she] performed the abdominal palpation [she] felt that there was growth in that baby'[139] and so did not consider other options for monitoring her growth.[140]

54. It was evident at inquest that FGR is difficult to identify clinically, particularly when its onset occurs late in a pregnancy, as was the case here.[141] It is estimated that 40 per cent of severely growth restricted babies born in Victorian hospitals are not detected prior to birth at 40 weeks' gestation.[142] The screening tools available to detect FGR – FHM and ultrasound – have limited sensitivity and accuracy.[143] The accuracy of each is further compromised by maternal obesity.[144]

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[135] Ms Folwell's VMR.

[136] Ms Folwell's VMR.

[137] Transcript page 625. Ms Budge considered that a FHM discrepancy of 2 or 3 cm would be a variance from normal (Transcript page 372).

[138] Transcript page 625.

[139] Transcript pages 567 and 624.

[140] Transcript page 568.

[141] The risk of adverse outcome or death of the foetus from FGR also increases as the pregnancy advances and so delivery before 40 weeks' gestation is recommended.

[142] Transcript page 125 (Teale). A/Prof Teale produced (but did not tender) the Victorian Department of Health's 'Victorian maternity services performance indicators – Complete set for 2010-11 and 2011-12', published in 2014, from which the statistic is derived [available at www.health.vic.gov.au/maternitycare]. Other experts agreed with the estimated rate at which severe FGR is 'missed' clinically.

[143] See generally the comments made by A/Prof Teale, Dr Tippett and Profs Hyett and McDonald in their oral evidence.

[144] See for instance Transcript page 471 (Hyett).

55. Measurements of fundal height and ultrasound findings provide a snapshot of foetal development at a particular juncture and, of course, do not preclude disturbance of the developmental trajectory at a later point.[145] Overall, the accuracy of ultrasound measurements and FHM performed by an experienced clinician is estimated to be about 70 per cent.[146] Notably, when ultrasound measurements are inaccurate, for instance foetal weight estimated from ultrasound, they can be inaccurate by as much as 'plus or minus 20 per cent'.[147] The limitations of these techniques are often poorly appreciated by midwives and medical staff.[148]

56. RNM Currie testified that there was nothing in Ms Folwell's clinical antenatal course to justify referral to an obstetrician for review.[149] A/Prof Teale and Dr Bernadette White, the Epworth Freemasons Medical Centre Consultant Obstetrician and Gynaecologist retained by WH to provide an expert opinion about Ms Folwell's obstetric management, endorsed that view.[150] It was, however, a minority view among the experts who testified at inquest.

57. The weight of the expert evidence was that while Ms Folwell's antenatal management 'wasn't terrible,' it was 'suboptimal' and that an opportunity to intervene was missed.[151] Prof McDonald,[152] Dr Tippett,[153] the Court's independent Obstetric expert and Head of Maternal Foetal Medicine at Monash Health, and Prof Hyett,[154] an Obstetrician and Head of High Risk Obstetrics at the Royal Prince Alfred Hospital retained by Baby Emma's family to provide an expert opinion, each testified that obstetric review would have been appropriate, particularly in response to static FHM. Profs McDonald and Hyett explicitly disagreed with A/Prof Teale's view that it was only possible to conclude that the clinical evidence potentially

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[145] A number of the medical witnesses weighed the ultility of serial measurements and ultrasounds (see generally the evidence of A/Prof Teale, Dr Tippett and Dr Hyett). Dr Hyett was a notable proponent of taking a 'longitudinal' view of the clinical picture rather than a cross-sectional one (Transcript page 494).

[146] Transcript page 234. Dr Tippett provided an illuminating explanation of the features examined by ultrasound, how they are useful clinically and the limitations of the technology to detect FGR (Transcript page 206).

[147] Transcript page 225.

[148] Transcript page 234. A number of experts referred to the 'false reassurance' provided by, particularly, ultrasound findings. Dr Tippett and Prof McDonald notes clinicians' 'over-confidence' in their tools generally. Dr Teale characterised the June 2011 ultrasound as 'misleading' (Transcript page 150).

[149] Transcript page 620.

[150] See generally Exhibit F and Transcript pages 110-202 (Teale) and Q and Transcript pages 421-459.

[151] Transcript page 229 (Tippett).

[152] Exhibit L and Transcript pages 276-277.

[153] Transcript pages 218 and 230.

[154] Transcript page 464.

indicated FGR with the benefit of hindsight.[155] The experts agreed that Ms Folwell's pregnancy appeared to be progressing well to about 34 weeks' gestation.[156] However, by the 38-week appointment on 18 July 2011, notwithstanding the limitations of FHM and the reassuring June 2011 ultrasound, Prof McDonald, Dr Tippett and Prof Hyett opined that FHM demonstrated a variance from normal indicating a need for obstetric review.[157]

58. Prof McDonald, conceding that the variance detected was two centimetres not the three centimetres stipulated in the Midwifery Guidelines,[158] observed that while guidelines are important they should not supplant clinical judgment[159] and, notwithstanding a number of potentially benign explanations[160] for little difference in growth over a three week period, she would have been concerned enough to seek a medical opinion.[161]

59. Prof Hyett reasoned similarly,[162] adding that FGR is a relatively rare abnormality that is difficult to detect and so these factors, in combination with the known limits of the clinical skill set,[163] should lower the threshold for resorting to another method of assessing foetal size.[164] In such circumstances, presuming that potential indicia of FGR are 'features of normality' is not helpful.[165]

60. Dr Tippett considered it 'of concern' that no medical review occurred[166] given that midwives had identified and documented that there 'could be a problem, but then didn't translate that

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[155] Transcript pages 296 (McDonald) and 496, 498-499 (Hyett).

[156] Transcript pages 310-312 (McDonald) and 480 (Hyett) and Exhibit J.

[157] Transcript page 318 (McDonald), 205 (Tippett) and 464 and 506 (Hyett). Dr Tippett's opinion appears somewhat more equivocal by the end of her evidence. Unfortunately, she does not completely answer a question which would clarify whether, in the absence of a report of RFM by Ms Folwell, there was sufficient clinical evidence (ie FHM 'alone') to warrant obstetric review (see 218, 229 and 230).

[158] Transcript page 314.

[159] Transcript page 315. I note that Ms Currie used 'clinical judgement' to explain her non-compliance with the WH Antenatal Clinical Guideline and not seek review for a 2cm size/date discrepancy (Transcript page 568).

[160] Such as the foetus' head descending into the pelvis, reduction in amniotic fluid in the latter stages of pregnancy and inter-observer error (Transcript pages 317-318).

[161] Transcript page 318.

[162] Transcript page 497, 'Guidelines provide guidance to clinicians, clinicians examine patients' (Hyett).

[163] Transcript page 498-499.

[164] Transcript page 471.

[165] Transcript page 463.

[166] Exhibit J.

into action'.[167] I note that none of the experts went so far as to suggest unequivocally that the absence of obstetric review was *un*reasonable.[168]

61. Dr White did not consider that there was any reason to assume that obstetric review 'at any time in the third trimester' would have detected FGR when midwifery review had failed to do so.[169] Dr Tippett and Prof Hyett considered it likely that obstetric review would have led to an ultrasound and had that occurred at 38 weeks' gestation, FGR would likely have been detected.[170] In their view, Ms Folwell's management thereafter would have included frequent CTG monitoring and/or induction of labour pre-term.[171]

Ms Folwell's last antenatal appointment – 25 July 2011

62. Before moving on to the management of Ms Folwell's labour, I will comment briefly on the evidence in relation to the last antenatal appointment on Monday, 25 July 2011. Ms Folwell's evidence at inquest was that during that last appointment she told RNM Currie that she had been unwell on the previous day, that she had perceived Baby Emma's movements to be 'a bit slower', and had spent the day in bed.[172] She had attributed her ill health to being tired and somewhat anxious as she approached her due date, and having the care of seven children.[173] Ms Folwell said she had felt better on 25 July 2011. When cross-examined, she reiterated that she had reported her own ill-health and RFM but that the midwife did not write this in her VMR.[174]

63. RNM Currie denied that Ms Folwell reported feeling unwell on Sunday, 24 July 2011 when they met the following day.[175] She testified that on 25 July 2011 Ms Folwell had been

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[167] Transcript page 234.

[168] See for instance, Prof Hyett's comments at Transcript page 481. I note that all of the experts tended to couch their opinions in terms of 'I would have done …' rather than the less equivocal, 'In my opinion best practice requires …'. Not all experts were asked the same questions in the same terms. The multiplicity of variables 'put' to the experts in cross-examination often confounded the delivery of a clear and unequivocal answer to some questions.

[169] Exhibit Q.

[170] Transcript pages 231 (Tippett), 506 and 463 (Hyett), and Exhibits J and S.

[171] Transcript pages 231 (Tippett), 506 and 463 (Hyett).

[172] Transcript pages 75-76.

[173] Ibid.

[174] Transcript page 34.

[175] Transcript page 570.

excited about the birth and was looking forward to meeting Baby Emma.[176] She had made a corresponding note, 'All well, baby active. Waiting patiently,' in the VMR.[177] RNM Currie stated that Ms Folwell first told her that she had been unwell, in bed, and that the baby had been less active when they spoke by telephone on Tuesday, 26 July 2011.[178] At that point, though 'surprised' to hear Ms Folwell had been unwell on the Sunday, she had not queried her apparently inconsistent report during the intervening antenatal appointment, advising instead that Ms Folwell attend the hospital for CTG monitoring.[179]

64. Prof McDonald commented on the apparent incongruity of the accounts of Ms Folwell and RNM Currie of the content of their last antenatal appointment. She observed that it was counter-intuitive to believe that RNM Currie would have not discussed and noted a report of maternal ill-health and RFM if one was made.[180] Similarly, she found it difficult to believe that Ms Folwell, having been unwell and bed-bound, would have reported only that all was well the following day. The accounts are, unfortunately, irreconcilable.

ADEQUACY OF THE CLINICAL MANAGEMENT OF MS FOLWELL'S LABOUR

65. At 3.38pm on Tuesday 26 July 2011, Ms Folwell called RNM Currie[181] to report that 'things weren't right'.[182] She had experienced pains that did not feel like normal labour pains since about 11am and Baby Emma's movements had slowed.[183] At the time of the call, she was grocery shopping and testified that RNM Currie advised her to go home and relax, have a cold drink to stimulate foetal movement, and call back in an hour.[184] Ms Folwell telephoned RNM

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[176] Transcript page 631.

[177] Ms Folwell's VMR.

[178] Transcript page 631.

[179] Transcript page 631.

[180] Transcript pages 286-287.

[181] Ms Folwell produced one page of a mobile telephone bill for 22-29 July2011 on which she had highlighted calls made to Ms Currie, which was appended to Exhibit C. A call is logged to Ms Currie's mobile telephone number at 3.38pm on 26 July 2011.

[182] Exhibit B.

[183] Exhibit B and Transcript pages 29-30 and 79.

[184] Transcript pages 29-30 and 79.

Currie again at 4.32pm on 26 July 2011[185] and reported that there had been no improvement in her condition.[186] She was told to go to Sunshine Hospital.[187]

66. At inquest, RNM Currie testified that she only recalled one telephone call from Ms Folwell on 26 July 2011.[188] Her account of it is different to that of Ms Folwell. She confirmed that Ms Folwell reported RFM, denied advising Ms Folwell to have a cold drink and call back in an hour and testified that she asked her to come in for CTG review.[189] RNM Currie called the assessment centre of the birthing unit to advise staff to expect Ms Folwell.[190]

67. According to ANUM Kay, in 2011 caseload midwives were 'quite independent' in their management of their patients while in the birthing unit and would not necessarily 'tell you absolutely everything' about their patient.[191] She observed that training delivered since that time had improved collaboration between midwives, the ANUM and obstetric/medical staff.[192] In the absence of complications, midwives may be the only clinicians present during labour or delivery.[193] However, midwives would consult the ANUM or escalate obstetric concerns to the Consultant Obstetrician or Obstetric Registrar on duty if necessary. Once consulted, medical staff would expect to be involved in management of a labour to some degree thereafter[194] and in such cases clinical decision-making is led by the Consultant or Registrar.[195] Similarly, if medical staff have asked for an update from a midwife within a particular period and the update is delayed, the doctor would follow-up personally.[196] In

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[185] Appendix to Exhibit C. A call is logged from Ms Folwell to Ms Currie's mobile telephone number at 4.32pm on 26 July 2011

[186] Exhibit B.

[187] Transcript page 30. Ms Folwell stated that she told Ms Currie that she was 'coming in' whereas Ms Currie testified that she advised Ms Folwell to attend hospital for review.

[188] Transcript page 571.

[189] Transcript page 571.

[190] Transcript page 572.

[191] Transcript page 97.

[192] Ibid.

[193] Transcript page 521.

[194] Ibid.

[195] Transcript page 406.

[196] Transcript page 521.

2011, only medical staff could authorise a Caesarean delivery[197] and, once a decision for surgical intervention is made, delivery would ordinarily occur within about 20 minutes.[198]

68. At 5pm, Ms Folwell was admitted to the assessment centre by RNM Budge. She confirmed information the midwife had already been provided by RNM Currie, namely, that Baby Emma 'wasn't moving well' and Ms Folwell 'might be in early labour'.[199] RNM Budge applied a CTG to provide continuous external monitoring of the foetus and any uterine contractions. After a few minutes, she observed a deceleration of the FHR to 60bpm with good recovery associated with a mild contraction. Unsure whether this pattern on the CTG trace indicated that Ms Folwell was transitioning to the second stage of labour, RNM Budge consulted RNM Currie who had just become available to take over care.[200]

69. At about 5.10pm, RNM Currie performed a vaginal examination [VE] with Ms Folwell's consent to assess the progress of her labour. Ms Folwell's cervix was three centimetres dilated and effaced, with bulging membranes. The midwife estimated that Baby Emma's head was at station -2[201] and that the FHR was 140bpm. Contractions were irregular and mild and occurring at a rate of one every 10 minutes. RNM Currie concluded that Ms Folwell's labour was not established and birth was not imminent.[202] The midwife noted her observations in the medical record along with the reported history of 'tightenings' since 11am, with some stronger contractions 20-30 minutes apart during the day, and concern that Baby Emma's movements had decreased.[203]

70. The midwives continued to monitor the CTG trace for about five minutes after the VE before concluding that it appeared 'abnormal'[204] and characterising it, retrospectively,[205] as a 'sinusoidal pattern'.[206]

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[197] Transcript pages 407, 641, and 89-90.

[198] Transcript page 101.

[199] Transcript page 369.

[200] Exhibit O.

[201] The 'foetal station' refers to the position of presenting part of the foetus in relation to the mother's pelvis. 0 station refers to the foetus' head being even with the ischial spines (the narrowest part of the pelvis). The foetus is said to be 'engaged' when the largest part of the head has entered the pelvis. If the presenting part lies above the ischial spines, the station is reported as a negative number from -1 to -5.

[202] Exhibit V.

[203] CB 115 (reverse side), Ms Folwell's WH progress notes.

[204] Exhibit V.

71. RNM Currie went to the midwives' station of the birthing unit and reported the concerning CTG trace to Consultant Obstetrician and Gynaecologist, Dr Reena Jacobs, and ANUM Kay.[207] RNM Currie testified that she also told Dr Jacobs that Ms Folwell was 'para 8 and gravida 11,'[208] with a cervix dilated to three centimetres who had called her that afternoon complaining of 'heavy abdominal feelings since 11am' and RFM 'over the past few days since Sunday'.[209]

72. Dr Jacobs denied that RNM Currie had handed over Ms Folwell's report of RFM.[210] The Consultant said that if she had known this history, she would have called for a Caesarean delivery straight away.[211] When Dr Jacobs' evidence about the handover was put to her at inquest, RNM Currie commented that it was 'possible but very, very unlikely'[212] that she had failed to handover a history of RFM because providing a 'complete clinical picture' was her usual practice.[213]

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[205] There was some effort at inquest to determine whether anyone had used the term 'sinusoidal' to describe Baby Emma's CTG trace during the labour given that the term first appears in the medical notes in a retrospective progress note made by Ms Currie on 28 July 2011. Ms Currie thought she used the term when informing the consultant about the CTG trace around 5.30pm (Transcript page 573-574); Ms Budge testified that the term was never used in her hearing on 26 July 2011 (Transcript page 350); Dr Jacobs' evidence was that Ms Currie had not described the CTG trace as sinusoidal (Transcript page 250) and that she had 'missed' that it was 'sinusoidal' at the time (Transcript page 251); ANUM Kay did not consider the CTG trace to have a sinusoidal pattern because it improved after the artificial rupture of membranes' (Transcript page 88).

[206] Exhibit V. A 'sinusoidal' CTG pattern is described as a smooth, regular, wave-like pattern with a frequency of about two-five cycles per minute, a stable foetal baseline heart rate of 120-160bpm and no beat-to-beat variability. Sinusoidal CTG patterns indicate severe foetal hypoxia (among other things) and are associated with high rates of foetal morbidity and mortality.

[207] Exhibit V and Transcript page 573. Originally, Ms Currie had thought that Dr Irshad was also present during this handover but at inquest, conceded the possibility that Dr Irshad was not present when she first reported the abnormal CTG trace to the obstetric team around 5.25pm (Transcript page 575).

[208] Para is an abbreviation of 'parity' (the number of times a woman has given birth) and Gravida is an abbreviation of the term 'gravidity' (the number of times a woman has been pregnant).

[209] Exhibit V and Transcript page 573.

[210] Transcript page 242. Dr Jacobs stated that the only information handed over was that Ms Folwell was a multiparous woman in labour, who had seven previous normal vaginal births and had been experiencing abdominal pain and increasing contractions and that she seemed anxious and distressed (Transcript page 244).

[211] Transcript page 251-252.

[212] Transcript page 614.

[213] Transcript page 574.

73. I note that ANUM Kay testified that she was not informed of RFM by RNM Currie, but was just asked to look at the CTG trace.[214] The ANUM considered that the CTG trace was non-reassuring and was perplexed that the midwives 'didn't see the urgency of the situation' suggested by it.[215]

74. At about 5.25pm, Dr Jacobs attended Ms Folwell in the assessment centre. Upon reviewing the CTG trace she formed the opinion that it was 'abnormal'[216] noting in particular, that at about 5.02pm and again at 5.26pm there were decelerations of the FHR to 50bpm and, generally, that there was poor beat-to-beat variability.[217] She considered the CTG trace to be concerning but 'not terminal'.[218] At inquest, Dr Jacobs stated that 'on reflection,' the first 30 minutes of the CTG trace was 'sinusoidal', but she had 'missed it' at the time.[219]

75. The Consultant noted the midwife's VE findings and considered that delivery should be expedited.[220] Dr Jacobs took no history from Ms Folwell directly,[221] did not physically examine her,[222] nor did she make any notes in the medical record.[223] Her plan was apparently communicated only verbally, initially to those present, namely, the midwives and the ANUM.[224] Dr Jacobs' plan was to assess Ms Folwell's progress of labour by further VE, perform an artificial rupture of membranes [ARM] to 'check the liquor' and commence foetal scalp electrode [FSE][225] monitoring to 'confirm this was a poor trace'.[226] If the CTG trace

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[214] Transcript page 410 and 420. Ms Kay's statement (Exhibit E) suggests that Ms Currie's initial escalation of concerns about the CTG trace was to the ANUM who, in turn, escalated the matter to the Consultant. I note that this is the only account presenting this chronology.

[215] Transcript page 102.

[216] Exhibit K and Transcript page 238.

[217] Transcript page 239.

[218] Transcript page 240.

[219] Transcript page 251.

[220] Transcript page 238.

[221] Transcript page 243. Dr Jacobs conceded that she should have taken a history from Ms Folwell.

[222] Dr Jacobs conceded at inquest that she ought to have examined Ms Folwell herself – though at what point (initially or otherwise) is unclear (Transcript page 263). A/Prof Teale volunteers that the Consultant's failure to examine the patient herself is 'one of the difficulties' with Ms Folwell's management (Transcript page 179).

[223] See Ms Folwell's WH medical record.

[224] Transcript page 241, also Exhibits E, K, O and V.

[225] A foetal scalp electrode is placed directly on the foetal scalp through the cervix. It detects actual beat-to-beat electrical signals of the foetal heart to enable it to be monitored directly (as CTG monitoring of the FHR is sometimes confounded by maternal pulse).

[226] Exhibit K and Transcript page 240.

'continued to be abnormal', her plan was for a Caesarean delivery,[227] and in any event, did not anticipate that the decision as to mode of birth would be made more than 30 minutes after her first review at 5.30pm.[228] Dr Jacobs asked that Ms Folwell be transferred to the birthing unit and she and the ANUM went to the unit ahead of them.

76. RNM Currie reportedly queried Dr Jacobs' decision to proceed with an ARM and was told that its purpose was to obtain 'more information'.[229] Although checking the colour of the liquor was not unreasonable in her opinion, she considered it a 'waste of time'.[230] RNM Currie thought that Baby Emma needed to be born 'sooner rather than later,' and that a Caesarean section [C-section] delivery was most likely given that Ms Folwell was only 3cm dilated and 'not really in labour'.[231] For her part, Dr Jacobs perceived 'a little bit of obstructive behaviour' from the midwives directed at her for 'interfering in clinical management'.[232] It made her feel unwelcome and her job more difficult.[233]

77. In the birthing unit, ANUM Kay commenced the paperwork for a C-section delivery in case it was needed.[234] Dr Jacobs recalled waiting about 10 minutes in Room 4 for Ms Folwell to arrive, but she did not. She was informed via ANUM Kay that Ms Folwell was still in the assessment centre and the CTG transducers had been removed as she was using the toilet. Before Ms Folwell arrived in Room 4, Dr Jacobs was summoned to attend another patient.[235]

78. As she was called away, Dr Jacobs instructed the Obstetric Registrar, Dr Ghazala Irshad, to 'keep a close eye on' Ms Folwell because she, Dr Jacobs, was concerned about the CTG trace and if 'progress was not satisfactory, or if the trace continued to be bad,' she should expedite

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[227] Exhibit K.

[228] Transcript page 240.

[229] Transcript page 576.

[230] Transcript page 576.

[231] Transcript page 575.

[232] Transcript page 241.

[233] Transcript page 242.

[234] Exhibit E and Ms Folwell's WH medical record.

[235] Exhibit K. I note Dr Jacobs' evidence at inquest was that the 'main reason' she left was the 'unfriendly environment' (Transcript pages 263-264).

delivery with a C-section.[236] Dr Irshad's account is significantly different as will be seen below.

79. At about 5.40pm, Ms Folwell arrived in Room 4 and the CTG transducers were re-applied at about 5.44pm.[237] Preparations for the ARM and a potential Caesarean delivery occurred simultaneously.[238] ANUM Kay inserted a cannula, drew blood for matching and started a Hartmann's[239] infusion.[240] Contrary to Ms Folwell's evidence, ANUM Kay testified that she did not administer any drugs by syringe,[241] though may have 'flushed' the intravenous line with saline,[242] and that there was no Syntocinon[243] administered at that time.[244] Her account is corroborated by Ms Folwell's medications chart.[245]

80. At about 5.50pm, RNM Currie performed a second VE with Ms Folwell's consent. She noted that the cervix remained three centimetres dilated and effaced, Baby Emma's head was 1-2cm above the ischial spines and her heart rate was 142bpm.[246] The midwife performed an ARM, noting the presence of old, thick meconium[247] in the draining amniotic fluid. RNM Currie immediately went to the midwives' station and reported the presence of meconium in the liquor and a lack of progress of the labour to Dr Jacobs,[248] and, she believes, Dr Irshad.[249]

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[236] Transcript page 241. I also note Ms Kay's recollection that Dr Jacobs directed her and Dr Irshad monitor the CTG trace, though there is no indication as to what time this occurred (Exhibit E). Ms Kay said in her statement that Dr Irshad to re-examine Ms Folwell after 20 minutes and that she let to see other patients as there were two experienced midwives with Ms Folwell (Exhibit E). The last contemporaneous note made by Ms Kay in Ms Folwell's medical record is a note timed at 1835 of permission for a VE to be performed

[237] Exhibit V.

[238] Transcript pages 606-607.

[239] A Hartmann's solution is used to replace mineral salts and body fluids.

[240] Transcript page 92.

[241] Transcript page 414.

[242] Transcript page 419.

[243] Syntocinon contains oxytocin which is a human peptide hormone and neuropeptide that is used to facilitate childbirth and may be administered (at different rates) to induce labour or control post-partum bleeding.

[244] Transcript page 415.

[245] CB 121, Ms Folwell's WH Medication Charts.

[246] CB 116, Ms Folwell's WH Progress notes.

[247] Meconium is the earliest stool of a mammalian infant. Its presence in amniotic fluid is a sign of foetal distress.

[248] Transcript page 634.

[249] Exhibit V and Transcript page 635.

RNM Currie recalled no specific instructions at that juncture, beyond being asked to apply a FSE.[250]

81. Dr Irshad testified that she had been in the Emergency Department until about 6pm and so disagreed with RNM Currie's recollection that she was present in the maternity ward when the presence of meconium-stained liquor was handed over to obstetric staff.[251] By her account then, it was around 6pm that Dr Jacobs first gave her instructions about Ms Folwell's management.[252] The Consultant informed her that Ms Folwell was a 'multigravida with meconium-stained liquor' and that there were 'some decelerations' on the CTG trace.[253] Dr Irshad stated that the ARM had been performed, the Consultant was aware of what it revealed and had already determined how to proceed prior to her involvement in the case.[254] Her instructions were to 'keep an eye on Ms Folwell' and, if she had any concerns about the CTG trace, to call off the labour and proceed with a Caesarean delivery.[255] Dr Irshad testified that she was only 'actively involved' in Ms Folwell's management after 6.40pm when she performed a VE.[256]

82. Dr Jacobs' evidence was that Dr Irshad telephoned her to inform her that meconium was present following the ARM.[257] Although she did not say when this occurred, the Consultant stated that the Registrar also reported that the CTG trace had improved when the FSE was attached.[258] Dr Jacobs observed that meconium and an abnormal CTG is an indication for C-section delivery, but not meconium alone.[259] She remained concerned and told the Registrar that if there was a 'delay' in progress of labour, C-section delivery should still be

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[250] Exhibit V.

[251] Transcript page 533.

[252] Transcript pages 520, 526 and 530.

[253] Exhibit T.

[254] Transcript pages 514 and 532-533.

[255] Exhibit T.

[256] Transcript page 533.

[257] Exhibit K.

[258] Exhibit K and Transcript page 244. In terms of timing, it may be possible to assume that the communication occurred after 6.20pm when the first FSE was applied, and perhaps closer to 6.40pm, when Dr Irshad first examined Ms Folwell and reviewed the CTG trace.

[259] Exhibit K.

considered.[260] She directed that Dr Irshad perform a repeat VE in 20 minutes to see how labour was progressing.[261] I note Dr Jacobs' evidence that she had faith in Dr Irshad and the ANUM and, at the time, had been reassured by their assessment of the CTG trace.[262] With hindsight, the Consultant conceded that she ought to have 'stayed to make the decision'[263] herself, should have performed a VE herself[264] and reviewed the CTG trace again.[265]

83. These conflicting accounts give rise to the possibility that there was a decision-making vacuum at a critical stage of Ms Folwell's clinical management.[266]

84. At around 6pm, and also at about 6.05pm, 6.10pm and 6.15pm, the CTG trace demonstrates a loss of contact such that there is a gap in FHR monitoring.[267] At 6.10pm, Ms Folwell is noted to be toileting.[268] At 6.20pm, RNM Currie applied the first FSE.[269]

85. At about 6.30pm, the CTG trace showed a baseline FHR of 135-140bpm, with decreased beat-to-beat variability and variable decelerations. Ms Folwell's contractions continued to be mild and were occurring at a frequency of one every 10 minutes. RNM Currie formed the view that the CTG trace remained abnormal and telephoned Dr Irshad to request review.[270] Shortly thereafter, the midwife noticed that the FSE appeared to have fallen off.

86. At 6.40pm, Dr Irshad attended to examine Ms Folwell.[271] The Registrar performed a VE with consent, noting that the cervix was dilated to 5-6cm and was 90 per cent effaced and that Baby

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[260] Transcript page 245. I note Dr Jacobs' evidence (which is somewhat at odds with the previous transcript reference) that she had faith in Dr Irshad and the ANUM and, at the time, had been reassured by their assessment of the CTG (Transcript page 252).

[261] Transcript page 246.

[262] Transcript page 252.

[263] Transcript page 252.

[264] Transcript page 263.

[265] Transcript pages 256 and 246.

[266] On any view of the evidence, the known circumstances were that Ms Folwell had been in the maternity ward for about an hour, there had been a period of abnormal CTG trace, an ARM revealing meconium-stained liquor and two VE's demonstrating poor progress of labour and that birth was not imminent.

[267] Exhibit R.

[268] Exhibit R.

[269] Exhibit R.

[270] Exhibit V. Dr Irshad disputes this account.

[271] Transcript page 510. Dr Irshad stated that she was responding to Dr Jacobs' instructions to 'keep an eye on' Ms Folwell rather than either of the two summonses Ms Currie claims to have made around 6.30pm.

Emma's head remained at station -1 or -2.[272] The membranes were absent and a very small amount of meconium-stained liquor was draining.[273]

87. At 6.50pm, Dr Irshad applied a new FSE.[274] She also reviewed the CTG trace and while it continued to demonstrate reduced variability of the foetal heartbeat, Dr Irshad considered that it was 'comparatively better' than the trace reviewed earlier by Dr Jacobs.[275] She formed the view that there was no indication to proceed to Caesarean delivery as Ms Folwell's labour was progressing 'rapidly'.[276] She advised RNM Currie to continue to monitor the CTG trace and to call her if she was concerned.[277]

88. At 7pm, Ms Folwell's contractions had increased to two-to-three in 10 minutes and they were regular.[278] RNM Currie noted a deceleration of the FHR to 65bpm for about 30 seconds, which she characterised as abnormal.[279] The midwife summoned Dr Irshad to review the CTG trace.[280]

89. However, at about 7.05pm when Dr Irshad attended Room 4, Ms Folwell was in bathroom with diarrhoea.[281] The Registrar reviewed the CTG trace and noted two decelerations.[282] She indicated to the midwife that she wanted to perform a VE to determine the mode of delivery.[283] RNM Currie informed Dr Irshad that she could examine Ms Folwell when she had finished using the toilet and asked her to leave the room.[284] Dr Irshad testified to feeling

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[272] CB 116, Ms Folwell's WH Progress notes.

[273] Ibid.

[274] Exhibit R.

[275] Exhibit T.

[276] Ibid.

[277] Exhibit R and CB 116, Ms Folwell's WH Progress notes.

[278] Exhibit V.

[279] Ibid.

[280] Exhibit V. Dr Irshad testified (Transcript page 525) that she was summoned to attend by ANUM Ms Kay and so it may be that the request was relayed.

[281] Exhibit R and CB 116, Ms Folwell's WH Progress notes.

[282] Exhibit T.

[283] Exhibit T and Transcript page 514.

[284] Transcript page 515.

'frustrated' and 'blocked' by the midwife, but had not considered it appropriate 'in that environment' to order people (the midwife) around.[285]

90. Ms Folwell remained in the bathroom for much of the following 15 minutes.[286]

91. At about 7.15pm, the second FSE detached and RNM Currie informed Dr Irshad.[287] At that point, Ms Folwell's contractions were occurring at a frequency of three-to-four per minute and they were of moderate strength.[288] Baby Emma's baseline heart rate was about 130bpm.[289]

92. At 7.20pm, Ms Folwell reported having a strong urge to push and so returned to the bed for the birth.[290] At 7.21pm, RNM Currie examined Ms Folwell and observed Baby Emma's head on view. She called for assistance from other midwives and asked that a paediatrician to be summoned to attend the birth.[291]

93. At 7.26pm, Baby Emma was born in poor condition and resuscitation was commenced immediately.[292]

Expert Midwifery and Obstetric Evidence

94. Dr White's opinion about the adequacy of the management of Ms Folwell's labour contrasted sharply with those of the other experts, and even with the qualified views expressed by A/Prof Teale at inquest.[293] Dr White was alone in her view that the CTG trace, though 'unusual' and 'not reassuring,' was not sinusoidal or 'terminal' from the outset.[294] She did not consider the pattern sufficiently 'regular' to be characterised as sinusoidal and noted a 'couple of little

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[285] Transcript page 515.

[286] CB 116, Ms Folwell's WH Progress notes.

[287] CB 116, Ms Folwell's WH Progress notes. Ms Currie's contemporaneous note times the FSE falling off at about 7.19pm while in a retrospective note, Dr Irshad times her notification of the second detached FSE at 7.10pm.

[288] CB 116, Ms Folwell's WH Progress notes.

[289] CB 116, Ms Folwell's WH Progress notes.

[290] Ibid.

[291] Exhibit V.

[292] Exhibit V and Transcript page 97. I note Ms Folwell's emphatic statement (Transcript pages 54-55) that her daughter was born at 7.22pm, not four minutes later as recorded in medical records and clinicians' statements but do not consider the discrepancy to be material to the findings I am required to make in the coronial investigation.

[293] A/Prof Teale's views moderated somewhat between his statement (Exhibit F) and his evidence at inquest (Transcript pages 110-202).

[294] Transcript page 427-428.

accelerations' around the VE.[295] She opined that the pattern was not one that would necessarily warrant an immediate C-section delivery, even if it were accompanied by a report of RFM.[296] Dr White considered it appropriate to perform an ARM to expedite delivery as would be anticipated to occur in a multiparous woman.[297] She opined that at no time did the CTG trace or the progress of Ms Folwell's labour suggest that an immediate Caesarean delivery was necessary.[298]

95. A/Prof Teale was consistent in his opinion that the CTG trace was 'a terminal trace' from the beginning, such that the outcome for Baby Emma would have been the same even if she had been delivered earlier.[299] Prof Hyett described the CTG trace as 'abnormal at all times' and 'clearly pathological'.[300] Dr Tippett characterised it as 'abnormal and non-reassuring' from the outset and then 'classically' sinusoidal,[301] likening it to the 'shit traces' she uses for teaching purposes, described as such because she wants the clinicians who see such traces to react with expletives and take prompt action.[302] Prof McDonald was astonished by the lack of understanding of the severity of the trace and the need for urgent action on the part of the midwives and medical staff.[303]

96. Opinion was unanimous that the midwives acted appropriately by escalating their concerns about the CTG trace to medical staff when they did.[304] There was also a clear

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[295] Transcript page 429.

[296] Transcript page 453.

[297] Transcript page 456.

[298] Transcript page 457.

[299] Exhibit F. Dr Tippett agreed with this assessment of Baby Emma's likely clinical course (Transcript page 215). A/Prof was not critical of either the midwives or medical staff for not recognising the CTG trace as 'terminal' because he considered that the 'very short-lived' improvement of the trace after the ARM would have reassured clinicians, though perhaps more than it should have done (see his statement and Transcript page 174). I note that following a Root Cause Analysis conducted after Baby Emma's death, all staff involved in Ms Folwell's management undergo CTG interpretation competency assessment and that all clinical staff were to be reminded to maintain CTG interpretation competency (Exhibits F and G).

[300] Exhibit S and Transcript page 464.

[301] Transcript page 221-222.

[302] Transcript page 222.

[303] Exhibit L. Dr Tippett agreed that is was not clear that anyone, contemporaneously, appreciated the severity of the CTG trace (Transcript page 223).

[304] Transcript pages 281-282 (McDonald), 222 (Tippett), 464 (Hyett), and 178-179 (Teale).

acknowledgement from the experts that, in practical terms, once obstetric staff were involved, the midwives' ability to influence clinical decision-making is limited.[305]

97. Opinion was also unanimous that by 5.30pm, when the CTG trace was first reviewed by Dr Jacobs, there was adequate evidence that an urgent response was required.[306] Prof McDonald,[307] Dr Tippett and Prof Hyett all agreed that delivery should have been expedited at that time and that the most appropriate method of expedition was a Caesarean delivery.[308]

98. Prof Hyett observed that the abnormal CTG trace suggested a likelihood that Baby Emma was already hypoxic/acidotic and so he would have performed a Caesarean section.[309] However, as Ms Folwell was a multiparous woman and on the cusp of active labour, it was not unreasonable to consider whether it was possible to expedite delivery by induction of labour, but only if the presumption of foetal hypoxia had been rebutted.[310] If Ms Folwell's cervix had been sufficiently dilated,[311] foetal blood sampling [FBS][312] could have occurred to determine whether Baby Emma was acidotic.[313] Prof Hyett opined that in the absence of evidence of the foetus' wellbeing, and repeated FBS over the course of the labour, it was not reasonable to attempt vaginal delivery or anticipate a precipitate one.[314]

99. I note that notwithstanding his comments about specific decisions made by his medical staff,[315] during his evidence at inquest A/Prof Teale conceded that there was 'delay'[316] in

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[305] Transcript pages 281-282 (McDonald), 223 (Tippett), and 178-179 (Teale).

[306] Transcript pages 162 (Teale), 281 (McDonald), 215 & 222 (Tippett), and 464-465 (Hyett).

[307] Prof McDonald opined that it was not unreasonable to perform an ARM to check the liquor, however, as 'nothing changed' thereafter and in light of the presence of meconium, a Caesarean delivery should have occurred thereafter (Transcript page 282).

[308] Transcript pages 281 (McDonald), 215 & 222 (Tippett), and 464-465 (Hyett).

[309] Transcript page 465.

[310] Transcript page 465.

[311] The cervix was not sufficiently dilated for foetal blood sampling until about 6.40pm.

[312] Foetal blood sampling [FBS], using blood taken from the foetus' scalp capillaries, allows measurement of the lactate level in blood which is used as an indicator of foetal hypoxia. Lactate levels in FBS of less than or equal to 4.1mmol/L are 'normal', the range 4.2-4.8mmol/L is 'pre-acidotic' and values greater than 4.8mmol/L are indicative of acidosis, requiring immediate delivery of the foetus.

[313] Transcript page 466.

[314] Transcript page 476.

[315] A/Prof Teale made a number of concessions during the course of his oral evidence. He reluctantly conceded that there were some 'communication concerns' between midwifery and medical staff (Transcript pages 159-160). However, he noted that these had not impeded the midwives' referral of the concerning CTG trace to the Consultant Obstetrician (Transcript page 179). Thereafter, A/Prof observed that 'the decision was Dr Jacobs' to make' (Transcript

responding to the CTG trace and at 5.30pm he would have performed a VE himself and, if birth was not imminent, would have proceeded to theatre for a C-section.[317]

THE TIMING OF BABY EMMA'S HYPOXIC INSULT

100. During the inquest, obstetricians A/Prof Teale, Dr Tippett and Prof Hyett were asked to comment on the timing of Baby Emma's hypoxic injury. In doing so, each referred to analysis of umbilical cord blood sampled immediately after birth which reflects gas exchange between maternal and foetal circulation in the placenta perinatally and is used clinically to diagnose foetal metabolic acidosis, an indicator of significant foetal hypoxic stress.[318] Derangements from normal reference ranges of particular combinations of blood gas values in umbilical venous[319] and arterial[320] samples can suggest the origin of an impaired gas exchange and may also indicate whether foetal hypoxia was short-lived or prolonged.[321] A foetus can tolerate a degree of hypoxia/acidosis during labour and delivery without significant long term consequences. However, pathological acidosis – acidosis beyond which adverse clinical events have a strong probability of occurring, especially if accompanied by abnormal clinical findings at delivery – is indicated by umbilical artery cord blood pH[322] of less than 7.0 and a base excess[323] of less than -12mmol/L.[324]

101. A/Prof Teale testified that Baby Emma's normal pH at the time of birth 'precluded significant hypoxemia immediately preceding birth'.[325] He considered the low base excess value to be

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page 179). He concede that 'one of the difficulties of the case' was that Dr Jacobs did not perform a physical examination herself (Transcript page 179).

[316] Transcript pages 163.

[317] Transcript page 175.

[318] Independent Expert Opinion of Neonatologist Dr Philip Henschke dated 13 October 2014 [Henschke report].

[319] Acid-base status of blood sampled from umbilical venous blood predominantly reflects maternal acid-base status.

[320] The acid-base status of blood sampled from the umbilical artery predominantly reflects foetal acid-base status.

[321] Henschke report.

[322] pH is a measure of the acidity or alkalinity of a solution. A pH level below the normal reference range for umbilical arterial and venous cord blood samples among infants delivered at or close to term indicates respiratory/metabolic acidosis.

[323] Base excess is a calculated measurement of degree of alkalosis or acidosis. It increases or becomes more positive with alkalosis and becomes more negative with increasing acidosis.

[324] Ibid.

[325] Transcript page 144

evidence of compensation due to chronic oxygen deprivation.[326] Dr Tippett observed that on the basis of the 'pre-terminal' CTG trace on presentation at hospital, 'normal' cord blood at delivery and the brain injuries identified on MRI, it appeared that the hypoxic event did not occur around the time of Baby Emma's delivery,[327] indeed, the normal blood gasses at birth tended to suggest that the foetus had recovered from the hypoxic event metabolically by the time of delivery.[328] In contrast, Prof Hyett was concerned about the validity of the cord blood analysis given that the data were internally inconsistent, having features consistent with acidosis, such as low base excess, and other features, such as an apparently normal pH, that were not.[329]

102. At my request, Dr Philip Henschke, Neonatologist at the Mercy Hospital for Women, provided an independent expert opinion about the clinical significance and accuracy of the evidence of Baby Emma's umbilical cord blood analysis and the likely timing of the hypoxic injury she sustained. Dr Henscheke reviewed the umbilical venous[330] and arterial[331] cord blood samples that were collected after Baby Emma's birth and analysed at Sunshine Hospital.[332] He observed that while the venous cord gas parameters fell within the expected normal range, as the umbilical vein predominantly reflects maternal acid-base status it offered no assurance that the foetus was not subject to hypoxic-ischaemic stress.[333]

103. In contrast, Dr Henschke considered that some of the umbilical arterial cord blood gas values were well outside physiologically plausible parameters and were therefore likely to indicate a sample heavily contaminated by an air bubble or froth.[334] Given that the pCO_2 value for this sample was contaminated, he opined that it was not possible to consider the recorded arterial

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[326] Transcript page 139.

[327] Transcript page 211.

[328] Transcript page 212.

[329] Transcript pages 466, 470 and 504.

[330] Venous cord blood analysis returned the following values: pH 7.29, pCO_2 31, pO_2 45, HCO_3 14.6 and BE [base excess] -10.7mmol/L, extracted from CB page 144, WH Final Blood Gas report.

[331] Arterial cord blood analysis returned the following values: pH 7.30, pCO_2 21, pO_2 132, HCO_3 10.0 and BE -14mmol/L, extracted from CB page 144, WH Final Blood Gas report.

[332] CB page 144, WH Final Blood Gas report.

[333] Henschke report.

[334] Ibid.

cord pH of 7.30 as a reliable indication of foetal wellbeing during labour and delivery.[335] Nonetheless, citing clinical research literature, the neonatologist stated that the base excess value should still provide a reasonably reliable measure of metabolic acidosis.[336] Dr Henschke noted that Baby Emma's umbilical artery cord blood sample returned a base excess value of -14.0mmol/L and he concluded that even if the specimen was contaminated by air, the findings most likely indicated the presence of significant foetal metabolic acidosis around the time of delivery of a type associated with long term consequences like hypoxic brain injury.[337]

104. To formulate his opinion as to the possible timing of Baby Emma's hypoxic injury, Dr Henschke considered the ACOG Taskforce on Neonatal Encephalopathy and Cerebral Palsy criteria[338] for identifying an asphyxial event with intra-partem timing[339] in light of the available clinical, radiological and post-mortem histopathological evidence. He was unable to identify any obvious sentinel event occurring immediately before or during labour but noted that expert interpretation of CTG patterns identified significant pathological changes during labour.[340]

105. Dr Henschke expressed reservations about the accuracy of Baby Emma's Apgar scores but noted that she manifested symptoms consistent with moderate to severe neonatal encephalopathy within three hours of birth and other significant neurological abnormalities around seven hours of age. Although clinical literature indicates that the onset of neonatal encephalopathy clinically usually occurs within12 to 36 hours of the hypoxic-ischaemic event, Dr Henschke considered that such time frames were only approximate, not precise or specific,

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[335] Dr Henschke observed that clinical studies had demonstrated that contamination with air can result in the spurious lowering of pCO2 values and a concomitant spurious elevation of pH in cord blood gasses.

[336] Henschke report.

[337] Ibid.

[338] American Conference of Obstetricians and Gynaecologists Task Force on Neonatal Encephalopathy and Cerebral Palsy (ACOG Committee on Obstetric Practice 2005) identified the following criteria as collectively suggesting that an asphyxia event had an intra-partem timing (within 0-48 hours of birth): (1) A sentinel (signal) event occurring immediately before or during labour; (2) A sudden and sustained foetal bradycardia or the absence of foetal heart rate variability in the presence of persistent, late or variable decelerations usually after a hypoxic sentinel event when the pattern was previously normal; (3) Apgar scores of 0-3 beyond 5 minutes; (4) Onset of multisystem involvement within 72 hours of birth; and (5) Early imaging study showing evidence of acute non-focal cerebral abnormality.

[339] That is, within close proximity to labour and delivery, zero to 48 hours.

[340] Henschke report.

given the many gaps in scientific knowledge about the nature and progression of cellular injury secondary to hypoxia.[341]

106. Dr Henschke noted and deferred to Radiologist Professor Stacy Goergen's expert interpretation of MRI imaging Baby Emma's brain performed on 28 July 2011 at RWH.[342] Prof Goergen commented that based on the images she reviewed, the hypoxic event leading to the observed findings could have occurred as early as two-to-three days prior to delivery or as late as during the final stages of labour and delivery.[343] Similarly, Dr Henschke deferred to Dr Ratnayake's opinion that the ischaemic changes evident on post-mortem histological sections of Baby Emma's brain appeared to be of days' duration and had probably developed in the perinatal period.[344]

107. Dr Henschke concluded on the basis of all of the available evidence that the hypoxic event that resulted in severe brain injury most likely occurred within a time frame of zero to 48 hours prior to delivery.[345] He could not be more specific, but was confident that the initiating hypoxic event did not occur more than 48 hours prior to delivery.[346]

CONCLUSIONS

108. The standard of proof for coronial findings of fact is the civil standard of proof, on the balance of probabilities, with the *Briginshaw* gloss or explication.[347] The effect of the authorities is that Coroners should not make adverse findings against or comments about individuals in their professional capacities, unless the evidence provides a comfortable level of satisfaction

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[341] Ibid.

[342] Ibid.

[343] CB 54-75, Statement of Prof Stacey Goergen. I note that Prof Goergen was unable to be more precise about the timing of the brain injuries due to the limitations of the imaging technology (and she noted the echo time used was not that preferred for MRI studies in infants) and the rate of natural evolution of the changes that occur within the neonatal brain after a global hypoxic-ischaemic insult.

[344] Exhibit U.

[345] Henschke report.

[346] Henschke report.

[347] *Briginshaw v Briginshaw (1938) 60 C.L.R. 336 esp at 362-363.* "The seriousness of an allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of the consequences flowing from a particular finding, are considerations which must affect the answer to the question whether the issues had been proved to the reasonable satisfaction of the tribunal. In such matters "reasonable satisfaction" should not be produced by inexact proofs, indefinite testimony, or indirect inferences…"

that they departed materially from the standards of their profession and in so doing, caused or contributed to the death.

109. It is axiomatic that the assessment of clinical management and care must be undertaken strictly without the benefit of hindsight. The trajectory of a patient's clinical deterioration may well be obvious after the event. Patterns or causal connections that can be traced from the privileged position of knowing the tragic outcome, may not have been obvious or even appreciable before that outcome.

110. In terms of the circumstances surrounding the third trimester of Ms Folwell's pregnancy and Baby Emma's birth, the clinical management and care provided needs to be assessed against what was known, or should reasonably have been known at the material time, that is when the nursing/midwifery and medical staff were caring for Ms Folwell antenatally and during her labour.

111. Having applied the applicable standard to the available evidence, I find as follows:

    a. Ms Folwell was a 38-year old, grand multiparous woman with a BMI of 37. Notwithstanding her risk profile for complications during pregnancy and childbirth there is no evidence to suggest that she should not have received antenatal care through a midwifery group practice, 'all risk' model of care;

    b. The antenatal care provided to Ms Folwell until (about) 34 weeks' gestation was reasonable and appropriate;

    c. The performance of an ultrasound in June at near enough to 34 weeks' gestation was in accordance with the WH guidelines for high BMI women and the results were reassuring in terms of foetal growth;

    d. The lack of clinical response to the documented relatively static fundal height measurements between 34 and 38 weeks' gestation was suboptimal and amounted to a missed opportunity for obstetric review and, potentially, earlier intervention and a different outcome for Baby Emma;

    e. Record-keeping of Ms Folwell's antenatal care was suboptimal. While mothers may appreciate having a Maternal Health Record with basic details of their antenatal course as a keepsake, the practice of clinical staff relying on the record which remains in the possession of the mother is fraught and the details noted in it are inadequate as a clinical record of the antenatal care provided.

f. On 26 July 2011, Ms Folwell was appropriately asked by RNM Currie to attend Sunshine Hospital for CTG monitoring to assess foetal well-being in response to her report of reduced foetal movements made that day. I am unable to determine if Ms Folwell made an earlier report to RNM Currie of reduced foetal movements at her last antenatal visit on 25 July 2011 and if that report went unheeded.

g. Upon Ms Folwell's presentation to the assessment centre, the decisions made by the RNMs between about 5.00-5.25pm, to apply a CTG, perform a vaginal examination to assess labour and foetal well-being and then to continue to monitor the CTG for some minutes before referral for Obstetric input were reasonable and appropriate.

h. By the time of Obstetric review by Dr Jacobs at about 5.25pm, competent interpretation of the CTG trace in the context of all the circumstances should have led to expedited delivery. As Ms Folwell was not in established labour, for all her multi-parity, a delivery by Caesarean section was indicated.

i. Alternatively, at 5.25pm, artificial rupture of the membranes and the placement of a foetal scalp electrode to verify the abnormality of the CTG trace would not have been unreasonable so long as there was close Obstetric monitoring and a timely clinical response to any findings. In any event, by 6.00pm, there was ample justification for an emergency Caesarean section.

j. Irrespective of whether the decision to proceed to Caesarean section was made at 5.25pm or by 6.00pm, Baby Emma would have been born earlier than she was by between 60-90 minutes.

k. Taken as a whole, the evidence amply demonstrates poor communication, poor collaboration and poor documentation of Ms Folwell's labour and delivery by RNM and Obstetric staff involved.

l. The hypoxic event that resulted in Baby Emma's severe brain injury occurred within a window of zero to 48 hours prior to her birth and the evidence does not allow me to make a more precise finding as to the timing of the event.

m. Thus I am unable to make a finding that any of the inadequacies of clinical management or care provided to Ms Fowell caused or contributed to Baby Emma's death. While the evidence does not support a finding that it is probably so, it is not possible to exclude the possibility that earlier intervention may have led to a different outcome.

n. That said, the poor communication and collaboration between clinicians evident here, could well cause or contribute to adverse outcomes in other circumstances, and cannot therefore be condoned in the interests of future patient safety.

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

Baby Emma's parents

Western Health, c/- TressCox Lawyers

Royal Women's Hospital

Dr Christine Tippett, Obstetrician/Gynaecologist

Dr Stacy Goergen, Radiologist

Professor Susan McDonald, Professor of Midwifery, La Trobe University

Dr Amanda J. Sampson, Radiologist, Women's Ultrasound Melbourne

Dr Phillip Henschke, Neonatologist

Consultative Council on Perinatal Morbidity and Mortality

Coroners Court of Victoria

Signature:

PARESA ANTONIADIS SPANOS
Coroner
Date: 30 January 2017