STATE CORONER'S COURT
OF NEW SOUTH WALES

Inquest:	Inquest into the death of Michaela Perrin
Hearing dates:	24-28 March 2017, 27-28 November 2017
Date of findings:	27 February 2018
Place of findings:	NSW State Coroner's Court, Glebe
Findings of:	Magistrate Harriet Grahame, Deputy State Coroner
Catchwords:	CORONIAL LAW – maternal sepsis
File numbers:	2014/311368
Representation:	Dr P Dwyer, counsel assisting, instructed by Mr Armstrong, solicitor, Crown Solicitors Office
	Mr C Magee of counsel, instructed by Moray & Agnew for Dr Penaneuva
	Mr Royle of counsel, instructed by Stacks Goucamp Lawyers for the Perrin family
	Mr R Sergi of counsel, instructed by HWL Ebsworth solicitors for Dr Addenbrooke
	Ms K Burke of counsel instructed by Hicksons for Northern NSW Local Health District
	Mr S Woods of counsel, instructed by Browns for Dr Tallis
	Mr Dawson solicitor, NEW Law for RN Lee and RM McKelvey
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Table of Contents

Introduction

1. Michaela Perrin died at Lismore Base Hospital on 22 October 2014. She was only 26 years of age. As Michaela succumbed to sepsis, arising from an infection after a recent caesarean section, her healthy newborn baby slept peacefully nearby.

2. Michaela's death is a terrible tragedy. Appropriate and timely medical care could have saved her life. Instead her three greatly loved children are being raised by her mother and her family continue to grieve their loss.

The role of the coroner and the scope of the inquest

3. The coroner is to make findings as to the identity of the nominated person, and in relation to the date and place of death.[1] The coroner is also to address issues concerning the manner and cause of the person's death. In addition, the coroner may make recommendations in relation to matters that have the capacity to improve public health and safety in the future.[2]

4. In this case there is no dispute in relation to the identity of the Michaela Perrin or to the time and place of her death. The inquest focused on the manner and medical cause of death. It was also necessary to consider whether or not her death was in any way avoidable and if so what mechanisms, if any, could be put in place to help prevent such a situation recurring.

The evidence

5. The inquest proceeded over seven days. A large number of statements were tendered, as were expert reports, medical records and various policy documents. Oral evidence was also received, including from Michaela's mother, and from medical and nursing practitioners involved in her care.

6. A number of experts also assisted the court by carefully reviewing her medical treatment. In relation to her obstetric care, Dr John Mutton and Professor Mike O'Connor provided reports and gave extremely valuable concurrent oral evidence before me. Professor John Raftos and Dr Tim Green also assisted in relation to reviewing the care Michaela received in the Emergency Department of Lismore Base Hospital.

7. Section 81(1) of the *Coroner's Act* 2009 (NSW) requires that when an inquest is held, the coroner must record in writing his or her findings in relation to the various aspects of the death. These are my findings in relation to the death of Michaela Perrin.

Brief chronology of events

8. Michaela Perrin had experienced no serious illnesses or injuries prior to her death. She lived with her new partner and her two children in a caravan park at South Lismore. She had previously worked in childcare and enjoyed a close relationship with her mother and sisters.

[1] Section 81 *Coroners Act* 2009 (NSW).
[2] Section 82 *Coroners Act* 2009 (NSW).

9. Both her children had been born by caesarean section, without complication and when Michaela found out that she was pregnant again in early 2014, it was understood that her new child would also be delivered in the same manner.

10. Michaela commenced her antenatal care at Lismore Base Hospital and is recorded as having attended seven antenatal visits.

11. The pregnancy initially progressed without issues. On 3 August 2014, there was an episode of apparent premature rupture of the membranes and in September, a threatened premature labour (at 33 weeks) was successfully treated. During the pregnancy, Michaela also presented on three occasions with skin infections.

12. On 16 October 2014, a planned caesarean section was performed under spinal anaesthesia and a healthy baby girl, Brittany Elizabeth Porter, was delivered. The surgical wound was closed with continuous subcutaneous caprosyn (absorbable sutures). Michaela was discharged on 19 October 2014, the third post operative day.

13. About 9.15 am on 20 October 2014, Michaela presented to the Emergency Department at Lismore Base Hospital complaining of wound pain. Her vital signs were taken and she was seen by Dr Alison Mitchell. Dr Mitchell called for the obstetrics and gynaecology registrar and Michaela was then seen by Dr Cristina Penanueva. After a short consultation Michaela went home with pain killers and was told to return if she experienced fever, vomiting or worsening pain.

14. Michaela returned to the Emergency Department the following day, with worsening symptoms. On this occasion she was seen in the Emergency Department by Dr Noora Jassim. Once again Michaela was referred to Dr Penaneuva.

15. Michaela was subsequently admitted and taken to the Woman's Care Unit.

16. Just after 6 am on 22 October 2014, a midwife, Ms McKelvey, entered Michaela's room to do her morning observations and dispense her medication. She found Michaela lying in bed. She was unresponsive and cold. The rapid response team was called. Michaela was pronounced dead at 7am.

17. Results obtained at Lismore Base Hospital after Michaela's death were positive for Community Acquired Methicillin-Resistant Staphylococcus Aureus (CA-MRSA).

18. An autopsy was conducted by Dr Allan Cala, senior staff specialist in Forensic Pathology at the Department of Forensic Medicine, Newcastle.[3] He recorded his finding as sepsis, as a result of wound infection, following caesarean section. He noted that there was frank pus in the line of the caesarean section wound. The pus formation was also extensive in the anterior abdominal wall adjacent to the surgical wound. Methicillin Resistant Staphylococcus Aureus (MRSA) was cultured from the ante-mortem and post-mortem blood cultures and the post-mortem wound swabs.

[3] Report of Dr Allan Cala, Exhibit 1, Tab 7.

19. There is no dispute that Michaela's death was caused by septic shock associated with a serious bacterial infection (MRSA) in her caesarean wound.

20. A close examination of the circumstances of her medical treatment raises serious questions about the quality of care Michaela received at Lismore Base Hospital.

The significance of earlier presentations for skin infections

21. The inquest examined the significance of Michaela's earlier attendances at Lismore Base Hospital for significant skin infections. She had attended in February, March and April 2014. Although treatment had included wound drainage and the prescription of antibiotics, no swabs had ever been taken. Further, it appears that these earlier attendances were unknown to the clinicians who dealt with her when she contacted the Hospital post operatively.

22. There was some dispute among the experts about the significance of these previous infections and their treatment. Clearly if it had been known that Michaela was a carrier of a Community Acquired Methicillin-Resistant Staphylococcus Aureus (CA-MRSA) there is a real possibility her post-operative caesarian infection may have been dealt with more quickly and effective antibiotics may have been prescribed in a timely manner. But it is not clear on the evidence now available what tests, if they had been taken at those earlier times, would have revealed. It was suggested, given that these earlier infections seem to have resolved without an antibiotic especially targeted at MRSA, that it is likely a different organism was the culprit on these earlier occasions.[4] However, as the swabs were not taken, we will never know for sure.

23. Both Dr O'Connor and Dr Mutton were of the view that it was standard practice that swabs should have been taken on these earlier occasions.[5] It would certainly have been best practice. Even if results had not revealed that Michaela was a carrier for MRSA, the number of infections over a short period of time suggested that she was somewhat susceptible to skin infection. It was useful information for any later clinician trying to get a complete picture.

24. The records of these earlier attendances were never reviewed by doctors who saw Michaela after the caesarean. They should have been seen by the clinicians who examined her in the Emergency Department on both 20 August 2014 and 21 August 2014.

25. The Northern NSW Health District has taken seriously the possibility that improved practise in relation to these earlier issues could have benefitted a patient such as Michaela. I note that it is regarded as "standard practice" that boils and wounds should be swabbed in the Emergency Department.[6] Significantly since Michaela's death Lismore Base Hospital has also implemented an MRSA clearance program. Women who have had a multidrug resistant organism can be tracked and flagged on the eMaternity computer system to provide staff with the relevant information.[7] This is a positive development.

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[4] See for example Dr Mutton's discussion of the issue. Exhibit 1, Volume 3, Tab 59, Report dated 20 October 2016, page 3.
[5] Transcript 27/4/17, page 67, line 43 onwards.
[6] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 4.
[7] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 4.

The caesarean operation

26. Michaela had undergone two previous caesareans. On her mother's account, Michaela had recovered well on both occasions and experienced little post-operative pain. In relation to her third pregnancy, Michaela saw Dr Tallis twice during her ante-natal care. On the second occasion she gave formal consent for an elective caesarean section.[8]

27. Michaela's third caesarean was performed by Dr Tallis on 16 October 2014. It was described as uneventful with an estimated blood loss of 300mls.[9] A wound drain was not used and the skin was closed with sutures.

28. Dr Tallis gave evidence before me. She was an impressive witness and gave every indication of being a careful and competent practitioner. She described using sutures as acting in accordance with her training and supervision.[10] She stated that she was taught not to use drains and had only seen them used extremely rarely. She had been taught to follow the NICE Guidelines,[11] which she said had been adopted by the Royal College of Obstetricians and Gynaecologists.

29. One of the questions that arose for consideration during the investigation of Michaela's death was whether the operation had been performed in an appropriate manner. The issue arose as the use of sutures, without a drain appeared, on the face of it, to be in conflict with the NSW Health Infection Control Policy in place at the time of Michaela's death.[12] This policy, which has now been replaced,[13] set out a guideline for "surgical procedures" that stated wherever possible skin should be closed with staples and a wound drainage system used. The policy was not directed specifically to caesarean procedures.

30. The court received significant assistance in relation to this issue.[14] Both experts, Professor O'Connor and Dr Mutton, expressed the opinion that the use of sutures was now far more common than the use of staples and should not attract any criticism.[15] They were not critical of Dr Tallis using sutures, although Professor O'Connor expressed a personal preference for using staples, in a subsequent caesarean.[16] There was some discussion of the various benefits of both approaches, but nothing to suggest a clear difference in the infection rate was indicated.

31. Michaela's mother, Cathy, herself a qualified midwife, gave evidence that Michaela had experienced both staples and sutures in the past. In more recent times Cathy had seen sutures being used in the Hospital where she worked.

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[8] Statement of Dr Tallis, Exhibit 1, Tab 22 [7].
[9] Statement of Dr Tallis, Exhibit 1, Tab 22 [13].
[10] Statement of Dr Tallis, Exhibit 1, Tab 22 [9-14], see also her evidence at Transcript 24/4/17, page 78, line 11.
[11] NICE Guidelines referred to relate specifically to caesarean sections and were published on 23 November 2011. See Annexure A to the statement of Dr Tallis, dated 12 April 2017, Exhibit 1, Tab 22A.
[12] Infection Control Policy - PD 2007_036, Exhibit 1, Volume 2, Tab 54.
[13] See current policy – Infection Prevention and Control Policy PD 2017_013 (7 June 2017).
[14] See also Exhibit 4, extracted from Beisher & Mackay's Obstetrics, Gynaecology and the Newborn and a series of other learned articles on the subject.
[15] Transcript 27/4/17, page 70 lines 40 onwards.
[16] See this discussion at Transcript 27/4/17, page 70 -72 .

32. I have no criticism of Dr Tallis's professional conduct whatsoever. Not only did she appear to be highly competent and well able to explain her clinical decisions, her kindness was demonstrated by the fact that she went to visit Michaela as soon as she heard that there had been a complication, notwithstanding the fact that she herself had just completed a 24 hour shift.

33. I note that the current NSW Health Prevention and Control Policy (PD 2017_013) does not contain specific comment in relation to issues such as sutures versus staples and/or the use of drains.

The adequacy of Michaela's treatment on 20 October 2014

34. Michaela had been discharged on 19 October 2014 with advice to take paracetamol and ibuprofen. Although she had been given an intraoperative prophylactic antibiotic, no further antibiotics had been prescribed. During the night of her discharge and early the following morning Michaela had experienced "hot and cold" flushes and her abdominal pain had increased. On the morning of 20 October 2014 Michaela asked her mother to take her back to Lismore Base Hospital.[17] Cathy Perrin explained that Michaela was normally a "non-complainer" and that she was very concerned about the level of pain her daughter was in.

35. Michaela was triaged by registered nurse Elissa Rapmund. Examination by registered nurse Daniel Pym was recorded in the following way; "pulse 125 bpm, temperature at 37.3 and pain score of 10 out of 10".[18] According to Cathy Perrin, Michaela was in so much pain that she "couldn't stand up straight".[19] Michaela was given endone at about 9.50am.[20]

The role of Dr Mitchell

36. The first doctor Michaela saw was Dr Alison Mitchell. Dr Mitchell had obtained her primary medical degree in 2007. By October 2014 she was midway through the ACEM four year post-graduate advanced training program. She had been employed as an emergency registrar in the Emergency Department of Lismore Base Hospital since about July 2014.[21]

37. Dr Mitchell reviewed the nurse's triage notes and took a brief history from Michaela. It is likely that this took place in a small room or cubicle located in the Emergency Department. It is common ground that she made an abdominal examination of Michaela and briefly examined her wound, which was superficially clean and healthy looking. There were clearly a number of factors which could indicate infection, including pain, a recent surgical procedure, a high heart rate (recorded as 125 at one point, later dropping), a high temperature (recorded as 37.8 at one point), and tenderness in the uterus.

38. I accept that while Dr Mitchell did not record the possibility of infection as a differential diagnosis in her clinical note, she was aware of the possibility and that is why she contacted the obstetrics team.[22] I accept her evidence that she asked Michaela about signs of systemic infection such as vomiting and offensive discharge.

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[17] Statement of Cathy Perrin, Exhibit 1, Tab 36, see also Transcript 24/4/17, Page 20, line 27.
[18] Emergency Department Clinical Record, Exhibit 1, Tab 47.
[19] Cathy Perrin, Transcript 24/4/17, page 21.
[20] Emergency Department Clinical Record, Exhibit 1, Tab 47.
[21] Dr Mitchell, Transcript 26/4/17, page 4, line 30 onwards.
[22] See her discussion of this issue at Transcript 26/4/17, Page 34, line 10 onwards.

39. Two experts in emergency medicine, Professor Tim Green and Dr John Raftos, reviewed Dr Mitchell's clinical decisions on that day. Both agreed that she was correct in immediately notifying the obstetrics and gynaecology registrar. There was some discussion about whether she could have "got the ball rolling" and ordered some inflammatory marker blood tests but there was no real criticism of the course of action she took.[23] Professor Green was satisfied that she "*discharged her duty of care appropriately and…was cautious enough to refer to a more senior experienced staff member*".[24] I accept his opinion. Had the rest of the system been working appropriately, Michaela should have received the care she required.

40. Both obstetrics and gynaecology experts, Professor O'Connor and Dr Mutton, were also of the view that the initial examination conducted by Dr Mitchell was appropriate in all the circumstances and that she did the correct thing to get the obstetrics and gynaecology registrar involved.[25] She should have been able to rely on the fact that a specialist review of the patient would then take place, which would necessarily involve a further physical examination, a more detailed history and if necessary the ordering of tests and further investigations.

41. Unfortunately, it is now clear that these expectations of continuing care were not met. I accept Dr Mitchell's evidence that had she known that the obstetrics and gynaecology registrar had not examined Michaela's uterus she "*would have actually asked [Dr Penaneuva] to examine [Michaela]"*. She explained "*..that, for me, was the critical thing because my biggest concern…the thing that triggered…this…is that she had a tender uterus…I was acknowledging that I don't examine…post caesarean uteruses, it's outside my field, I needed them to do it."*[26]

42. I note that Michaela's mother was critical of the manner in which the physical examination took place, a matter hotly contested by Dr Mitchell. Cathy Perrin described it as both rushed and painfully executed. Within the context of this inquest it is unnecessary for me to make a firm finding either way in relation to this issue. More significantly perhaps, Michaela's mother also expressed dissatisfaction in relation to the communication and listening skills of staff on the day. Cathy Perrin said that she told staff, both doctors and nurses, repeatedly that something was "seriously wrong".[27] She told staff that Michaela's current state was "totally different" to how well she was after her two previous caesareans but nobody would listen. I accept her evidence in relation to this issue and I hope it provides a learning opportunity for all involved staff. Close listening to information provided by family members can provide an extremely important, but sometimes undervalued, perspective in medical care.

Dr Penaneuva's first contact with Michaela

43. When Dr Mitchell referred Michaela to the obstetrics and gynaecology registrar, Dr Penaneuva became responsible for the patient. The court heard evidence about how the referral was made and who took the call, but in my view little turns on the issue. At the time

[23] See for example Dr Raftos, Transcript 28/11/17, Page 11, line 44 onwards.
[24] Professor Green, Transcript 28/11/17, Page 12, line 33.
[25] Transcript of evidence 27/4/17, page 75.
[26] Dr Mitchell, Transcript 26/4/17, page 55-57.
[27] Cathy Perrin, Transcript 24/4/17, page 21, line 41 onwards.

of Michaela's attendance on 20 August 2014, Dr Penaneuva was employed as a career medical officer in obstetrics and gynaecology at Lismore Base Hospital.[28] After training in the Philippines she had commenced as a resident medical officer at Lismore Base Hospital from 2003 and had worked as an unaccredited obstetrics registrar from 2007-2013.[29]

44. From the outset, it was incumbent on Dr Penaneuva to come to her own conclusion in relation to the care required by Michaela.

45. In any assessment of what occurred, Dr Penaneuva's care must be judged as grossly inadequate. Dr Penaneuva conceded this herself during the inquest.[30]

46. Her consideration of the relevant issues was cursory at best. Dr Penaneuva's failings included,

    - She did not write any notes in relation to this assessment.[31]
    - She did not review the triage notes or any notes made by Dr Mitchell.[32] She told the court that Dr Mitchell told her "everything was fine".[33] This is highly implausible. In any event, Dr Penaneuva did not take an adequate history herself which would have indicated a fluctuating temperature and great pain throughout the night.
    - She did not identify the possibility of sepsis or seem to understand that she should have had a very high index of suspicion, given Michaela's presentation and recent caesarean section.[34]
    - She did not question Michaela about the intensity of her pain, using a pain scale. She did not take seriously or consider that the pain experienced was totally different to pain experienced by Michaela after either of her other caesareans. She did not take the concerns of Michaela's mother seriously. By not engaging with the family she missed an opportunity to understand the total picture.
    - She did not palpate the abdomen or make any proper assessment of the pain in the uterus.[35]
    - She did not take vital signs, including temperature.
    - Her decision to release Michaela almost immediately, with endone was wholly premature.

[28] Dr Penanueva, Transcript 26/4/17, page 88, line 17.
[29] For further discussion of her qualifications and experience see Dr Penanueva, Transcript 26/4/17, Page 87 onwards.
[30] Dr Penaneuva, Transcript 26/4/17, page 95, line 19 onwards.
[31] Evidence of Dr Mitchell, Transcript 26/4/17, page 55, line 40 onwards.
[32] Evidence of Dr Penaneuva, Transcript 26/4/17, page 92, line 1.
[33] Evidence of Dr Penaneuva, Transcript 26/4/17, page 93, line 20 onwards.
[34] For discussion of this point see Dr Mutton, Transcript 27/4/17, page 79.
[35] Evidence of Dr Penaneuva, Transcript 26/4/17, Page 93, line 10.

47. Dr Mutton and Professor O'Connor, the experts who reviewed Dr Penaneuva's conduct, found it greatly lacking. Most significantly Dr Penaneuva appeared to give no consideration to the possibility of sepsis. In Dr Mutton's view, there was already enough to treat the diagnosis as "sepsis until proven otherwise".[36] In his view, any competent practitioner with specialisation in obstetrics and gynaecology should have had a high index of suspicion for a woman presenting with serious pain four days after a caesarean.[37] Dr Penaneuva did not. She failed to understand that the symptoms of sepsis can be less obvious in post-partem women.

48. I accept their shared view that Michaela should have been admitted on 20 October 2014 for tests and further close observation. There were a number of investigations which could have been immediately undertaken, including her white cell and neutrophil counts and C-Reactive Protein Tests (CRP). An abdominal ultrasound could have been undertaken which is likely to have shown evidence of fluid collection, indicating a likely wound infection. A lactate test should have been undertaken and empirical antibiotics, wound swabs and blood cultures commenced. Had she been admitted her vital signs could have been regularly monitored and fluids commenced.[38]

49. Instead she was sent home, with pain killers.

The adequacy of Michaela's treatment on 21 October 2014

50. Overnight Michaela developed left sided abdominal swelling, which was red, hot and tender. She complained to Cathy Perrin that she had been feeling hot and cold. Cathy Perrin stated that the pain was so severe that Michaela was bent over and barely able to walk.[39]

51. Michaela and Cathy arrived back at the Emergency Department at Lismore Base Hospital around 9.50am[40] or 10.39 am[41] with a fever (39.3 degrees), tachycardia (120 bpm) and severe pain (nine out of ten) associated with vulval swelling of the labia and mons veneris.[42]

52. It does not appear that Michaela was seen by a doctor until she was examined by Dr Jassim at around 1.15pm.[43] However, it is possible that Dr Jassim recorded the entry in her notes slightly later than her first contact.[44]

53. Dr Jassim was working as a registrar in the Emergency Department. She had achieved her primary degree in Wales and had been at Lismore Base Hospital since 2013.

54. It was immediately clear to Dr Jassim that even though Michaela was "a stoic lady", that she was in significant pain and that her mother was very worried.[45] Dr Jassim wanted her

[36] Evidence of Dr Mutton, Transcript 27/4/17, page 77, line 10.
[37] Evidence of Dr Mutton and Professor O'Connor, Transcript 27/4/17, page 79, line 35.
[38] Dr Mutton, Transcript 27/4/17, page 40, line 40.
[39] Cathy Perrin, Transcript 24/4/17, Page 28 line 1 onwards.
[40] Statement of Nurse Merric Parker, Tab 26 [6].
[41] Statement of Nurse Tili Lampe, Exhibit 1, Tab 27 [6].
[42] Lismore Base Clinical Records, Exhibit 1, Tab 48.
[43] Statement of Dr Jassim, Exhibit 1, Tab 24, Transcript 27/11/17, Page 6.
[44] Statement of Dr Jassim, Exhibit 1, Tab 24, Transcript 27/11/17, Page 6, line 19.
[45] Dr Jassim, Transcript 27/11/17, Page 7, line 36.

admitted. Dr Jassim conducted a proper examination and commenced the appropriate tests. At the same time she correctly sought a review from the Obstetrics and Gynaecology Department.

Dr Penaneuva's second contact with Michaela

55. Dr Penaneuva attended the Emergency Department as requested and conducted an examination of Michaela. Michaela reported that she had a rash on her stomach, a temperature and that she felt flushed. Michaela told Dr Penaneuva that her temperature had also been high the night before.[46] She had a high pulse rate of over 100. Dr Penaneuva palpated Michaela's stomach and felt a thickening of the wound.[47]

56. Dr Penaneuva told the court that she became concerned that Michaela "*was suffering an infection.*"[48] However, she did not tell anybody this or record it in her clinical notes. She kept this information "*in her head*".[49] In explanation she said "*I just didn't – it was my fault I didn't say it, but in my head, that she might, she might be having some degree of sepsis, so from that time I said to Dr Jassim to carry out the investigations"*.[50] Dr Penaneuva later told the court that she was not aware of the sepsis guidelines and "*didn't really realise that she will really go downhill that quick"*.[51] In contrast to her oral evidence that she thought that Michaela might have "*some degree of sepsis*", Dr Penaneuva is reported to have told Cathy Perrin, that Michaela had a "skin infection".[52]

57. While Dr Penaneuva told the court she thought that Michaela "might" have had "some degree of sepsis", both experts expressed the view that the time for suspicion had well and truly passed, it was "obvious" Michaela had sepsis and the situation was urgent and indeed potentially life threatening.[53]

58. As a result of Dr Penaneuva's examination, a number of steps, which should have been taken the day before, were finally performed. Dr Penaneuva asked Dr Jassim to undertake tests including blood cultures, ultrasound of the abdomen, a mid stream urine specimen and vaginal swab. Somewhat extraordinarily, given the pain she was in, Dr Penaneuva suggested that Michaela undertake the vaginal swab herself. In the end Cathy Perrin did it for her.[54]

59. Dr Penaneuva also requested that Dr Jassim order intravenous antibiotics for a presumed wound infection and IV ceftriaxone and metronidazole were subsequently commenced. While the experts were not critical of the antibiotics initially prescribed, the delay in commencing these medications meant that by the time Michaela's results came back and a better targeted medication could be ordered, Michaela was already dead.

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[46] For discussion of these issues see Dr Penaneuva's evidence at Transcript 27/4/17, page 17 onwards.
[47] Dr Penaneuva, Transcript 27/4/17, page 17, line 18.
[48] Dr Penaneuva, Transcript 27/4/17, page 17, line 20.
[49] Dr Penaneuva, Transcript 27/4/17, page 17, line 30.
[50] Dr Penaneuva, Transcript 27/4/17, page 17, line 31 onwards.
[51] Dr Penaneuva, Transcript 27/4/17, page 18, line 30 onwards.
[52] Cathy Perrin, Transcript 24/4/17, Page 42,line 25.
[53] For discussion of this point see Transcript 27/4/17, page 85, line 30 onwards.
[54] Statement of Cathy Perrin, Exhibit 1, Tab 37 [66] and Transcript 24/4/17, page 30, line 25.

The role of Dr Jassim

60. It is perfectly obvious that IV fluids should also have been commenced immediately. However they were not. Dr Jassim gave evidence that she intended that they be given and that is clear from her clinical notes. She accepted the records indicating that they were never commenced. She described the day as "horribly busy",[55] and believes that she may have overlooked it. It was her practice to write herself a list of what needed to be done and she may have just "thought she had done it".

61. Dr Jassim gave oral evidence about this issue and should be commended for her honesty. She told the court her usual practice would be to order the fluids at the same time she ordered the drugs and she could not understand what had happened on this occasion.[56] I accept that whatever happened it was the result of an isolated human error in a busy workplace.

62. Whether Dr Jassim forgot to write up the request form, or it was somehow lost is now unknown. What is more significant is that it became a collective failure. Dr Jassim did not notice, Dr Penaneuva did not notice, nor did other staff involved with Michaela either in the Emergency Department or later on the ward.

63. The failure to give fluids is a significant one. Fluids support the circulation of antibiotics throughout the system. Professor Mutton pointed out that while the antibiotics given at that time would not have been effective against the MRSA Michaela was later found to have, fluids would still have had a protective effect and may have increased Michaela's chance of survival until the correct antibiotics were identified. Given that sepsis does result in hypo perfusion, the introduction of fluids was an essential part of the treatment she desperately needed.[57]

The role of Dr Addenbrooke

64. As at October 2014, Dr David Addenbrooke was employed as a senior registrar in the Obstetrics and Gynaecology Department. By agreement, however he was fulfilling the role as acting Consultant with a view to being appointed as a Consultant in January or February 2015.[58] He was thus Dr Penaneuva's superior at the time of Michaela's admission. Dr Addenbrooke gave evidence that during his first obstetric position at Lismore Base Hospital, he had been supervised by Dr Penaneuva and she was a doctor in whom he had confidence.[59]

65. On 21 October 2014, Dr Addenbrooke was the Consultant on call. He had been conducting a clinic at Kyogle during the morning and he returned to the hospital some time in the afternoon. It is common ground that he was never asked to see Michaela and that he did not in fact see her, until after her death.

66. There appear to have been two brief conversations about Michaela's care and management between Dr Penaneuva and Dr Addenbrooke on 21 October 2014. The first was an informal update which took place on the labour ward. Dr Addenbrooke recalled

[55] Dr Jassim, Transcript 27/11/17, page 14, line 1 onwards.
[56] Dr Jassim, Transcript 27/11/17, page 19, line 30.
[57] For discussion of this point see Transcript 27/4/17, page 86, line 5 onwards.
[58] Dr Addenbrooke, Transcript 26/4/17, page 60, line 45.
[59] Dr Addenbrooke, Transcript 26/4/17, page 64, line 1-2.

being informed that a patient had been admitted, that there was a wound collection, that she had a fever and was undergoing a septic screen and had been commenced on empirical antibiotics.[60] He was not given the patient's background or made aware that she had also presented the previous day in significant pain. He was not informed of the level of elevated inflammatory markers or any of her other vital signs, aside from temperature.[61] He was not informed of the results of Dr Jassim's physical examination. In short Dr Addenbrooke explained that the whole conversation would have taken place over one to two minutes.[62] I accept his evidence that there was no specific discussion of sepsis, or any indication that the patient was critically unwell.[63] Dr Addenbrooke agreed that this conversation may have taken place around 2pm. He stated that he had no reason to doubt Dr Penaneuva's assessment of the patient.[64]

67. Late that afternoon Dr Penaneuva contacted Dr Addenbrooke again. It is common ground that this conversation was also very brief. Dr Penaneuva informed him that the results of the CT scan were now available and that they revealed a "superficial collection". As microbiology cultures were not yet available, Dr Addenbrooke agreed that the commencement of ceftriaxone and metronidazole was appropriate.

68. Dr Penaneuva sought Dr Addenbrooke's advice on one issue and that was in relation to whether there was an immediate need for surgical drainage of the collection indicated on the CT scan. It was Dr Addenbrooke's evidence that he gave advice in the context of the limited information he had. He believed that Michaela was "stable". He had not been told the extent of the inflammatory markers. Dr Addenbrooke told the court "*the general gist of that second contact, which once again, would have been one or two minutes and I think on the telephone would have just been focussing on whether or not to drain the collection and there was not really a discussion undertaken about sepsis and there was not a presentation made to me of a patient who was critically unwell.*"[65]

69. It is important to state that where Dr Addenbrooke and Dr Penaneuva's accounts of the conversations between them diverge, I accept his version of events.

70. Both Dr Mutton and Professor O'Connor considered whether Dr Addenbrooke had adequately considered the issue of wound drainage. It appeared to be Professor O'Connor's original view that, given Michaela's condition, the "wound should more probably than not have been drained" on 21 October 2014. However, he certainly conceded in oral evidence that based on the information available to Dr Addenbrooke at the time, as opposed to Michaela's actual condition, the advice he gave to closely observe her, to fast her and then if she deteriorates proceed to draining the abscess "might have been a reasonable decision". Dr O'Connor described the situation that confronted Dr Addenbrooke in giving advice was "a bit like looking through a glass darkly".[66]

71. Dr Addenbrooke told the court that had he been fully informed about Michaela's condition at that time he would have been concerned about the possibility of sepsis and would have

[60] Dr Addenbrooke, Transcript 26/4/17, page 64, line 1-2.
[61] Dr Addenbrooke Transcript 26/4/17, page 66, line 1-10.
[62] Dr Addenbrooke Transcript 26/4/17, page 66, line 30 onwards.
[63] Dr Addenbrooke Transcript 26/4/17, page 66, line 40.
[64] Dr Addenbrooke Transcript 26/4/17, Page 67, line 48 and elsewhere.
[65] Dr Addenbrooke Transcript 26/4/17, Page 71, line 6 onwards.
[66] Professor O'Conner, Transcript 28/4/17, Page 69, line 39.

emphasised the need for close observation.[67] Dr Addenbrooke was of the view that a patient with Michaela's presentation and clinical history ought to have been on hourly observations, with checking of her temperature, heart rate, blood pressure and oxygen saturations.[68]

72. Given Dr Penaneuva's presentation in court it was difficult to fully understand Dr Addenbrooke's stated confidence in her abilities and judgement. Perhaps this is explained by their past relationship and the fact that she had previously supervised Dr Addenbrooke. It is impossible to know. Nevertheless, the experts were asked whether Dr Addenbrooke, as consultant, should have had a more pro-active approach. Certainly it appeared to be Professor Mutton's view that further questioning about the available results would have been appropriate. On the other hand, Professor O'Connor suggested that, given the longstanding relationship between them, it "might have been perfectly reasonable to accept what she said on face value."[69] I accept that Dr Addenbrooke's confidence in Dr Penaneuva, while ultimately misplaced, was genuine.

73. There was certainly some attempt by Dr Penaneuva to shift responsibility onto Dr Addenbrooke. In her statement Dr Penaneuva stated that she "assumed he would check on her during his rounds because he was the Senior Registrar at the time".[70] When cross-examined on the issue she later admitted that typically there are no evening rounds.[71]

74. In my view it is clear that Dr Addenbrooke intended to review Michaela in the normal course of events on rounds the following morning. Dr Penaneuva knew this was normal practise. I accept that if he had been alerted to the seriousness of Michaela's condition he would have seen her that evening. While I find it hard to understand Dr Addenbrooke's confidence in Dr Penaneuva, I do not believe his care fell below a reasonable standard for a consultant. I am of the view that he was not fully informed about the critical condition Michaela was in.

Handover to other doctors in the unit

75. Dr Penaneuva asked the resident medical officer, Dr Aponte to look at Michaela's wound about 4.30pm on 21 October 2014. The purpose of this appears to have been so that someone else could see the redness of the pelvic area so that there could be a point of comparison the following day, given that Dr Penaneuva would not be on duty. It is surprising that Dr Penaneuva did not make notes about what she observed or ask Michaela about the level of pain at this time. She certainly did not communicate to Dr Aponte that Michaela's condition was extremely serious.[72]

76. When Dr Penaneuva left the hospital that evening, it was incumbent upon her to conduct an appropriate handover with the evening on call obstetric registrar in case Michaela deteriorated during the evening. The relevant doctor that evening was Dr Dilger who was rostered on overnight. The usual process appears to have been that this should occur in person or by telephone. In her original statement dated 12 February 2015, Dr Penanueva

[67] Dr Addenbrooke Transcript 26/04/17, Page 72, line 6 onwards.
[68] Dr Addenbrooke, Transcript 26/4/17 Page 69, paragraph 45.
[69] Transcript 28/4/17, Transcript 28/4/17, Page 71, line 46.
[70] Supplementary Statement of Dr Penanueva, Exhibit 1, Tab 14A [58].
[71] Dr Penaneuva, Transcript 27/4/17, Page 54, line 30.
[72] Statement of Dr Aponte, Exhibit 1, Tab 19.

stated that she "handed over to the obstetric registrar".[73] This was later denied by Dr Dilger, who claimed no knowledge of Michaela on 21 October 2014.

77. Dr Penaneuva told the court that she contacted Dr Dilger by passing a note to the theatre sister.[74] She told the court that it was her expectation that Dr Dilger "might see the patient afterwards".[75] She could no longer remember exactly what sort of paper she had written on, claiming that it was smaller than A4 in size and may have been "something like a "post-it".[76] I do not accept Dr Penaneuva's evidence in this regard. It is telling that there was no mention of this highly irregular method of handover in her first statement. It is also significant that records indicate that Dr Dilger was not in fact in the operating theatre at the time that Dr Penaneuva states this would have occurred.

78. It was Dr Dilger's evidence that she did not receive any notification that day. The usual practice for handover at that time was "verbal, either by telephone or face-to-face",[77] handwritten notes were not used and she did not ever receive one.

79. On this issue I prefer the evidence of Dr Dilger to Dr Penaneuva. Whether Dr Penaneuva did not contact Dr Dilger because she failed to recognise the seriousness of Michaela's condition or because she forgot is now unclear. However I am satisfied that no handover occurred. This is a significant failing in all the circumstances.

80. Dr Penaneuva's failure to handover correctly was already in breach of normal practice, nevertheless it is pleasing that since Michaela's death the Northern NSW LHD has reviewed and formalised the co-ordination of the maternity unit shift clinical handover and has continued to audit the process.[78]

Care on the ward

81. Michaela appears to have arrived on the ward at around 1:30 pm. Dr Penaneuva had ordered that she be observed every four hours.[79] She was not on a sepsis pathway. There is significant doubt about whether the ward was an appropriate place for Michaela, given her need for frequent observation and the care that could be offered there, given the staffing constraints. Both Professor O'Connor and Dr Mutton gave evidence that there were strong grounds for arguing that Michaela should have been placed in a High Dependency Unit of some type so that strict observations, in line with the sepsis guidelines, could have taken place. Given what we now know about the staffing level in the maternity unit that night, I have no doubt that it was not the appropriate place for Michaela.

82. Ms McKelvey commenced her evening shift at 9.30pm. She was originally allocated five patients and their babies to care for over the course of the evening.[80] There were other women with complications, including a patient that had pre-eclampsia and another who was having difficulties with breast feeding and needed support. Each patient was in a separate room. When Ms McKelvey's colleague left to attend the birthing suite, she was left to care

[73] Statement of Dr Penaneuva, Exhibit 1, Tab 14, [22].
[74] Dr Penaneuva, Transcript 27/04/17, Page 36, line 45.
[75] Dr Penaneuva, Transcript 27/04/17, Page 38, line 8.
[76] See discussion of this issue at 28/4/17, Page 28, line 40 onwards.
[77] Statement of Dr Dilger, dated 31 May 2017, Exhibit 8.
[78] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 4.
[79] Dr Penaneuva, Transcript 27/4/17, Page 24, line 5.
[80] Ms McKelvey, Transcript 27/11/17, Page 55, line 15 onwards.

for nine women. Ms McKelvey said she felt "stressed out, it was a very busy shift".[81] She spoke to her team leader about the situation, but she was also under a great deal of pressure and was unable to assist.

83. Ms McKelvey appears to have been the only person caring for Michaela overnight. She had only been qualified as a midwife since April 2014 and was in her first position. She told the court that at the time of Michaela's death she had not heard of the sepsis pathway or ever seen a document about the sepsis pathway.[82] She did not remember having any training on sepsis during her Direct-Entry Midwifery course.

84. It is very clear that Ms McKelvey was not told that Michaela needed frequent observations or was in a critical condition. There was certainly no mention of the sepsis pathway at the handover.[83] There is only one observation recorded on the Standard Adult General Observation Chart during the period of care by Ms McKelvey. That is the note at 11.45 pm. The observations are recorded in the normal range, with the exception of pain. Ms McKelvey told the court that she made other informal observations of Michaela throughout the night, speaking to her briefly around 10.30pm and 1am. She walked past Michaela's room later and saw that the light was off. She assumed Michaela was sleeping.

85. After seeing her at 1am, Ms McKelvey did not see her again for the next five hours. She found her unresponsive around 6am and called for help. At 6.30am the Emergency Department registrar was called to a cardiac arrest. Although there were extensive attempts at resuscitation, Michaela's life was pronounced extinct at 7am.

86. There is no doubt that Nurse McKelvey was ill equipped to care for Michaela, given the lack of information she had about her condition, her own knowledge of sepsis, and the number of other patients she had to care for. Had Michaela been appropriately seen by a consultant earlier that evening, in my view she would not have been placed in a single room, in an over-stretched department, cared for my a junior midwife. In other words, the failings of care on the ward relate directly to Dr Penaneuva's inadequate management of her patient earlier in the day. Ms McKelvey appeared deeply troubled by Michaela's death. In my view she was asked to care for a patient without adequate training or support.

The results of Michaela's blood test

87. The experts were not critical of the antibiotics that Michaela had been commenced on.[84] However, after her death, when the results came back from the laboratory, it became clear that other medication targeted at MRSA was appropriate. Unfortunately, the result was not available until 2.30 pm on 22 October 2014.

88. The Court was informed that up until 10 January 2015, Pathology Services were provided at Lismore Base Hospital until midnight, seven days a week. The service has now been extended to 24 hours a day.[85] This provides is a significant improvement.

89. The Court was also informed that contact can now be made on an outreach basis with an infectious disease specialist at Royal North Shore Hospital if advice is needed.[86]

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[81] Ms McKelvey, Transcript 27/11/17, Page 56, line 50.
[82] Ms McKelvey, Transcript 27/11/17, Page 48, line 5 onwards.
[83] Ms McKelvey, Transcript 27/11/17, Page 61, line 3 onwards.
[84] Dr Mutton, Transcript 27/4/17, page 90, line 20 onwards.
[85] Letter of Wayne Jones, dated 26/4/17, Chief Executive Northern NSW Local Health District, Exhibit 5.

How did Dr Penaneuva fail to recognise and treat Michaela's sepsis in a timely manner?

90. Throughout her evidence Dr Penaneuva showed a startling lack of awareness in how to recognise sepsis and how serious the condition is. For this reason it was necessary to examine what training she may have had in relation to the issue. While she suggested that she had little or no education or exposure to the issue, I do not accept that is the case.

91. The Court was informed that an email sent on behalf of the Director Medical Services, Dr Katherine Willis-Sullivan went to all relevant medical officers, including Dr Penaneuva on 31 July 2014.[87] The email entitled "Sepsis Kills-Inpatient Pathway" clearly states that "missed recognition and delayed management of the patient with sepsis" has been identified as a major risk and the cause of high mortality rates. The email informed staff that the "Sepsis Pathway" was being rolled out.

92. It was Dr Penaneuva's evidence that she may not have seen the email. She agreed it had gone to her email address, but she could not confirm that she had opened it.[88]

93. In addition to the email, there was a facility-wide education and information roll-out of the Inpatient Sepsis Pathway, which included a number of training and educational opportunities for staff.[89] While it is clear that the Northern NSW Local Health District had provided staff with some education in relation to this critical issue, there has been recognition since Michaela's death that more needs to be done and the Court was informed about a variety of further educational and training opportunities subsequently provided.

The need for recommendations

94. I have considered carefully whether there is a need for recommendations in this matter. In my view the need is greatly reduced by the positive attitude taken by the Northern NSW Local Health District in relation to this inquest. On careful review of the material it is clear that many of the recommendations originally sought by the Perrin family have already been taken up by the Northern NSW Health District in response to Michaela's death.

Changes already made by Northern NSW Local Health District

95. It was apparent that those representing the Northern NSW Local Health District at this inquest were aware of the inadequacy of care provided to Michaela.

96. The court received detailed information about changes and improvements that had been made as a direct result of Michaela's death,[90] and I do not intend to recite each of them here. While it appears regrettable that it has taken some time for these important changes to be made, it is pleasing that there are now improvements to report. These include steps taken to address systemic issues and to specifically improve the care and safety of women presenting to Lismore Base Hospital during the post-partum period.

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[86] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 5.
[87] Exhibit 2.
[88] Dr Penaneuva, Transcript 28/4/17, page 37, line 10.
[89] For details in relation to these initiatives see Letter of Wayne Jones, dated 30/8/17, Chief Executive Northern NSW Local Health District, Exhibit 6, page 1 onwards.
[90] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65.

97. There has finally been a significant push to educate both Emergency Department staff and Maternity Unit staff in relation to maternal sepsis.[91] The Maternal Sepsis Pathway was introduced in December 2016 and is utilised for women greater than 20 weeks gestation and up to 42 days post-partum. Education for staff at Lismore Base Hospital commenced in March 2017. The importance of education on this issue cannot be underestimated and must be ongoing if it is to have lasting effect. It was extremely clear that at the time of Michaela's death, the issue of maternal sepsis was not well understood by Dr Penaneuva or Ms McKelvey. It is extremely unlikely that they were the only health workers at Lismore Base Hospital with this knowledge gap.

98. Aside from changes already mentioned in the these findings, I accept that there have also been improvements in systems for nurses and midwives to identify clinically deteriorating patients, in relation to checking maternity unit patients overnight and in relation to shift handover.[92] These are necessary changes and show some understanding of the serious gaps in care demonstrated in the evidence before me. In my view the Northern NSW Local Health District has now made significant improvements in the care it offers, albeit some years after Michaela's tragic death.

99. The recommendations I make today are limited only because the changes already made at Lismore Base Hospital demonstrate a willingness to learn from this tragedy, not because there were no significant problems in the care it offered. I thank the Perrin family for their tenacity. In my view their continued participation in the inquest process has driven considerable improvement already.

Evaluation of the care provided by Dr Penaneuva

100. I note that while Dr Penaneuva remains a medical practitioner, she is no longer working in an obstetrics and gynaecology role at Lismore Base Hospital. Dr Penaneuva gave evidence before me and I had an opportunity to observe her over two days. She was not a reliable witness. At times she seemed confused and unable to answer straightforward questions. It was difficult to tell if she was nervous or somehow impaired. There were times when her answers appeared self-serving, inherently implausible and even untruthful. In particular, I do not accept that she notified Dr Dilger in relation to Michaela. Her evidence on this and other matters was unreliable.

101. Given the demonstrated gaps in Dr Penaneuva's knowledge and her apparent lack of insight in relation to a number of issues I remain concerned that she does not understand the magnitude of her failings in relation to this death.

102. Dr Penaneuva showed a wholly inadequate knowledge of sepsis, particularly as it can occur post caesarian. This is demonstrated in a number of ways including by her ordering four hourly observations and her failing to notify her consultant or the overnight on call registrar of the seriousness of Michaela's condition, before leaving the hospital. She did not appear to understand that the signs of sepsis can be more subtle in a post partem woman than in the general population or act accordingly.

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[91] For details of these indicatives see Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 1 onwards.
[92] Letter dated 20/4/17 from Northern NSW Local Health District, Exhibit 1, Tab 65, page 2 onwards.

103. The issues identified with Dr Penaneuva's clinical practice were not limited to a single mistake. Any practitioner can make an error of judgement, especially when busy, we are all imperfect and capable of human error. Dr Penanueva's failings were of a different magnitude. They included a serious lack of essential medical knowledge, inadequate medical note taking and clinical handover, and an inadequate approach to history taking and the physical examination of a patient. Unfortunately when confronted with these issues, Dr Penaneuva demonstrated a tendency to try and shift the blame onto others. The learned experts who reviewed her care and treatment of Michaela were unanimous in pointing to its inadequacies and I accept their professional opinions on this matter.

104. One of the powers I have pursuant to section 82 (2) of the *Coroners Act* 2009 (NSW) is to recommend that a matter is investigated or reviewed by a specified person or body. I have been asked by the Perrin family to consider a recommendation that Dr Penaneuva be referred to the Health Care Complaints Commission (HCCC) for further investigation. Having heard all the evidence I am of the view that it is desirable to make such a recommendation in this case.

Findings

105. The findings I make under section 81(1) of the Act are:

Identity
The person who died was Michaela Perrin.

Date of death
She died on 22 October 2014.

Place of death
She died at Lismore Base Hospital, Lismore NSW.

Cause of death
She died of sepsis.

Manner of death
Michaela Perrin's death was potentially avoidable. She died after receiving grossly inadequate medical care.

Recommendations

To Northern NSW Local Health District

106. I recommend that consideration is given to using Michaela's story of rapid deterioration from maternal sepsis as a case study for educating midwives and other staff at the Lismore Base Hospital Maternity Unit.

To the Health Care Complaints Unit

107. I recommend that a copy of these findings be forwarded to the Health Care Complaints Commission (HCCC) so that consideration may be given to an investigation of Dr Penaneuva's clinical conduct.

Conclusion

108. Finally, I offer my sincere condolences to Cathy Perrin and to Michaela's sisters and their families. It should be noted that they bravely attended each day of this inquest in an attempt to shine a light on the circumstances of Michaela's death in the hope that nobody else should suffer as Michaela did. Their grace and courage was outstanding. One can only imagine their pain in sitting through the evidence we heard. It is clear that their tenacity and commitment to this process has already driven considerable change in the Northern NSW Local Health District.

109. I was greatly moved by the love the Perrin family had for Michaela and for the way they continue to care for her beautiful children. I thank Cathy Perrin for bringing to court a family photograph and for sharing with us the children's progress.

110. Had Michaela been treated in an appropriate and timely manner, there is every likelihood that she would have survived.

111. I close this inquest.

Magistrate Harriet Grahame
Deputy State Coroner
27 February 2018
NSW State Coroner's Court, Glebe