IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2017 0191

FINDING INTO DEATH WITHOUT INQUEST

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

Amended pursuant to *section 76 of the Coroners Act 2008* on 11 November 2019

Findings of:	Simon McGregor, Coroner
Deceased:	**Finn Moser**
Date of birth:	10 January 2017
Date of death:	11 January 2017
Cause of death:	Head injury in the setting of labour
Place of death:	The Royal Women's Hospital 20 Flemington Road, Parkville Victoria 3052

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INTRODUCTION

1. Finn Moser was a one-day-old baby who was born at the Royal Women's Hospital (RWH) located at 20 Flemington Road, Parkville Victoria 3052 on 10 January 2017.

2. There were complications during Finn's delivery and shortly afterwards he was found to have suffered brain injuries. He did not recover and died on 11 January 2017.

PURPOSE OF A CORONIAL INVESTIGATION

3. Finn's death was reported to the coroner as it appeared to be unexpected and was therefore a 'reportable death' for the purposes of the *Coroners Act 2008*.

4. The role of a coroner is to independently investigate reportable deaths to establish, if possible, identity, medical cause of death and surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability.

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

6. The Coroner's Investigator, Senior Constable Hannah Smith of Victoria Police, prepared a coronial brief in this matter. The brief includes statements from Finn's parents, the forensic pathologist who examined Finn and the investigating officer.

7. Further statements from clinicians at the RWH were provided directly to the Court. An expert report reviewing the hospital treatment was also provided by Associate Professor Edward Weaver. Finn's family also submitted additional materials.

8. After considering all the material obtained during the coronial investigation, I determined that I had sufficient information to complete my task as coroner and that further investigation was not required. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity.

9. I have based this finding on the evidence contained in the coronial brief. In the coronial jurisdiction facts must be established on the balance of probabilities.[1]

10. In considering the issues associated with this finding, I have been mindful of Finn's and his parents' basic human rights to dignity and wellbeing, as espoused in the *Charter of Human Rights and Responsibilities Act 2006*, in particular sections 8, 9 and 10.

CIRCUMSTANCES IN WHICH THE DEATH OCCURRED

11. Bree Chisholm (previously Bree Moser) became pregnant with dichorionic diamniotic twins[2] (DCDA) in 2016 and had an estimated due date of 1 February 2017.[3]

Fetal weight discordancy and recommendation for induction

12. On 4 January 2017, an ultrasound scan gave estimated fetal weights of 2.447kg for one twin and 2.850kg for the other. This placed the first fetus in the 45th percentile for growth and the second in the 80th percentile. The images of the first twin were limited due to the deep engagement of the fetal head.[4]

13. Fetal weight discordancy in twins is calculated by subtracting the weight of the smaller twin from the weight of the larger twin and dividing by the weight of the larger twin. Based on these measurements of fetal weight, the fetal weight discordancy was approximately 14.1%.[5]

14. Hospital staff calculated the fetal weight discordancy incorrectly, arriving at a figure of 20%.[6]

15. A fetal weight discordancy of more than 20% is considered a cause for concern, and so staff recommended induction of labour.[7] A plan was made to admit Ms Chisholm to hospital on 9 January 2017.[8]

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

[2] A DCDA twin pregnancy is where each twin has its own chorionic and amniotic sacs and results from the fertilisation and development of two eggs. As such, each fetus has a placenta.

[3] Statement of Professor Mark Umstad dated 26 April 2018, Coronial Brief.

[4] Statement of Professor Mark Umstad dated 3 October 2018, Coronial Brief.

[5] Ibid.

[6] Ibid.

[7] Ibid.

[8] Statement of Professor Mark Umstad dated 26 April 2018, Coronial Brief.

Admission to the Royal Women's Hospital

16. Ms Chisholm was admitted to the RWH at 7.40am on 9 January 2017. She was counselled about the need for her twins to be born as Finn's growth appeared to be slowing. At 9.00am, induction began using prostaglandin gel.[9]

17. At 4.30pm on 9 January 2017, the amniotic sac around Finn was ruptured. The fluid was clear and copious, which is considered a good sign, and fetal monitoring was normal. Ms Chisholm was transferred to the Birth Centre and commenced on antibiotics. At 5.25pm, she was put on an infusion of Syntocinon (oxytocin) to stimulate labour.[10]

18. Over the night of 9-10 January 2017, Ms Chisholm's labour progressed slowly and her contractions were incoordinate. The dosage of Syntocinon was steadily increased in an attempt to overcome this.[11]

19. At 8.00am on 10 January 2017, Ms Chisholm's care was handed over to consultant obstetrician, Dr Julia Unterscheider and Dr Mei Lin Tan, a senior registrar in obstetrics and gynaecology. On this day, Dr Kelly van den Haspel[12] was working as a junior registrar with Dr Unterscheider and Dr Tan.[13]

20. Dr Unterscheider was informed that Ms Chisholm was undergoing induction of labour for presumed discordant growth. At this time, Dr Unterscheider recalculated the growth discordance between the twins. She arrived at a figure of approximately 15%, representing concordant growth rather than discordant growth.[14]

21. Ms Chisholm stated that this recalculation was never discussed with her.[15]

22. Fetal heart rate was being monitored using cardiotocography (CTG). Dr Unterscheider reviewed Finn's CTG trace (the record of his heart rate over time) during the handover. She considered that the CTG trace was normal.[16]

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[9] Expert Report of A/Prof Edward Weaver dated 4 July 2018, Coronial Brief.
[10] Ibid.
[11] Ibid.
[12] Dr van den Haspel was an obstetrics and gynaecology registrar, level 2.
[13] Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief; Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief; Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.
[14] Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief.
[15] Bree Chisholm's Response to the Coronial Brief.
[16] Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief.

23. Dr Unterscheider and Dr Tan determined that the management plan was for a caesarean section unless there was a significant change in cervical dilation.[17]

24. At 8.43am, Ms Chisholm was reviewed by Dr van den Haspel.[18]

25. Dr van den Haspel found that Ms Chisholm was 4 centimetres dilated, that her cervix was 0.5 centimetres long with a medium consistency and that Finn was at station-2 with mild caput but no moulding apparent. Dr van den Haspel also reviewed the CTG trace for both twins and found both traces reassuring.[19]

26. Dr van den Haspel also noted that Ms Chisholm's contractions were in-coordinate despite her being on a second bag of Syntocinon at maximum strength.[20] Based on the lack of progress in labour, Dr van den Haspel considered that caesarean section would be the appropriate mode of delivery.[21]

27. Dr van den Haspel communicated her findings to Dr Tan. Dr Tan agreed that a caesarean section was appropriate.[22]

28. Ms Chisholm agreed to a caesarean section but wanted to continue trying for a normal vaginal birth if possible. Due to this request, her Syntocinon infusion was left running while arrangements for the caesarean section were made.[23]

29. While awaiting arrival of theatre staff to collect Ms Chisolm, Dr van den Haspel monitored the CTG traces for Ms Chisholm's twins. At 9.10am, she noted an abnormal CTG trace for Finn. Dr van den Haspel called the operating theatre to inform them that surgery should be expedited however, the CTG trace was not sufficiently abnormal to meet the criteria for a 'Code Green' immediate delivery.[24]

30. Due to the abnormal CTG trace, the infusion of Syntocinon was ceased prior to Ms Chisholm being transferred to the operating suite.[25]

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[17] Ibid.
[18] Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.
[19] Ibid.
[20] 'Maximum strength' is 96ml/hr of 20U Syntocinon in 1 litre normal saline.
[21] Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.
[22] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief.
[23] Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.
[24] Ibid.
[25] Ibid.

Transfer to Operating Theatre and delivery

31. Midwifery staff attended at 9.53am to transfer Ms Chisholm to the operating theatre. The CTG monitor was taken off Ms Chisholm before her transfer.[26]

32. Dr Unterscheider decided that, as Dr Tan was an experienced registrar in her final year of training, Dr Tan was sufficiently competent to carry out the delivery by caesarean section without direct supervision.[27]

33. Dr Unterscheider and Dr Tan discussed that there was a heightened risk of post-partum haemorrhage in this birth, and Dr Tan ensured that the necessary equipment and medications were in the theatre to manage any post-partum haemorrhage.[28]

34. Present in the delivery room were Dr Tan, Dr van den Haspel, anaesthetist Dr David Morgan, members of the paediatric team and several nurses and midwives.[29]

35. After Dr Morgan had put a spinal block in place, Dr van den Haspel performed another vaginal examination and confirmed that Ms Chisholm was 4 centimetres dilated. She did not see any indication that the first twin, Finn, might have an impacted head. Dr van den Haspel then commenced a caesarean section, under Dr Tan's supervision.[30]

36. Once Dr van den Haspel had opened the uterus, she recognised that Finn's head was deeply impacted in the maternal pelvis, moulding was present and Finn's head was in a deflexed position. Dr van den Haspel attempted to remove Finn's head from the pelvis with gentle upward traction for approximately one minute, with no success. Dr Tan then took over the delivery from Dr van den Haspel.[31]

37. Dr Tan requested that Dr Unterscheider be contacted. At around this time the uterus underwent a tonic contraction, obstructing access to Finn. Dr Tan asked Dr Morgan to administer Glyceryl Trinitrate (GTN) to relax the uterus. A 'Code Pink' was then called for urgent

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[26] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief.
[27] Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief.
[28] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief; Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief.
[29] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief.
[30] Ibid.
[31] Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.

obstetric assistance. This occurred approximately one minute after Dr Tan requested that Dr Unterscheider be contacted.[32]

38. At Dr Tan's request, a midwife began assisting to disimpact Finn's head vaginally. By a combination of disimpaction vaginally and delivery through the caesarean incision, they were able to disimpact Finn's head to the level of the pelvic brim, making his face visible.[33]

39. Dr Tan then attempted a delivery using forceps, but due to the position of Finn's head she was unable to place the forceps properly.[34]

40. Another consultant obstetrician, Dr Boski Shah, arrived due to the 'Code Pink' emergency call and assisted with the delivery. Dr Shah was able to complete Finn's delivery and hand him to the paediatric team, approximately four minutes after Dr van den Haspel had first opened the uterus.[35]

41. Finn's twin brother, Lenny, was then delivered without complication.[36]

Neonatal care

42. Finn was immediately taken to a resuscitation cot and cardiopulmonary resuscitation (CPR) was commenced. Finn began breathing regularly around thirty minutes after his birth and he was taken to the Neonatal Intensive Care Unit (NICU).[37]

43. A cranial ultrasound performed later on 10 January 2017, showed swelling of the brain and impaired cerebral blood flow. A brain magnetic resonance imaging scan on 11 January 2017 showed signs of brain injury consistent with brain death. The neonatal consultants determined that the prognosis was 'extremely grim' and that death or severe disability was an expected outcome.[38]

44. After discussion with Finn's parents, the decision was made to palliate Finn and he died in his parents' arms.

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[32] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief.
[33] Ibid.
[34] Ibid.
[35] Statement of Dr Mei Lin Tan dated 13 March 2018, Coronial Brief; Statement of Dr Kelly van den Haspel dated 9 March 2018, Coronial Brief.
[36] Ibid.
[37] Royal Women's Hospital Medical Records.
[38] Ibid.

IDENTITY AND CAUSE OF DEATH

45. On 11 January 2017, Frank Moser visually identified Finn's body. Identity is not in dispute and requires no further investigation.

46. On 13 January 2017, Dr Sarah Parsons, a Forensic Pathologist practising at the Victorian Institute of Forensic Medicine, conducted an autopsy upon Finn's body and reviewed a post mortem computed tomography (CT) scan. Dr Parsons completed a report, dated 8 May 2017, in which she formulated the cause of death as '*I(a) Head injury in the setting labour*'.

47. Dr Parsons noted that Finn's head injuries included bilateral subdural haematomas, patchy subarachnoid haemorrhages, a cephalohaematoma, a subgaleal haematoma and a linear skull fracture.

48. Dr Parsons further commented that whether the injuries are due to the head being stuck in the pelvis or being pushed against the pelvis during uterine contraction, or whether it is due to disimpaction of the head from the pelvis is unclear.

49. I accept Dr Parsons' opinion as to the medical cause of death.

REVIEW OF CARE

50. Due to the possibility that Finn's death might have been preventable, this matter was referred to the Coroners Prevention Unit (CPU)[39] for a review of the care provided by the RWH.

51. The CPU obtained statements from clinicians involved in Finn's delivery. They also received a statement from Professor Mark Umstad of the RWH, describing the results of an internal review undertaken by the RWH after Finn's death.

52. On the CPU's advice, an expert opinion on the management of maternity care provided to Ms Chisholm was requested from Associate Professor Edward Weaver of the University of Queensland. A/Prof Weaver supplied a report dated 4 July 2018, identifying several issues with the RWH's management of Ms Chisholm's labour and delivery.

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[39] The Coroners Prevention Unit (CPU) was established in 2008 to strengthen the prevention role of the coroner. The unit assists the Coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations. The CPU also reviews medical care and treatment in cases referred by the coroner. The CPU is comprised of health professionals with training in a range of areas including medicine, nursing, public health and mental health.

53. A copy of this opinion was provided to the RWH. Prof Umstad provided a supplementary statement in response to the opinion, detailing that he believed that A/Prof Weaver's report was accurate and well considered.[40]

Antenatal care

54. A/Prof Weaver found that the antenatal care throughout Ms Chisholm's pregnancy was provided to a good standard and that it was reasonable to induce her at nearly 37 completed weeks of gestation, considering clinical concerns about Finn's growth.

55. He noted that the decision to schedule induction of labour on 9 January 2017 was based, in part, on a miscalculation of growth discrepancy. Despite this, he still considered that it was reasonable to induce labour due to reasonable concerns about Finn's reduced growth velocity.

Management of labour

56. In A/Prof Weaver's opinion, the overall labour management plan for Ms Chisholm was reasonable and well within a normal standard of practice. He believes that the use of Syntocinon and the management of the infusion was appropriate and well within an acceptable standard of care. Medical notes did not provide A/ Prof Weaver with any evidence that there was an indication for earlier delivery.

57. He considers that it was reasonable for Ms Chisholm to attempt a vaginal birth, given that her babies were coping well with labour. When it seemed obvious that labour progress was arrested, the treating team proceeded with a caesarean section.

58. A/Prof Weaver detailed that in his opinion, there were several reasons why Ms Chisholm's labour progressed slowly. These included that it was her first labour, she was pre-term, she was induced and Finn was in a right occipito-posterior[41] position. He stated that it was reasonable to allow her sufficient time in labour to see if she could deliver her babies vaginally. When labour stalled, she was rightly consented for a caesarean section and that this was done in a timely fashion.

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[40] Supplementary statement of Professor Mark Umstad dated 3 October 2018, Coronial Brief.

[41] The occiput or back of the fetus' head lies in the posterior rather than the anterior part of the pelvis. As a consequence, the fetal head is deflexed. Deflexed means the head is not flexed, optimally babies have a flexed head (chin to chest) when delivered vaginally.

59. A/Prof Weaver noted that it was an unusual decision to continue with the Syntocinon infusion after the decision had been made to transfer Ms Chisholm to the operating theatre for a caesarean section.[42] In Ms Chisholm's circumstances, as she had poor progress after 15 hours on a Syntocinon infusion after an elective induction of labour for DCDA twins with a potentially growth restricted leading twin, A/Prof Weaver opined that there was little point in continuing with the infusion.

60. Despite this, he does not consider the continuation of the Syntocinon infusion for the approximate two hours that it took to transfer Ms Chisholm to the operating theatre, to have made a difference to the degree of impaction of Finn's head. This is especially so, given that Ms Chisholm had already been receiving the Syntocinon infusion for the preceding 15 hours, with little progress.

61. A/Prof Weaver considered the vaginal examination findings in theatre to be noteworthy. Specifically, that they were unchanged, with Ms Chisholm's cervix remaining at 4 centimetres of dilation, and Finn's head being located at 'station-1'[43]. Effectively, this meant that Finn's head had been forced into a tight space by the contractions of the uterus but it was not fixed there and should have been able to have been 'un-wedged' via suitable techniques.

62. In relation to the approximate two hour delay from the decision to perform an emergency caesarean section and the actual delivery, A/Prof Weaver stated that it is possible that fetal distress could have occurred during this period, given that Ms Chisholm was still receiving a Syntocinon infusion and given the absence of fetal monitoring.[44] In his opinion, while it is best practice to continue fetal monitoring during a patient's transfer to theatre for an emergency caesarean section, he does not consider the failing to do so to have made much difference to the outcome.

63. It is noted in medical records that Ms Chisholm's caesarean section was listed as a Category 3 out of the four categories prescribed by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (the College). This was considered to have been appropriate but does not detract from the issue that fetal monitoring during the transfer period should have

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[42] An exception to this would be in uncommon instances of a trial of operative birth in the operating theatre, where it would be important that the woman is still having strong, regular contractions, to see if a vaginal birth can be achieved.

[43] Meaning that the head was positioned 1 centimetre above the ischial spines, bony landmarks situated in the mid pelvis.

[44] The Syntocinon infusion was ceased at 9.21am and the CTG at 9.53am (when the tracing was normal).

continued to ensure that acute fetal distress did not occur, necessitating a more urgent classification.

Fetal monitoring

64. CTG monitoring was commenced at 9.00am on 9 January 2018. Medical notes show various tracings covering the period Ms Chisholm was induced through to her labour. The CTGs are all 'essentially normal', however on occasions there were periods of tachysystole, where Ms Chisholm's uterus was having five to six contractions every ten minutes. A/Prof Weaver noted that during these periods, there was no indication of any associated fetal compromise. Therefore, these tracings should be classified as abnormal but unlikely to be associated with any fetal compromise.

65. A/Prof Weaver further stated that there were several indications for continuous electronic fetal monitoring in labour, as per the College's *Intrapartum Fetal Surveillance, Clinical Guideline* (the guideline). Specifically, Ms Chisholm had the following indications:

    (a) DCDA twins;

    (b) induction of labour;

    (c) intra-uterine growth restriction; and

    (d) the use of oxytocin during labour.

66. The guideline also state:

> The fetal heart rate should be monitored by intermittent auscultation during unavoidable interruptions, at times of potential fetal vulnerability, with re-commencement of continuous CTG when feasible. Interruptions to fetal monitoring should be minimised during transfer to the operating theatre and prior to delivery of the fetus.

67. Given these indications, A/Prof Weaver considered that monitoring should have been conducted throughout labour and should have continued during Ms Chisholm's transfer to the operating theatre through to the commencement of the caesarean section. He further noted that given Ms Chisholm was still receiving Syntocinon, it was important to ensure that Finn's condition[45] was satisfactory prior to the commencement of the caesarean section.

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[45] The leading twin and the twin with intra-uterine growth restriction, who was more at risk of intrapartum fetal distress.

68. Professor Umstad's supplementary statement details that it is the RWH's standard practice to continue with fetal heart rate monitoring between the time of transfer from the Birth Centre to the commencement of surgery, including in the holding bay. He further details that a portable CTG monitor is available to facilitate such monitoring.[46]

69. Professor Umstad agreed that it would have been 'preferable' for the continuation of monitoring of Finn's heart rate between the time Ms Chisholm was transferred to the holding bay and the commencement of the caesarean section.[47]

70. A/ Prof Weaver opined that it is impossible to say whether or not Finn was already in distress when the caesarean section was commenced due to this lack of monitoring.[48] If Finn was distressed during this time, then it is possible that this could have contributed to his death. The extent of this possible contribution is impossible to determine.

Caesarean section and delivery

71. It is known that extraction of the fetal head can be problematic at emergency caesarean section. A/Prof Weaver noted that in this case, Ms Chisholm was only 4 centimetres dilated, with the last recorded station of Finn's head being station-1 (not low). Given that the pregnancy was a twin pregnancy at just under 37 weeks gestation, it was reasonable to assume that Finn was relatively smaller than a singleton pregnancy at a comparable gestation. In addition, Finn was lying longitudinally (normal). Ms Chisholm's body mass index was normal and she had had no prior surgery. None of these factors suggested a potential for operative difficulties.

72. When the vaginal examination was conducted prior to the caesarean section, in addition to the status of Ms Chisholm's dilation status, the position of Finn's head with respect to Ms Chisholm's pelvis should have also been determined. It is not clear from medical notes that this occurred.

73. During labour, Finn's head was recorded as being in an occipito-posterior position. If that was still the case at the time of the vaginal examination, this should have been communicated to Dr Tan. An occipito-posterior position was likely to make extraction of the fetal head more

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[46] Statement of Professor Mark Umstad dated 3 October 2018, Coronial Brief.
[47] Ibid.
[48] Noteworthy, even though this scenario is unlikely, given that the CTG trace was normal when it was ceased.

difficult. Such information may have resulted in a consultant being present in theatre at the outset of the caesarean section.

74. A/Prof Weaver was specific that he did not consider Ms Chisholm's labour to have been obstructed. He considers that her labour did not progress because of a combination of incoordinate contractions[49] and a mal-position of Finn's head. As detailed above, it is unclear if the doctors performing the caesarean section were cognisant of Finn's occipito-posterior position and the potential difficulties that may be encountered as a result.

75. A/Prof Weaver was satisfied with Dr Untersceider's opinion that Dr Tan was sufficiently experienced to carry out the delivery without supervision. Specifically, given that Dr Tan was an experienced registrar in her final year of training, this was a reasonable view to have taken. He does however, detail that it is important that a registrar performing a caesarean section has a clear idea of why labour has not progressed. Subsequently, A/ Prof Weaver believes that it was imperative that the vaginal examination was performed immediately prior to the commencement of the caesarean section.[50]

Presence of a consultant obstetrician

76. A/Prof Weaver noted that he considers it unusual that the doctors in this case had such difficulties in delivering Finn's head. Given that it was only located at station-1 and Ms Chisholm was only 4 centimetres dilated, he would have expected such a procedure to be straightforward.

77. It was A/Prof Weaver's opinion, that it is sound clinical practice and good risk management for a consultant obstetrician to be present in the theatre during cases when there is a reasonable expectation that difficulties could be encountered. At the very least, he stated that there should always be provision in any teaching hospital for a registrar to request a consultant to be present when performing a potentially complex caesarean section.

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[49] The midwives' notes incoordinate contractions on a number of occasions and correctly increased the Syntocinon infusion rate in an attempt to overcome the problem.

[50] This would have alerted the surgeon to any unanticipated progress in labour, allowed a check of the station of the fetal head and enabled the surgeon to determine the position of the fetal head with respect to the pelvis and its degree of de-flexion.

78. The RWH does have guidelines that are consistent with A/Prof Weaver's opinion. Specifically, situations where a consultant obstetrician is expected to attend are prescribed in RWH's protocol, *Escalation to Senior Medical Staff Rostered to Birth Centre.*

79. As already discussed at paragraph 32, Dr Unterscheider decided that Dr Tan was sufficiently competent to carry out the delivery without direct supervision.[51] A/Prof Weaver stated that given Dr Tan was an experienced registrar in her final year of training, this was a reasonable decision. Noting Dr Tan's level of experience, this decision was still contrary to the RWH procedure, *Escalation to Senior Medical Staff Rostered to Birth Centre,* which states that a consultant obstetrician is expected to be present for a caesarean birth of a multiple pregnancy. While a consultant was not present from the outset of surgery, A/ Prof Weaver noted that when Dr Tan could not deliver Finn and had exhausted all options, it was right to stop and request consultant attendance.

80. I note here that in November 2017, the College published the *Training Registrar Supervision Guideline.* This guideline was published after Finn's death and addresses issues of supervision and credentialing.

Cause of Finn's injuries

81. A/Prof Weaver stated that he had never seen a fractured fetal skull caused by labour alone, nor had he heard of such an occurrence. He concluded:

> I think the injuries were most likely to be caused by the various actions used in elevating and delivering the fetal head, though it is impossible for me to say which practitioner caused such injuries.

Royal Women's Hospital response to death

Internal Review

82. The RWH's internal review resulted in six recommendations:

    (a) The Department of Ultrasound at the RWH should reinforce the correct calculations of growth discordance in twins with all relevant clinicians.

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[51] Statement of Dr Julia Unterscheider dated 13 March 2018, Coronial Brief.

(b) To optimise patient outcomes and to facilitate teaching opportunities, the Birth Centre obstetric consultants will be instructed about their attendance at potentially difficult births and deliveries.

(c) Vaginal examinations prior to operative deliveries in the operating theatre are to be performed by the most senior obstetric clinician present.

(d) The medical practitioners involved have been provided with education about additional techniques for disimpaction of the fetal head. This education will continue to be provided to all obstetric trainees.

(e) Disimpaction of the fetal head is to be performed by the most senior ostetricion present.

(f) The guidelines for obstetric consultant presence at caesarean section will be reviewed by the Division of Maternity Services.

83. All recommendations were noted as having been actioned and a new guideline having been developed, *Impacted Fetal Head at Caesarean Section – Management*. A copy dated 8 April 2018 of this guideline was provided to the Court.

84. A/Prof Weaver agreed with the conclusions reached by the RWH's internal review of Finn's case, commenting that they were reasonable. He added that his additional recommendation would be the implementation of a clear centralised credentialing system for obstetric trainees in the performance of complex caesarean sections. Such a system would allow consultant obstetricians to have current information on registrars' scope of practice. Regular updates every six months would contribute to individual registrar's summative assessments.

Response to A/Prof Weaver's expert opinion

85. The RWH agreed with A/Prof Weaver's recommendations. According to Prof Umstad, they are actioning the recommendations as follows:

(a) A clearer process for credentialing and signing off the competence of individual registrars to perform complex caesarean sections, is presently under development.

(b) Once finalised, this credentialing process will be updated every six months at the time of each registrar's summative assessment.

(c) This list will be available in the operating theatre suite and the Birth Centre for ease of reference via the intranet and via a hardcopy that is readily accessible. The intranet has been chosen as it is available to all staff: midwifery, nursing and obstetric at all access points within the hospital which includes the operating suites, Birth Centre, antenatal wards and emergency department. It is also accessible for consultants who are offsite at the time.

86. I request confirmation of the above for the Court's record.

Coronial Context

87. In 2017, the Queensland Deputy State Coroner Lock conducted an Inquest[52] into a perinatal death resulting from birth injuries following an obstructed labour. The finding recommended that the College update the guideline, *Delivery of the fetus at caesarean section* to include a description of techniques that may be adopted to deliver a fetus with a deeply impacted head. A revised version of the guideline was published in July 2017.

88. While I recognise that based on the evidence before me, Ms Chisholm did not suffer from an obstructed labour, there is nonetheless a common issue of a deeply impacted fetal head in the pelvis that required vaginal disimpaction and a technically difficult extraction at caesarean delivery.

89. The recommendation in this guideline is for the elevation of the fetal head vaginally by an experienced assistant. In this case, it was performed by a midwife.

90. The revised guideline was not available at the time of Finn's birth however, I am satisfied that had it been available and had it been followed, the outcome may have been different. The revised guideline cites 'some evidence that inflatable devices might reduce the risk of uterine injury'.

91. On 18 September 2019, the Victorian Acting State Coroner, Caitlin English, handed down her findings[53] into a perinatal death resulting from complications of an impacted fetal head at full dilation. In the course of her investigation, expert advice was obtained recommending that the College consider evidence on inflatable devices in the minimisation of fetal head injuries.

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[52] Deputy State Coroner John Lock Finding of Inquest into the death of Nixon Martin Tonkin [2014/1999].
[53] Acting State Coroner Caitlin English Finding into Death without Inquest, Lucia Grace Sefton (Bowlen) [2015 3982].

92. The College responded to this proposed recommendation by detailing that there is some evidence that inflatable devices might reduce the risk of uterine injury but that there is no high-quality evidence of a reduction in fetal head trauma and limited evidence of any clinically significant neonatal benefit. They further commented that the studies of the use of inflatable devices do not include enough women at preterm gestations to determine their role in such situations. They noted that, although such devices may be of benefit, its use in preterm deliveries is currently unproven and should remain at the discretion of the treating clinician.[54] Specialist review of this response considered it to be reasonable overall, given that the College can only recommend changes based on evidence.

93. I consider that following Finn's case, it would now be of assistance for the College to review the evidence on techniques and devices to reduce head injuries. I note the RWH currently uses the fetal pillow inflatable device[55].

CONCLUSIONS

94. I accept A/Prof Weaver's conclusions in his report.

95. I recognise that the RWH have acknowledged issues with their practices that played a role in Finn's death, and have implemented recommendations from their internal review to improve the care they provide in the future.

96. After addressing Finn's case in his expert report, A/Prof Weaver noted his concern that there have been increasing numbers of cases like Finn's reported in recent years, while prior to 2009 he had never heard of a baby dying from a skull fracture following a difficult extraction at caesarean section.

97. Finn's death highlights the importance of diligent monitoring of labour progress and early involvement of experienced consultant obstetricians. I consider that education is required to improve detection of a technically difficult extractions during caesarean deliveries and ensure that the doctors involved are practiced in the correct manoeuvres that may be required to minimise injury to the mother and baby. For these reasons, I will be referring this finding to the College for consideration as to any lessons that can be learnt from Finn's death.

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[54] Ibid.

[55] A balloon device designed to elevate a deeply impacted head out of the pelvis marketed as a *Fetal Pillow*®.

98. In this context, I consider that there are further actions which could be taken to minimise the likelihood of deaths such as Finn's, and I will make recommendations below to this effect.

RECOMMENDATIONS PURSUANT TO SECTION 72(2) OF THE ACT

1. I recommend that the RWH ensure their guidelines and current practices are aligned with College's guideline, *Delivery of the fetus at caesarean section*; and that final vaginal examination just prior to an emergency caesarean should be conducted by the most experienced obstetrician present.

2. I recommend the RWH and the College refresh their education resources covering the following issues:

   (a) early identification and escalation to consultant obstetric staff of obstructed labour or potentially difficult fetal head extractions during caesareans;

   (b) multi-disciplinary scenario based training, such as Practical Obstetric Multi Professional Training (PROMPT)56 that includes techniques to be adopted for safe delivery of the baby where the head is deeply impacted in the pelvis. This should be targeted to obstetric medical staff as part of all obstetric training programs;

   (c) the risk of head injuries, particularly skull fractures and significant bleeding, in relation to obstructed labour and vaginal disimpaction; and

   (d) continuous fetal monitoring, particularly in theatre and up until the time of caesarean. The RWH should ensure continuous fetal monitoring is part of their clinical guidelines.

3. I recommend Safer Care Victoria supports the training mentioned in recommendation 2(b), specifically by targeting education in relation to vaginal disimpaction being provided to midwives who are present in caesarean sections and who may be required to assist in vaginal disimpaction.

4. I recommend the College review their current guideline, *Delivery of the fetus at caesarean section,* to specify:

[56] Evidence based multi-professional training for obstetric emergencies.

(a) that vaginal examinations immediately prior to commencing a caesarean section should be performed by the most senior obstetric clinician present; and

(b) inclusion of the College's recommendations into the mandatory surgical safety 'timeout' checklist[57], which is completed prior to commencement of all procedures. In particular, it should specify the need for a vaginal examination prior to commencing a caesarean section and the identification of obstructed labour or a difficult head extraction. If this is identified or suspected, the multi-disciplinary team in theatre need to be aware of their roles, responsibilities and the techniques to be employed. A discussion on the manoeuvres that may be required could be part of the surgical safety 'timeout' checklist.

5. I recommend the RWH ensure compliance with the College's November 2017 guideline, *RANZCOG Training Registrar Supervision Guideline.* The Guideline was published after Finn's death and addresses issues of supervision and credentialing.

[57] A World Health Organisation (WHO) Surgical Safety Checklist to increase the safety of patients undergoing surgery by systemic checking to ensure conditions are optimal for patient safety. The surgical 'timeout' is performed by the surgeons, anaesthetist and theatre nurses in the operating theatre immediately before a planned procedure. At the time a person is brought into theatre, the surgical team pauses to confirm patient identity, surgical site and planned procedure.

FINDINGS

99. Pursuant to section 73(1B) of the Act, I direct that this finding be published on the Internet.

100. Having investigated the death, without holding an inquest, I make the following findings pursuant to section 67(1) of the *Coroners Act 2008*:

(a) The identity of the deceased was Finn Moser, born 10 January 2017;

(b) The death occurred on 11 January 2017 at the Royal Women's Hospital located at 20 Flemington Road, Parkville Victoria 3052 from a head injury in the setting of labour; and

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

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

(a) Ms Bree Chisholm, senior next of kin

(b) Mr Frank Moser, senior next of kin

(c) Ms Dimitra Dubrow, Maurice Blackburn Lawyers on behalf of Bree Chisholm, interested party

(d) Ms Janine McIlwraith, Slater and Gordon on behalf of Frank Moser, interested party

(e) Ms Lisa Ridd, MinterEllison on behalf of the Royal Women's Hospital, interested party

(f) Professor Mark Umstad, Royal Women's Hospital, interested party

(g) Dr Julia Unterscheider, Royal Women's Hospital, interested party

(h) Dr Mei Lin Tan, Royal Women's Hospital, interested party

(i) Dr Kelly van den Haspel, Royal Women's Hospital, interested party

(j) Dr Sue Matthews, Chief Executive, Royal Women's Hospital, interested party[58]

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[58] Amended to reflect the name of the current Chief Executive of the Royal Women's Hospital. Internally identified on 7 November 2019.

(k) Dr Vijay Roach, Royal Australian and New Zealand College of Obstetricians and Gynaecologists, interested party

(l) Adjunct Professor Tanya Farrell, Consultative Council on Obstetric and Paediatric Mortality and Morbidity, interested party

(m) Professor Euan Wallace, Safer Care Victoria, Victorian Department of Health and Human Services, interested party

(n) Nursing and Midwifery Board of Australia, interested party

(o) Senior Constable Hanna Smith, Coroner's Investigator.

Signature:

SIMON McGREGOR

CORONER

Date: 11 November 2019