STATE CORONER'S COURT
OF NEW SOUTH WALES

Inquest:	Inquest into the death of Angelique Burton-Ho
Hearing dates:	24-28 September 2018
Date of findings:	23 November 2018
Place of findings:	NSW State Coroner's Court, Glebe
Findings of:	Magistrate Harriet Grahame, Deputy State Coroner
Catchwords:	CORONIAL LAW – manner and cause of death, clinical review, sufficiency of medical care, REACH program
File numbers:	2015/235464
Representation:	Mr A Casselden SC, Counsel Assisting, instructed by Mr E Freelander, Crown Solicitor's Office
	Mr P Townsend of NSW Legal Aid, for Mr Burton
	Mr G Gemmell, instructed by Ms L Beyers of HWL Ebsworth, for Dr Maclean
	Mr P Rooney, instructed by Mr Renwick of McCabe Curwood, for South Western Sydney Local Health District
	Ms B Haider, instructed by NSW Nurses and Midwives Association, for Nurses Abotomey, Aspinwall and Davis

Findings:

The findings I make under section 81(1) of the *Coroners Act* 2009 (NSW) are:

Identity
The person who died was Angelique Burton-Ho.

Date of death
She died on 11 August 2015.

Place of death
She died at Sydney Children's Hospital, Randwick, NSW.

Cause of death
She died from cardio-respiratory failure.

Manner of death
Angelique had severe aspiration pneumonia against a background of significant congenital structural challenges. Her rapid deterioration was not recognized in a timely manner.

Non publication orders:

A non-publication order pursuant to s 76 *Coroners Act* 2009 (NSW) is noted on file in relation to certain evidence given by one of the involved nurses. The order does not cover evidence referred to in these findings.

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Introduction

1. Angelique Burton-Ho died at Sydney Children's Hospital (SCH) on 11 August 2015.

2. Angelique was only 12 years of age. She was, by all accounts, an extraordinary girl. Both her parents spoke of her strength, tenacity and zest for life. She was big hearted, generous and kind.

3. Angelique's mother spoke of her wide circle of friends. She had a huge smile and a delicious sense of humour. She was creative and industrious. She developed a passion for film and was already creating popular YouTube clips. Angelique was wise beyond her years and her future was bright.

4. Angelique's father spoke of her grace and positivity. She was enormously caring to those less fortunate than herself. Angelique worked to buy Christmas gifts for homeless people and took joy in distributing presents throughout Sydney.

5. Angelique's death is a terrible tragedy that continues to cause enormous grief and distress to those who loved her. I acknowledge their heartbreaking pain and profound loss.

The role of the coroner

6. The role of the coroner is to make findings as to the identity of a nominated person and in relation to the place and date of death. The coroner is also to address issues concerning the manner and cause of the person's death.[1] The place and date of Angelique's death is known. For this reason the inquest focused on the circumstances surrounding her death and the care she received at Bowral Hospital.

7. A coroner may also make recommendations in relation to matters that have the capacity to improve public health and safety in the future.[2]

The evidence

8. The court took evidence over four days and heard final oral submissions from the parties on the fifth. The court also received extensive documentary material in six volumes. The material included witness statements, medical records, audio and video recordings.

9. The court heard from medical staff involved in Angelique's care in the days prior to her death. It was also assisted by the expert testimony of Professor Isles, a specialist in paediatric respiratory medicine.

10. A list of issues was prepared before the proceedings commenced[3]. As the inquest proceeded the focus intensified around her clinical management and care at Bowral Hospital between 9-11 August 2015.

[1] Section 81 *Coroners Act 2009* (NSW).
[2] Section 82 *Coroners Act 2009* (NSW).
[3] List of Issues. Attached to Court file.

Background

Angelique's medical history

11. Angelique had a complex medical history. After being born prematurely she had been diagnosed with VATERL association (previously VATER association). This is an association of medical complications including vertebral defects, anal atresia, cardiac defects, trachea-esophageal fistula, renal abnormalities and limb abnormalities. People diagnosed with VACTERL association have at least three of these characteristic features. Angelique had been previously treated for tracheal oesophageal fistula, atrial septal defect, and spinal problems including a tethered cord, a dislocation of the cervical spine at C5/6 and a fusion of the spine at C3/4/5. To assist the spinal issues, Angelique had undergone surgery to place rods into her spine to straighten her neck and strengthen her back.

12. Angelique was asthmatic and had a history of lower respiratory infections and restrictive lung disease. She had been admitted to hospital on multiple occasions for treatment of pneumonia and bronchiolitis. Her spinal problems made it difficult to complete intubation, if necessary, but the Ear Nose and Throat (ENT) team at SCH had successfully managed to do so in the past.

13. Angelique's medical difficulties were well known to those who had previously cared for her and the need for special care had been recorded on her medical records at Bowral Hospital. Dr Marlene Somna, a paediatric otolaryngologist at SCH had prepared a letter with specific intubation instructions which was placed on Angelique's file for guidance should the need for intubation arise.[4] Her own paediatrician, Dr Hart had also prepared a letter stating "If Angelique presents to ED myself or the Paediatrician on call should be informed and consulted at an early stage. She is not to be discharged without a conversation with the Paediatrician on call."[5]

14. Angelique had been admitted to hospital on multiple occasions for the treatment of bronchitis and pneumonia. Between 3 October 2012 and 19 July 2015 she had been admitted to Bowral Hospital on 11 occasions with pneumonia or other respiratory illnesses. During two of those admissions, on 4 October 2012 and on 23 December 2013 Angelique had required transfer to SCH.

15. Armanda Ho, Angelique's mother was also knowledgeable about Angelique's medical care and was always available to assist with providing relevant background.

Bowral Hospital

16. Bowral Hospital is a 91 bed facility located in the township of Bowral in the Southern Highlands. The town has approximately 13 000 people and is situated about 136 kilometres from Sydney. The Bowral Hospital is part of the South Western Sydney Local Health District (SWSLHD). It is categorised by NSW Health as a District or C1 Hospital. Bowral Hospital has a children's ward, comprising of only eight beds. The hospital does not have an intensive care unit or a paediatric intensive care unit. At the time of Angelique's final admission there was no ENT specialist on staff.

[4] Exhibit 1, Tab 13, page 88
[5] Exhibit 1, Tab 13, page 87

Brief Chronology

17. On 24 May 2015, Angelique attended Bowral Hospital complaining of a sore throat and a headache. She had been vomiting and coughing the night before. She appeared short of breath at the time. Angelique was diagnosed with an influenza-like strain of pneumonia. She was discharged on 30 May 2015. Angelique was re-admitted on 13 July 2015 and discharged six days later.

18. On 8 August 2015, Angelique complained of a sore throat and aches and pains in her legs. She felt generally unwell. Armanda took her to a local Bowen therapist. However, overnight she did not improve.

19. In the morning of 9 August 2015 Armanda Ho took Angelique back to Bowral Hospital. Records indicate that she was triaged in the Emergency Department at 11.56 am and asked to wait for a doctor to review her. Given her triage category, she should have been seen in one hour. Her vital signs appear to have been within the acceptable limits for paediatric patients. She was afebrile. The triage nurse indicated that she had been vomiting and had a sore throat. It was also noted that “child doesn’t feel sick at triage”.

20. Angelique and her mother waited up to two hours but were not seen by a doctor. Angelique was tired and wanted to go home. Given that she was not feeling any worse, her mother agreed. Unfortunately, once home Angelique deteriorated. She began to vomit liquid and became lethargic. Angelique’s mother took her back to Bowral Hospital.

21. Angelique was triaged for the second time at 5.42 pm. She was noted to be vomiting and feeling short of breath. Her oxygen saturation levels had decreased to 79% and her heart rate was recorded at 119 bpm. She was afebrile. On this occasion Angelique was given the triage category of two, meaning she was to seen by a doctor within ten minutes.

22. Angelique was taken to the resuscitation area and given oxygen. A mobile chest X-ray was performed. Records indicate that she had a respiratory rate of 34 breaths per minute. She had reduced air entry in her left lower lobe and bilateral and biphasic fine crepitations on auscultation. The chest X-ray was reported to show no obvious acute collapse, congestion or consolidation. The clinical impression was of lower respiratory tract infection and possible pneumonitis. A treatment plan was recorded where Angelique was to be admitted under Dr Kenneth Maclean. Anti-biotics and blood tests were ordered.

23. Dr Mark Fisher was the emergency physician on duty. At the time of Angelique’s admission he was employed as a resident medical officer in the Bowral Hospital’s emergency department. He had no prior involvement in Angelique’s care. Dr Fisher gave evidence before me. While his handwritten written medical notes are brief, he nevertheless impressed as a conscientious and thoughtful doctor. He had an independent memory of having cared for Angelique and had recently had the opportunity to review medical records retained by the Hospital.

24. Understandably, with the passage of time his recollection of events was incomplete. There was for example some confusion about whether blood gases were ordered during his consultation that evening. Dr Fisher believed that he would have ordered blood gases and

told the court, “a venous blood gas is almost standard on all of our patients.”[6] He also said that he had a recollection of speaking with Armanda Ho and saying “the gas doesn’t look too bad.”[78] Unfortunately, if the testing actually occurred, the blood gas recording was not affixed to the paper medical records and there is now no way of being certain if the blood gases were tested at this point or what the result showed if this had indeed occurred. It emphasises the importance of a more expansive written medical record.

25. Dr Fisher made it clear that he was well aware Angelique had a “difficult airway.”[9] He accepted that she was a high-risk patient who should be admitted for treatment and monitoring. However, he did not feel she needed retrieval or transfer to a tertiary hospital at that point. When questioned in relation to this issue he explained his thinking,

> “…I felt that she did not need retrieval at that point…the decision to transfer a child should be made in consultation with an inpatient team paediatrician. I thought she was responding to initial treatment…as she had done in previous presentations and similar circumstances. And in fact, in my review of her previous attendance one month before, she’d actually presented in a much worse state then and got better with simple supportive therapy…”[10]

26. Dr Fisher contacted Dr Maclean who was the on call consultant paediatrician. They discussed Angelique’s presentation and his provisional diagnosis. Dr Fisher was reassured that Dr Maclean was familiar with Angelique[11]. Dr Fisher explained that he had known Dr Maclean for many years and was confident that had he harboured any concerns Dr Maclean would have raised retrieval at that point. Dr Fisher initially remembered having had a face-to-face handover with Dr Maclean where Angelique’s care was discussed. However, given Dr Maclean’s evidence I think that this is most unlikely to have occurred. Nevertheless, I am satisfied that some kind of verbal handover took place, at least when they spoke on the telephone regarding admission.

27. Dr Maclean was the locum consultant paediatrician on call that weekend. He gave evidence that he received a phone call from Dr Fisher around 7.30 or 8 pm. He received a briefing and agreed that Angelique should be admitted to the Children’s Ward. He stated that he realised he had “a clear need to come in and see Angelique”[12], however he was fatigued. He stated that he had been on call at Bowral Hospital for three days. He decided to take a nap while she was being transferred to the ward.[13]

28. Dr Maclean apparently saw Angelique around 11 pm or 12 midnight. His medical note is brief and contains some observations, but little or no stated analysis or planning.[14] The written note provides little guidance for the nurses who would be observing Angelique overnight. Dr Maclean did not see blood gas results or order any himself. He told the court that he decided

[6] Dr Fisher Transcript 24/9/18 page 31, line 4.
[7] Armanda Ho has no recollection of this conversation taking place.
[8] Dr Fisher Transcript 24/9/18 page 38, line 45
[9] Dr Fisher Transcript 24/9/18 page 24, line 20 onwards
[10] Dr Fisher Transcript 24/9/18 page 25, line 30 onwards
[11] Statement of Dr Fisher, Exhibit 1, Tab 9G, paragraph 24
[12] Dr MacLean Transcript 24/9/18, page 58, line 50
[13] Dr MacLean Transcript 24/9/18, page 61, line 11
[14] Medical Notes Exhibit 1, Tab 12, page 58

"if there's any, any deterioration at all over the next few hours, then I would be doing gas and chest X-ray at that point to re-evaluate her status – to reconsider"[15] He stated that he was taking her mental state and responsiveness as one marker and he also took into account the fact that she was a child with a "significant dislike of having any bloods and blood test done."[16] He stated that he left the ward leaving a "clear instruction" to call him if there was any increase in the respiratory rate, any increase in her oxygen requirement or "any change whatsoever". He stated that he felt confident that this would occur. In my view, given its importance it would have been prudent to record these concerns and instructions more clearly in the medical records. This would have had the effect of emphasising to nurses and to later medical staff that this was a child whose observations needed to be very closely monitored.

29. Dr Maclean could not recall whether he had a handover with Dr Hanson the following morning.[17] However he stated that he was aware that Dr Hanson would have taken over care at 8 am on 10 August 2015. It was incumbent upon Dr Maclean to specifically alert Dr Hanson to the need for close observation of Angelique, given her history and known medical issues.

30. It appears that Angelique had a difficult night. Nurse Sarah Abotomey recorded it as "unsettled."[18] Angelique is recorded to have been waking frequently to cough and expectorate. She was mildly tachycardic. Her sputum was blood stained and she was noted to quickly desaturate in oxygen unless she was breathing through a mask. Nurse Abotomey gave evidence that when she wanted a doctor to prescribe intravenous paracetamol that night, she telephoned the Emergency Department doctor, as she would not wake an on-call paediatrician for "a very simple order like that". She told the court that she did not observe a decline in Angelique overnight which would have necessitated her calling a paediatrician in. However she had some memory of Armanda Ho raising concerns about the blood in Angelique's sputum[19].

31. At around 8.35am on Monday 10 August 2015, Angelique was reviewed by Dr Nils Hanson, staff specialist paediatrician. His medical note is brief. He recorded a probable diagnosis of pneumonia and bronchospasm. He did not appear to be particularly worried about Angelique's condition. His plan was to continue with oxygen, antibiotics and bronchodilation. There was no change ordered to the frequency of her observations. She was seen by a physiotherapist twice that day.

32. Nurse Angela Davis gave evidence that she observed Angelique to be deteriorating, with increased work of breathing during the afternoon. Angelique had been placed in a wheelchair and had gone for a short walk with her mother. On her return, Nurse Davis was concerned enough to escalate her concerns to Dr Hanson.[20]

33. At around 2.47pm Angelique was seen again by Dr Hanson. His medical record of this consultation is extremely brief. He ordered repeat bronchodilator therapy with Salbutamol

[15] Dr MacLean Transcript 24/9/18, page 61, line 61
[16] Dr MacLean Transcript 24/9/18, page 61, line 13
[17] Statement of Dr MacLean, Exhibit 1, Tab 9F, paragraph 16. See also his discussion of this issue at Transcript 24/9/18, page 64, line 17 onwards
[18] See her nursing record at Exhibit 1, Tab 12, page 58
[19] Nurse Abotomey Transcript 25/9/18, page 13, line 4 onwards
[20] Nurse Davis Transcript 25/9/18, page 24, line 2 onwards

and prescribed intravenous hydrocortisone. In his statement he said that it was his "overall impression that Angelique was improving clinically".[21] However, when reviewing the material in court, he agreed, on reflection, that she appeared to be "getting worse at that stage."[22] He explained his decision not to contact NETS or initiate retrieval to Sydney Children's Hospital was simply because at the time he did not think her condition warranted it.

34. This was the last review by a doctor until the paediatric registrar arrived the following morning.

35. Armanda Ho stated that Angelique's breathing had become very laboured by the afternoon of 10 August 2015. She was also concerned that Angelique was starting to get very bloated. As the afternoon extended into evening Armanda became more concerned. She said "I was asking for gases to be done…and nothing happened that…night, because there was no doctors around."[23] Armanda was concerned enough to take a short video of Angelique on her telephone at 8.29 pm.[24] The video, which was tendered in these proceedings, shows Angelique's laboured breathing. Armanda stated that she felt "nobody was listening to me."[25]

36. Nurse Sally Aspinwall was the nurse in charge of the children's ward overnight. She commenced her duty at 10.45 pm on 10 August 2015 and finished her shift at 7.15 am on 11 August 2015. She was working with an enrolled nurse, Monica Cook. Nurse Aspinwall stated that she checked on Angelique at about 11.15 pm. She stated that Angelique was sitting up in bed and she had increased rate of breathing. Her oxygen was running at 8 litres per minute and her oxygen saturation was 97%. Her initial account stated that when she checked on Angelique at 1.15 am her oxygen saturation had dropped to 84-85%, her respirations were 30-38 and she was "shoulder shrugging".[26] However, during her oral evidence she backed away from the exact figure she had given in relation to oxygen saturation, claiming that she could see no contemporaneous record of that and that while she was unsure, it may have been that her former solicitor had suggested the precise number. In any event, she accepted that Angelique's saturations were "poor" or in the red zone. She accepted that they were less than 90%.

37. The medical notes record a clinical review was called by Nurse Aspinwall at 1.15 am on Tuesday 11 August 2015. The written record notes that blood oxygen saturation had fallen to 88-89% on 10L/min of oxygen. Her respiration rate was 36 breaths per minute and her heart rate was 126 bpm. Nurse Aspinwall records the interventions commenced were Ventolin and that Angelique was encouraged to cough.[27]

38. Nurse Aspinwall conceded that with the benefit of hindsight she should have involved a doctor at this point.[28] She also agreed that with the benefit of hindsight Angelique was not improving as she had originally suggested, in fact she was deteriorating on objective measures.[29] She conceded that she should have increased the frequency of the vital sign

[21] Statement of Dr Hanson, Exhibit 1, Tab 9E, paragraph 27
[22] Dr Hanson Transcript 25/9/18, page 58, line 25 onwards
[23] Armanda Ho Transcript 24/9/18, page 15, line 25 onwards
[24] Video Exhibit 4
[25] Armanda Ho Transcript 24/9/18, page 16, line 10 onwards
[26] Statement of Nurse Aspinwall, Exhibit 1, Tab 9D
[27] See her nursing record at Exhibit 1, Tab 12, page 61
[28] Nurse Aspinwall Transcript 26/9/18, page 9, line 47 onwards
[29] Nurse Aspinwall Transcript 26/9/18, page 11, line 18 onwards

observations.[30]Although Nurse Aspinwall completed a "Clinical Review Call Record", she did not take advice from another practitioner and consequently Angelique was not reviewed by a "fresh set of eyes" at this crucial time.

39. When Nurse Davis returned on the morning shift at 7am on 11 August 2015, it was clear to her that Angelique was extremely unwell. She observed Angelique to have increased work of breathing and significant wheezing. She was receiving oxygen through a Hudson mask at 8 litres per minute. She was coughing and vomiting small amounts. Nurse Davis was concerned that her work of breathing was increasing and that her oxygen saturations had decreased to 88%. Nurse Davis, who had some prior history with Angelique, escalated her concerns to the Nurse Unit Manager (NUM) Nurse Bell, so that the paediatric registrar and consultant could be called to review the child urgently.

40. Dr Preeti Raghavan was completing a rotation as an advanced trainee paediatric registrar at Bowral Hospital at the time of Angelique's admission. She was working Monday to Friday shifts at that time. She did not attend work on Monday 10 August due to ill health. She told the court that she received a phone call from one of the nursing staff after 8 am on 11 August.[31] At that time she was already driving towards Bowral Hospital from Sydney. She was informed that Dr Richard Hart had also been called to attend. Although she was not certain she thought she had been called by Nurse Davis, but it may have been Nurse Bell.[32]

41. Both doctors made their way to the Hospital. Dr Raghavan arrived first and commenced a full review. She was immediately seriously concerned and requested a blood gas analysis to check for possible respiratory failure. There were no earlier blood gas results available to compare. She ordered another chest X-ray and commenced other treatment. She immediately conveyed her very serious concerns to Dr Hart by telephone.

42. Dr Hart had considerable knowledge of Angelique's medical history and had been involved in her care both at the Hospital and as her general paediatrician. Immediately upon his arrival he recognised that Angelique was acutely unwell and took over her medical management. She was placed on a CPAP machine that needed to be brought from an adult ward. Her venous blood results confirmed severe respiratory distress.[33]

43. From the time of Dr Hart's arrival he realised he needed urgent assistance and back-up. A decision was made to contact the Newborn and Paediatric Emergency Transport Service (NETS). This is a statewide emergency service for the medical retrieval of critically ill newborns, infants and children in NSW. The service brings clinicians together by conference call to discuss acute problems and to assist in planning a solution. It provides immediate access to a clinician at a tertiary hospital who can advise and assist. It is more than a transport service and provides triage and advice for practitioners to plan the best solution for a child. At times clinicians are transported from the tertiary hospital, at other times arrangements are made to retrieve the child.

44. Dr Hart contacted NETS very soon after his arrival at the Hospital, with the first call being logged at 9.25 am. Dr Hari Ravindranathran, a consultant paediatric care intensivist was added to the call by 9.31am, by which time arrangements had already been made to take a

[30] Nurse Aspinwall Transcript 26/9/18, page 11, line 14 onwards
[31] Statement of Dr Raghavan, Exhibit 1, Tab 9B paragraph 7 onwards
[32] Dr Raghavan Transcript 26/9/18, page 20, line 1 and later at page 22, line 25
[33] Statement of Dr Hart, Exhibit 1, Tab 7, page 4

team to Bowral by helicopter. Dr Hart gave a brief history of Angelique and described her difficult airway. He informed the team that it was "imminent that Angelique would need an airway". He stated that her "deterioration over the last few hours is worrying"[34]. A plan was agreed upon. Dr Hart was to arrange an anaesthetist, investigate whether a private ENT specialist was available to assist, have BIPAP available and once the NETS team arrived, a decision could be made about the safety of moving Angelique back to Sydney.

45. The court had the benefit of reading the transcripts of the conversations which took place. They demonstrate appropriate and efficient planning.

46. Dr Hart sought the assistance of a local ENT specialist Dr Simon Greenberg and the duty anaesthetist Dr Russell Bourne to secure an airway, while waiting on the NETS helicopter to arrive. Dr Bourne stated that he observed Angelique to be in extreme respiratory difficulty at this point. Her vocal cords could not be visualised after a gaseous induction was performed. After two unsuccessful attempts at intubation, a laryngeal mask airway (LMA) was inserted. Doctors formed the view that without paediatric equipment and expertise, airway intervention whether by endotracheal tube or surgical tracheostomy was likely to be nearly impossible. After discussion, it was decided that she would need to be transported with the LMA. There was recognition of the severity of the situation during the NETS communications. Dr Greenberg was concerned that repeated attempts at intubation could precipitate an airway crisis. It was decided that transferring her with the laryngeal mask was not ideal, but the "lesser of two evils".[35] It was recognised that there was significant risk, but it was the best option available to treating doctors at that point. The court has no criticism of either Dr Bourne or Dr Greenberg who were faced with an impossible situation.

47. Upon arrival at Sydney Children Hospital Angelique was taken immediately into theatre for an attempted endotracheal intubation at 2.20pm. She was in acute respiratory distress, hypoxic and cyanotic. She was not conscious.[36] Members of the Sydney Children's Hospital ENT team commenced treatment. It was decided that it was not safe to leave the oral airway in place and nasal intubation was achieved. The focus then became improving her cardio-respiratory state in preparation for moving her to the Children's Intensive Care Unit.

48. Around this time Angelique suddenly went into cardiopulmonary arrest. It was apparently rapid and sudden with asystole and no cardiac output in seconds.[37] CPR was commenced, but despite treatment she could not be saved. Having reviewed all the medical evidence the court has no criticism of any care Angelique received at SCH or during the retrieval process.

Were there missed opportunities in the care provided to Angelique by medical staff?

49. Angelique was well known to various doctors and nurses at Bowral Hospital. She had been admitted with similar complaints on a number of occasions, most recently in May and July 2015. As previously noted, her records would have been available and there could have been easy access to a practitioner who had cared for her previously. Nevertheless, both her parents were extremely concerned about aspects of the care she received.

[34] NETS transcript Exhibit 1, Tab 14
[35] NETS transcript Exhibit 1, Tab 18
[36] Statement of Professor David Lowinger Exhibit 1, Tab 23, paragraph 5c
[37] See Statement of Professor Lowinger, Tab 23, paragraph 5m

50. An expert and independent review of Angelique's medical treatment was obtained. Professor Alan Isles, an experienced paediatric respiratory specialist was retained to review the file and medical records. I do not intend to repeat his detailed review of Angelique's deterioration.

51. In short, Professor Isles had significant criticisms of her management from the start. He was of the view that insufficient notice was taken of her deterioration between her two attendances at Bowral Hospital Emergency Department on 9 August 2015. In his view, given what was already known about her compromised airway, she should have been retrieved at this point. He stated that the prudent approach would have been to "prepare for the worst and move Angelique out to Sydney as soon as practical after her presentation".[38] In oral evidence he said "I think the issue of prevention comes into play and that faced with a child with a known critical airway who was presenting with a sudden deterioration in observations, I would suggest that more than casual thought should have been given to stopping the process at that point, not admitting her to the children's ward, seeking medical advice, and contemplating transfer to Sydney at that point in time."[39]

52. Professor Isles saw Angelique's admission and subsequent treatment from a risk management perspective. In his view she was a difficult and complex patient by virtue of her congenital abnormalities. Bowral Hospital did not have an ENT surgeon or a paediatric ICU. It was Professor Isles's view that "the chances of a relatively inexperienced person intubating somebody with an airway (such as Angelique's) was pretty much zero."[40] It was well documented that she would need an ENT surgeon "with very fancy tools" and the controlled support of a paediatric intensive care unit. He stated that if he had seen Angelique in the emergency room, he would have been "terrified at the prospect that something could go wrong" and that she would need intubation or resuscitation.[41]

53. From the moment of her admission to the children's ward, Professor Isles identified a number of points where there was evidence of deterioration which should have triggered medical review. In a careful reading of her observation charts he recognised a number of points where action should have been triggered. He identified what he saw as the beginning of the "slippery slope" that characterised her final sudden deterioration.[42]He was critical of incomplete observations and of the quality of the medical notes taken. The quality of the medical notes affected the handovers between practitioners and indicated an overall lack of planning. He was of the view that there was an inadequate grasp of the level of risk involved. Professor Isles was enormously troubled by the period between 3 pm on 10 August 2015 and around 8.30 am on 11 August 2015, when there was no medical practitioner involvement in her care.[43] He was "dumbfounded" by the fact that the "medical review" called for at 1.15 am on 11 August 2015 was called for and answered by the same nurse.[44]

54. It was suggested that Professor Isles had the benefit of hindsight and that his experience was only in tertiary hospitals. Nevertheless, I accept his opinion that Bowral Hospital did not manage the significant risks this patient faced in a timely manner. Having considered all the

[38] Report of Professor Isles Exhibit 1, Tab 24. Page 16
[39] Professor Isles Transcript 27/9/18, page 9, line 34 onwards
[40] Professor Isles Transcript 27/9/18, page 10, line 46 onwards
[41] Professor Isles Transcript 27/9/18, page 11, line 1 onwards
[42] See Exhibit 8
[43] Professor Isles Transcript 27/9/18, page 11, line 40 onwards
[44] Professor Isles Transcript 27/9/18, page 12, line 12 onwards

evidence, I am of the view that whether the retrieval planning should have commenced in the Emergency Department or at some time during the afternoon or evening of 10 August 2015, may well be a matter where reasonable minds differ. However, it is clear that it should have been contemplated or considered well before Dr Hart's arrival at the Hospital sometime after 9 am on 11 August 2015.

55. There is compelling evidence that an attitude of some complacency had crept into the management of Angelique's complex health issues. It may be that because staff had seen her recover well in the recent past from similar presentations that they let their guard down on this occasion. There certainly appears to have been a lack of planning or adequate curiosity in her progress during her final admission to the children's ward. This is not to suggest that the doctors who treated Angelique were uncaring, just that her regular presentation may have blinded them to the severe risk she would face should intubation be urgently required. The nursing staff were not placed on high alert to inform doctors of any deterioration and opportunities to escalate her care were undoubtedly missed.

Concessions and changes made by South Western Sydney Local Health District

56. While it is somewhat unfortunate that it took so long, I am nevertheless heartened by the manner in which the South Western Sydney Local Health District (SWSLHD) made concessions at the commencement of the inquest about deficiencies in the care that was provided. In opening, counsel for the Hospital made it clear that the Local Health District now conceded that aspects of the care provided to Angelique were arguably deficient in the late evening of 10 August 2015 and in the early hours of the morning of 11 August 2015.[45] As the inquest proceeded, it was apparent that this concession had prompted review and change in relation to local procedures.

57. While he did not agree with all of Professor Isles's criticisms, Dr Richard Hart, the Director of Paediatrics also told the court that he accepted there were missed opportunities in Angelique's care. In particular he identified the time of the clinical review at 1.15 am on 11 August 2015 as a time where Angelique's deterioration was so significant that a phone call to a doctor who could "attend, re-assess, escalate and perform further investigations was called for."[46] Later in his evidence he agreed that the increase in oxygen requirements at 9 pm "would have warranted a discussion" with the on-call consultant.[47]

58. It was directly suggested to Dr Hart that perhaps a degree of complacency had crept into the Hospital's management of Angelique's condition, especially given her recent admissions, from which she had recovered. He denied that this was the case. However it is telling that during his phone calls with NETS he stated that they had been "lowered a bit because she's come in twice recently and she's managed to cope for a few days…not deteriorated, but we won't do it again."[48] Later, quite spontaneously he stated "…I guess it's going to have to a clear understanding she gets…comes to be admitted with a respiratory illness we have to transport her early"[49]. These candid remarks indicate that he was already critically reviewing

[45] Transcript 24/9/18 page 48 onwards
[46] Dr Hart Transcript 26/9/18, page 24, line 35 onwards
[47] Dr Hart Transcript 26/9/18, page 25, line 1 onwards
[48] NETS transcript Exhibit 1, Tab 15
[49] NETS transcript Exhibit 1, Tab 19

her treatment, even as the emergency unfolded. Tragically, it was too late for Angelique to benefit from this insight.

59. Dr Hart outlined a number of changes he said had taken place since Angelique's death. I accept that the fuller introduction of electronic medical records means that more information about a patient should be easily accessible to treating doctors now than it was back in 2015. Other changes most relevant to Angelique's death included,

- The introduction of better planning for the treatment of complex paediatric patients and the escalation of their care. All children with complex and high-risk medical conditions who are also involved with a tertiary hospital will now have written action plans developed by their specialists outlining the steps for escalation if deterioration occurs. These plans are to be documented on the patient's electronic medical record, which is accessible to all staff. The plans should include practical strategies and thresholds to inform the on-call paediatrician and a threshold to initiate discussion in relation to retrieval.

- The introduction of changes to the management of respiratory support in the Children's ward. Maximum thresholds in relation to respiratory support to paediatric patients have now been set. All changes to respiratory support are to be approved by a paediatrician. Specific thresholds will also trigger consultation with tertiary hospitals. Observations for patients receiving respiratory support have been clarified.

- The introduction of changes in relation to clinical handovers and ward rounds, particularly in relation to high acuity patients. Systems have reportedly been developed to improve continuity of care and earlier assessment of high acuity patients.

- The provision of further training to staff in relation to respiratory and life support. Paediatric staff have undertaken or have been enrolled to undertake an Advanced Paediatric Life Support course. There has been increased training in relation to life support protocols and procedures.[50]

60. These changes are to be commended. However, it became evident that not all of the changes had been fully communicated to current staff. Nurse Aspinwall, for example, told the court that she was aware of some of the changes but unclear on the existence of the threshold requirements outlined by Dr Hart.[51] I am confident that following this inquest, Dr Hart will make sure that these recent changes are fully understood and implemented.

Ryan's Rule and REACH

61. Angelique's mother gave poignant evidence that although she was desperately worried about her daughter she "didn't have a voice" and that she felt nobody was listening to her. Armanda Ho gave evidence before me and impressed as a highly intelligent woman who had a good grasp of the medical issues her daughter faced. Even in great emotional pain she was well

[50] Other matters were also raised in Dr Hart's statement of 24 September 2018
[51] Nurse Aspinwall Transcript 26/9/18, page 12, line 14 onwards

spoken and insightful. If someone of her obvious capability felt nobody was listening, a problem exists.

62. Professor Isles gave evidence that in Queensland a program has been implemented called Ryan's Rule, to assist in providing family members with the means to force medical review if they are unsatisfied with treatment of their child. The rule was introduced following coronial proceedings in that state.[52]

63. Professor Isles said parents are generally the "best judge of their child", and for this reason it is a good safeguard to give them the clear right to call for medical review. He spoke briefly of the way the scheme is advertised by posters in lifts and public spaces in the hospital and through information packs given to parents on the ward.[53]

64. The issue has also been raised in prior coronial proceedings in this state. Deputy State Coroner O'Sullivan considered the issue during the inquest into the death of a child named Kyran Day in December 2016[54]. At that time the court was provided with information from the Chief Executive of the Clinical Excellence Commission (CEC) in relation to a somewhat similar scheme operating in NSW as part of a program called "Partnering with Patients". The Recognise, Engage, Act, Call, Help (REACH) scheme is a component of "Partnering with Patients" and aims to enable a patient, family or carer to escalate concerns about the condition of themselves or their loved ones while in a NSW Hospital. REACH is a program that is used in adult and children's hospitals.

65. Patients, family and carers are encouraged to initially engage with the treating nurse or doctor if they have concerns, but if concerns remain following the clinical review, an emergency response can be requested by calling a local hospital phone number designated by the health service as the REACH number. The local number is promoted through posters displayed within the hospital and through patient brochures.[55]

66. The REACH program was apparently operating at the time of Angelique's admission to Bowral Hospital in August 2015. A sticker attached to her file at around 8.30pm on the night of her admission indicates that a nurse has recorded giving information to a patient or carer about the REACH program. This notation occurs at the time of her admission to the children's ward. However there is no other evidence from family or nursing staff to provide any clarity around what or how that information was conveyed. Unfortunately there was no evidence from the Local Health District about the extent or success of the program, or on how it is advertised or utilized in Bowral Hospital.

67. I have given some thought as whether it is appropriate on the scarce evidence before me to make recommendations in relation to this issue. The fact that Armanda Ho felt that nobody was listening to her is deeply concerning. The Local Health District must assess whether REACH is currently fulfilling its aims at Bowral Hospital and if not move quickly to revitalise the program so that parents such as Armanda do not feel unheard.

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[52] Inquest into the death of Ryan Charles Saunders. Decision of State Coroner Michael Barnes, 7 October 2011

[53] Professor Isles Transcript 27/9/18, page 10, line 46 onwards

[54] Inquest into the death of Kyran Day. Decision of Deputy State Coroner Teresa O'Sullivan, 21 December 2016

[55] Inquest into the death of Kyran Day. Decision of Deputy State Coroner Teresa O'Sullivan, 21 December 2016, see discussion and comparison between Ryan's Rule and REACH, page34 onwards

Cause of death

68. An autopsy was not conducted. However, the medical records were reviewed by an experienced forensic pathologist, Dr Tony Ansford. He recorded her cause of death as cardio-respiratory failure, due to aspiration pneumonia. He noted that she had VATER syndrome as a significant issue.[56]

69. Associate Professor Simon Lowinger, who was involved in Angelique's final interventions, recorded the most likely cause of death as "progressive cardio-respiratory failure due to precipitous severe pneumonia in an already compromised patient leading to a sudden cardio-respiratory compromise and arrest."[57]

Was Angelique's death preventable?

70. Tragically, it is clear that Angelique's death was potentially preventable. There are no certainties, but in my view, had she been retrieved from Bowral Hospital at an earlier time she may have had a real chance of survival. Unfortunately, by the time she was flown from Bowral Hospital, it was clear to all those involved in her care that her condition was critical. They knew she was exhausted and that she may not survive.

The need for recommendations

71. Section 82 of the *Coroners Act 2009* confers on a coroner the power to make recommendations that he or she may consider necessary or desirable in relation to any matter connected with the death with which the inquest is concerned. It is essential that a coroner keeps in mind the limited nature of the evidence that is presented and focusses on the specific lessons that may be learnt from the particular death.

72. Changes already made or contemplated by the Local Area Health Service have reduced the need for more comprehensive recommendations. However, in my view it was evident that some consolidation of the recent changes is called for. In addition to that, it appears that it will be useful for SWSLHD to enhance the operation of the REACH program at Bowral Hospital. It is perfectly clear that Armanda Ho was not happy with the level of care being provided. Had her concerns been properly escalated to a doctor, it is likely Angelique's critical condition would have been identified at an earlier time.

Findings

73. The findings I make under section 81(1) of the *Coroners Act 2009* (NSW) are:

Identity

The person who died was Angelique Burton-Ho.

[56] Medical Records Review document prepared for the Coroners Certificate. Exhibit 1, Tab 3A
[57] Report of Professor Lowinger, Exhibit 1, Tab 23, paragraph 6C

Date of death

She died on 11 August 2015.

Place of death

She died at Sydney Children's Hospital, Randwick, NSW.

Cause of death

She died from cardio-respiratory failure.

Manner of death

Angelique had severe aspiration pneumonia against a background of significant congenital structural challenges. Her rapid deterioration was not recognized in a timely manner.

Recommendations pursuant to section 82 Coroners Act 2009

74. For reasons stated above, I make the following recommendations South Western Sydney Local Health District

1. That the SWSLHD consider introducing a training programme to be undertaken by all paediatric nursing staff at Bowral and District Hospital (Hospital) to ensure that paediatric nursing staff are aware of, and understand, the Hospital's policy in relation to paediatric respiratory support as set out by Dr Richard Hart in paragraphs 15 to 18 of his statement to the inquest dated 24 September 2018, namely:

   The Hospital has now introduced thresholds for maximum respiratory support to paediatric patients. This threshold is 6 litres per minute via Hudson mask, and 2 litres per kilogram (or a maximum of 25 litres) at 60% fraction of inspired oxygen (FiO2) via heated, humidified high-flow nasal cannula (HHFNCO2)

   When this threshold is reached paediatric review is triggered, including consultation with tertiary referral hospital regarding advice and/or potential transfer of the patient.

   All changes in oxygen therapy are now also required to be approved by the on-duty Paediatrician. Nursing staff can escalate respiratory support as required prior to discussing this with the Paediatrician, however the change must be subsequently approved by a Paediatrician.

   All paediatric patients on respiratory (oxygen) support are now required to be on a minimum of hourly nursing observations. If an inpatient is identified as high acuity by the nurse-in-charge or Paediatrician, a discussion is triggered with the nurse-in-charge and the Director of Nursing regarding increased nursing observations. A sick patient identified as high acuity would be placed on 1:1 nursing automatically. Patients on 1:1 nursing or oxygen therapy are prioritised at handover with no interruptions.

2. That the SWSLHD consider developing a local Clinical Emergency Response System (CERS) protocol and a local paediatric specific CERS protocol for the Hospital as required by clause 4 of NSW Health Policy PD2013_049 "*Recognition and Management of Patients who are Clinically Deteriorating*" (NSW Health Policy).

3. That the SWSLHD ensure that the local CERS and the paediatric specific CERS protocol for the Hospital makes clear that when a Clinical Review is initiated in the Hospital that a "designated responder", as defined in the local CERS or paediatric specific CERS protocol, cannot be the same person who initiated the Clinical Review[58].

4. That the SWSLHD consider conducting a refresher training programme to be undertaken by all paediatric nursing staff at Bowral and District Hospital to ensure that paediatric nursing staff are aware of, and adequately understand, the REACH program[59].

5. That the SWSLHD give consideration to conducting an audit of how the REACH program is communicated to patients and their families upon admission to the Bowral and District Hospital and assess, as best one can, the effectiveness of the particular mode of communication. Further that consideration is given to raising awareness of the program through the purchase and display of posters in patient rooms.[60]

Conclusion

75. Finally, I once again express my sincere condolences to Angelique's family. Their loss is profound and ongoing.

76. I thank Angelique's family for their participation in this inquest. They have been motivated to improve the health system for others and I commend their courageous efforts in this regard. I thank them for the generosity they have shown in sharing memories of their much loved daughter. She was an extraordinary girl, who will not be forgotten.

77. I close this inquest.

Magistrate Harriet Grahame
Deputy State Coroner
23 November 2018
NSW State Coroner's Court, Glebe

[58] Clause 4.2 of the NSW Health Policy requires that "*Each level of escalation within the local CERS requires a 'fresh set of eyes' to review the patient who is clinically deteriorating*".
[59] Recognise, Engage, Act, Call, Help (REACH) is a component of the Partnering with Patients program developed by the Clinical Excellence Commission in 2012-2013.
[60] Relevant posters and other material are available from the CEC.