IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2012 / 0293

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)

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

Inquest into the Death of: CAROLINE EMILY LOVELL

Delivered On:	24 March 2016
Delivered At:	Coroners Court of Victoria 65 Kavanagh Street Southbank Vic 3006
Hearing Dates:	Over 13 days on the 27 February 2014 and between the 10 to 18 June 2014, and 17 to 20 March and on 27 May 2015.
Findings of:	Peter White, Coroner
Representation:	Mr R Harper of Counsel for Gaye Demanuele Mr S Cash of Counsel for Melody Bourne Ms Symons, and Mr J Larkins and of Counsel, for Nicholas Lovell Mr M Magazanic Solicitor for Jade Markiewicz, Caroline Lovell's mother Ms S Hinchey of Counsel now Her Honour Judge Hinchey, for Ambulance Victoria
Police Coronial Support Unit:	Sergeant Tania Christiano, assisting the Coroner

I, Peter White, Coroner, having investigated the death of CAROLINE EMILY LOVELL

And having held an inquest in relation to this death between the 10th to the 18th of June 2014 and the 17th to the 20th of March 2015,

At Coroners Court, Southbank

Find that the identity of the deceased was CAROLINE EMILY LOVELL

And the death occurred on 24 January 2012

At the Austin Hospital, 145 Studley Road, Heidelberg, Victoria 3084

In the following circumstances:

1. Caroline Lovell (Caroline) was a 36-year-old female who delivered a healthy baby girl by vaginal delivery, on the morning of 23 January 2012 in a birthing pool in the lounge room of her Watsonia home, where she was attended by two midwives. Prior to her delivery, she had not engaged in regular antenatal care with neither a series ultra sound nor on-going medical reviews, undertaken.

2. She had one previous child, a daughter Y, born at the Geelong hospital some two years earlier, after which she had experienced a Post-Partum Haemorrhage, (PPH). That event significantly increased the risk of similar difficulty in any subsequent delivery.[1]

3. From a note believed to have been made contemporaneously it is accepted that baby (X) was born at 8.52 am, in the birthing pool.

4. Thereafter in notes made later that afternoon by midwife Gaye Demanuel (Gaye), in consultation with her colleague Melody Bourne (Melody), it was suggested that Caroline remained in the birthing pool until 9.50 am, whereupon she lost consciousness (or *fainted* as described by Gaye), as she stood up to get out of the pool, with her heart rate measured at 88, and her blood pressure thereafter measured for the first time following birth, at 80 and 85/50.

5. See also comments made by the midwives to Paramedic Maree Daley at the Lovell home referred to below, where it is alleged the midwives told her that no blood pressure or pulse were taken at the scene, and the further evidence of Mercy Consultant Obstetrician Dr Petterson, who attended at the Austin Hospital ED, where she states that Mercy Hospital Medical Registrar Adam Pendlebury, who also attended at the Austin Hospital and collected information from the *two midwives present,* was told that,

[1] See clinical notes concerning birth of Y at Exhibit 21, 204.6 and Caroline's PPH with an estimated 600 ml blood loss, before suture. See the analysis of the significance of this previous PPE in the evidence of Professor Susan McDonald, set out below.

She'd had a child before, "normal delivery 3 years ago. Normal deliver(y) at 8.52 am following onset of labour in the morning. Midwife... reports uterus well contracted with physiological (indistinct)... Syntocin 10 units given at approximately 1 hour after birth," which is almost an hour after the birth- *was hyperventilating at about 10.55 am. "Then she had a maternal collapse."*

She had a heart rate of 88 and blood pressure of 90 on 50. CPR commenced.[2]

6. Returning again to the notes later prepared by Gaye in consultation with Melody, it is suggested there that the placenta was delivered at 9.57 am (i.e. after leaving the pool) and that Caroline's total blood loss into the pool was no more than 400 ml.

7. It is established from the 000 Chronology Report Event exhibit 12(c), that a call was made to 000 at 10.27.55 and from the MICA electronic Patient Care Report exhibit 5(d), and that the MICA vehicle was dispatched at 10.30. At 10.33.32 the Chronology Report indicates the dispatcher informing the MICA officers that breathing has slowed right down. Counting consistent with the administration of CPR can be heard from 10.37.48. At 10.38.54 the ESTA 000 chronology informs the MICA officers that Caroline has earlier gone into cardiac arrest, with no specific time for that event provided.

8. MICA Officers arrived at the scene at 10.39 am and commenced their attempts to secure her resuscitation.[3]

9. Caroline was subsequently removed, at 12.02 pm, (some 83 minutes later), to the nearby Austin Hospital where she was met by a team of experienced consultants and medical officers, and given a massive transfusion of blood products of approximately 5 litres, with uterine bleeding continuing during which, at part of retained placenta was found and removed.

10. She became coagulopathic with multi-organ failure and disseminated intravascular coagulopathy, (DIC). There was hypoxic brain injury with a grossly abnormal ECG, ischaemic hepatitis, acute renal failure and respiratory distress syndrome, with persistent bleeding despite the transfusion of blood and blood products platelets and prothrombin

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[2] See exhibit 16 the statement of Maree Daley and transcript 932, the evidence of Dr Petterson and also exhibit 3(c), the transcript of the 000 call made at 10.27.55 by the doula, Carmen Bulmer, and later midwife Melody Bourne. The estimates of time and vital sign reading prior to 000 report to AV, are discussed below under Findings.

[3] See AV Electronic Patient Care Report at exhibit 21 page 2-48. See also under Findings below, as to sequence and timing of events prior to 000 report to AV, and as to the time of onset of cardiac arrest.

concentrate. Caroline passed away at 0.30 am on January 24, 2012, and at that time, the clinical impression was that her cause of death was post-partum haemorrhage, (PPH).[4]

11. I deal with the evidence concerning these matters below.

Purpose of a coronial investigation

12. The purpose of a coronial investigation is to ascertain if possible the identity of the deceased person, the cause of death and the circumstances in which the death occurred.[5] In the context of my investigation into Caroline's death, it is the medical cause of death, which is important including the mode or mechanism of death, together with the context or background and the surrounding circumstances of death, which are sufficiently proximate and causally relevant to the death.[6]

13. The broader purpose of a coronial investigation is to contribute to the reduction of the number of preventable deaths through the findings of an investigation and the making of recommendations by coroners, a matter generally referred to as the prevention role. Coroners are also empowered to comment on any other matter connected with the death, including public health, or safety or the administration of justice. These are effectively the means by which the prevention role may be advanced.

The Investigation

14. This finding is based on the totality of the material the product of the coronial investigation into Caroline's death. That is, the brief of evidence prepared by Senior Constable Shane Lynch, with additional statements obtained by the Police Coronial Support Unit and my solicitor Ms Iona McNab, 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 will remain on the coronial file. In writing this finding I do not purport to summarise all of 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.

The issues

15. Following an initial review of the brief prepared in this matter and after considering the response from various interested parties to questions relating to the actions of both the

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[4] See Autopsy report at exhibit 11 page 12, and the evidence of Dr Petterson from transcript 921.

[5] See Section 67(1) of the Coroners Act 2008.

[6] See Harmsworth v the State Coroner (1989) VR 989.

midwives and the Ambulance Victoria (AV) officers attending on Caroline, the Court identified a number of issues, which required further investigation. Among other matters the Court sought additional detail on the exact length of time Caroline remained in the pool following the birth, and why vital signs were not documented after the birth, and why there was a delay in management of the third stage of birth, given Caroline's PPH history.

16. Dr Campbell a Consultant Obstetrician, and Professor McDonald, the Latrobe University Professor of Midwifery, who both provided expert opinion on the actions of the midwives, reviewed these responses.

17. Additional information was also sought as to the basis for estimations made of the total blood loss into the pool, and from the AV paramedics in regard to the reasons for the time taken at home, before transportation to the Austin Hospital took place.

18. Professor Rachford the Medical Director of Ambulance Queensland, also reviewed this material and provided his expert opinion on the actions of the paramedics.

19. Ultimately, the inquest focused on the following issues;

    i. The cause of death.

    ii. The knowledge of Caroline's previous history of PPH, and the clinical risks associated with home birth.

    iii. The non-recognition of her clinical deterioration.

    iv. The failure to document post-partum vital signs and observations.

    v. The length of time spent in the birthing pool following the birth and the failure to actively manage the third stage of birth.

    vi. The appropriateness and timing of the midwives response. [7]

    vii. The appropriateness of the timing of the removal of Caroline by Ambulance Victoria, to the Austin hospital.

Evidence concerning the circumstances of the home birth

Dr Bevz [8]

20. Caroline first attended at the Andrew Place Clinic on 6 December 2010, where she saw Dr Bevz. After discussing her history, which included a history of hospital admission for

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[7] See exhibit 2(d), The Australian College of Midwives Guidelines for Consultation and Referral.

[8] Dr Bevz

psychosis, she discussed the difficulties she was anticipating in having to face the Christmas period. She was prescribed valium, to assist sleeping. According to Dr Bevz, Caroline did not display any evidence of mental illness or of anxiety, and his colleagues also did not express any such concerns.[9]

21. Caroline was later seen on several occasions at the practise over the next several months, by Dr Bevz and his practise colleagues. Her medical records inform that these visits included a pap smear, a preconception blood test, a preconception pelvic ultrasound for a uterine fibroid, and discussion concerning her intention to have a home birth.

22. She became pregnant during 2011, and repeated her intention about having a home birth. She was offered alternative options on four occasions, including obstetrician care, while being made aware of the risks of home birth. During this time, she requested monitoring of her iron deficiency and borderline anaemia, but declined any other medical intervention.[10]

23. On November 16, 2011, Caroline again saw Dr Bevz. Dr Bevz noted that she cut her off and didn't want to talk about further testing but was purely there for a full blood examination and iron studies. Had Caroline not so responded he would have advised her to undertake serial antenatal blood monitoring. She would also have recommended ultra sound testing to assess for any potential complications. His further testimony was that such care was routine during early pregnancy and could only be ordered by a Doctor. She also stated that care during the later stages of pregnancy, would normally be taken care of by a specialist. She did not ask to speak with Caroline's partner. Her iron study ferritin level was 9, which was within the normal range.

24. On November 22, 2011, Caroline attended the practise and saw a Dr Kelly. She was found to have an iron deficiency arising from her only taking, *one tablet intermittently*, and was advised in relation to that matter. She was also offered a test for thalassemia.[11] She stated that she had had such a test previously, which was negative, and declined the offer of a further test.

25. Dr Kelly's note also recorded that her,

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[9] Transcript 32.

[10] See exhibit 1.

[11] Transcript 27. Thalassemia was described by the witness as a genetic condition, an abnormality of the haemoglobin which transports oxygen around the body, which can be severe depending upon the genes of both parents.

Blood pressure well controlled. And that she was worried about the pain connected with birth and that the last birth was, Vagina with epidural and vacuum. Aware of other options than homebirth and, Very sure she wants to do this.

26. And then in handwriting the words, *retained placenta,* which words were not part of the original type written recording, and for which inclusion Dr Bevz could offer no explanation.[12]

27. Caroline did not ask Dr Bevz to meet or to speak or confer with her midwives, and they never made contact with her.

28. Dr Bevz agreed with Counsel for Gaye that PPH had been discussed with Caroline, and that she had chosen homebirth having been told of that risk.[13]

Gaye Demanuele

- Relevant medical history

29. Gaye Demanuele (Gaye) testified that at the time of Caroline's second pregnancy, she was a registered midwife with a graduate diploma of midwifery and a diploma of applied science, nursing.[14]

30. Gaye stated that the Barwon Health medical records shown to her by Caroline were incomplete:

There was no antenatal Intrapartum or postnatal notes, there was no discharge summary. There were operative reports; there were pathology reports and ultrasound reports.[15]

31. She stated that she went through every document that Caroline handed her. She told Caroline the discharge summary from Barwon Health would be useful to view, but did not ask her to

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[12] Transcript 26.

[13] Transcript 38.

[14] Transcript 143. I note here that both midwives successfully applied for Certificates under section 57 of the Coroners Act 2008, which applications were granted after I determined that they both had reasonable grounds to object to providing testimony, on the basis that such evidence may tend to self incriminate. Both witnesses then elected to testify, and the use for which that testimony might or might not be used was then explained in accord with Section 57. Transcript page 13.

[15] Transcript 137. The underlining is mine. I am satisfied that the words "*They were*" recorded at transcript page 137 line 4 of the transcript is either incorrectly transcribed or not intended, and that the words used or intended were, "*There were ...operative reports...etc*" In testimony Gaye was asked to review the Geelong Hospital file which was a part of Exhibit 21. See also exhibit 3(b) which sets out the two documents she agreed that she had been shown and reference to the great many others that either she could not remember seeing, or believed that she had not been shown.

obtain it.[16] Nor did she seek it herself. She thought Caroline was *a good historian* and that they,

> *explored the details of her birth experience in great depth.* [17]

32. According to Gaye she did not know about the earlier PPH as Caroline did not know about it herself.[18] I also note however that Gaye's testimony was that Caroline did tell her about *a second degree tear, which was sutured,* and that this fact was not recorded by Melody Bourne who was filling out the antenatal booking form.[19] I further note the evidence concerning the potential seriousness of a second degree vaginal wall tear as testified to by Dr Campbell, which is set out below in the summary of his evidence.

33. Gaye recalled that the midwifery arrangement was that Melody would do many of the visits, and she would do some of the visits and they would both attend the birth. She stated that Melody was moving from being a secondary midwife to a primary midwife and that they were sharing the primary midwife role. Melody and Gaye had attended 20 births together. Gaye was the primary carer for 19 of the 20. I note that Gaye's evidence was that she did not believe that the arrangement was hierarchical, with each mid wife being a midwife in their own right.

> *She looked to you to make primary decisions in regard to clinical decisions, is that true or not true? A. Melody did say that, that's true.*
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> *Was that statement truthful? A. It's her truth. I viewed it, as we would always talk through these decisions if they were needed to be made. Obviously in an emergency situation, I did take the lead. Was that the case in the birth of X Lovell? A. Yes – not in the birth, in the events that happened post birth... yes.* [20]

Gaye further testified that she was aware of the earlier blood test levels and was concerned that the Hb and ferritin levels were borderline low. After the second blood test results at 32 weeks, she stated that she recommended to Caroline that she have iron stores and a full blood

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[16] Transcript 143-45.

[17] Transcript 145.

[18] See Nick Lovell's similar evidence. See also Caroline's letter to Dr Francis of Geelong Hospital dated 11 November 2008 at exhibit 4(e), in which she writes of her retained products of conception (RPOC) with an *8x6x3 cm placenta tissue,* remaining in her uterus after the birth. I note that she goes on to lodge certain complaints about the management of Y's birth, but does not refer to a PPH.

[19] Transcript 145-46. The matter of Gay's prior knowledge of an earlier level 2 tear which required suturing is discussed below under Comments.

[20] Transcript 147-50.

exam again but her evidence was that Caroline did not choose to do that, as she said that she was feeling the best she had all pregnancy, and was taking her iron supplements. That conversation was also not documented.

In response to further questions from Mr Cash for Melody, Gaye testified that when she saw the records from Geelong Hospital she knew it was not a complete record because it did not include the obstetric history and the discharge summary.[21] Gaye additionally agreed that exhibit 21 and specifically the notes at 204.6 dated September 2008 indicate that Caroline had suffered from a PPH, with a blood loss estimated at 600 mls, at the birth of her first daughter. She stated that she was not aware of this history. Her further evidence was that she was not aware of placenta accreta during Caroline's first delivery, which would have required an automatic referral to an obstetrician. She retained only small pieces of placenta, and the protocol did not refer to retained products that require a D&C, at a later stage.[22] Gaye did not try to contact Caroline's GP, at any time throughout the pregnancy. There was no record of Gaye having requested or of Caroline having given her consent for Gaye to speak to other medical professionals about her medical information or history.[23] Caroline informed Gaye of her RPOC, (retained products of conception).[24] Gaye was aware of the earlier fibroid but, in the circumstances it did not cause concern.[25]

34. Again, according to Gaye, they discussed having an ultrasound and Caroline decided not to have one as she was concerned about the effect of an ultrasound on her foetus.

> *We discussed the very rare scenarios of things like cord prolapse, blood loss during the labour, that would need to be referred straight – the woman would need to go to hospital. We discussed shoulder dystocia, and postpartum haemorrhage and of course a particular focus for Caroline was aware she had had retained products previously and*

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[21] See exhibit 21 the medical records including those from Geelong Hospital. See also exhibit 3(b), which is a record of the page numbers x 2, (both relating to the two following D&C procedures), from the Geelong Hospital record within exhibit 21 that Gaye had a recollection of seeing, as opposed to the 20 documents she claimed not to have seen, and the 90 odd she could not recall seeing.

[22] See however the evidence of Melody and her notes of *placenta accrete*, at the booking meeting, as discussed at para 100 below.

[23] Transcript 161-64. Caroline had been in contact with a Dr Francis of Geelong Hospital, concerning matters related to the birthing process, she had experienced at Geelong Hospital.

[24] Transcript 151-59. And the Pregnancy Booking Form, at exhibit 2(c)

[25] Transcript 169-70.

how we might do – what strategies we might do to prevent that but there was still a possibility that could happen again and what we would do about that.[26]

35. She did not discuss plans with Caroline such as what would constitute an emergency situation, and what the first line emergency treatment would be and when and in what circumstances the need to call an ambulance might be determined. Some hospitals are offering back up bookings, but with catchment areas that do not cover the whole of Melbourne. In Gaye's view, even though the facility for a back-up booking was not available, this was not a circumstance that should have persuaded them against a home birth. [27] She further denied that Caroline's decision to have a home birth was a political one.[28]

- Management of the birth

36. In relation to taking Caroline's blood pressure, she did not agree with Consultant Obstetrician and Court appointed expert witness Dr Campbell, that blood pressure needed to be taken after 15 minutes following birth and then every 15 minutes thereafter.

37. She preferred to allow the mother and baby to bond unless there was a good reason for disturbing them. She considered taking the blood pressure between one and six hours after birth was appropriate.[29]

38. It was also not uncommon in her experience for the mother to wait up to 30 minutes before birthing placenta after a separation bleed, especially if bonding with the baby.[30]

39. Her further testimony was that there was no need to examine the perineum if there is no excessive blood loss (as here). *You would usually only do it after the birth of the placenta unless you have an indication for concern.*[31]

40. Gaye later testified that the bluey was placed in position to assist her to make a judgement about blood loss. She did not change the bluey before the paramedics arrived. The bluey had been placed on carpet. It did not stain the carpet.

41. Gaye was then asked about the impact of blood loss.

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[26] Transcript 166.

[27] Transcript 168.

[28] Transcript 169.

[29] Transcript 171. See also Melody's evidence below.

[30] Transcript 172.

[31] Transcript 276.

At around 800 mls of blood loss depending on the condition of the person, you would probably feel faint...If it was a rapid loss you would feel quite unwell. Gaye then offered in evidence a series of pictures of an apparently bloodied birthing pool headed, Estimating Blood Loss.[32]

42. While noting that the pool liner in the exhibit was a different colour to the pool liner in the pool used by Caroline, Gaye estimated by reference to the exhibit, that when Caroline was taken from the pool she had lost a total of 365 mls of blood, with the blood being dispersed by her movement, through the water.[33] Her later estimate was that only 300 mls was lost into the pool, with the other 100 mls, lost following the birth of the placenta, which took place after she was lifted out of the pool.[34]

43. Gaye additionally testified that,

So having attended many water births, the visual appearance and again the NHS guidelines from the UK describe care of a woman following water birth and blood loss in the water and they describe where the water is still translucent and you can clearly see the woman's body through the water, that the blood loss is less than 500 mls. Of course considering the clinical picture of the woman...

Coroner: Exactly, but what I'm suggesting is that there are variables that would have to be applied in any assessment of this matter and that given 500 mls is such a small quantity given the volume of these pools, I just don't understand how it's practicable to be able to make an assessment of when the magic figure of 500 mls has been reached?

A There's no absolute accurate way to measure blood loss either in water or on land. The only way to accurately measured is in caesarean section when you're using suction and collecting it in a canister. There are numerous studies on estimating blood loss and I stress the term estimating because that's the term that's used, estimated blood loss.

So there is no accurate way, in or out of water, they're indicators of what's appropriate and what's not and you must always assess the clinical picture of that particular woman

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[32] Transcript 281-82 and exhibit 3(e).

[33] Transcript 284.

[34] Transcript 286.

and how the blood loss is affecting her, because any woman having just given birth has the potential to lose too much blood.' [35]

44. An examination of the perineum and the vagina was planned, but did not occur due to the events that unfolded.

I was observing for blood loss but Caroline-it's not actually-unless there's a large amount of blood or there's a lot of pain, it's not absolutely necessary to examine the woman's vagina or perineum immediately after the birth of the placenta, that's practiced in a hospital but during a home birth there's time to wait until the woman is ready to do that. So if there's no excessive blood loss and the woman is not expressing any distress about a tear it can be appropriate to leave it for an hour later perhaps.' [36]

- Lighting in the lounge room and her management of the birth and birth of the placenta.

45. The curtains were closed on the window on the southern side of the room but the curtains on the eastern side of the room were open. [37]

46. Gaye did not agree with Dr Campbell or Professor McDonald's opinion that the third stage of birth should have been actively managed. Gaye further stated that she did not suture any tears. She did give the placenta a *quick examination,* but, *as Caroline was distressed, she turned her attention to that.*[38]

47. She also observed that the placenta *appeared complete* and the *membranes were ragged.*

48. She examined it for between 30 seconds to one minute. Her further evidence was that she wanted to go back and do a more thorough examination.

Now, you said it's important to ensure that there was no missing cotyledons? ... That's correct. Yes. And why is it important to assess for that? Um, because if there is any tissue left behind in the woman's uterus that can - there are several possibilities, one of it being of excessive bleeding. Another, um, of long - the longer term problem of infection, and as Caroline had experienced because there was - in her first birth because there was still tissue left and it was secreting, um, the hormones of pregnancy,

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[35] Transcript 176-77. See also the evidence of Paramedic James Bellett, Dr Campbell and Professor McDonald on the difficulty of estimating blood loss in this manner, at respectively transcript pages 785, 1017-18 and 1330.

[36] Transcript 182-83.

[37] This evidence is inconsistent with the evidence of other witnesses to these events.

[38] Transcript 180-86.

that that interfered with lacto genesis and that created problems for breastfeeding her first baby.

And it's true that at the Austin Hospital a cotyledon was actually found within Caroline? A. that's true. And so where your statement says that it appeared intact, the placenta, in actual fact it wasn't intact and there was a cotyledon missing; is that correct? There wasn't a cotyledon - there wasn't a complete cotyledon missing, there were fragments.[39]

49. In reference to resuscitation, Gaye's resuscitation equipment was in her car and it was unable to be retrieved during the resuscitation attempt, while Melody's birth kit was in the lounge room. Melody had a Laerdal mask but not an Oxy viva mask. Oxygen was available but it was not used as the oxygen mask and tube remained in Gaye's car. Gaye further testified that she confirmed the ventilations were effective as she could see the rise and fall of Caroline's chest.[40]

50. Gaye additionally stated that Caroline collapsed very suddenly,

I've attended many patients who have - were experiencing hypovolemia after trauma, after miscarriage, so I was not standing idly by while a woman was bleeding to death. There were no signs of frank or concealed, or excessive blood loss. [41]

51. Gaye also stated that she wrote the notes of their attendance at X's birth later in the day with Melody, this after she had been to the hospital and then to Caroline and Nick's home to collect their equipment. She stated that when making the record she worked back from the time the ambulance was recorded as arriving. It was her evidence that from the time Caroline asked for an ambulance to the time it was called was within five minutes. Caroline collapsed suddenly and an ambulance was called.[42] Gaye's notes indicate that at 10.10 am Caroline started to hyperventilate, but that she was able to slow her breathing down. She attributed this to anxiety as it was her opinion that if Caroline had, *air hunger* that she would not have been able to slow her breathing down.

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[39] Transcript 189-91.

[40] Transcript 193-94. See also exhibit 12(c) the ESTA recorded conversation, where Melody asks Gaye if she wants her to go to (Gaye's) car to get her mask.

[41] Transcript 202. I note here that loss of consciousness is a sign of possible blood loss, and that any such loss of consciousness at or following a birthing requires a thorough investigation.

[42] Transcript 210-16.

52. She later testified that she didn't attribute Caroline's condition to anxiety, but that her symptoms were the same as those for anxiety.[43] Gaye further testified that she was an experienced mental health nurse and that she assessed that Gaye was well in respect of her mental health. Gaye was then further questioned by Counsel for Jade Markiewicz about the statement (not amended) of Paramedic, Maree Daley. Gaye denied saying to Maree Daley that they assumed Caroline was suffering from anxiety.[44]

53. Her further evidence was that the pool water did not get darker between the placental separation bleed and Caroline getting out of the water.[45]

54. Caroline was placed on a *bluey* when she was helped out of the pool. Gaye's evidence was that if a woman is having an excessive bleed, one bluey *would not absorb all of that.* The bluey was specifically placed to assist her to make a judgment of the extent of any blood loss. There was no evidence as to whether a second bluey was in place but it was Gaye's evidence that even with a second soaked bluey, this would not be enough blood loss to cause a woman to collapse.[46]

55. The proposition of the ambulance officer's evidence that the room was dark when they arrived was put to Gaye and she accounted for her opinion that the room had sufficient light by stating that the ambulance officers had to come in to the room from a bright sunny day and that they were used to bright lighting for their procedures.[47]

56. Gaye was not in a position to see vaginal bleeding following the birth but drew conclusions from the general colouring of the pool. She later testified that she could see the vaginal area, *when the initial placental bleed happened.*

57. Thereafter she relied upon her observations of the water colour to assess blood loss.

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[43] Transcript 216. See also transcript at page 229 where she stated that she believed was experiencing an anxiety attack, and at transcript page 235, where she refuted the suggestion that she had misjudged Caroline's decline, as an anxiety attack.

[44] There were two Patient Care Reports, one prepared by the MICA officers and a second at exhibit 21 page 2.55 prepared by Maree Daley. Ms Daley's PCR does not refer to the suggestion that Caroline had suffered from anxiety.

[45] Transcript 267. I note that during her evidence given following her recall, that the colour of the pool was said to have altered from her seeing red in the water, to a *brown(y) colour*. Transcript page 1230.

[46] Transcript 277-80.

[47] See the officers drawing of the scene they found when they entered the house, and of the observation that the room was "dark" at exhibit 12(b), and the MICA Patient Care Report at exhibit 21, page 2.48.

It's not easy to see blood loss, but if there was more blood loss the water would be getting darker. [48]

we need to be as unobtrusive as possible to not disturb the mother, baby interaction and we don't want to disturb the Oxytocin release of the mother so we do it as unobtrusively as possible, but we always ... stay very near to her.[49]

58. Melody was also observing.

59. At about the time of the palpitation of the fundus undertaken while Caroline remained in the pool, (to ensure there was no blood collecting in her uterus), Gaye stated that she also took her radial pulse. The pulse was 80.

I could see her body through the bloodstained...lightly bloodstained water.[50]

60. Gaye further testified that there was no deterioration of her condition after the birth, while she remained in the pool. If there had of, she would have helped Caroline out of the pool so that she could, *observe the blood loss directly.*[51]

61. During this time she was not talking with Caroline. She was *trying very carefully not to disturb her. She was talking to her baby and she was talking to Nick...She was just so happy so just joyful and with welcoming her baby.* [52]

62. Gaye testified that at 9.50 Caroline said she was feeling uncomfortable, (not light headed).[53] And that her pulse was taken and again measured at 80.[54] This was a reassuring sign. Melody asked about blood loss. Gaye assessed her blood loss as *moderate.* She believed this occurred after Caroline had been removed (lifted) from the pool and was sitting on the floor. *As we lifted her out she came to and regained her colour.*[55]

63. In response to further questions concerning management of the 3rd stage Gaye stated that under a Western Australian guideline *about water birth,* you would need to take the mother

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[48] Transcript 268-70.

[49] Transcript 270.

[50] Transcript 271.

[51] Transcript 272.

[52] Ibid.

[53] See Melody's evidence of "*light headedness*" in her own statement, at exhibit 2 page 3.

[54] See again Findings below as to the unreliability of this record.

[55] Transcript 274.

out of the water after the placenta (separation bleed), to give her the injection... *you can't do that in water, but in the UK where water birth is an accepted choice there is no evidence requiring the woman exit the pool for the birth of the placenta if she is having a physiological birth of the placenta...* [56].

64. Gaye was later recalled on her own application, to testify in response to the evidence provided by paramedic Maree Daley, a summary of which is set out below.

65. She testified that the blood pressure taken at 9.50 am was taken by her with a sphygmomanometer and a stethoscope. The BP was 85 over 50.

> *I applied the blood pressure cuff to Ms Lovell's arm, I palpated her pulse, I inflated the cuff. When I released the pressure, then I listened with my stethoscope for the return of the systolic pressure and watched the gauge to ... see the reading of the blood pressure.*[57]

66. Her further testimony was that a BP reading was taken at 9.57 am, following the birth of the placenta by Melody, which she stated was 85 on 50. She also used the sphygmomanometer and her stethoscope. Then later at 10.10 a further reading this time of 80 over 55 carried out by Gaye and then after Caroline became pale and diaphoretic at 10.20 am, a further reading of 80 over 50, where she had difficulty listening for the return of the pulse. *If not precise then it's a good indication.*[58]

67. Gaye further denied saying to Paramedic Maree Daley that they had not taken Caroline's blood pressure when she started hyperventilating. She also denied saying that she did not have a blood pressure machine, *as I did use the sphygmomanometer.* [59]

68. In additional cross examination by Counsel for Jade Markiewicz, Gaye was taken to the hand written notes made of the events described above. In answer to these questions she stated that the first time blood pressure (85/50) was taken was after Caroline recovered consciousness following her collapse as she got out of the pool at 9.50, which she believed was at 9.51 or 9.52. She also stated that she knew the times of the birth, when the placenta was birthed and when the use by the paramedics of the defibrillator took place, by looking at her phone. She

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[56] Transcript 275-76.

[57] Transcript 1217.

[58] Transcript 1219. See also footnote 2 above.

[59] Transcript 1220.

didn't record those times contemporaneously. She agreed that she hadn't said this previously, this because she had not been asked. Gaye was further questioned about the pool colour and confirmed that at all times she could see Caroline's skin in the water, which she considered to be very important.

69. Concerning the evidence of Paramedic Maree Dailey she agreed with Counsel that she did *most of the answering,* and that the placenta was delivered approximately one hour after the birth. She also agreed that she had said the fundus was firm and that Caroline had lost a total of 400 mls of blood only.

70. She told Maree that *000 was called when Caroline became altered conscious,* but did not say either that no blood pressure was taken or that they did not have a blood pressure machine with them. (Maree) was correct in every other respect, *but not the blood pressure issue.*

Melody Bourne [60]

71. Melody was a Registered Midwife, graduating with a Bachelor of Midwifery in April 2009.[61] In March 2011, she started practising private midwifery. In July 2011 Melody was engaged by Caroline to work alongside Gaye in the homebirth of her daughter. Melody worked in a *shared capacity* with Gaye but stated that she deferred to Gaye as the more senior midwife in matters of clinical process.[62] By this she meant, *clinical decision making processes.* [63]

72. Caroline was 16 weeks pregnant when she engaged Melody and Gaye. She stated that both she and Gaye had a shared care arrangement with Melody attending six antenatal appointments with Caroline by herself, three appointments along with Gaye and with Gaye attending one appointment by herself.[64]

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[60] On the afternoon of June 11, Melody was seen to be unwell while testifying and was excused. Transcript 132-34. Later in the inquest, and after hearing from all interested parties, Melody was excused from giving further evidence. Counsel representing Melody, Mr Cash, continued to represent her for the remainder of the inquest including the making of submissions, and I am grateful to him for his taking on of this responsibility.

Having regard to the fact that Melody was excused before completing her evidence and while noting the content of that evidence, I direct myself that her testimony is to be considered of neutral value.

[61] See statements of M Bourne at exhibit 2, 2(a) and 2(b).

[62] Ibid.

[63] See transcript page 51

[64] Ibid.

73. Melody stated that she had reviewed Caroline's medical and obstetric history and talked to Caroline about her first birth experience.[65]

- Management at the scene

74. On 23 January 2012, Nick called Melody at approximately 2.15 am to inform her that Caroline's waters had broken at about 12.30 am and mild contractions had begun at 1.45 am. They arranged for Nick to call her again when the contractions increased. He called again at approximately 3.15am to let her know that the contraction had increased in intensity. Melody and Gaye had agreed that Melody would attend first and keep Gaye informed of Caroline's progress. Melody arrived at approximately 4.05 am.[66]

75. As above I note here that at all relevant times apart from the time of birth (and according to Gaye certain other observations made before 9.45 am) that all other observations and medical history were recorded retrospectively by Gaye during the afternoon of 23 January, following discussion between herself and Melody. This major part of the record was made on the basis of recollection going backwards from the time of the arrival of AV, and without reference to any earlier made notes.[67]

76. On arrival, Melody observed Caroline managing her contractions and sitting upright. She observed vaginal loss of clear amniotic fluid. At 4.40 am, Melody assessed foetal heart rate at 138-150 beats per minute and Caroline's heart rate as 80 beats per minute.[68]

77. At approximately 5 am, the doula, Carmen Bulmer arrived. At 5.20 am Melody palpitated the baby *to left occipital posterior and vertex engaged.* She stated that on all assessments the baby's heart rate was within normal limits.

78. At 6.50 am, Caroline had further vaginal loss consisting of another *show* and gush of amniotic fluid. At approximately 7.30 am Melody requested Gaye's assistance. Gaye arrived at approximately 8.05 am and performed a vaginal examination confirming full dilation. At 8.40 am the head was on view and at approximately 8.52 am, Caroline birthed her baby girl.

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[65] Ibid.

[66] Ibid at Brief page 27. Statement of M Bourne

[67] See transcript page 1220 and the notes at exhibit 2(c) at page 2.27, which is the midwives clinical record of their dealings with Caroline compiled after Gaye and Melody returned from the hospital, and from collecting items from the Lovell home.

[68] Ibid.

79. At 9.25 am Caroline complained of intermittent afterbirth pains. *Her blood loss was assessed as placental separation by Gaye.*

80. At 9.50 am Caroline, *wished to get out of the pool.* She complained of being, *uncomfortable and light headed.* Her blood pressure was taken for the first time.

81. Again according to Melody, pulse was assessed at 80 beats per minute. She conferred with Gaye, who assessed Caroline's blood loss into the pool as *moderate. Caroline expressed a wish to birth her placenta.* Melody and Nick then assisted her to get out of the pool upon which, after rising to her feet, she sat down again and then lost consciousness. She was then immediately lifted out of the pool and onto the floor. Melody felt there was minimal blood loss and Gaye suggested that Caroline's *fainting* may have been associated with blood clots sitting on her cervix.[69]

82. Gaye then advised a managed third stage birth of placenta, *to which Caroline consented.* At 9.57 am the placenta was born while Nick held the baby. A fundal massage then took place with nil clots expelled. Gaye assessed Caroline's post - partum and stated that she estimated a total blood loss of 400mls. Caroline continued to rest on the floor and had a little to eat and drink. At 10.10 am Caroline attempted to sit up but became light headed and reclined again. [70] Melody observed minimal blood loss at this time, but Caroline remained restless and uncomfortable and became agitated and began to hyperventilate, while Gaye tried to reassure her and to get her to slow her breathing. At 10.15 am Caroline again became agitated and asked to go to hospital. Caroline stated that,

I am dying. [71]

83. Further efforts were made to calm her and a discussion about the provision of valium took place. [72] At 10.20 am Caroline became pale and was cold and clammy and ultimately unconscious, and a decision as then reached to call an ambulance. Melody under instruction

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[69] I note here that loss of consciousness, was described by the witness as "fainting". Excessively low blood pressure or hypotension (i.e. a fall in blood pressure below that which normally occurs in pregnancy), and "light-headedness", are also both consistent with significant blood loss.

[70] Low Blood Pressure or Hypotension (if it had been measured) could be expected to improve on sitting down. The failure to manage the 3rd stage with blood pressure records properly maintained resulted in an absence of records, which could have been expected to better inform as to the possible cause underlying Caroline's loss of consciousness, this leading to a full physical examination re PPH.

[71] IB page 28. It is also the case that Gaye had not undertaken a medical examination of Caroline, at this time. As to the reliability of the midwives record of times and readings following the birth, see Findings below.

[72] I note that the use of valium often occurs in connection with anxiety.

from the emergency operator attempted unsuccessfully to find a pulse. Gaye then advised that she had determined a heart rate and CPR was commenced with Melody performing ventilations while Gaye undertook cardiac compressions, this continuing until the paramedics arrived and took over.

84. Gaye and Melody later went to the Austin hospital in their own vehicle and met with an unnamed ED Department physician. They did not bring the placenta with them. [73]

85. They later then left the hospital and returned to the Lovell residence where they removed the pool from the lounge room, along with other belongings. Melody left the home and she and Gaye again met together, and in collaboration Gaye wrote up their notes of the events described above, this occurring that afternoon after their return from collecting the bathing pool, and other equipment.

86. On the following morning Gaye rang Melody and informed of the overnight death.

- Background and experience

87. Melody had never worked in a hospital setting.[74] Between starting work in April 2009 and the birth of X, she attended 24 births in total, mostly homebirths with a couple of planned hospital births, the vast majority of these undertaken under supervision by Gaye. [75] Her practice up until the birth of X was to work with a more senior midwife.[76] There is no guideline, which required this but Melody did so as she thought it was appropriate.[77] Melody is no longer practising as a midwife.[78]

88. Caroline, when engaging Melody and Gaye contacted them both independently.[79] Melody described their professional relationship as an *informal mentorship*, stating that they worked

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[73] See evidence of Dr Petterson below. The placenta was not taken to the hospital by Gaye and Melody and was later unable to be located despite directions from the Court and the efforts of the Vicpol investigator Senior Constable Lynch.

[74] Transcript 47.

[75] Transcript 47. Melody stated that in attending at births in hospital as a privately practising midwife, she wasn't recognised as eligible to practice clinically as required to have visiting rights, which is not currently available to private midwives'. Transcript 48. She was there as a support person.

[76] Transcript 48.

[77] Transcript 46-49.

[78] Transcript 44.

[79] Transcript 49.

as a partnership and were beginning to provide care in a more shared way. Melody later agreed that she was being mentored by Gaye. [80]

- Management planning undertaken by Gaye and Melody

89. No formal shared care arrangement was put in place with Caroline's general practitioner.[81] Caroline had standard ante-natal blood tests, one at around 18 weeks in to her pregnancy and she made decisions about Caroline's care based on those results, in consultation with Gaye.[82]

90. It was Melody's understanding that during a period prior to Caroline's pregnancy with X, there was the option of *back up bookings* with the Royal Women's Hospital where the basic information such as blood test results were lodged with the Hospital in the event that a woman who had chosen a homebirth, needed to be transferred to hospital. This did not involve any clinical review.[83] It was also her recollection that this service was not available to Caroline at the time of her pregnancy however she was unsure if this was because the RWH had withdrawn it all together, or if they had put a catchment area in place.[84] Melody did not attempt to make a back-up booking with a hospital because as far as she was aware, it was not an option in the two *tertiary (teaching) hospitals*, the Royal Women's and the Mercy for Women.[85]

91. Her notes of the antenatal appointment on 4 January 2012 indicate that transfer to the Mercy Hospital had been discussed, but she stated in evidence that no formal arrangements had been made.[86]

92. Melody also stated that she first met Nick and Caroline on 28 July 2011, for an introduction, the purpose of which was for the couple to decide if they would employ her. After both she and Gaye were engaged to assist in the birth, they met Caroline for the booking visit on 10 August 2011.[87]

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[80] Transcript 49-51.

[81] Transcript 53.

[82] Transcript 53-54.

[83] Transcript 55.

[84] Transcript 56.

[85] Transcript 58. I note here that the evidence does not suggest that either mid-wife saw fit to seek to establish more certain information concerning the availability of back up bookings, and infer from this that Gaye as the senior midwife, did not view such availability as being an important consideration.

[86] Transcript 55-61.

[87] Transcript 63.

- Medical history and approach to management of risk

93. Her further evidence was that they inspected Caroline's medical records from Barwon Health in relation to her first pregnancy at the initial booking visit. She did not consult them again. Melody further stated that she did not review each document in the medical record. She talked to Caroline about her first birth but could not recall what evidence came from the medical record or from her conversations with Caroline.[88] She recalled Caroline saying that she had had an assisted ventous (suction cup) birth with epidural. She could not recall specifically discussing Caroline's first birth with Gaye but stated that she would have as part of Caroline's care.[89] When questioned whether after discussing the issues about first birth she then consulted the medical record, she stated that she could not recall doing that. [90]

94. In discussion with Caroline about her first birth, Melody stated that she was not made aware that Caroline had suffered a second degree tear, but if she had been told she would have made a note of it.[91]

95. Melody did make a note that Caroline had had two D&Cs for retained products of conception, *with possible accreta.*[92] It was her understanding that the existence or other of *placenta accreta* was *undetermined,* and therefore that did not cause her concern, or prompt her to undertake any further investigation of that matter. Melody also testified that she was aware that had there been a finding of placenta accreta that Caroline's pregnancy would have had to be, *referred off.*[93] She then testified that she didn't recall a conversation with Caroline about accreta. When further questioned about this however she agreed that she had made a note to the effect that, *Accreta not determined.*

96. She was also aware that Caroline had suffered a uterine fibroid.[94] Caroline had a preconception scan that showed the fibroid had not grown or changed location. Melody had

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[88] Transcript 64.

[89] Transcript 65.

[90] Transcript 63-65.

[91] Transcript 66. See also contradictory evidence of Gaye on this issue, referred to above.

[92] Transcript 68.

[93] Transcript 86.

[94] Transcript 69.

an *ongoing* awareness of the fibroid during Caroline's labour.[95] Melody further stated that she was not aware that Caroline had a PPH when delivering her first child.[96]

97. Melody stated that as part of taking the history of a woman, a type of risk assessment would have been performed, but there was no document setting out any risk analysis. There would have been a conversation around the fibroid and the retained products of conception, (RPOC) [97] Caroline had low ferritin levels, which were of concern throughout her pregnancy and discussion with Caroline occurred around diet and supplements.[98] Caroline had two blood tests, one at about 19 weeks and one at 32 weeks. At 19 weeks her Hb was 114 and her ferritin was 14 but these levels did not cause Melody any concern.[99] Melody was aware of the Midwifery Guidelines for Consultation and Referral.[100] The guidelines recommend action if her Hb under 90. Subsequent blood tests showed her Hb was 107 and her ferritin was 9. At this point supplements and diet would be discussed.[101]

98. It was Melody's understanding that the low ferritin would be potentially more serious, in the recovery period.[102]

99. Melody was further questioned about the National Midwifery Guidelines for Consultation and Referral, [103] and whether she used them when she participated in the booking procedure. *I can't answer that with accuracy. I know I have looked at them a lot since that time.*[104] In regard to clause 4 and the requirement that there be a referral to doctors or tertiary care if risk factors are present, Melody stated that there was a process in place if a woman declines to follow that recommended course of action, that involved talking to other health care providers but from Melody, only with the women's consent. She did not feel the need to complete Appendix A with Caroline.[105]

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[95] Transcript 70.

[96] Transcript 69-71.

[97] Transcript 75.

[98] Transcript 76.

[99] Transcript 76.

[100] Exhibit 2(d), Transcript 77.

[101] Transcript 79.

[102] Transcript 80.

[103] Exhibit 2(d).

[104] Transcript 81.

[105] Transcript 87

100. Melody was unsure what should occur if the woman refused to accept such a recommendation.[106]

> *but to actually just close the door on a woman and say goodbye without knowing that she is in some way being supported in whatever process is happening for her, I think it's - that - yeah, ethically that's really important.*[107]

101. Concerning Caroline's PPH at her earlier birth, Melody understood now, that this was caused by a perineal tear, which is different to a cervical tear.[108]

- Blood loss in the pool and post birth management.

102. Melody's further recollection of the birth pool was that it had a clear inner lining and a light green outer.[109] There may have been a blue cover to keep the water warm but she could not remember. [110]

103. At the completion of the birth of the placenta, Melody testified that Gaye estimated there to be 400mls blood loss. Prior to that there was a separation bleed in the pool at approximately 9.25 am. The birth pool had a capacity of 560 litres, but it was not filled to capacity. Melody's understanding of attempting to estimate blood loss in the pool was based on the transparency of the water.[111] Caroline opted for a physiological birth of the placenta. Once outside the pool, she was given Syntocin to assist with the birth of the placenta as Caroline had had a *fainting* episode.[112] They did not examine Caroline,

> *after her faint because there were more kind of pressing events occurring and it didn't appear that there was any excessive blood loss.* [113]

104. Melody again testified that there was not an opportunity to examine Caroline's perineum, and the tear was not identified.[114]

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[106] Transcript 83-4.

[107] Transcript 75-80. See also the guidelines at exhibit 2(d) Appendix A,

[108] Transcript 85.

[109] Transcript 88.

[110] Transcript 88-89.

[111] Transcript 91-92.

[112] Transcript 95.

[113] Transcript 95.

[114] Transcript 96.

She was unwell at that time. She wasn't doing as well as would normally be expected? A. Yes... If an examination had occurred at that time would you have expected it to have disclosed the fact that there had been a 5 centimetre tear? A. Yes.[115]

105. Her additional evidence was that there were no suturing undertaken at the scene.[116]

106. Caroline's pulse was taken at 9.25 am, and her blood pressure at 9.50 am. Gaye and Melody's practice was to take the blood pressure within an hour of the baby being born.[117] (See additional evidence concerning hospital practise of taking blood pressure and pulse every 15 minutes after birth, until the placenta is born).

107. Her further evidence was that there was ongoing but minimal blood loss on to the bluey, *which was exactly what you would expect to see after a woman has given birth.*[118]

108. The placenta was *viewed* by both Melody and Gaye, but *not examined.*[119] Melody's further testimony was that the resuscitation equipment was not in the car, but in the house with her.[120]

Doula Carmen Bulmer [121]

109. Carmen Bulmer was a student doula. She described herself as being someone who had been to less than three births and whose role was in non-medical birth support, *who is often referred to as mothering the mother...There is no specific qualification, it simply someone who is there to serve...My experience as a doula has been one other home birth and the birth of my own son in 2010.*[122]

110. Carmen met Caroline for the second time some 4 weeks before she was due. This meeting like the first, took place at Caroline's home. Melody was present but Gaye was not. The purpose of the meeting was to find out what Caroline wanted for her birth and to go through a birth plan. She described Caroline as being rather vague in regard to her plan, but that it was not to

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[115] Transcript 95-96.

[116] Transcript 97.

[117] Transcript 115. See contrary evidence from Gaye at paragraph 31 above, as to when blood pressure testing might properly commence after birth.

[118] Transcript 114.

[119] Transcript 129.

[120] Transcript 130. See however the ESTA CD audio, part of exhibit 12(c), in which Melody asks Gaye bout getting a mask from (Gaye's) car.

[121] Exhibit 15 taken on October 12 2012, and transcript from 1092. (I note here that the statement was made some 9 months after the matters under examination, without materials or notes. Transcript 1115).

[122] Exhibit 15 page1.

be hot and for a curtain to be put up for privacy and for a birth pool to be used. She also decided that her mother in law would be there to care for Y.

111. On 23 January at 4 am Carmen received a call from Nick to attend. She arrived shortly after 5 am. She helped Nick prepare the pool, which had been supplied by the midwives. They filled the pool with water at body temperature. Around 6am Caroline came out of the bedroom and got into the pool.

She was in labour in the pool and groaning with every contraction.

112. Caroline got up to go to the toilet and then lay on her bed. Later she topped up the birth pool with warm water. Thereafter Gaye arrived and Caroline got back into the pool. According to Melody, at around 9.30 am she gave birth to a little girl. One of the midwives picked the baby out of the water and handed her to Caroline and Nick, the baby was still attached to the cord as Caroline had not delivered the placenta.[123]

Caroline seemed to get sleepy so midwives told her to get out of the pool... Caroline fainted as she stood up and it took all of us to lie her on the carpet. Once she was lying down Caroline "came to" straight away.

Later Caroline became disorientated. She was given some food and something to drink. She had only a little... She was panicking...She started getting delirious...She asked Nick for valium...She then started hyperventilating, which is a sign of shock.

She started getting more and more agitated and panicky and the midwives and Nick began talking about whether an ambulance needed to be called...

I walked out with the baby while Nick was on the phone to 000. When I came back in Nick was telling 000 that Caroline was unconscious and the midwives had started doing CPR and that she had no pulse.

113. Carmen further testified as to the changing colour of the pool water following the birth.

There was some blood...darker water.

114. She didn't notice how it changed while Caroline continued to sit in the pool. [124] She didn't notice if the midwives discussed the changing colour of the pool water, but later stated that

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[123] According to the midwives who took a contemporaneous not of this matter, the birth took place at 8.52 am.

[124] Transcript 1113.

she was not paying attention to this matter. [125] This was later contradicted in response to a further question from Mr Cash, for Melody. There was no suturing undertaken over this time.

115. The ambulances and a fire truck arrived. They worked on Caroline... Later she was taken to hospital by ambulance. She had not given pain medication during the labour or birth.[126]

> *At about 12 pm the midwives came to let us know that Caroline was staying in hospital and that it was unsure what the problem was. They also collected their equipment.* [127]

116. She gave assistance in taking the bath outside. She found blood clots in the bath. She was present and at least one of the midwives or both, were present.[128] She did not assist in the cleaning of the bath.[129]

117. In further testimony Carmen explained that there was one window in the lounge room and that it was positioned as shown in her diagram exhibit 15(a). The window looked out on to the front garden. There was something covering the window, which she could not remember. The lights were turned off but there were light from another room which provided some light in the lounge room. The light was adequate to allow for blood pressure, to be measured.[130] The curtain which was put up was at the door to the entrance hall and kitchen, was placed there to give Caroline privacy, from the rest of the house. The lounge room was sparsely furnished.

118. Carmen could not remember how long Caroline stayed in the pool following the birth.[131] She did not question what the midwives said about that matter.

119. Carmen took photographs on Caroline's camera at and just after the birth. She took photos of Caroline and the baby and Nick. These were taken over a relatively short period of time. The camera had a flash. Carmen was not sure if she used the flash, but later agreed that the first photograph apart, it appeared that she had not.[132]

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[125] Transcript 1143.

[126] Transcript 1125.

[127] Exhibit 15 pages 4-5.

[128] Transcript 1128.

[129] Transcript 1129.

[130] Transcript 1143.

[131] Transcript 1100. See however transcript 1124 where she gave an inconsistent answer ("shocked if it was 50 minutes") and that she took the photographs over the period Caroline remained in the pool following the birth.

[132] Transcript 1099 and later Mr Cash's x-examination at transcript 1136-8, together with photographs 1-18 at exhibit 15(c). See also exhibit 14 (c), two further photographs also taken by Carmen, which were subsequently referred

120. After Caroline got out of the pool and the placenta was birthed, she looked after the baby and sang to her while they sat on the couch. Carmen was not involved in the CPR. She wasn't a party to everything that was said from that time.[133]

121. She had no recollection of Nick's conversation with the female MICA Officer following the arrival of the Ambulance Victoria. She remembered that one of the midwives commented that there hadn't been much blood loss. (In further examination by Counsel for Jade, I note that Carmen limited her observation about reference to minimal blood loss, to the period following Caroline's getting out of the pool).[134] She also remembered that the midwives had checked the uterus, in combination.

122. Carmen further agreed that Caroline appeared very much her own woman and that she was not being directed by anybody. Caroline provided information about what she wanted. Nick was supportive but he was not making decisions about medical matters.

Nicholas Lovell (Nick)

123. Nick was present at the birth of their first daughter Y in the Geelong Hospital. He could not recall any discussion with the medical staff in relation to Caroline having had a post-partum haemorrhage during Y's birth. Nick recalled that Caroline had obtained medical records from Barwon Health before the birth of X but could not recall what they were. He did not recall Caroline approaching Barwon Health in relation to any documents that may have been missing from the medical records provided under Freedom of Information legislation.[135]

124. Nick understood that Gaye was the more experienced midwife and it was going to be, *a shared co-operative effort.*[136]

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electronically to Dr Campbell for review. These show the crowning of X and emergence of blood from the vagina, and Caroline and X 11 minutes later, while they were still in the pool following the birth.

See also Dr Campbell's comments on a comparison between the clear water at birth, and the darkened water in the pool approximately 11 minutes later, with the placenta either still in the uterus or vagina.

That view being that the photographs were consistent with his earlier opinion that the fact that she was allowed to stay in the pool for a further 47 minutes makes it highly probable that a PPH occurred. See also exhibit 14(b) Dr Campbell's opinion.

Ms Hinchey for Ambulance Victoria at transcript 1130, on the difficulty of interpreting colour and frame exposure, also noted and considered.

[133] Transcript 1112.

[134] Transcript 1122.

[135] Transcript 337-40.

[136] Transcript 342.

125. Nick stated in evidence that Caroline got to hold X for a period of approximately one hour, not the 5-10 minutes that Jade Markiewicz had reported he had told her.[137] His later evidence was however that he recalled having a conversation with Jade Markiewicz at the hospital, [138] but could not recall what he told her. He further agreed that it was possible he told Jade that, *the baby was born at 8.52am, and that Caroline had a panic attack and was having trouble breathing and that she fainted and yelled out that she wanted to go to hospital.*[139] I also note that when questioned about a further alleged conversation with, *"a good friend"* of Caroline's, Ms Elvira Kalenjuk, which allegedly took place in his home on 25 January 2012 shortly after Caroline's death, that he agreed that it was possible that he also told Ms Kalenjuk that Caroline began to experience difficulty 7 to 8 minutes after the birth. [140]

126. The lighting in the room was soft, not pitch dark.[141]

127. Nick considered that Caroline was not someone who would disregard her own safety for the sake of making a political statement.[142]

> *Did Caroline believe that her second pregnancy with X was low risk?... Um, yeah, that's how I would understand that she understood it, yeah.*[143]
>
> *In relation to the birth of Y, Just to be clear... You understand that she was aware that she had had a post-partum haemorrhage, that she wasn't aware that she had had a post- partum haemorrhage, or that she didn't know?*
>
> *I wasn't aware that she'd had a post-partum haemorrhage, and I wasn't aware that she was aware she had had a post- partum haemorrhage.'* [144]

128. Caroline got through X's birth without pain relief.[145] Nick stated that Caroline was passionate about home birth but he is not sure that he would have called her a *campaigner'*.[146]

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[137] See witnesses evidence at transcript 344 and Jade Markiewicz statement at exhibit 10 page 5.

[138] See Nick's evidence at transcript page 343.

[139] Transcript 648.

[140] See Ms Kalenjuk's statement at brief page 53(ii), and the cross-examination of Nick at page 649-50.

[141] Transcript 635.

[142] Transcript 647.

[143] Transcript 679.

[144] Transcript 647.

[145] Transcript 654.

[146] Transcript 656.

129. Nick had never seen his wife have an anxiety attack.[147]

> *Mr Cash: You don't have a recollection of the pool being very, very red or very, very dark, do you? A. it wasn't very, very dark.* [148]

Nick also remembered having a conversation with a female paramedic (Maree Daley) at the scene. He was very upset at this time and could not recall what he had said to her.

Jade Markiewicz[149]

130. Jade Markiewcz was Caroline's mother. Caroline had initially wanted to have a home birth with her first child Y. Jade understood that Caroline previously had fibroids and the home birth was deemed too risky, and that she was advised to have the birth at Hospital, rather than at home. When contractions started they went directly to Geelong Hospital, where the birth took place.

131. The...birth of Y took place over a 24-26 hour period. Y was positioned wrong (sic) when the birth commenced, she was posterior and became stuck. Y was eventually born with the aid of a vacuum device.[150]

132. Later she went back to hospital because part of the placenta had remained attached and had to be removed. This had led to difficulty with the feeding of Y.

133. When Caroline became pregnant with X, Jade was told of the pregnancy and became aware that Caroline was adamant about having a home birth. Some months later Jade and Caroline discussed the latter's plans for a home birth of her second child. Jade felt that Caroline had been influenced by her in-laws who were in favour of home birth and also by the fact that she had felt out of control and that no one was listening to her and what she wanted, in regard to medication and pain relief when she had to go to Hospital to have Y. [151] Jade had concerns about home birth but felt that she had to be careful about how she expressed those concerns. Later Jade was told that Caroline had selected a midwife. Jade further testified that knowing her daughter she would have been meticulous about this process.

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[147] Transcript 658.

[148] Transcript 665.

[149] See statement at exhibit 10 and testimony from transcript 687.

[150] Exhibit 10 page 1.

[151] Ibid page 2.

134. Jade stated that she did in fact press Caroline on the question on what contingency plans would be set in place, if she had to go to hospital. Caroline told her that there would be two midwives and a doula and that they would know what to do.

135. Jade also stated that she asked her daughter if she had had a scan or seen a Doctor to have a pregnancy assessment. Caroline would simply say,

136. *No the midwives are always checking me,* and that she didn't think a scan or further medical assessment were necessary. [152]

137. At 5am on the morning of January 23 2012, Jade had a message from Nick informing that Caroline's waters had broken and that he would keep her informed. Jade resisted the urge to call back while waiting for news, this until 11.45 am when she called Nicks phone, which was answered by his mother Brenda. She was informed that a daughter had been born but that Caroline had had a heart attack and was being taken to the Austin Hospital. Jade then went straight to the Hospital arriving at about 1.10 pm. On arrival she approached Nick and asked what had happened. Nick began to explain as set out above, before his father, Barry Lovell, interrupted and accused Jade of trying to blame someone.[153]

138. Nick also told her at the hospital that she had asked for valium.

139. Later they were approached by Dr Ruglass while still at the Austin, who told them that Caroline was in a dire condition and that was insufficient blood flowing through her arteries and that her brain was starved of oxygen and as a result her organs had started to fail and that she was unlikely to survive.

140. Jade left the hospital at around 4.45 pm but returned when they were as a group advised to return to the hospital. They remained with Caroline until 12.30 am on 24 January, when she died, after her life support was turned off.

141. Jade further testified that she spoke to Gaye in Mentone on 1 February, 2012 as Gaye had said she didn't want to talk over the phone. Gaye told her that X was born at 8.52 am and that Caroline had held her for up to one hour while they waited for the placenta to be born. She repeated certain other observations previously given by Gaye in evidence. Jade asked her

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[152] Ibid page 3. Jade also expressed concern to Caroline about her increased size and that she appeared to be carrying a large baby, and that Caroline herself was, *a very petite girl.* Caroline had faith in her midwives and insisted everything was alright.

[153] Ibid page 3.

about what contingency plans were in place and was told they would discuss what happened if the need should arise.

> *From that I understood there to be no contingency plan, other than to develop one when it happens. I also asked Gaye what she knew about Caroline's medical background and if she was aware of her previous birthing history. I was told she had read the history from the Geelong Hospital, so from that one can assume she was aware of the history of placenta retention and vacuum birth. Gaye stated several times that Caroline was low risk.*

142. And further,

> *It is my understanding that Gaye arrived at 8 am on the morning of the birth and that Melody had been left in charge of the birthing process to that time. Some weeks later I learnt that this was Melody's first solo birth.* [154]

143. Jade testified that she had been told by Nick that Caroline only got to hold her baby for 5 to 10 minutes and that she retained her belief that it had only lasted for the 5 to 10 minutes before she deteriorated quickly. She did not accept Counsel for Nick's suggestion that being emotionally upset, he may have spoken in error to her about this matter.[155]

> *What do you say has occurred? A ...I am doubtful very doubtful that my daughter held her baby for 60 minutes, as has been testified to by the midwives.*

144. Jade's additional evidence was that she had never heard her daughter express political views about home birth and that she never spoke broadly about the way hospitals treat women in birthing situations and that her daughter did not share the opinions about home birth expressed by Gaye.[156] She also stated that she understood the reason for Caroline transferring to the Geelong Hospital was the advice she received from the midwives at that time that fibroid posed a risk and she would be better off in hospital. She did not discuss with Jade whether a similar advice had been given by Gaye or Melody during the period they attended upon her. In Jade's opinion Caroline's intention to proceed with a home birth with X arose from her being upset with the treatment at Geelong hospital, during Y's birth.

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[154] Ibid page 4 and 5. I note from the evidence of both midwives that Gaye did in fact arrive at shortly after 8 am with Melody having arrived some 4 hours earlier. See Gaye's statement exhibit 3 page 3 and Melody's statement exhibit 2 page 2.

[155] Transcript page 70.

[156] See exhibit 3(d) an article which appeared in the magazine, the Organiser by Gaye Demanuele under the heading 'Why Birth is a Feminist Issue'. See The Organiser, December 2013 edition.

Cate Turner and Alistair Phillips.[157]

145. Cate Turner and her partner provided evidence concerning the events surrounding her going into labour at a home birth, which took place 12-13 July 2011. They spoke of their involvement with midwives Gaye and Melody who officiated during the labour, before their ambulance transfer to the Royal Women's Hospital and of the behaviours of both women, immediately before, during and after the birth. They also informed as to the fact that both women attended the funeral of their son Ethan who was still born, and the point was made that this occurred on July 27 2011, the day before both midwives first met together with Caroline and Nick Lovell, at their booking meeting.

Ambulance Victoria

Paramedic James Bellett

146. On arrival, Mr Bellett noticed the window to the front garden had curtains that were closed. He asked Nick to brighten the room, which he did by opening the curtains and turning on the light. To him, visibility in the room was dark when he entered, which matter was recorded, on the site scene drawn by the witness.[158]

147. One of his first questions to the midwives was the question of bleeding. He recalled the single bluey that was blood stained.[159] During their treatment of Caroline they were constantly

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[157] On I believe March 20 2015, I was informed by the Court receptionist Ms Molyneaux, that she had taken a call from an apparently adult female who wished to speak to me before I closed the inquest. I directed my assistant Sergeant Cristiano to return the call and advise me whether she considered the caller was likely to have information relevant to my inquiry, and if so to disclose that information to Counsel representing all interested parties. As a result I was informed that Counsel had been so informed and that Counsel for Jade Markiewicz, intended to explore the matter further with leave given to all parties to apply to re-open the inquest to call further evidence, should that be seen as appropriate. Transcript 1382-83. Priest v West Ct of App, S APCI 2010 0140, considered.

By letter dated 17 April 2015 I was informed by mail from Mr Magazanik, that statements had been taken from a Ms Turner and her partner a Mr Phillips, with same supplied to me, (and from the Court then to all interested parties), together with a request that I re-open the inquest and take further evidence. The Court reconvened in respect of other matters on May 27, 2015 and on that date I ultimately accepted the statements of Ms Turner and her partner into evidence and with no application made by any party that either potential witness, or that any other witness, should be called or recalled to provide vive voce evidence.

The evidence of Ms Turner and Mr Phillips together with attachments, became exhibits 23 and 24.

[158] Exhibit 12(b). See also his record on the MICA electronic Patient Care Report, Exhibit 21, page 2.48 where it is recorded that, the *patient was found naked lying supine alongside home birthing bath in dark room lights off, curtains closed. Patient appears dry with damp hair. No visible blood nearby patient aside from stained 'bluey'. Bath blue in colour, approx. 2 feet deep, with blood stained water.*

[159] Transcript 783.

assessing blood loss through external examination. His evidence was that they never quite ruled out postpartum haemorrhage.[160]

148. He recalled that the pool had a blue outer. His partner noticed clots in the pool. He did not look in the pool directly himself.

> *I spent next to no time looking into the water but in general discussion collectively we did...My partner and I had a discussion about it. Throughout this case we had several frequent discussions and reassessments of what we were doing and how we were going and at one point I remember discussing with my partner about the pool and he made note that it was just dark in colour with clots. So he noticed clots in there? A. He did.* [161]

149. Throughout the treatment of Caroline, he measured her fundus with the assistance of the midwives to ensure the uterus was contracting down and not potentially concealing a haemorrhage. It was *quite firm* when he arrived and did not change while he was treating Caroline. This suggested to him that they were dealing with potential space to conceal a haemorrhage.[162]

150. They remained at the scene for 82 minutes in an effort to stabilise Caroline before they transferred her to the Austin Hospital. When further pressed on this matter he stated that even if he believed that there had been a major blood loss, he would not have conducted this response differently.[163]

> *The important point about that was that at that time and for a period until 10.29 the evidence suggests that she remained conscious. So my question is ...if you'd arrived within that time and found her conscious, would you have then commenced her transportation to the hospital?...We would have commenced assessment, initiated management and at the same time transported her to hospital.* [164]
>
> *The bluey is A2 sized. And a white cotton? Absorbent pad. Absorbent pad? And I think the absorbent pad is approximately an A2 size so four by four and the bluey, the plastic*

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[160] Transcript 783-84.

[161] See hearsay evidence at transcript 784-85.

[162] Transcript 786. My belief is that the witness said (or meant to say) that Caroline was not hiding a haemorrhage. Relevantly the witness went on to observe that he and his MICA his partner were not experts in understanding the principle(s) involved in having a properly contracted uterus.

[163] Transcript 788.

[164] Transcript 794.

cover I guess is bigger again. It wasn't – I do remember it being blood-stained, so blood, but the entire white pad certainly wasn't covered in blood."[165]

151. It did not look like a post-partum haemorrhage but it is always difficult to assess blood loss in any situation.[166] If a person is unconscious but not in cardiac arrest, it is possible to transport them.[167] At 11.53 am she showed vital signs, so she could be considered stable. She was taken from the living room at 11.54 am and then loaded at 12.02 pm.[168]

152. ESTA records 10.27.55 am as the time the call was received.[169]

153. It was Mr Bellett's further opinion that finding her unconscious on arrival meant that Caroline stood a better chance of survival with Ambulance Victoria officers performing CPR at the scene.[170]

At any stage, Mr Bellett, looking back over this record, can you see a point where you ought to have withdrawn resuscitation or decided to extricate Caroline? A No. And rush her to hospital? A. No.[171]

Maree Daley [172]

154. Paramedic Maree Daley (Maree) testified that her MICA team was dispatched to the Lovell home at 10.32 am on 23 January, 2012 and arrived at 10.39 am. On entry she saw Caroline lying supine on the floor being attended by midwives, Melody and Gaye. Gaye was undertaking CPR. An adult female was at the bedroom doorway cradling a peaceful newborn. A distraught partner (Nick) was sitting in the lounge room also. She noticed that the birthing pool was partly filled with dark coloured water.

155. Paramedic James Bellett walked into the house first. Maree was about 1 minute behind.

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[165] Transcript 795.

[166] Transcript 795. See explanation for this occurrence offered in the evidence of Dr Baber set out below.

[167] Transcript 797.

[168] Transcript 798.

[169] Transcript 805-06.

[170] Transcript 834.

[171] Transcript 838.

[172] Maree Daley is an Advanced Life Support Paramedic who attended on Caroline and Nick on the morning of X's birth. See her statement exhibit 16 as amended, and transcript of evidence from 1152 and her electronic Patient Care Report at exhibit 21 page 2-55.

There was some light in the room but it wasn't great. And then the curtains were being opened as I walked in, so that improved the lighting. ...it certainly was getting lighter as I entered the room.[173]

156. On her entry, Maree noticed that the pool had a dark blue lining, (with the inner lining being green). The pool was partly filled with dark coloured water. She couldn't see the bottom. At that time she thought ...,

I have no idea how much blood could possibly be in there.[174]

157. Her first task was to help move Caroline to the centre of the lounge room, for *clear and full access.* Blood was observed on a number of towels and a bluey, *but the amount observed was not concerning.*

158. At 10.50 am the patient was defibrillated once. Thereafter she was relieved from her earlier *airway* duties, (helping to try and oxygenate the heart). She undertook various jobs as directed. At about the time that a spontaneous circulation had been re-established, she offered to colleague Officer Morley from MICA 15, to speak to Nick Lovell, to seek information as to what had occurred before the 000 call was made.[175] It was important to collect such collateral information.

159. Nick told her that,

Caroline had asked for an ambulance as she thought she was going to die but was re-affirmed by the midwives.

160. She had a history of bipolar and some recent anxiety attacks in the past so the midwives tried to calm her breathing. Nick stated that she said that, *you need to call an ambulance, I am going to die.*

Nick then demonstrated on me by grabbing my shirt, how Caroline had grabbed his top, looked him in the eyes and said Nick I am telling you, (emphasising you) you need to call an ambulance. I am going to die. Nick then stated he replied... He then continued sobbing uncontrollably.[176]

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[173] Transcript 1157-58.

[174] Transcript 1160.

[175] MICA officers assume command in cases where they attend with paramedics.

[176] Exhibit 16 page 3.

161. They were squatting in the hallway at this time. His mother was next to him. [177]

162. Maree then spoke with Melody (Bourne) in the kitchen.

> *(Melody) was shaking and very teary. She asked if Gaye could be with us while we spoke so Gaye joined us. Gaye was initially defensive and also upset. She did most of the answering, but they were in agreement throughout. They said the baby was born at 8.52 am, and the placenta was delivered an hour later. Carolyn was given 10 units of Syntocin. The fundus was firm and the midwives believed there was a blood loss of only 400 mls. They stated Caroline then started hyperventilating which they assumed to be anxiety.*
>
> *I asked them if they had checked her blood pressure or pulse at that time. They said, No. They stated they did not have a blood pressure machine with them.*[178]

And in further testimony, Maree later testified that there may have been confusion between them as she noticed they in fact did have a blood pressure machine there, but she maintained that she did ask if they had taken blood pressure and they said, *No*[179].

163. *I was writing things down as they said them, on a little notebook that fits in my pocket.* She, later that evening, drafted the statement tendered in evidence but not the reference to Nicks grabbing of her shirt.[180]

164. Maree further testified that she did not see a sphygmomanometer, (for the manual taking of blood pressure), in the room. She also affirmed in questions from Counsel for Nick, that Nick did not introduce himself and that she only became aware that he was Caroline's husband, when they spoke. She further agreed with the suggestion that he was upset, and that it was quite possible that he had no recollection of what he said to her at this time.

165. Her further evidence was that Nick and the midwives knew what had been said by Caroline to Nick because they had also been present when these words were used.[181] This had not been put in her first statement but it was the truth and had been added after her pre- hearing

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[177] Transcript 1163.

[178] Ibid page 4.

[179] Transcript 1155.

[180] Transcript 1166. See also my further questioning of the witness on these matters and her response at transcript 1167-8. Q *Did you record earlier what was said by Nick and the midwives to you*? A. I've never forgotten them but had I written them down elsewhere? *Yes I had in my first draft. But because of making it coherent it didn't end up on my second draft, because of-that's the one I submitted.*

[181] Transcript 1181.

conversation with Counsel for Ambulance Victoria. She had felt it inappropriate to add these sensitive matters to her original statement while, *he is pouring his heart out.* [182]

166. In answer to further questions on the issue of the taking blood pressure, Maree stated that she felt there may have been confusion about the taking of blood pressure because she had been sitting in Court and heard the midwives testify that blood pressure was taken.

> *So clearly there was a blood pressure machine there. So clearly there has been a misunderstanding on - when I asked the question.*[183]

167. In further testimony she recalled that she had asked about blood pressure and that Gaye had answered her questions, (Gaye and Melody agreed with each other throughout) and said that,

> *there is no blood pressure machine there, and later, that no blood pressure had been taken.* [184]

168. In regard to exhibit 12(b) the AV mud map and the reference to kylie, *half soaked with bloods and clots*, Marie considered that the original could have been moved because when she arrived she wouldn't have described it as half soaked. She saw only that there was, *some blood staining on the bluey and on the towel.*

169. Concerning the lighting the light was on when she arrived. The blinds were in the process of being opened.

170. In answer to further questions on arrival, Maree (and her colleagues) knew that the situation was critical. MICA staff had arrived with lights and sirens. She had also arrived under lights and sirens. On arrival a considerable amount of equipment had to be transported into the house largely by the MICA officers. When she got in it was clear to her that MICA Officer James Bellett had already arranged for improved lighting. Concerning her assessing the colour of the water she agreed with Counsel for Melody, that she assessed it only momentarily, and didn't pay attention to the colour of the pool lining. Maree also agreed that when referring to not having a blood pressure machine Gaye may have been referring to a blood pressure machine that doesn't automatically inflate the cuff at the press of a button.

171. In further answers to Mr Harper for Gaye, Maree stated that her written amendments to her statement, included after consultation with her Counsel, were made from memory as the first

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[182] Transcript page 1177-78.

[183] Transcript 1182.

[184] Transcript 1184-6.

draft and also the original hand written notes had since been earlier thrown out or deleted. She hadn't forgotten these matters however as they remained within her memory. [185]

172. She remembered the incident with Nick, which has been

> *Burn't into my brain, where he grabbed my shirt and relived these words.* [186]

173. Maree also remembered the discussion around whether Caroline was believed by the midwives to be suffering from anxiety. She did not believe she had misinterpreted what she was told about the belief that Caroline was suffering from anxiety.[187]

Professor Stephen Rashford [188]

174. Professor Rashford offered his view that the administration of 47 mg of adrenaline while remaining at the scene for a period of 82 minutes,

> *would be deemed completely and utterly inappropriate.*

He further offered that,

> *in his long experience with the emergency services and pre-hospital care that he had never seen such a case where this amount of adrenaline has been administered at the scene of a cardiac arrest, no matter what the circumstances... Whilst I am a strong advocate for advance resuscitation on scene, essentially bringing the hospital interventions directly to the patient in an attempt to achieve a positive outcome, this must be balanced against the needs of the patient.*[189]

175. Most cases of cardiac arrest requiring resuscitation are related to ischaemic heart disease with the time at the scene most likely unimportant. In such matters resuscitation should continue until the return of spontaneous circulation (ROSC) is achieved, or until further resuscitation is deemed to be futile. This was however a much more complicated case (occurring in a young

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[185] Transcript 1195.

[186] Ibid.

[187] I note here the evidence of Gaye transcript 229, that she didn't ever assume or attribute her condition to anxiety, but stated instead that she did *experience* anxiety.

[188] See statement at exhibit 6. Professor Rashford is the Director of the Queensland Ambulance Service and was requested to provide the Court with an expert opinion in regard to the treatment provide to Caroline by Ambulance Victoria following their arrival at her home at 10.39 am, approximately 12 minutes after the receipt of the 000 call.

in his long experience with the emergency services and pre-hospital care that he had never seen such a case where this amount of adrenaline has been administered at the scene of a cardiac arrest, no matter what the circumstances.

[189] Exhibit 6 page 4.

healthy woman with no cardiac history, in child birth), and it would be expected that the paramedics would consider the causes of the arrest would be varied and multi- dimensional.

176. According to Professor Rashford, it is also expected that she would have shown an indication of anaemia at the scene and that there was no basis for assessing the possibility of blood loss, based upon the midwives methodology of reaching their own estimate.

177. In such circumstances a variety of potential causes for her cardiac arrest could not be excluded at the scene.[190] Professor Rashford further noted that at the time of the first ROSC, 11.12 am, a total of 11 mg of adrenaline had been administered.

178. This was a very ominous sign from the outset that Mrs Lovell was not going to survive, whatever the event was which precipitated her cardiac arrest.[191]

179. Professor Rashford went on to state that when the first ROSC was achieved at 11.12 am, it was achieved with a narrow complex heart rate of 127 bpm but with the EtCO2 of 12 mm Hg.

180. His opinion was that generally speaking following the restoration of vital signs the EtCO2, will rapidly climb back to normal and supra normal figures as the patient's circulation improves and lactic acid is circulated manifests as a rising EtCO2. The inappropriately low EtCO2, indicated a low output state.

181. Her anaemia coupled with an EtCO2 of 12 mm Hg,

> *should have prompted the paramedics to think of blood loss and consider early transport to hospital, albeit taking into account the safety concerns associated with that.* [192]

182. Professor Rashford further opinion was that the evidence suggests that AV officers did not identify that blood loss was a significant cause in Caroline's rapid deterioration, and therefore that they pursued a standard cardiac arrest management.

183. His additional evidence was that it was highly unlikely that the protracted scene resuscitation made any difference to the outcome for Mrs Lovell... Even with rapid extrication while attempting to maintain CPR and other measures, would have been somewhere between 10 and 20 minutes.

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[190] Ibid page 4 and 5.

[191] Ibid page 5.

[192] Ibid.

Any individual who regains ROSC following the admission of 11 mg of adrenaline, rarely survives, let alone in the setting of major blood loss.[193]

For the same reasons set out above Professor Rashford was also critical of the AV critical incident review of this matter.[194]

Professor Stephen Bernard [195]

184. Professor Barnard stated that he *strongly disagreed* with Professor Rashford in each of his criticisms.

185. His opinion was that it was appropriate to apply the cardiac life support algorithm which requires adrenaline of 1 mg IV every 3-4 minutes. Thus for resuscitation that lasted 70 minutes he would have expected a total administration of 24mg of adrenaline. [196]

186. Professor Bernard also offered that while such a large dose as was given was unnecessary, that clinical testing in Europe established that a very high dose of adrenaline was not harmful during a cardiac arrest.[197]

187. In regard to loading and transporting the patient at an earlier time, Professor Bernard stated that transferring the patient and continuing her resuscitation on route was unsatisfactory for a number of reasons. These were that chest compressions are ineffective during loading and transport to hospital. In addition his opinion was that it would have been difficult for just two officers to maintain CPR compressions over this period.

188. Concerning hypovolemia as a cause of the arrest Professor Bernard considered that the available evidence at that time, did not suggest bleeding.

189. Indeed the bleeding that caused this arrest was completely concealed within the uterus.[198]

190. He suggested instead that the low ETCO2 at 11.12 when the first RTOC was achieved was consistent with both PE and AFE, which is also seen in many patients who have cardiac arrest without blood loss during CPR and that it was not accurate that low ETCO2 is indicative of

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[193] Ibid page 7.

[194] Ibid page 6.

[195] See statement at exhibit 5. Professor Bernard is the Senior Specialist in Intensive Medicine at the Alfred Hospital since 2007, and Medical Advisor to Ambulance Victoria since 1994.

[196] See exhibit 5 page 1.

[197] Ibid page 3.

[198] Ibid page 4, and Gaye's statements as to the extent of vaginal bleeding into the pool.

blood loss. He also suggested that Professor Rashford was wrong in his assessment that anaemia should have been evident as patients undergoing CPR do not necessarily present symptoms of anaemia. (Professor Rashford had pointed out that the haemoglobin level would not have materially changed at the scene, where only saline could be provided).

191. Professor Rashford and Professor Bernard also testified as to the cause of the blood loss which they both estimated as being 2-3 litres. (Dr Petterson thought 3 litres).[199]

192. I note here Counsel for Gaye's submission that Professor Barnard stated that the most likely cause of Caroline's arrest must have been pulmonary embolism or amniotic fluid embolism

> *As a critical care physician I would certainly have considered that the most likely cause of the arrest was pulmonary embolism or amniotic fluid embolism.*
>
> ...
>
> *In my experience, a low end –tidal carbon dioxide would be expected in pulmonary embolism and amniotic fluid embolism, and is also seen in many patients in cardiac arrest without blood loss during CPR.* [200]

193. I also note however that Professor Barnard later in testimony took the view that this (large) amount of blood, must have been lost in the birthing pool. [201]

194. Professor Rashford agreed with Professor Bernard.

> *If there wasn't a significant amount of blood concealed haemorrhage once Mrs Lovell arrived at hospital, and the only place that we knew there was blood was in the pool, then that's where it would have to be.* [202]

He also thought that it was very unlikely that Caroline had suffered such a haemoglobin loss in the last weeks of her pregnancy.[203]

Austin Hospital

Professor Rinaldo Bellomo [204]

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[199] Transcript 944.

[200] See exhibit 5 page 4.

[201] Transcript 368-69 and at 374.

[202] Transcript 490.

[203] Transcript 489.

195. According to Ambulance Victoria notes and the Paramedics verbal report to the witness had given birth at home and that within the next hour she had delivered the placenta and her uterine fundus was becoming firm.

196. The AV notes also record that Syntocin had been administered at approximately 10 am, at which time no bleeding was evident.[205]

197. On arrival at the Austin, Caroline was critically unwell, with a Glasgow Coma Score of 3 and a haemoglobin level of (Hb) of 46g/L.[206] This was assessed by Professor Bellomo to be an Hb level that was consistent with PPH.[207]

198. Her coagulation was also *profoundly abnormal...with a d-Dimer level >100 times the limit of normal, consistent with massive DIC.*[208] On arrival three possible diagnosis were discussed. These were exsanguination, AFE and PE.[209]

199. At the time there was evidence that her blood could not clot any more, exhibit 8(b).

> *We have a laboratory abnormality which clearly shows that the patient's blood was unable to clot, and then we have to make references to why that was so. And explanations are theoretically available, but impossible to prove or disprove.*
>
> *Ah this would be a picture we would typically see in the presence of AFE. The textbook characteristics of AFE are shortness of breath, coagulation abnormalities and shortness of breath, coagulation abnormalities and acute respiratory distress. Not connected with the substantial amount of saline. No ...It is consistent with AFE what else? In this situation I cannot think of another explanation.*[210]

Dr Claire Petterson.[211]

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[204] Dr Rinaldo Bellomo is an eminent nephrologist and an ICU Consultant at the Austin Hospital. He attended the ED together with Consultant Obstetrician Dr Pedderson, and her obstetric colleagues as well as a Consultant anaesthesiologist. Dr Bellomo did not profess any particular experience in respect of AFE.

[205] Statement at exhibit 8 page 1.

[206] This is very low and signifies a major blood loss. In a hospital setting transfusion would have occurred before these readings became so low.

[207] See statement at exhibit 8 page 2.

[208] Ibid

[209] Transcript 586.

[210] Transcript 594-95.

[211] Dr Claire Petterson is a Consultant Obstetrician at the Mercy Hospital. She travelled to the Austin Hospital with Ob department colleagues before Caroline's arrival, to assist in her care. Prior to her present appointment she had run the

200. Dr Petterson was questioned about Caroline's tear to her vaginal wall and perineum, by reference to Dr Baber's findings at autopsy. Dr Petterson stated that the extent of bleeding from such a tear would depend upon what the tear was through. She described how *such a tear may pour through, which you may lose a considerable amount of blood.* You would have to move quickly to get it under control. The bleeding in that area could be venal or arterial. Caroline wasn't actively bleeding when she was seen by Dr Petterson, who further testified that she didn't know about the vaginal tear and couldn't comment on that matter.[212]

> *She had already bled out, if you like. I mean she had bled to the extent where she had stopped bleeding... she'd bled so much blood that presumably her blood pressure had dropped, and then the bleeding stopped, but I don't know where the bleeding was coming from whether it was the tear, or from the uterus.* [213]

201. Dr Petterson was then questioned about the extent of the bleeding into the pool. She did not agree that it might have only been 300mls of blood lost. Dr Petterson also spoke with the two midwives,

> *I think that what they thought was "panicking" was her desperately trying to get some oxygen. So I think that she was probably like that before she left home, well before the ambulance was called.* [214]

202. Dr Petterson detailed that Caroline had received some 11 units of blood product, at the Austin, and the Court also heard that she had been provided with 3 litres of saline by ambulance officers at the birth scene. The saline would not have helped carry oxygen.

> *You can't sustain life on saline.*

Concerning major blood loss and then a delay before a collapse Dr Petterson stated,

> *...young women can sustain a substantial blood loss without dropping their blood pressure, and then all of a sudden they just collapse and die.*[215]

And further,

Birth Centre at the Royal Women's Hospital for a period of 15 years. She did not access medical records when she made her original statement, exhibit 13, which I note is undated, but was received by the Court only shortly before her testimony provided in March 2015.

[212] Transcript 937. See also transcript 980 in reference to her evidence concerning the vaginal tear.

[213] Transcript 928.

[214] Transcript 938.

[215] Transcript 931.

It could occur a bit later because as I said before young people tend to compensate, and then it just tips over the edge and they go off. They, they have strong circulatory systems and they can compensate for quite a lot of blood loss for quite a long time, and then they'll just ...collapse.[216]

203. Dr Petterson went on to describe how medication including Syntocinon was provided on admission, to help the uterine contract and stay contracted, because they didn't want the uterus to relax again and cause more bleeding.[217] Her later evidence was that at that point they assumed that the uterus was the source of the bleeding.[218] When then questioned on the uterus having regard to the ambulance officers observation, she stated that she didn't mean the uterus was totally *atonic*, but that it wasn't contracted enough to stop the bleeding.

204. The fundus was described as,

boggy but contracted below three fingers... uterine cavity formally explored, retained products, Bakri Ballon inserted. Reference to, "*no Bakri Balloon inserted*", in her original statement, (exhibit 13), corrected.[219]

205. Dr Petterson who was in attendance (and had access to the blood coagulation test results) was satisfied that the cause of death, was PPH, *by far.*

An amniotic Fluid Embolism does make the blood not clot but I think it was still (a) PPH. It's just that this is a thing that we see frequently and I've certainly seen it frequently. And you have to act very quickly to get it under control. And I just don't believe the amount of blood that she'd lost was 400mls, with the amount of blood she required. [220]

Dr Mark Rugless.[221]

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[216] Transcript 941-2 and 944.

[217] Transcript 934.

[218] Ibid.

[219] A Bakri Balloon was inserted in the uterus and blown up with fluid to put pressure on vessels to assist in preventing further bleeding. I further note that in cross-examination Dr Petterson agreed with Mr Harper that given the amount of saline provided by the AV officers that it was possible that the midwives had in fact found the uterus to be firm, and that by the time of her examination it had become *boggy*. Transcript 990.

[220] Transcript 939.

[221] Dr Mark Rugless was an Emergency Department Consultant at the Austin Hospital. He expressed no particular expertise or experience in AFE.

206. On admission Caroline was also assessed by emergency Consultant Dr Mark Rugless. As part of his haemodynamic assessment he performed a bed side ultrasound of her heart, chest and abdomen. She had a dilated globally hypoketic heart with severe systolic dysfunction, consistent with severe acidosis. There was no free intra-abdominal fluid or blood and she did not have a pneumothorax despite bilateral pleural catheters inserted by Mica officers. There was a small amount of clot within her uterine cavity. Clinically she had a Hb level of 46/L, Disseminated Intravascular Coagulation DIC and oozing blood from previous puncture sites.[222]

207. Dr Rugless was informed of her known history (which at that time excluded PPE) and he considered AFE. Later his opinion was informed by his further examination of Caroline and his involvement in her treatment and from her response.

> *...a haemoglobin of 46 is very low, ... it's not what I would have expect a fit young person to have after 400 mls of blood loss... it does imply that she had had more blood loss than stated.*[223]
>
> And, *She didn't have an evidence of ah, destroying her own blood...there are other causes of a sudden blood drop. If you start to haemolyse your blood so the blood just gets destroyed, but that wasn't the case. There was no other evidence of that in her blood tests, so I think she must have dropped her haemoglobin from blood loss... Like the most obvious explanation.*[224]

Cause of Death

Dr Yeliena Baber[225]

208. At an autopsy undertaken on the January 27, 2012 Dr Baber found a 1.5 centimetre tear in the perineum and a 5-centimetre tear to her vaginal wall, which was, *in continuity with the perineal laceration.*[226]

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[222] Statement at exhibit 7 page 1. I note that the haemoglobin level at 24 weeks was 114, and 107 at 32 weeks, and that in the last weeks she was taking iron supplements.

[223] Transcript 570.

[224] Transcript page 573.

[225] Dr Yeliena Baber is a senior forensic pathologist at the Victorian Institute for Forensic Medicine. She conducted an autopsy on Caroline Lovell.

[226] See Autopsy report at exhibit 11 page 9.

209. Dr Baber concluded that the cause of the collapse was consistent with postpartum haemorrhage; that autopsy findings were consistent with this assumption and that there was no evidence of amniotic fluid embolism at autopsy and *no other evidence of significant natural disease which would have precipitated the collapse.*

210. In testimony, Dr Baber was further questioned on this matter,

> *there was this five centimetre tear of the vaginal wall, which is half the length of the vagina and it's through the full thickness of the vaginal wall through to the skeletal muscle of the support system of the perineum so this is a significant injury.*
>
> *It's a significant injury, it's through the full thickness of the vaginal wall, which is two or three centimetres thick and it's a vascular structure and it would undoubtedly bleed.*[227]

211. Dr Baber also stated that the warm water in the bath would have enhanced the bleeding from the tear as a result of vasodilatation. She said that she was in no doubt that the whole of the lacerated surface (over both the perineum and the vaginal wall) would have been bleeding... *It would also have been actively bleeding, there's no doubt.*[228]

212. Dr Baber further offered the following,

> *What is the explanation for the absence of a significant amount of blood following the birth of the placenta, after she left the pool?*
>
> *She probably lost a significant amount of blood volume already, prior to the delivery of the placenta.*
>
> *What also is the relevance of fainting and hypovolemic shock to the bodies bleeding after the birth of the placenta? If she's commenced the process that leads to her arrest how is that likely to have affected flow from the injury to the placenta?*
>
> *She was significantly hypotensive at the time she exited the pool.*
>
> *Yes?*

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[227] Transcript 846. See also exhibit 11(b) the histopathology report prepared by the RCH in respect of material referred for examination by Dr Baber.

[228] Transcript 877.

So a massive bleeding wouldn't have been possible because she didn't have the blood pressure to drive at that stage...She wouldn't have had the blood pressure to drive a dramatic haemorrhage at that stage.[229]

And further,

A normal healthy individual can maintain their blood pressure within normal levels for a period of time until they can start to decompensate and their body can't deal with that blood loss anymore and is at that point that it drops.[230]

213. In the comments section of her report Dr Baber noted that at the time of admission to the Austin Hospital ED, a 300 ml clot was evacuated from the lower genital tract consistent with PPH and that Caroline had a partly uncontracted atonic uterus, and there had been a PPH.

214. In her testimony, Dr Baber further amplified this opinion. She stated that *the clinical suspicion of the reason for the initial collapse was post-partum haemorrhage.* She found no evidence of or other explanation for Caroline's collapse such as an AFE, as suggested by Professor Cade, or of significant natural disease that would have precipitated her collapse.

215. Both Dr Baber and Dr Ruglass further testified that there was no evidence of red blood cell destruction, which has been seen as an indicator of a possible AFE.

216. Dr Baber was also questioned about the Hb finding at the Austin Hospital of 46, following a reading of 107 at 32 weeks.

Clearly she has had a large drop in haemoglobin. She had three litres of saline or thereabouts. Not all of that stays in the vascular compartment because it is crystalloid so some of that would be lost to the surrounding tissues , how much I don't know, that's not my area of expertise so that would certainly account for an element of hemodilution, how much I have no idea. I don't agree there was evidence of red blood cell destruction on the film.

Coroner: You don't agree there was evidence of blood cell destruction?... on the film.

Could you amplify your reasoning please?

A. If there is red cell destruction then the blood cells will show fragmented blood cells because they are in pieces. The commonest cause of crenated blood cells is purely the

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[229] Transcript 853.

[230] Transcript 892.

fact that the blood's been put into that specific blood tube with something called EDTA which clots the blood in the tube so it can be looked at. The Ph of the slide upon which the blood has been smeared and then there are several medical reasons for it, which include hypersplenism and uremia, but blood cell destruction does not give a picture of crenation...

Would you have expected to find evidence of blood cell crenation if that had occurred? A. Yes. It wasn't commented on in the report and if it had been seen it would have been reported on. [231]

Dr Baber was further questioned about the 63 grams of placenta (approximately 13% of an average sized placenta), which was removed from Caroline at the Austin Hospital. Her testimony was that if the placenta was delivered in one piece she would expect that amount of missing placenta, to have been noticed on inspection.[232]

Professor John Cade[233]

217. Professor Cade testified that the clinical features are the sudden onset of respiratory failure with an acute respiratory distress syndrome presentation and disseminated intravascular coagulation (DIC). Since natural disease and obvious complicating disease were excluded by autopsy as the cause of death and because PPH was recorded on Caroline's admission to the Austin Hospital,

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[231] Dr Baber testified about blood cell crenation which involves the removal of fluid as distinct from cell destruction, which destroys the cells leaving them in parts. She was referred to and discussed a number of learned articles on AFE. See transcript from 860-69 and exhibits 11(e), the blood film review and 11(f), the full blood count results. Blood crenation occurs when the make-up of a red blood cell is altered, most commonly because when the red blood cell is taken, it is not preserved properly. While red cell destruction is consistent with DIC it does not establish AFE, without more. The failure to find the foetal material in the lung does not support a finding of AFE. *It makes it less likely but does not entirely exclude it.* Transcript 869. Dr Baber was further questioned about Professor Cade's conclusion that the evidence of the extent of coagulopathy throughout Caroline's body supported a finding of AFE. Dr Baber considered instead that the fact that she was oozing from various puncture sites created after her arrival at hospital, *has no bearing on the severity of the DIC. However abnormal her coagulation was she would be oozing from the puncture sites by the very nature, that her clotting was deranged.* (Transcript 874).

[232] Transcript 880. See also the evidence of Gaye as to her examination of the placenta and her finding of the complete nature of the placenta birth at exhibit 3 page 3 and exhibit 3(a) page 6, and her later evidence at transcript 189-91 that part of a cotyledon from the placenta was missing, and found at the Austin Hospital. See also the discussion by Dr Baber on this issue, as set out above.

[233] See statement of Professor Cade at exhibit 9 and curriculum vitae at exhibit 9(b). Professor Cade is the Principal Specialist in Intensive Care at the Royal Melbourne Hospital. His evidence is found from Transcript 596, resuming at page 720. He stated that in conjunction with the Royal Women's Hospital that his unit saw 2 cases per year and, *has possibly the largest experience of this in the State.* Transcript 618.

the cause of her collapse has to be related to PPH. At 1.50 pm the lower genital tract was found to be full of clot, and a diagnosis of uterine atony was considered. At 5.30 pm, marked vaginal blood loss and uterine clot were recorded. At 8 pm, there was ongoing bleeding due to coagulopathy, an intrauterine balloon was inserted for tamponade, some retained placental fragments were removed and a perineal tear was sutured.

In turn the underlying cause of the PPE is either primary or secondary. Primary haemorrhage refers to bleeding which arises from the placental site or from uterine cervical or vaginal trauma. Secondary haemorrhage refers to bleeding which is due to a systematic disorder, such as coagulopathy or other haemostatic disorder.

AFE is not caused by PPH. [234] Rather AFE causes shock and collapse in its own right and causes coagulopathy, which is responsible for secondary bleeding.[235]

And in response to a question from the Court,

No the blood isn't ... wasn't shed it was destroyed... within the body, it was destroyed by the flood of material that comes from an AFE. It is foreign material that circulates in the mother and causes a massive reaction. The mechanism is very much argued and the consequences are well recognised. The underlining is mine.

218. Professor Cade further observed that a haemorrhage sufficient to have caused Caroline's collapse about two hours before her admission is a plausible explanation for her death, *only if the observations recorded by the midwives were incorrect or misleading. This is because only relatively normal external blood loss was reported because the uterus was considered well contracted at this time and because at autopsy there was no observation of major trauma, (i.e. because of primary bleeding) or pelvic haematoma (concealed blood loss).* [236]

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[234] Transcript 722

[235] Transcript 731.

[236] See exhibit 9 page 1-2. In later testimony Professor Cade was questioned by Counsel for Jade Markiewicz, concerning his reliance upon the statements suggesting that there had not been significant bleeding into the pool. (Transcript 620). In response he testified that he had adopted the midwives evidence because he had no reason to disbelieve it, this because in his opinion, (independently of what was being said about blood loss into the pool), the clinical picture established that an AFE had occurred, rather than a PPH emanating either from a traumatic injury at birth to the uterus or vaginal wall. He further described the tear to the vaginal wall as a minor vaginal trauma.

219. His further view was that the tear to the vaginal wall occurred during the birth but that it was very unlikely to have bled extensively.[237] Professor Cade considered that as a secondary haemorrhage was in evidence during her admission due to a severe and well documented coagulopathy, the failure of the blood to clot in the form of a DIC, - that the only plausible precursor event was AFE.

> *this is the likely cause of the patient's initial collapse and of her subsequent coagulopathy. The diagnosis of AFE is a clinical one, and evidence of foetal material in the maternal circulation (e.g. at autopsy) is neither sensitive nor specific for this dramatic complication.* [238]

220. Professor Cade additionally stated that AFE can occur at any time in the birthing process, it is an enigmatic process and *its mechanism is ill understood; there are no specific animal models.* [239]

221. He further offered that Mrs Lovell's cardiac arrest could not have been caused by blood loss because firstly the blood loss has to be enormous in a healthy young person and,

> *You arrest at the time. You don't wait for half an hour to arrest.* [240]

222. Professor Cade was further referred by the Coroners assistant to an article on AFE by Dr Stephen Clark, whom the witness described as a well-known expert in this area. He was then referred by Mr Cash for Melody, to Dr Clark's opinion that,

> *This situation has historically been made even more confusing by the false assumption that the finding of cells of foetal origin in the maternal pulmonary circulation, was pathognomic for AFE.*[241]

223. And further,

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[237] Transcript 608

[238] Ibid.

[239] Transcript 613. I note here that Counsel for Melody submitted that in evidence Professor Cade referred to laboratory tests to do with *quantification*, transcript 722, and that this testing was related to an earlier reference by the witness to *abnormal* blood cells suggesting ... *the possibility of haemolysis*, Transcript 622. I am satisfied that Professor Cade's position was that AFE depended upon clinical presentation and could not be established by red blood cell testing alone. (See Mr Cash's submission at page 9).

[240] Transcript 738.

[241] See exhibit 9(d), page 323.

Although once felt to be pathognomic for this condition, such debris may also be found in women with other types of critical illness... Conversely, as many as a quarter of women with classic AFE syndrome may have negative pulmonary histological examinations for squama cells, and other foetal debris. Thus at the present time, the diagnosis of AFE must be made clinically. It can neither be confirmed nor refuted based on histological studies of lung tissue.[242]

224. Dr Clarke further commented,

Several decades after its initial description, the analogy with a "lightning strike" remains appropriate.[243]

225. Professor Cade agreed with the opinion of Dr Clarke, stating that the finding of foetal material in testing of the maternal circulation does not assist the diagnosis of AFE. [244]

226. Professor Cade was then referred to a second article *Current concepts of immunology and diagnosis in Amniotic Fluid Embolism* by a Dr Michael B Benson, from Chicago.[245] He testified that this article spoke largely about the mechanism of AFE.

227. He was later referred by Counsel assisting the Coroner to page 4 of Dr Benson's article where it refers to the presence or absence of foetal material present at autopsy.

(*The presence or absence of foetal material in the maternal circulation of living women cannot either confirm or refute the diagnosis of AFE. However limited available evidence suggests a somewhat different conclusion at autopsy where the presence of intravascular material, foetal material, does seem to be specific for AFE*).

228. In further discussion of this aspect of Dr Benson's opinion, Professor Cade sought to emphasize the greater expertise of Dr Clarke in this area and testified that there were hundreds of articles on a similar theme, confirming that the finding of foetal material in the maternal circulation, particularly at autopsy, is of historical interest only.[246] His view was that it was Caroline's clinical presentation rather than the finding or not of any foetal material at autopsy, which supported his view on AFE in this instance.

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[242] Ibid page 326

[243] Ibid page 328.

[244] Transcript 609.

[245] Exhibit 9(e).

[246] Transcript 611-12.

229. See also the similar reservation on the significance of a finding of foetal material in blood, as expressed by Dr Campbell.

230. Professor Cade was then referred by Sergeant Cristiano, to the Royal Children's Hospital Microscopic Examination Report exhibit 9(c), and to the finding of a diffuse haemorrhagic process throughout virtually the whole of the cervix and a tear within the vaginal wall, which extends close to the skeletal muscle. [247] He testified that the origins of such an extensive haemorrhage can either be local i.e. in the region of the uterus itself, or systemic, which occurs when the uterus has been affected the same as all other organs in the body by a diffuse haemorrhagic process. He said that as she had a disseminated intravascular coagulation (DIC) the origin of the haemorrhage throughout the uterus was systemic.

> *It could be that there's a local cause of such haemorrhage, which given this picture-would be quite unusual.* [248]

231. Concerning Caroline's presentation I note here that Professor Cade did not consider that the drop in Caroline's haemoglobin level from 107 at 32 weeks to 46 at 12.33 at the Austin was a significant factor. He considered that the blood loss was consistent with the estimate of blood loss made by Gaye.

232. In response to a question from the Court the witness explained,

> *Some of it was due to dilution, probably quite a lot of that drop was due to dilution. Well for a start we've got a lower threshold than 107 to start with. Then we have got quite a lot of dilution. She has had three and a half litres of fluid, and she has had some blood destruction as well. And she has had a...and a litre of defined blood loss. And I don't see that we need to find any more blood loss to explain those findings.*[249]

233. Professor Cade further testified that Caroline's actual blood loss including loss through cell destruction would have to be less than a litre and a half and *probably less given the blood destruction,* which loss through AFE was *unquantifiable.* [250] Professor Cade did not consider

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[247] Ibid page 2.

[248] Transcript 604.

[249] Transcript 621

[250] Transcript from 625, where the witness was questioned about the relationship between Caroline's drop in haemoglobin and the cause of her blood loss.

that the fact that the vaginal wall tear was found at autopsy to have penetrated skeletal muscle, constituted a major trauma.[251]

234. Professor Cade further stated that the coagulopathy was so extreme that it had to be associated with AFE. He further could not exclude as a possibility that Caroline had suffered from both AFE and PPH, although he thought that was unlikely.

> *I personally don't think there is solid evidence for it, but ah it means you've got two conditions.*[252]

235. Professor Cade further agreed that some of the symptoms suffered by Caroline could occur as a result of PPH, including shortness of breath hypotension and even cardiac arrest.[253]

236. Professor Cade also commented on the delay in calling an ambulance.

> Court. *Well, you can ask your question arising. But my question is this, when you measure 85 over 50 –and your client, has been in the pool for some time since the birth, faints, - is that the point when you consider outside assistance is required? ...Ah, I think it would have been desirable at that point, and it became essential probably about 10 minutes later.*

237. Finally, Professor Cade was critical of Dr Baber's attribution of the failure to find foetal material in the lungs, to a finding that AFE was not indicated at post mortem examination.

> *my view is that the correct pathology comment would be that foetal material...was or was not observed in the maternal lungs. But not to make a comment as to whether or not there is therefore an amniotic fluid embolism, (or not).* [254]

Dr John Campbell [255]

238. Dr Campbell testified that the cause of bleeding was through a PPH, agreeing with Dr Rugless and Dr Baber that an extensive bleed had occurred before Caroline left the pool. He stated that a number of matters supported this view. These were,

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[251] Transcript 602-3.

[252] Transcript 628. And, he had never seen such a case before. Transcript 723.

[253] Transcript 724.

[254] Transcript 746. Dr Baber's evidence as set out above, was not as attributed to her by Professor Cade.

[255] Dr Campbell is a Senior Consultant Obstetrician at the Monash Specialist Centre and testified that he had been a specialist obstetrician for almost 40 years.

a) That her cause of death as established by the autopsy was Global Cerebral Ischaemic Injury following cardio respiratory arrest in the immediate post-partum period.[256]

b) The clinical impression of the cause of death was post-partum haemorrhage. The drop in haemoglobin to 46g/L on arrival compared with the earlier haemoglobin level of 107g/L at 32 weeks, was supportive of that finding.

c) There was a 5 cm posterior vaginal wall tear in continuity with a 1.5cm perineal tear. This was a second degree tear to the perineum and the vaginal wall together, *which can bleed horrifically.*

d) Exploration of the uterus on 23 January 2012 revealed retained placental cotyledon.

e) The records from Barwon Health record that Carolyn had a PPH with the birth of her first child in 2008, and that the uterus contained a fibroid (myoma) which was shown to be 5 to 6 cm in diameter and within the uterine wall in position.

f) From 8.52 to 9.50 am, Carolyn remained in the birthing pool with no active management of the 3rd stage of labour before her removal.

g) It was suggested that the assessment of blood loss was made by looking at the mixing of blood in the birthing pool. The volume of water in the pool together with Carolyn's body mass was not far below the full line. The volume of the pool at the full line was 560 litres, and any assessment of blood loss on this basis was unreliable.

h) The photographs of the birthing taken at the scene by the Doula Carmen Bulma, exhibit 14(c), as later discussed by the witness in exhibit 14(b), were indicative of a continuous bleeding following the birth. (I note here that this additional written testimony was not sought to be the subject of further cross examination, or was it otherwise contested by the introduction of additional evidence).[257]

239. Dr Campbell further testified specifically in regard to estimates of blood loss, that the statement of Melody Bourne indicates that she viewed the placenta at 9.57 hours and considered it, *whole with ragged membranes.* [258]

Coroner's Assistant. What kind of blood loss are we looking at?

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[256] See Autopsy Report at exhibit 11 page 12.

[257] See Dr Campbell's supplementary statement at exhibit 14 (b) and photographs from the Jade Markiewicz owned memory stick considered at exhibit 14(c). See further discussion in Finding below under Cause of Death.

[258] See Dr Campbell's first statement at exhibit 14 pages 1-2.

With blood loss we all know that most people can tolerate a blood loss of up to 750 mls with very little symptoms and I am talking about healthy pregnant women here, I'm not talking about older people. If you lose up to 30% of your blood volume (which) in pregnancy is 6 litres roughly ...so two litres... you will start to develop symptoms and the classic symptoms are confusion, agitation, shortness of breath, fear, anxiety, and a general feeling of not (being) well, combined with a deterioration (in) the clinical signs of pulse and blood pressure and the patient looking pale.

So you conclude that there must have been blood loss into the pool? A. Yes to me it does, yes. [259]

Dr Campbell further observed,

As I stated in my previous report, and in evidence, I do not consider it is possible to measure the volume of blood loss in a large volume birthing pool. However I am concerned by the colour of the water at 11 minutes after birth. I consider that should have been a strong indication for the midwives to remove Ms Lovell from the birthing pool and to begin to accurately assess the amount of bleeding. I consider the failure to do that led to the severe blood loss that ultimately occurred.[260]

Later in answer to questions put by Mr Harper for Gaye, Dr Campbell stated,

Now if there was bleeding from say a vaginal tear or tear to the perineum ... assuming that's the case, would you expect that bleeding to have been observable once Ms Lovell was out of the birthing pool? A. Not if she had low blood pressure. No because the low blood pressure stops bleeding. [261]

240. Dr Campbell further stated that in his opinion the source of bleeding was either the vaginal tears referred to above and the uterus. (*I can't say precisely which), but there are two sources, the uterus and the tears and it's well known that bleeding can occur from either. Certainly vaginal tears can be associated with a huge blood loss. So my clinical understanding from the material I received is that the loss continued, not at a huge gush, but slowly and steadily for that long time. I'm very certain that if (Caroline) been on a bed, or having a mat underneath*

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[259] Transcript 1007-8.

[260] Exhibit 14(b) page 2.

[261] Transcript 1063-4.

to collect the blood that it would have been easily observed but I don't believe it could have been observed in the pool.[262]

241. Dr Campbell was then asked about the nature of the tear and went on to classify the tear to the vaginal wall and the tear to the perineum together as a second-degree tear. His further evidence was that second degree vaginal tears can, *bleed horrifically. The pelvis in pregnancy is highly vascularised. There (are) huge veins and if the tear extends through a vein it just pours, and as Dr Petterson said, you have to locate the tear and quickly suture it to stop the bleeding, because nothing else has any effect.*[263]

242. *It is hard to be definite and certain about the diagnosis of AFE- because it is hard to be definite and certain about the diagnosis... it is often a diagnosis of exclusion but there are cases where you find foetal debris in people who have not suffered AFE and that statement (of Professor Cade), I agree with, yes.*[264]

243. In response to additional questions raised by Mr Harper for Gaye, Dr Campbell's testimony was AFE, when it occurs generally occurs at the birth of the baby. There have been a couple of cases recorded postpartum but in the analysis of those it really was a diagnosis of exclusion when they couldn't think of anything else, and this is the situation with AFE. He noted Professor Cades view that it could occur at the birth of the placenta. He referred to similar views by a *Benson* which had previously been offered, but these were considered to be theories and hypotheses that were never proven, *and as such Benson's work was not included in the registry of AFE conducted in the US.*

244. Dr Campbell, further considered that no one could hold themselves out to be an expert in AFE, because there were so few cases. He had not professionally dealt with such a case and had been called upon to medico-legal review 3 such cases only. (See his discussion at transcript 1048-49).

245. Now do you have expertise in interpreting those results as to whether they are consistent with AFE as opposed to say a postpartum from a uterus which has failed to contract … *No that's not my area of expertise I'm not a resuscitationist.*

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[262] Transcript 1009.

[263] Transcript 1011. Discussion then ensued in which Dr Campbell stated that following a review of the hospital notes, he believed it was most likely that the three vaginal sutures found during the autopsy examination, were inserted after Caroline was admitted to the Austin Hospital.

[264] Transcript 1052.

246. He further stated that he recognised the blood results exhibit 8(b), as indicating DIVC.

> *Hypothesising as to causes I go back to the clinical picture, which speaks very strongly for PPH, the effect of blood loss and the replacement transfusion, I'm not able to answer that question.*[265]

247. As to the suggestion that he lacked expertise, he further stated,

> *I would be very surprised if we have anyone in this city who could say "I have an expertise," which I would define as having more than 50 cases of AFE.*

Dr Campbell further referred to the AFE registry in the US, *that will help us enormously to get further with our understanding of what happens in this situation but (appropriately), the criteria are very strict...*

These are,

> *Accute hypotension or cardiac arrest, acute hypoxia,* (well she certainly had that) - *coagulopathy or severe haemorrhage in the absence of other causes and all of these occurring during labour, caesarean delivery an operation called DNE-which is a late term abortion –and within 30 minutes postpartum with no other explanation. So that's the American criteria for having a registry.* While he was not specifically asked, the clear inference from Dr Campbell's testimony was that, in his opinion, the US established criteria for determining AFE was not satisfied in this case. I note here that his views on the application of the US approach to AFE classification, were not challenged.

248. Dr Campbell also spoke of the risks of PPH which existed for Caroline.

> *Caroline had a documented history of a PPH and the presence of a uterine fibroid in the birthing summary from Barwon Health. There is irrefutable evidence that PPH in a previous pregnancy is a risk factor for PPH in the following pregnancy. A study published in 2007 showed the risk of recurrent PPH in a second pregnancy was 14.8%...*
>
> *There is also clinical evidence that uterine fibroids, by interfering with the contraction of the uterus, may contribute to PPH.*[266]

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[265] Transcript 1055. He was being questioned by Mr Harper about the D-Dimer results at medical record brief 2-303. (12.28 23/1) This two page document became exhibit 8(b).

[266] Exhibit 14 page 2.

249. Dr Campbell was further asked about the desirability of the midwives obtaining the full medical record including the discharge note from the Geelong Hospital. Dr Campbell spoke about the practise of always seeking clinical notes to backup patient claims concerning a medical history. This was especially important in cases where a patient may have reason to understate the position and also where a patient simply may not be aware of a relevant prior event.[267]

250. Dr Campbell also testified as to the efficacy of leaving a mother in the birthing pool for a period of one hour after the birth.

> *I consider it unsafe practise, in a woman with a previous PPH to manage the third stage of labour in a birthing pool. The normal time for completion of the third stage in a woman delivering her second child is 30 minutes. Standard midwifery practise requires proceeding to assist the delivery of the placenta after 30 minutes has elapsed. Having failed to remove CL from the birthing pool immediately after delivery of her baby, the failure to remove CL after 30 minutes was again significantly below the standard expected from trained midwives.*[268]

251. Concerning the risk factors confronting Caroline, and management of the third stage, Dr Campbell stated,

> *I consider that CL should have been advised of the increased risks of home birth, particularly the risk of a physiological third stage, and directed to a birth centre where safe midwifery care would be provided. CL should also have been advised that active management of the third stage was essential in order to reduce the risk of PPH. I am not able to assess the details of the discussion on these points by the midwives with CL.*
>
> *I am concerned that active management of the third stage was not provided. This was a significant departure from accepted midwifery practise and I consider this was a major factor in the cause of the severe PPH that occurred.*[269]

Professor Susan McDonald [270]

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[267] Caroline's husband Nick Lovell testified that he did not believe Caroline was aware that she had previously suffered from a PPE. See transcript 647.

[268] Exhibit 14 page 5.

[269] Ibid page 3.

[270] Professor McDonald is Professor of Midwifery at Latrobe University and at the Mercy Hospital for Women. Her statement became exhibit 18 and her evidence given in conjunction with Mrs Joy Johnson Midwife, and Dr Rachel Reed lecturer in midwifery and PhD, commences from transcript 1241.

252. Professor McDonald testified that the obstetric records from Barwon Health she received included a discharge summary, (which both Gaye and Melody denied receiving). That summary disclosed to her that Caroline had lost 600 ml of blood at the time of birth of Y and that the placenta and membranes were found to be incomplete. The records also include reference to D&C for the removal of the retained products of conception, which was associated with a further PPH also of 600 ml. These records disclosed a higher risk of PPH in any subsequent pregnancy.

253. Knowledge by the midwives of a D&C of the history of retained products of conception, which was not in dispute, should have led to a detailed discussion with Caroline about her past medical history. Such a discussion should have been recorded and signed by Caroline in accordance with The National Midwifery Guidelines, as set out at exhibit 2(d).

254. Professor McDonald with Ms Johnston and Dr Reed testified that an active 3rd stage management should have been recommended given Caroline's history, rather than the physiological course adopted by Gaye.

> *If the midwives were unaware of the previous PPH but were aware of the fibroid and previous RPOC, should active management of the third stage occur? Professor McDonald. We are in general agreement that it should have been offered and discussed and encouraged...and documented.*

255. Dr Reed then offered a further (contrary) analysis.

> *In regard to this that would be the standard recommended practise for any previous PPH or issues with the placenta but after that's been discussed with the woman, if she has then made a choice to have a physiological placental birth, which a lot of women do who have previous PPH or previous risk factors, then there would be a discussion about at what point that might change. So in this case she fainted, there was a change, and then active management was put into place.*[271]

256. Professor McDonald also addressed the adequacy of the midwives observations made following the birth, and specifically what was overlooked.

> *In my opinion, this was an area of gross inadequacy on the part of both midwives in failing to recognise signs consistent with a deteriorating patient and failure to employ appropriate resuscitation measures.*

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[271] Transcript 1291-2. I note that this opinion was offered by Dr Reed, independently of the views of her two colleagues.

a) One hour elapsed following the birth before a blood pressure was measured and only then when Mrs Lovell collapsed whilst getting out of the pool. Mrs Lovell's signs and symptoms including an expression of restlessness, exhibiting agitation disorientation anxiousness loss of consciousness (faint), the progression of her altered and deteriorating conscious state (unresponsive to stimuli or verbal command), persistently blood pressure recording, progressively rising heart rate (however subtle), respiratory distress(assessed as being hypoventilation due to a panic attack), were all consistent with possible hypovolaemia or at the very least a severe deviation from normal.[272]

257. Professor McDonald further detailed how Caroline's known low haemoglobin and ferritin (iron) levels impacted her presentation and as her opinion as to the extent and source of the blood loss.

> I *mean my own opinion of perhaps why there was little blood loss when she got out of the pool was because the majority of the blood was actually in the pool so either her uterus was well contracted, it is possible- and I have to say that all three of us (Professor McDonald, Dr Reed and Mrs Johnston), were unaware of the pathology or the autopsy report that indicated the depth of that vaginal laceration at 6.5 centimetres, which was an extremely deep laceration to the vaginal wall'.*[273]

And further,

> *they often do (bleed) quite profusely so it is to us a mystery as to why it was she was bleeding from that tear, why it wasn't more visibly obvious in the pool but we can't answer that question. It's not possible for us to... in our collective view it would be necessary for her to lose many litres of blood that she lost in order to have reached the state she was in I guess. If you were to guess that it was a possible cause of the fatal outcome but we can't estimate other than to say that in our view it would be a lot of blood, that the 300 mls that was recorded wouldn't adequately cover the amount of blood that would cause the collapse and very rapid deterioration of Ms Lovell.*[274]

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[272] Exhibit 18 page 5-6.

[273] Transcript 1299.

[274] Transcript 1303.

Findings

1. Caroline Lovell was 36 years of age when she died on 24 January 2012 at the Austin Hospital following the home birth of her second child, X. She was generally well during her pregnancy although she was involved in a low impact motor vehicle collision five weeks earlier and had been monitored by her GP for anaemia.[275] Caroline's relevant obstetric history included a retained placenta cotyledon [276] and PPH, [277] following the birth of her first baby Y, at the Geelong Hospital in 2008. During this pregnancy she also had a uterine fibroid, [278] approximately five centimetres in size.[279] In 2005, Caroline had laser treatment for Cervical Intraepithelial Neoplasia, (CIN). [280]

Cause of Death

2. Having reviewed all of the evidence and Counsels submissions I find that Caroline died of

   1(a) Global ischaemic injury following cardio respiratory arrest in the immediate post-partum period

   1(b) Post-Partum Haemorrhage

3. In so finding I have given consideration to the findings of Senior Pathologist Dr Baber and Obstetrician Dr Campbell and to the treating Obstetrics Consultant Dr Petterson, as well as

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[275] Caroline's GP, Dr Bevz, testified about the advice he gave her concerning her plans for a home delivery, a course he opposed, and the reasons offered for that opposition.

[276] Placental cotyledon is a small piece of placental tissue.

[277] A postpartum haemorrhage (PPH), is defined as clinically excessive bleeding greater than 500 mls that makes the mother display some or all of the following symptoms. That is pallor, light-headedness, weakness, palpitations, sweating, restlessness, confusion, air hunger, syncope and or the results or signs of hypovolemia, tachycardia, oliguria and decreasing oxygen saturation. The condition is potentially life threatening to the wellbeing of the mother, and requires immediate attention by suturing. A history of PPH is an indicator of a significantly increased likelihood of a similar condition occurring during a subsequent birth.

[278] A uterine fibroid is a benign muscular tumour which grows in the uterus.

[279] The fact of these matters was not in dispute, although Gaye Demanuele and Melody Bourne denied knowledge of the history of PPH. The implications of any failure of knowledge in the midwives concerning this history is considered below.

[280] CIN is a severe form of dysplasia that spans more than 2/3 of the epithelium and may involve full thickness.

(The information set out in the above footnotes was consistent with the evidence given at inquest and confirmed from various clinical data bases, during the hearing).

those other clinicians who saw her at the Austin. [281] I have also considered the view(s) proffered on this matter by expert witness Professor Cade, and by Professor Bellomo.[282]

4. I have further considered the uncertainties around the diagnosis of AFE together with the fact that the diagnosis has been described as one of exclusion. I have also considered Professor Cade's testimony that there are some symptoms common to both AFE and PPH.

5. The reasons for my conclusion that it was a PPH and not an AFE, that led to Caroline's death are adopted from the summary of reasons referred to above in the testimony of Dr Baber and Dr Campbell as supported by Dr Petterson and others, and from my finding that the statement made by Gaye as to the extent of Caroline's post-partum bleed into the birthing pool, which was initially relied upon by Professor Cade, (and by both Ambulance Victoria and Melody), was in fact wholly unreliable. In reaching this conclusion I have further considered the sequence of events which occurred, and most particularly Caroline's ongoing clinical presentation, which included loss of consciousness when she sat up, or was stood up. Also

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[281] I have considered Mr Harper's criticism of the expertise of Dr Campbell based upon his review of exhibit 8(b), the Austin Hospital D-Dimer test results for 23/1 at 12.28. I further note that the giving of opinion evidence by Dr Campbell was not challenged at the commencement of his testimony, or made the subject of a voir-dire inquiry.

As set out in the summary of his evidence Dr Campbell answered questions about the effect of Caroline's blood loss and transfusion, and its relevance to AFE by stating that he was not qualified to answer those questions. (He also made reference to the level of experience with AFE he believed was available to practitioners in this state, and questioned how any practitioner with that level of experience might be called upon to provide an expert opinion).

I have further considered the evidence that an AFE, (as distinct from DIC) is determined by a consideration of clinical matters and changes in presentation, in preference to any particular laboratory testing.

Also relevant is the fact that the D-Dimer testing, exhibit 8(b), the subject on which Dr Campbell's expertise was attacked is a blood test which may disclose DIC, but from exhibit 8(b), may also indicate a thrombo-embolism, and a variety of other conditions, with AFE not specifically included. (I accept that the evidence does establishes that DIC is consistent with, though not proof of AFE).

I further note that Professor Cades evidence about *an AFE footprint* as referred to in the submission of Mr Cash, stemmed from the D-Dimer tests indication that a severe anti-coagulation or coagulopathy had occurred, and that such a coagulopathy must have been caused by an AFE.

I find that on all of the evidence, Dr Campbell's answers to the questions as set out, do not cause me to have any doubt about his ability to address the matters raised in this inquest. Having regard to all of the evidence I am also satisfied that Dr Campbell is well qualified to provide opinion evidence as to the cause and circumstances of Caroline's death. I further find that his evidence included a cogent review of the clinical aspects of Caroline's changing presentation.

(As set out below, I find that the clinical evidence considered by Dr Campbell and others, is in fact strongly indicative of a PPH caused by an injury or injuries to the vaginal wall and perineum, and probably also to the uterus. I also find that the evidence establishes that proof of a severe coagulopathy without more, does not establish that an AFE caused the coagulopathy).

[282] Professor Bellomo's opinion has also been considered. In so finding I note that Professor Bellomo was not specifically questioned having regard to the evidence suggesting that a massive PPH had earlier occurred, with blood loss collecting in the birthing pool at the Lovell home.

relevant was her agitation and light headedness followed by her feelings of impending doom. I have also considered her failure to bleed significantly after her removal from the pool, this despite the serious injury identified by Dr Baber and later within the RCH, and her low Hb reading on her arrival at the Austin. [283]

6. I find myself satisfied that the events which occurred following her removal were all connected to her cardiac instability, which occurred due to her earlier bleeding into the pool. I am further satisfied that the depth of the vaginal wall injury in muscle,[284] and in the region of extensive arterial and venus blood vessels, plus the investigations undertaken at the Austin Hospital, point firmly to the conclusion set out above.

7. I also find that the evidence relied upon by Professor Cade concerning the existence of an uncertain level of blood pressure following her removal from the pool as indicative of the fact that it could not have been significant blood loss through PPH that caused Caroline to fall into a state of unconsciousness and later to arrest, is explained by the evidence concerning blood pressure decompensation, which can occur when a young person has already lost a significant quantity of blood. I have reviewed the evidence of Professor Cade, particularly as it relates to his finding of blood cell destruction and his evidence that this was consistent with the DIC found at autopsy, and also AFE. In this regard Professor Cade has additionally testified about findings of AFE in cases without a finding at autopsy of foetal fragments in the maternal lung, a finding which is now, *of historical interest only.*

8. I have considered again Professor Cade's reference to AFE occurring in this manner in the light of Dr Baber's findings at autopsy that there was no evidence of foetal remnants so found. I further understand that there is no testing which might establish whether an AFE in fact occurred in this way, and that the means of identifying AFE relies heavily upon a clinical diagnosis. I also note the evidence of Dr Campbell that the finding of foetal remnants in the maternal lung is an unreliable indicator of AFE, a matter also alluded to by Dr Baber. [285]

9. While DIC did occur and may occur in conjunction with AFE, I find that the absence of foetal material in Caroline's lung does not establish whether an AFE did or did not occur in this case. I am also satisfied that the evidence establishes that an extensive coagulopathy does not, without further clinical evidence, establish that an AFE caused the coagulopathy.

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[283] Exhibit 9(c).

[284] See also Professor Cade's opinion on this matter at transcript 727.

[285] Transcript 869.

Further having regard to the rest of the evidence and most particularly the clinical evidence and the autopsy findings, supporting the proposition that Caroline had sustained a well advanced PPH by the time she was lifted from the pool I find that there is in fact a high probability that a PPH leading to a massive vaginal bleed into the pool, rather than AFE, either with or without a finding of foetal material in the lung, caused or materially contributed to Caroline Lovell's death. Professor Cade's additional evidence was that Caroline's low Hb level at admission, must have occurred as a result of an AFE. Given the weight of the clinical evidence in this case I find that I am satisfied that her low Hb on arrival at the Austin occurred as a result of the PPH. In so finding I note that DIC is also known to occur in conjunction with a massive haemorrhage.

10. The later evidence provided by Dr Campbell, following my receipt of the USB record of the birthing photographs as referred to above, is also relevant. As I consider is the reservation expressed in regard to the depth of the colour of the "*redness*" of the water in the pool, on the taking of the second photograph.[286] However the fact that that photograph shows at least one large clearly defined blood clot, is I find a proper a point of reference in respect of colour, in the setting of similarly discoloured pool water.

11. It follows and I find that the Exhibit 14(b) photographs do in fact reflect that a significant vaginal bleeding into the pool occurred over the 11 minutes following the birth (and thereafter) as suggested by Dr Campbell, and that this "*snapshot*" of evidence coupled with the hearsay observation concerning the pool made by MICA officer Bellett and the observation of Paramedic Daley, both set out in the evidence above, support Drs Baber, Campbell and others in their opinion as to the cause of death.

12. I further find that the photographic evidence later considered by Dr Campbell, [287] showing the pool with the baby's head having just passed through the vaginal entrance, and the discoloured pool water 11 minutes later, coupled with the evidence of the vaginal injury found at autopsy, is all indicative of a high probability of a PPH.[288]

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[286] See comments from Ms Hinchey of Counsel, for Ambulance Victoria, at transcript 1130.

[287] See exhibits 14(b) and (c).

[288] Mr Cash for Melody submits that there is no evidence in regard to their being an 11 minute gap between the two photographs exhibit 14(c) discussed by Dr Campbell in 14(b). Two memory sticks were prepared from the photographs, taken by Carmen Bulmer at X's birth on the morning of January 23, 2012. One was supplied to the Court by Jade Markiewicz, which was circulated to the parties and ultimately to Dr Campbell, and the second subsequently by Nick Lovell. Transcript 1381-82. Both show the previous days date January 22, 2012, and different times for the taking of these same two photographs with Jades memory stick showing time stamps 9.59 pm (image 3266) and 10.10 pm (image

The fact that there is also photographic evidence of a fresh blood staining on the baby's head in the first photograph, is further suggestive of a tearing in the vagina and/or perineum occurring as the baby's head was delivered.[289] This coupled with the fact that Caroline was left in the pool in the same condition for a further 47 minutes, and of her falling into a state of unconsciousness, with relatively minimal vaginal bleeding following her attempt to get out of the pool, is I find additional proof of a well advanced PPH.

I am satisfied then that the source of the bleeding was the six and one half cm tear referred to above, and that the uterus that was later found by Dr Petterson to be partly non-contracted, may also have contributed to the bleed.[290] And to the extent that the opinion evidence of Professor Cade is inconsistent with the above, I find that I do not accept that opinion.

13. Finally having further regard to Professor Cade's observations made concerning Dr Baber's opinion, I hold that Dr Baber as an experienced forensic pathologist is expected to seek to find a medical cause of death having regard to all relevant matters, which include the histopathology results obtained through autopsy. This course will often involve a weighing of medical evidence, as I find occurred in a properly measured and systematic manner, in this case.

The events of January 23 2012

14. Caroline's home birth was attended by two practising midwives, Melody Bourne and Gaye Demanuele, the latter of whom was the most experienced of the two and who was in control of the response to the events, which unfolded following her arrival at Caroline's home. Doula,

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3286); and Nicks showing time stamps for the same two photographs of 7.59 pm (image 3266 and 8.10 pm (image 3286): I further note the evidence from Nick that no photos were taken from a point 9 minutes after the birth to the point when Caroline left the pool. (Transcript 655) and Carmen's similar evidence that she only took photographs over a *10 to possibly a 15 minute period,* after the baby was born, *and then put the camera down.* (Transcript 1098-99).

This evidence satisfies me that there was in fact an 11 minute gap between the taking of the two photographs and I note that this understanding as adopted by Dr Campbell, was not the subject of objection when his second statement, exhibit 14(b), was admitted into evidence.

Both of the memory sticks referred to have been held in safe custody until the present time. For the purposes of completeness I formally add them now to the list of exhibits. They become exhibits 25 supplied by Jade, and 26 supplied by Nick. I also note that the first such photograph shows a mirror that had been placed in the water in a position to Caroline, which as I commented upon at inquest, may have been placed to assist in a relatively close observation of the birth, and what then occurred. No evidence suggesting its intended or actual use in this manner was provided.

[289] Ibid.

[290] See Autopsy Report at exhibit 11, page 12. See also testimony of Dr Petterson set out above concerning the possibility that the condition of the uterus changed as a result of the infusion of saline, which took place before Caroline was transported to the Austin.

Carmen Bulmer, also attended and took photographs of the birth with a camera supplied by Caroline.[291] The matter of her photographs apart, I note that the evidence provided by Carmen Bulmer was made in the circumstances of there being a considerable lapse in time between her involvement in X's birth, and her making of a witness statement, when she was unassisted by earlier note taking or other documentation. I further note her uncertainty about a number of central matters including her recollection as to the time Caroline remained in the pool following the birth.[292] Her evidence was unsatisfactory and I direct myself to attach little weight to it.

15. I also again direct myself that I should treat the evidence given by Melody Bourne as of neutral value, for the reasons previously identified.

16. Caroline's husband Nick Lovell was also present together with his mother who was caring for three-year-old Y.

17. At approximately 8.52 am on 23 January 2012, X was born in the home birthing pool, which had been set up in the lounge room of the Lovell's residence. She weighed 4160 grams.[293] X began respiration spontaneously.

18. Following the birth Caroline remained in the 560-litre pool for at least one hour. During this period I note that in addition to the changing colour of the pool, the first 11 minute portion of which is reflected in exhibit 14 (b), that Caroline displayed evidence of afterbirth pain, and I am satisfied that she also experienced a massive vaginal blood loss. The source of this bleeding was the tear to the vagina and perineum, and also a (possible) bleeding from the uterus. There was no measurement of blood loss volume, which according to her testimony Gaye assessed as minimal, and as occurring because of placental separation.[294] I do not accept this evidence.

19. At approximately 9.55 am Gaye records having performed a fundal massage, while Caroline remained sitting in the pool. This occurred in circumstances of her earlier failure to

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[291] See the photographs taken at this time, exhibit 14(c) referred to above and Dr Campbell's report on the matter at exhibit 14(b). See also my finding in regard to Cause of Death set out above.

[292] Transcript 1148.

[293] I note that X's birth weight was more than the average birth weight of a full-term newborn in developed countries, which is 3400 grams.

The information set out in the footnotes above came from the evidence not in dispute, and was confirmed from various clinical data bases considered at that time.

[294] A small amount of blood caused by the placenta separating from the uterine wall.

systematically measure blood pressure and pulse and maintain a clinical record of same, and to undertake a physical examination of Caroline all of which caused her to remain uninformed as to the extent of Caroline's likely blood loss to that point.[295]

20. At about this time Caroline wanted to get out of the pool as she felt uncomfortable and complained of feeling faint. Nick and Melody then assisted her to get up, but while getting to her feet she lost consciousness. She was then lifted on to the floor by her husband, the two midwives and the doula, where she lay prone and shortly later became responsive again. Gaye offered that Caroline's *fainting* may have been associated with blood clots sitting on her cervix. As set out I reject this explanation also.

21. According to Gaye, at the time of getting out of the pool, Caroline's pulse was 88, (and BP 80 to 85 over 50), and her blood loss was described as moderate. In regard to this evidence of pulse and blood pressure, I do not accept Gaye's evidence as a reliable record of blood pressure at that time. Apart from the fact that a stethoscope and sphygmomanometer rather than a digital blood pressure machine was (allegedly) used, I note that Gaye's record of these and the events which followed was made from her recollection some 4-6 hours after the events described, following discussion with Melody.

22. I also note that this occurred after she had attended the Austin ED where she had among other things, sought to defend allegations put to her concerning her alleged misstatement as to the extent of Caroline's blood loss. It also took place after she had returned to the Lovell home and removed the pool and its contents, this despite what I am satisfied was her comprehension of the potential relevance of this evidence to questions likely to be later asked of her.

23. As set out in the summary of her evidence above there was also a contradiction within her evidence as to how various times in her clinical record (exhibit 2c) were established. Initially it was said they were based on the midwives recollection and from working back from the time of arrival of AV, and in later evidence, by reference to her phone clock.[296]

24. Rather, and without a contemporaneous clinical record, I find the reference to a particular minute at which certain events were said to have occurred, is an indication both of the unreliable nature of the accuracy of those times and more generally of the accuracy of the

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[295] The failing to take a blood pressure reading for almost on hour after the birth was considered unsatisfactory practise as set out in the expert evidence summarised above. See also the evidence of Dr Petterson's finding concerning her examination of the uterus, referred to above.

[296] See however her earlier repudiation of the use of a clock or time device, for which she stated that she did not have the opportunity as she, *was responding to the woman's needs.* Transcript 216.

record. In the absence of other evidence I find then that both the times and rates referred to by Gaye constitute an unreliable record of those matters and that with two exceptions, that there is no evidence that goes to establish that blood pressure was taken, or recorded in the manner she described.

25. The first exception, which goes only to the fact that blood pressure and pulse were taken, arises from Nick Lovell's evidence.

> *At some time during this period Caroline began to become stressed and anxious and asked for an ambulance to be called...At this point I became very worried and wanted to know what was happening...The midwives then began checking Caroline's pulse and blood pressure, and asking her what was happening.*[297]

26. From this evidence I find that blood pressure and pulse were in fact taken when Caroline became distressed, and asked for an ambulance to be called. It is not known how the BP measure was taken.

27. The second exception concerns exhibit 3(c), the transcript of the record of the ESTA phone call made by Carmen Bulmer at 10.27.55. where Melody is later heard to tell the operator,

> *her heart rate is about 100,... her BP is about 80 over 50,* and later that there had been *no excessive blood loss.*

28. I find that this hearsay record, which I understand reflects Melody's reporting over the phone of what she was being told at the time by Gaye, represents a relatively reliable report of the heart and blood pressure readings taken by Gaye at the time of this call, and of what she consistently said to Melody concerning blood loss.

29. In this regard I would add that I can find no reason to disbelieve the seemingly inconsistent evidence given by Paramedic Maree Daily, about what she was initially told by Gaye concerning this matter.[298]

30. I am also satisfied that the failure to take blood pressure readings until this time, i.e. when Caroline asked for an ambulance to be called, is consistent with Gaye's view that a mother's bonding with her newborn should not be interrupted by the taking of blood pressure, and in

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[297] Exhibit 4 page 2.

[298] I note here that I cannot exclude the possibility that the confused answers given to a well-focused Paramedic Daley (as set out above), were a reflection of Gaye's growing concern that Caroline's blood pressure had not been taken, or recorded, in an appropriately professional manner.

normal circumstances might not be taken for, *up to six hours after birth, depending on the observation of the mother...* [299]

31. I further find that Caroline's PPH and ultimately her respiratory collapse, occurred in circumstances where she had a bodily response to the threatened disruption caused by her blood loss, which protected her heart and brain function at the expense of other organs thereby maintaining blood pressure. I find that it is therefore not surprising that Caroline suddenly lost consciousness after getting to her feet while maintaining an uncertain level of systolic pressure but did not continue to bleed significantly after she left the pool. From Dr Petterson, *she had bled out,* by this time.

32. I also note that Gaye informed Melody that a total of 400 mls of blood had been lost following the birth, (and that only a minimal amount of blood was lost following her getting out of the pool). As above I also do not accept this evidence as reliable and find instead that by the time Caroline was taken from the pool, she had lost a very much greater amount of blood by a vaginal bleed into the pool, which bleed had commenced during the birthing process.

33. Caroline was given a dose of syntocinon by intramuscular injection to assist. Shortly later and more than one hour after the birth of her baby, and after the administration of oxytocic and the syntocinon, Caroline birthed the placenta.

34. The placenta, which was subsequently discarded before it could be reviewed by the examining pathologist, was described by the midwives as *whole .... ragged with membranes.* I do not accept this evidence.

35. Approximately 15 minutes later Caroline attempted to sit up, but again became light headed and so she reclined. She then experienced shortness of breath and became distressed and agitated and was treated with, *Arnica* and a *Rescue Remedy.* [300]

36. Both Gaye and Nick attempted to pacify her and gave her a brown paper bag to breathe into, but she remained in an agitated state and thereafter with her breathing symptoms rapidly

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[299] Transcript 171.

[300] Rescue remedy is a homeopathic Bach flower remedy used for treating stress, anxiety and panic attacks. See exhibit 2(c) at page 2.28.

deteriorating, she asked for an ambulance to be called and that she be taken to hospital. Gaye who was fully in charge of the room, did not respond to this demand.[301]

37. At this time Caroline stated that she, *was going to die,* and I find that she literally begged for an ambulance to be called. Again there was no response and it was not until she went into a state of collapse or near collapse that the ambulance was finally called for. I further find that the earlier experience of Cate Turner as set out in Exhibit 23, is both relevant and probative of this matter.

38. At 10.27.55 am, the doula phoned 000, seeking urgent Ambulance of Victoria (AV), attendance.[302] I deal with the delay between Caroline's demand for an ambulance, and its later calling below.

39. I am satisfied that as reported to the paramedics, Caroline remained in the birthing pool for approximately one hour. During this time there was no active management of what was her third stage of labour. I find that Gaye's failure to conduct or direct a full examination of Caroline, including a vaginal examination following the birth of X, or again following the birth of the placenta an hour later, was inconsistent with midwife protocols concerning the management of the third stage [303] and a significant omission in her management. I am further satisfied that a competent clinical examination at either point in time and at all points between would have confirmed a picture, which suggested that a heavy blood loss into the pool was occurring, or had already occurred, as a result of a PPH.

40. The failure by Gaye to systematically take, or to direct the taking of blood pressure readings again during the period before the birthing of the placenta, was a further important omission as I am satisfied that the bleeding into the pool had commenced at birth and that the detection of progressing hypotension, which might have been expected in these particular circumstances, would have further assisted the midwives in remaining focused on that possibility.

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[301] See Dr Petterson's response to this level of management at transcript 960-61. I further note that Gaye's decision not to comply with Caroline's request, could only have had a deteriorative impact upon her level of confidence in her circumstances, and in her belief in her choice of midwife.

[302] See discussion below of ESTA records and the findings in regard to the vital sign observations, which are to be distinguished from the midwives version of these matters.

[303] See exhibit 2(d) sections 8 (non-recognized) and 9 (also non-recognized). See also the evidence of Dr Campbell and Professor McDonald referred to above.

41. I additionally find that even allowing for the failure to actively manage the third stage, and despite the evidence indicated by Caroline's loss of consciousness as she tried to get out of the pool and the discolouration of the pool, which should have been clearly observable if Gaye had taken the sensible course of directing the turning on of the lights at this time,- that the possibility of a PPH was ignored with Gaye instead far too quick to attribute Caroline's state to a benign cause of anxiety, not associated with blood loss.

42. I further find that this occurred in a setting in which Gaye steadfastly maintained her commitment to home birth, without outside intervention. In other words I find that these acts and omissions were undertaken without objective judgement, and with little regard for the norms and protocols adhered to by her peers.[304]

43. It is also the case that Gaye so conducted herself while understanding that her colleague Melody Bourne was not sufficiently experienced to independently review the evidence herself.

44. In the absence of completed evidence from Melody it is not appropriate for me to further comment on her contribution to these events save as to say that if there was a failure on her part, that failure appears to have been related to a failure in judgement, in that she aligned herself with Gaye to undertake a home birthing practise without having the clinical training needed to independently assess and respond to the circumstances that presented at any particular time.

Ambulance Victoria

45. An ambulance was called and AV registered receipt of the 000 network at 10.29 am. Melody briefed the ambulance dispatch officers about Caroline's condition. About 5 minutes later, at approximately 10.34 am, Caroline arrested.

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304 See evidence of Gaye at transcript page 238-39. See also Exhibit 3(d), an article by Gaye published in "the Organiser" December 2013 headed, Why Birth is a Feminist Issue, and the discussion of the article in her twitter exchange with Dr Rachel Reed, on the 13 December, 2013, at exhibit 17(a).

See also the evidence of Gaye's conversations with Cate Turner and on occasion with her husband Alistair Phillips, at exhibits 23 and 24, about hospital birthing and the reasons for her preference for home birthing, together with her attitude to Cate Turner's anguished request for a transfer to hospital, which evidence I find is relevant and probative of her attitude to hospital birthing at the time of X's birth.

See also the response of Gaye to the suggestion by Counsel for Jade Markiewicz of at transcript page 238, where she talks about her view of certain staff within hospitals and certain midwives in the community, and goes on to state that, *this has no bearing on my need to call an ambulance or not. I responded to the symptoms that Ms Lovell had. She collapsed in front of me. I was not thinking about the political environment at that point in time. I was responding to a woman who collapsed in front of me.*

46. CPR was commenced and continued until the AV paramedics (James Ballet, Phillip Morey, Maree Daley and Callum Bloomer, arrived at 10.39 am. At that time Messrs Ballet, Morey and Daley immediately attended to Caroline who was assessed and found to be in a Pulseless Electrical Activity (PEA) arrest. Active resuscitation continued for a total of eighty-two minutes before they stabilised her for transport to the Austin Hospital at 12.02 pm. The distance from the Lovell home in Watsonia to the Austin Hospital was 7.4 km.

47. This was an unusually long delay, which I find was grossly complicated by the advice given by Gaye concerning Caroline's level of blood loss. As above I find that the advice so given was manifestly incorrect.

48. Walking into an emergency situation involving a home child birth, with an arrested young woman as they did, I find that it is understandable that the paramedics accepted what they would have considered to be reliable clinical information coming from professional colleagues. In other words they couldn't have been expected to know the level of experience or competence of the midwives and would have assumed that they had satisfied themselves that a PPH had not in fact occurred as they were told, and of which matter they also informed the staff at the Austin ED following arrival. The fact that at the time of their arrival at her side, that Caroline was not bleeding to any significant degree would also have confirmed the officers in the view that no PPH had occurred. [305]

49. I further find that having been so mislead, the AV officers did not appreciate the urgency of the need to prevent any further bleeding and to provide a blood transfusion, as they were working on the basis of a cardiac arrest caused by a medical reason, rather than a situation requiring surgery (by suture and transfusion), which situation they believed would be more likely to respond to a longer resuscitation at the scene.

50. Turning to the treatment provided during the some 82 minute period stay at Caroline's home I find that the provision of a total of 47mg of adrenalin over that period was highly unusual.

51. This was a complex presentation involving a young woman with no history of previous cardiac disease who had lost consciousness after unusually, a birth at home, and who was believed not to have suffered a PPH and was not responding typically to emergency care

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[305] Professor Barnard (who played no active role at the time of these events), took a similar view of the officer's situation. *It was my view that PPH in this situation was extremely unlikely.* Transcript 543.

provided in accord with AV protocol.[306] This then left the officers with a terrible dilemma and while it is easy in hindsight to say that they ought to have moved her and have attempted under extreme difficulty, to continue resuscitation during transportation, I consider that in all the circumstances, that the decisions they made cannot be faulted.

52. In regard to the adrenalin use and the ongoing resuscitation it is clear that its use at the scene did not contribute to Caroline's respiratory failure.[307]

53. On the evidence I further find that Caroline's immediate removal would not have saved her life. Rather the fact that she had apparently arrested approximately 5 minutes prior to AV's arrival, at 10.39am, establishes that the decision to delay her transfer until she had achieved a limited respiratory improvement occurred at a time well past the point at which a successful result might otherwise have been expected. [308]

Austin Hospital

54. Upon arrival at the Austin Hospital, Caroline remained in an unconscious state and was noted to be profoundly anaemic, as indicated by a low haemoglobin count. She required large amounts of adrenaline, in addition to that supplied to her at the scene by AV, to help maintain and further raise her blood pressure. She was diagnosed and treated for an out of hospital, hypovolemic cardiac arrest, due to PPH.

55. The initial resuscitative efforts at the Austin by a team that included emergency physicians and obstetricians from the Mercy Hospital for Women, focused on the treatment for hypovolemia with the transfusion of blood products and both medical and surgical attempts to control her uterine bleeding. This included the administration of more oxytocics and the insertion of a Bakri balloon into her uterus.

56. The clinical impression of the Consultant, Dr Petterson was that Caroline had experienced a significant PPH resulting in her collapse at home. This diagnosis was supported by the presence of a very low haemoglobin count of 46 g/L on arrival (falling from 108g/L

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[306] Although PPH had not been entirely discounted by the AV Paramedics, the preponderance of evidence establishes that the clinical report provided by Gaye led their focus to centre on a cause other than haemorrhage.

[307] See the evidence of Professor Bernard referred to above, and the fact that additional adrenaline was used, (together with a substantial transfusion of blood product), later at the Austin ED.

[308] According to the report received by emergency services the 000 dispatcher was told that Caroline had gone into cardiac arrest some minutes before we know that the ambulance officers first arrived. See also the similar opinions of Dr Petterson and Professors Bernard and Rachford on this matter, as set out above and the comments concerning the onset of the cardiac arrest set out below.

approximately 5 weeks earlier), and a partly atonic uterus, indicated by the inability of the uterus to contract, and the 5cm posterior vaginal wall tear continuous with a 1.5cm perineal tear. See also discussion at footnote 219 above.

57. The exploration of the uterus also revealed retained placental cotyledon. I also note here that Gaye who had gone to the Austin Hospital with Melody was told of the extensive clotting that had been expelled from Caroline's cervix. As above I also record that in response Gaye testified that she sought to refute the inference that she hadn't reported Caroline's blood loss truthfully. [309]

58. Thereafter Caroline developed significant multi-organ failure complicated by severe coagulation failure. She was transferred to the ICU where she was seen to have a severe and irreversible hypoxic brain injury. With a grossly abnormal EEG. [310] She was also seen to have hypoxic injuries to her lungs liver and kidneys, requiring support of all major organs and persistent bleeding despite massive transfusions of blood and blood products. This occurred as set out above, because the blood flow to these organs was shut down by the body to preserve blood flow to the heart and brain in a physiological response to her heavy blood loss.

59. Despite the great efforts of the clinical and nursing staff concerned, Caroline Lovell died at 0.30 am on 24 January 2012, some 12 hours after her arrival at the Austin Hospital.[311]

<u>The knowledge of Caroline's previous medical history including her history of PPH, and the clinical risks associated with a home birth</u>

60. Women with a prior history of PPH have as much as a 14.8% risk of recurrence in a subsequent pregnancy. Associated risks factors include retained placenta, failure to progress through a second stage of labour, Placenta accrete, hypertensive disorder and a large for gestational age, newborn. [312]

61. There are many known risk factors for PPH. These are not known to be helpful in preventing the condition but do assist in risk analysis decisions regarding suitability for attempted home birth and preparedness in applying a PPH management protocol. The consistently elevated

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[309] Exhibit 3 page 5.

[310] An EEG is performed to measure electrical activity in the brain.

[311] The specialist and nursing staff referred to above were bought together by the Austin Hospital on receipt from AV of details of the difficulties encountered by the officers who were trying to resuscitate Caroline, this all before transporting her to the Austin Hospital took place. I commend the efforts of all of those concerned with the putting into place of these arrangements, together with all of those who attended on Caroline, and later upon her family.

[312] X birth weight was 4160 gm, which was considered large for her gestational age.

risk of a recurrence of a PPH also highlights the need for women with such a history to have active management of the third stage of labour and the desirability for women with such a history of giving birth in a hospital that has on site blood cross match facilities as well as the availability of the resources that may be needed including medical support, medication, blood products, and medical equipment including resuscitation equipment. Caroline's history of RPOC and fibroid, known to both midwives, should also have been seen an important risk factor weighing against a home birth.

62. It is not in dispute that Carolyn had a documented history of PPH and the presence of a uterine fibroid, as set out in the birthing summary from Geelong Hospital. Gaye and Melody were both aware of the uterine fibroid and both Gaye and Melody were also aware of the two D&C operations undertaken to remove RPOC. The possible presence of placenta accrete was also known and recorded by Melody, (and therefore heard of, if not considered by Gaye).

63. On the evidence of Gaye certain sections of Caroline's records from Geelong Hospital were not provided during the booking meeting. Having further regard to the letter written by Caroline after Y's birth to the Geelong Hospital and its failure to refer to a PPH, [313] and to the evidence of Nick on the matter of her knowledge of her previous PPH, I find that the discharge report was not part of the Hospital materials shown to the midwives at that time.

64. I further find however that it was inappropriate for either midwife to dismiss even the possibility of a PPH from any risk analysis, given the failure to additionally seek and obtain all relevant materials from the Geelong Hospital. When further questioned on this matter Gaye testified only that she told Caroline that it, *might be useful*, while not specifically telling her to seek to obtain same. Instead according to Gaye, she chose to rely upon what Caroline told her herself about her earlier birthing experience, as she was said to be, *a good historian.*

65. I note that while there may well have been some reluctance, as alleged by Gaye, to supply a medical history at the request of a midwife, Caroline was always entitled to receive same and if she didn't have it, she should have been directed by Gaye to seek it, this before Gaye as the senior midwife determined how best to proceed. [314]

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[313] See exhibit 4(e).

[314] See evidence of Dr Campbell set out above.

66. I also note that Gaye's testimony was that Caroline had told her that she had sustained a second degree tear during her earlier birth, which was sutured.[315]

67. A second degree tear with suture, is not indicative of an earlier PPH but it should have been sufficient to put an experienced midwife on notice that such an injury may have occurred and might re-occur, and that he/she needed to be especially watchful, and prepared to meet this eventuality. In such circumstances and in the absence of a discharge note, I find that Gaye had effectively been cautioned about the possibility of an earlier PPH, with the further possibility of placenta accrete as recorded by Melody, and that it was incumbent upon her to direct her own conduct having regard to that caution.

68. Her need to proceed with caution before agreeing to a home birth and even allowing for that judgement, her duty to be especially vigilant at the home birth itself was made greater by her knowledge of the fact that at Caroline's previous delivery, that the birthed placenta had not been intact and that there had been RPOC, leading to the two D&C surgeries.

69. Rather than so act I find instead that Gaye turned a blind eye to identifying the risk concerning these possibilities and thereby allowed herself to avoid discussion of a plan for a labour and birth that involved ensuring the availability of appropriate medical support. I further find that it was her bias against in-hospital birthing procedures that caused her to disregard her duty to obtain the Geelong Hospital discharge summary, before determining whether or not to agree to participate in Caroline's home birth plan.

70. Such knowledge should have alerted her to the risks associated with a home birth in this instance and in the absence of a reliable medical history, she should have followed protocol and recommended strongly against it. Following and if necessary she should finally have refused to participate.

71. The fact then that she chose to proceed with the home birth notwithstanding these unresolved issues was unprofessional and inappropriate.[316]

72. Again in the absence of any plausible alternative I find that it was her bias against hospital birthing, which led to this approach.

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[315] Transcript 146. According to Gaye this wasn't recorded as Melody was doing the recording in the booking form. According to Melody she wasn't made aware of the second degree tear, but would have recorded that matter if she had been told. See transcript page 66 and also Dr Campbell's testimony in respect of second degree tears, set out above.

[316] See National Midwifery Guidelines Appendix A, exhibit 2(b), as to the circumstances and manner in which a midwife may refuse to provide care.

Medical management and the non-recognition of Caroline's clinical deterioration

73. As above, I find that Caroline gave birth to X at 8.52 am that morning. The birth took place in a 560 litre birthing pool, which had been set up in the living room of the Lovell's home. The midwives had placed the pool in the lounge room and filled it with warm water. Caroline remained in the pool for at least one hour.

74. I refer again to Exhibit 14(b) one of a series of photographs taken at the scene by the Doula Carmen Bulmer, which were later kept by members of Caroline's family.[317]

75. As earlier referred to it is again relevant that in regard to this new material Dr Campbell reported in his supplementary statement, dated 4 May, 2015, that there was blood staining on the baby's head indicating, tearing in the vagina, and or the perineum as the head delivered. The water in the pool was noted by Dr Campbell as being, *very clear,* at this time. Another photo taken 11 minutes later shows the water, is very discoloured and the colour is red brown, consistent with the presence of blood.[318]

76. Dr Campbell's further opinion was that the colour of the water was *a strong indication to the midwives to remove Caroline from the birthing pool, and to begin to accurately assess the amount of bleeding.*[319]

77. It is also the case that during Caroline's labour the lounge room was dark, the light was off and that the lounge room had one window only, with its potential for natural light excluded by blinds. [320] Further evidence concerning the lighting was that throughout the approximately 60-minute period after X's birth, the midwives did not turn on the lights or open the blinds, or use a torch to get a better look at the condition of the pool. See also the MICA Patient Treatment report as to the findings of MICA officer Bellett, on his arrival at the scene.

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[317] This material was ultimately provided to the court only late in proceedings by Jade Markiewitz

[318] See discussion of the inference to be drawn from this evidence discussed under cause of death above.

[319] I find that the colour of the water as evidence by these separate photographs does not provide an insight into the precise extent of bleeding at any particular time. I find however that the sequence establishes to my satisfaction that the bleeding was ongoing and needed to be carefully observed, and appropriately managed. Necessarily both observation and management should have taken place with Caroline outside of the pool. See also discussion of this matter under Cause of death, set out above.

[320] See Nick Lovell's evidence and diagram of the room at exhibit 4(c). See also the evidence of MICA officer James Bellett, set out above, as to the lighting in the room at their time of arrival and his Patient Care Report at exhibit 21, page 2.48. The evidence of Gaye's initial reference to a second uncurtained living room window referred to above, later not supported, and the earlier experience of Cate Turner in regard to lighting, is further probative of this matter.

78. It is common ground that Caroline herself was not examined for possible PPH, while she remained in the pool. It is also the case that Gaye did not physically examine Caroline for possible PPH, even after she left the pool and lost consciousness, although her *fainting* so called, was consistent with blood loss, and blood loss arising from a PPH, is known to occur during the birthing process. I further find that the failure to properly explore PPH as a potential diagnosis occurred in a setting of a failure to manage the third stage with blood pressure testing and properly kept records. This also occurred with Gaye making significant assumptions concerning an explanation for Caroline's light headedness and agitation, both of which symptoms I am satisfied were in fact consistent with a massive blood loss, through PPH.

79. According to the evidence Gaye also did not examine the pool or otherwise seek to investigate this possibility because she considered that the colour of the pool did not indicate a major blood loss after Caroline had left the pool.

80. I further note that there was no examination of the pool after Caroline was finally assisted to leave the pool. Such an examination, had it occurred, might have confirmed at least a suspicion of blood loss into the pool at that time, or indeed at the point when Caroline started to demand that an ambulance be called and stated that she felt she was going to die.[321]

81. I find that the failure to remove Caroline from the pool and to examine her immediately after delivery, coupled with the failure to maintain appropriate blood pressure and vital sign monitoring in the hour following the birth was wholly inappropriate and caused or substantially contributed to her death. Gaye's failure to provide adequate lighting during this period is equally troubling and defies both reason and common sense. I further consider such an approach to have to have been ill planned and a threat to Caroline, and to have constituted a significant deviation from the appropriate management of what became a post-partum haemorrhage. [322]

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[321] Transcript page 185.

[322] Further the decision later reached to go back to the Lovell home and remove the birthing pool from the lounge room and to empty it, caused a loss of physical evidence potentially relevant to the issue of how much bleeding into the pool had earlier occurred. Such action in which Gaye admitted participation, was undertaken in the knowledge that the events that had occurred earlier that morning had already been questioned by Hospital staff, and were likely to be questioned by family members as well as by her responsible professional authority.

82. It was alleged in cross examination that there was a delay in the request by Caroline for an ambulance to be called, until the calling of same, of approximately 15 minutes. In response Gaye testified that the delay was only 5 minutes.

83. In this regard I note that Melody in her statement stated that at 10.10 am, Caroline (who had earlier also *fainted* while getting out of the pool), attempted to sit up from her position on the floor, but again became light headed and lay back down.

84. Thereafter she became distressed following which Gaye took some time seeking to calm Caroline down and gave her a paper bag to breathe into. Caroline was then said to have slowed her breathing but later began to hyperventilate again, and asked for an ambulance to be called. Her husband and both midwives were also attending to her at this time.

85. Shortly thereafter Caroline became very agitated and demanded to go to hospital. She stated that she was dying and Gaye then questioned her. She then got to her knees and then lay back down. Efforts were made by each of those present to calm her down. At some point thereafter Caroline became pale, diaphoretic and unresponsive. An ambulance was called by Carmen.[323]

86. It is known from independent ESTA 000 records that the call from the Lovell home came in at 10.27.55 am; [324] that this call was registered by AV at 10.29 am and that MICA officers and a Paramedic were separately dispatched at 10.30.[325]

87. From this time and by again accessing the CD of the 000 phone call, which was replayed in Court in what was a closed session, I observe that at 10.29.44 the dispatcher states that Caroline was, *unconscious (or has fainted), and then that she was conscious and breathing. Not alert.* During this period Melody informs the dispatcher that Caroline's, *heart rate is about 100 and BP is about 80/50.* At 10.33.32 it is noted that breathing has *slowed right down.* At or about that time Nick is heard saying, *Caroline, stay with me Caroline.*

88. Thereafter at 10.36.58 there is unidentified mumbling, followed at 10.37.48 by what I am satisfied is counting undertaken in connection with the delivery of CPR. Shortly afterwards Nick informs the operator that CPR is being given and at 10.38.54 the responder states to the en route MICA officers,

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[323] See exhibit 3 the statement of Melody Bourne at pages 28-9

[324] See exhibit 12(c).

[325] See exhibit 21 the MICA Patient Care Report, at page 2-48.

You are responding to a patient in apparent cardiac arrest. The patient is a 36 year old female, who is conscious and breathing Code 31-D-3: Not breathing at all.

1 The cardiac arrest was witnessed. [326]

89. From this record of time stamped evidence and from exhibit 12(c), the transcript of the call, I am satisfied that Caroline became unconscious again at a point shortly before the 000 call was made at 10.27.55. Thereafter she was unresponsive (and not alert) and lapsed in an out of a conscious state until at 10.33.32, Melody observed that her breathing had slowed to a significant degree. Soon after at approximately 10.34, I find that Caroline went into cardiac arrest and stopped breathing, following which there was unidentified communication between those parties, or at least some of those who were present.

90. Sometime later, at a time before 10.37.48, CPR was commenced by Gaye with the MICA team arriving at the scene 10.39.43. At 10.42.08, the MICA team leader confirmed to ESTA dispatch that a cardiac arrest had occurred.[327]

91. Turning now to the earlier time estimates made by Gaye (and Melody) and having regard to the circumstances in which their clinical record was later put together, I find as indicated above, that the post recording by Gaye of these further estimated points in time is unreliable, and that I cannot infer as is suggested, that all of the abovementioned observations were also only approximately 5 or even 7 minutes out.

92. What the evidence does establish however is that there was a significant delay in responding to a quickly deteriorating situation, in the period following the removal of Caroline from the pool. Getting Caroline to the near-by hospital, as soon as these symptoms first appeared was important especially while she remained in a mostly conscious state. It was her deteriorating condition then, rather than Caroline's later demands for an ambulance, which should have resulted in an ambulance being called, that is before either Caroline (or Nick) were caused to make that demand. [328]

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[326] The CD of the 000 call made to ESTA was part of the Brief of evidence and was admitted into evidence as part of exhibit 20. Earlier, on 12 June 2014, a transcript of the 000 call was admitted through Counsel for Jade Makiewicz.

[327] While the counting consistent with CPR can be heard on the ESTA tape at 10.37.48, followed by Nick's comments concerning the giving of CPR, I find that such evidence does not permit an inference to be drawn as to precisely when the delivery of CPR commenced.

[328] See the evidence set out above including that of Professor Cade, and that of Dr Reed at transcript 1360-61.

93. Coming back to the demand that an ambulance be called, I cannot say precisely over how long a period following the demand, that this delay took place. But given the activity that reportedly occurred at this time, which involved all present and the time taken by the midwives to assess the response by Caroline to those actions, I find that the period of 5 minutes estimated by Gaye is unlikely, and that a period of not less than 10 minutes is much more probable.

I am further satisfied that the major blood loss through PPH referred to above resulted in a sequence of events leading to hypotension and to physiological changes which included agitation, light headedness, a sense of impending doom and to a loss of consciousness. Ultimately protective mechanisms failed and cardiac arrest and significant brain damage leading to her death, then occurred.

Conclusion

94. I find that the management by Gaye Demanuele of the home birthing of X was inadequate in that she at times together with others acting under her instruction,

a) Failed to obtain a relevant further history from the Geelong hospital, including the discharge note, this before agreeing to act as the senior midwife in her planned home birth. I note that this occurred notwithstanding the fact Caroline had reported to Gaye and Melody that it was her belief that she had suffered from a stage 2 tear and had been sutured following the birth of her first daughter Y, and had also suffered RPOC and Fibroid, with possible placenta accrete undetermined. This history suggested a level of previous difficulty that needed to be fully understood and assessed before such agreement could be properly reached, which did not occur.

b) Proceeded to accept responsibility to manage the homebirth without further seeking or obtaining access to materials confirming such history and failed to conduct a risk analysis concerning Caroline's proposed homebirth, in such circumstances.

c) Failed to consult with Caroline's local GP with a view to making arrangements for her on going blood testing and ultra sound examination(s), as were required.

d) Failed to create a safe environment for the birthing, in that the room lighting provided at her direction, which might have but did not include the use of a torch, made it difficult to observe whether a PPH had or had not occurred.

e) Failed to manage the third stage in an appropriate manner in that she left Caroline and for the most part X, sitting in the pool for not less than one hour without testing her for pulse, blood pressure or physically examining her for the possibility of PPH.

f) Failed to call Ambulance Victoria when Caroline first fell unconscious and had to be lifted from the pool.

g) Failed to call Ambulance Victoria when Caroline later begged for that to be done, maintaining this position for a period of not less than 10 minutes until Caroline further declined into a state of collapse with the 000 call finally made at 10.27.55 and,

i) Failed to provide Ambulance Victoria officers, and later the Austin Hospital ED, with an accurate medical history.

95. Additionally I find that Gaye's Demanuele's conduct discloses a strong basis for belief that that the current regulatory system failed to cause this then registered midwife to perform her duties in an appropriately professional manner. Rather I find instead that she acted quite as she pleased and without regard to the potential for interference from those responsible for ensuring compliance with the protocols then in place. The fact that the National Midwifery Guidelines exhibit 2(d), do not separately deal with home birth as such requires a separate and further consideration, and this matter is dealt with below under Recommendations.[329]

96. I find that this death was preventable. I further find that the various acts and omissions described above caused, or substantially contributed to the death of Caroline Lovell.

97. It is also noted that prior to this inquest and in the face of action taken by the Australian Health Practitioners Regulation Agency, which action might have resulted in Gaye's deregistration as a midwife as well as the unfavourable publicity associated with such a process, that Gaye took it upon herself to arrange for her own immediate deregistration. The fact that she testified that she is now seeking employment as an unregistered midwife in her own words, to offer assistance to the mother, *who catches the baby with her own hands,* is a matter of concern that should be immediately addressed. [330]

98. I further note that available statistics concerning home birth in Victoria reveal that in 2011 Victoria had a total of 579 of all home births in Australia (1267), which later figure comprised

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[329] Exhibit 2 (d), the National Midwifery Guidelines (and the more recently published guidelines), have both been reviewed by the Court. Both seek to deal with the duties and responsibilities of midwives generally, without seeking to distinguish the considerations that may arise for those specialising in the home birth area of public service.

[330] See transcript pages 241-46.

just 0.4 % of all births in that year. The same set of statistics show that nationally the difference in outcome for home births as opposed to hospital deliveries was negligible, (0.8% stillborn at homebirth, as against 0.74% overall). [331]

99. A search of the Australian Institute of Health and Welfare (AIHW) website reveals not dissimilar statistics for 2013, when 97% of women or 296,611 gave birth in hospitals, while a much smaller proportion gave birth in birthing centres (2% or 6085), with 0.3% or 958 giving birth in a home setting.

100. Having regard to all of the evidence and to Counsels submissions and to matters of general principle, I recommend that women in this State should be put in a position to be able to make informed choices concerning where and in what circumstances they give birth. It is also important however that people on both sides of this debate recognise that the State of Victoria, has a proper and concurrent interest in ensuring that rules are in place that allow for a high level of safety for both babies and mothers, as well as for the protection of those practitioners properly engaged in this activity, wherever it may occur.

101. The best way to achieve these various objectives is to ensure that prospective parents are properly informed as to the advantages and disadvantages of various birthing options, while restricting the provision of all planned home birthing services, to properly trained and accredited midwives (and medical practitioners) only.

Recommendations

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

I recommend that,

a) The Department of Health and Human Services, in conjunction with the Australian Health Practitioner Regulation Agency, examines the adequacy of the regulatory system currently in place and develops a specific regulatory framework for privately contracted midwives, working in the setting of a home.

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[331] See Australian Institute of Health and Welfare's Australia's Mothers and Babies 2011 Report. The report did not examine the results for mothers but we know from the evidence of Dr Rachel Reed that maternal deaths in child birth are an almost unheard of event, in both Australia and in the UK. Transcript 1367.

b) The Nursing and Midwifery Board of Australia develops specific guidelines to define mandatory clinical competency and clinical experience standards, for privately contracted midwives, working in the setting of a home.

c) The Nursing and Midwifery Board of Australia develops a system for monitoring mandatory clinical competency and clinical experience standards, for privately contracted midwives, working in the setting of a home.

d) The Department of Health and Human Services provides ongoing training for registered midwives specifically engaged in providing home birth services. For the protection of all concerned, participation in such ongoing training should be mandatory.

e) Additionally, I recommend that the Department of Health and Human Services undertakes a public campaign designed to provide education for women and for their partners who maybe considering home birth, to seek to inform as to how safe and otherwise reasonable decisions on this matter should be reached.

f) I also recommend that the Department of Health and Human Services, in conjunction with the Australian Health Practitioner Regulation Agency, examines the question of whether there is a need to create a regulatory offence that would prohibit the receipt either directly or indirectly of a financial commission of any type for attending at a place of birth while being an unregistered midwife (or medical practitioner). [332]

g) Pursuant to Sections 49(1) and 69(2) of the Coroners Act 2008, I recommend that the Director of Public Prosecutions examines the evidence collected in this investigation and takes such action against Gaye Demanuele, as he may deem to be appropriate.

I direct that copies of this finding be provided to,

Nicolas Lovell

Jade Markiewicz

Gaye Demanuele

Melody Bourne (through her legal representative)

The Chief Executive of Ambulance Victoria

The Chief Executive of the Department of Health and Human Services in the State of Victoria

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[332] I note that in South Australia legislation which seeks to regulate the activities of unregistered midwife practitioners has been in place since 2013.

The Chief Executive of the Nursing and Midwifery Board of Australia

The Chief Executive of the Royal Australasian and New Zealand College of Gynaecologists and Obstetricians

The Chief Executive of the Australian Health Practitioner Regulation Agency

Dr John Campbell

Professor John Cade

The Director of the Victorian Institute of Forensic Medicine

Professor Stephen Bernard

Professor Stephen Rashford

Professor Susan McDonald

Ms Joyce Johnston

Dr Rachel Reed

The Director of Public Prosecutions in the State of Victoria

The Chief Executive of the Consultative Council on Obstetric and Paediatric Mortality and Morbidity in the State of Victoria

The Manager Coroners Prevention Unit

Senior Constable Shane Lynch

Signature:

Peter White

Coroner

Dated, March 24 2016.