

Inquest Touching the Death of Hayden Blake Nguyen
Mr Richard Travers H.M. Senior Coroner for Surrey

Findings and Conclusion

A. INTRODUCTION

1. This has been the inquest into the death of Hayden Blake Nguyen, who, in this document, I shall refer to as “Hayden”, as we have done during the course of the inquest.
2. The Interested Persons (“IPs”) in this inquest are :
 - a. Hayden’s parents, Thong Nguyen and Alexandra Nguyen who are represented by Clodagh Bradley KC,
 - b. The Chelsea and Westminster Hospital NHS Foundation Trust which is represented by Nageena Khalique KC, and
 - c. Dr Jonathan Penny who is represented by Stephen Brassington of counsel.
3. The purpose of this inquest is as laid out in section 5 (1) of the Coroners and Justice Act 2009, which provides that I must ascertain who the deceased person was and when, where and how he came by his death. At the pre-inquest stage it was agreed that the procedural duty under Article 2 of the ECHR is not engaged in this inquest, but that its scope should include investigation of the following specific matters:
 - a. Hayden’s medical cause of death,
 - b. Hayden’s presentation and condition from his arrival at hospital on the 24th August 2016 until his death on the 25th August 2016,
 - c. The treatment and care provided by the Chelsea and Westminster Hospital,
 - d. Whether the treatment and care provided by the Hospital on the 24th and 25th August 2016 was appropriate and/or in accordance with any relevant local or national policies, protocols or guidelines, good practice or other relevant standard, and
 - e. Whether the treatment and care provided probably caused or more than minimally contributed to Hayden’s death and/or

whether any different treatment and care could or probably would have prevented his death.

4. In order to investigate these issues, I have received and admitted oral and written evidence from witnesses, together with documentary evidence. In this document, I make reference to some of the evidence I have heard but it is not intended to be, and is not, a comprehensive review of all the evidence before me. Rather, my intention is to explain, by reference to parts only of the evidence, why I have reached my findings of fact and conclusions. However, in reaching my findings and conclusions, I have taken account of all the evidence I received, both oral, written and documentary. If a piece of evidence is not expressly mentioned, it does not mean that I have not considered and taken full account of it.
5. Set out below are my findings and conclusions. All my findings have been reached on the balance of probabilities. Unless stated otherwise, I found the witnesses from whom I heard oral evidence to be truthful and doing their best to assist me. Therefore, my review of the evidence which is set out below can be taken as my findings as to what probably happened, even if I have not stated expressly that I have accepted the evidence and found the facts accordingly.
6. I should add that this inquest is the second inquest which has been held to investigate Hayden's death. At this inquest there has, quite properly, been some reference to evidence given at the first hearing. However, I must emphasise that the findings and conclusions I have reached, as set out below, are based solely on the evidence I received in this inquest. Further, my findings and conclusion have not been influenced in any way by those reached in the first inquest or in any other investigation which has taken place into Hayden's death.

B. REVIEW OF THE EVIDENCE AND FINDINGS OF FACT

Background and the Evidence of Hayden's Parents

7. I heard oral evidence from both **Thong Nguyen** and **Alexandra Nguyen** who are Hayden's parents. They both gave detailed evidence which I summarise below.

8. I was told that Hayden was born on the 19th August 2016 at Queen Charlotte's Hospital, London at 39 weeks' gestation, after what had been, essentially, a normal pregnancy. Mrs Nguyen had been ill for two weeks prior to the delivery, with a temperature as high as 39 degrees, but she had recovered several days prior to the delivery. At birth, Hayden needed five rescue breaths but his Apgar scores were good and he took his feed, from a bottle, without any problems. Mr and Mrs Nguyen were concerned that Hayden was quiet and raised that with the clinicians at Queen Charlotte's Hospital, but they were reassured.
9. Hayden was discharged on Sunday, the 21st August 2016. Mr and Mrs Nguyen told me that the following day his temperature was over 39 degrees when he woke from his afternoon nap. It was a very hot day and Hayden had been swaddled. Mrs Nguyen said she called 111 for advice and they advised removing his clothing and taking him to hospital. However, after removing his clothing, his temperature returned to normal and he was still feeding very well. She said that as the midwife was due to visit the following morning, and things appeared to have settled, she decided not to take him to hospital. On Tuesday, the 23rd August, the midwife visited in the morning and said that Hayden was well, apart from being very slightly jaundiced. The following morning, Wednesday, the 24th August, a nurse visited to perform the "heel prick test" which had not been done at the hospital; she was happy with how Hayden presented and no problems were noted.
10. Mrs Nguyen told me that on the afternoon of the 24th August, at around 3.30pm, *"I woke Hayden for an afternoon feed. I noticed he was very warm and I took his temperature, which was high. I tried to feed him, but he wouldn't take any formula. This was incredibly concerning, as he had always fed ferociously up until that point and we were well educated that not feeding is a cause for concern in newborns. This was the first time since birth that Hayden had stopped feeding. I called 111 to tell them that Hayden had spiked another temperature and that this time he had stopped feeding. The 111 operator advised us to take him directly to Charing Cross Accident and Emergency, which we did"*.
11. Mr Nguyen explained that the Charing Cross Hospital did not, in fact, have a paediatric unit and so, after seeing the General Practitioner there, they were diverted to the Chelsea and Westminster Hospital. The doctor had confirmed that Hayden had a raised temperature and had attempted to give him paracetamol at about 7pm, but Hayden had spat out most of it. The doctor thought it was likely that Hayden had a urinary tract infection.

12. Mr Nguyen said they arrived at the Chelsea and Westminster Hospital (which I shall now refer to as "the Hospital") at about 7.30 pm. On arrival in the Paediatric Emergency Department ("the PED"), Mrs Nguyen recalled being seen quickly by a nurse, taken to a cubicle, and then seen by a doctor soon after that. She said she was *"very upset, worried and crying the whole time"*. They both recalled trying to feed Hayden, with about 5 to 10 mls being squeezed from the bottle, but the formula just dribbling out of his mouth. His normal feed was between 60 and 70 mls. Hayden was taken out of the cubicle for a lumbar puncture to be performed. It was after that, Mrs Nguyen said, that she recalled seeing a Consultant, who she now knows to be Dr Penny, for the first time. She recalled that he stood at the entrance to the cubicle and that she felt relieved because a senior doctor would now be overseeing Hayden's care. She said that she gave Dr Penny an extensive history but he seemed disengaged, mostly responding with "Hmm", and he spoke directly to another doctor present, Dr Grecu, rather than to her or her husband. Mrs Nguyen said she asked Dr Penny how worried he was about Hayden to which he responded, *"Not that worried"* or words to that effect. She said that at some point they were told that Hayden would be admitted, but the wait for transfer to Mercury Ward felt lengthy. They were not told that Hayden's working diagnosis was sepsis.
13. Mr Nguyen stated that, on the ward, his wife tried to feed Hayden again, but he still would not take any milk, and they were worried that he had not eaten since 4 pm and that he had not slept since arriving at the Hospital. Both Mr and Mrs Nguyen recall Hayden being given a first fluid bolus. Thong Nguyen said that Hayden *"let out a visceral scream ... we watched him develop a mottled rash. We were watching him when he started to have trouble breathing, his chest would bellow out and then suck in. This breathing started shortly after the first fluid bolus and continued for the rest of the night. His breathing never improved. It was frightening to watch. His nurse in Mercury Ward was at his bedside almost all the time. She was witness to the clear, visible, physical changes and his deterioration during this time."* Mrs Nguyen said, *"As the bolus was administered, Hayden screamed and almost immediately developed a vivid, mottled rash that spread all over his body, from his feet right up across his torso. I pointed at him and said to Nurse Gill, "This is new and this is different," and she agreed. Right after the bolus, Hayden started violently gasping for breath. His ribcage and stomach were moving in and out dramatically. It was terrifying, unlike anything I'd ever seen. It looked like he might break his ribs. I pointed out the drastic change in his breathing to Nurse Gill and she agreed that it was both new and alarming"*.

14. Mr Nguyen said that they felt “*looked after*” on Mercury Ward and they were appreciative that the nurse, Nurse Gill, remained at Hayden’s bedside the entire time. He said that the two ward doctors, Dr Norman and Dr Bako, came in and out and they did not feel that Hayden had been “*forgotten*”. However, they were very worried about Hayden and when Dr Penny later attended, they asked him how worried he now was, and he said he was more worried than previously, stating that it was possible Hayden had a viral disease or genetic disorder. They were also concerned that the machine used to monitor Hayden’s oxygen saturations and heart rate was unreliable. Mr Nguyen said, “... *for around 90% of the time, the machine was alarming and not able to provide a trace. It was alarming almost continuously and so much so that the nurses showed us which button could be used to silence the alarm ... we were told many times to ignore the machine because it wasn’t giving a good trace*”.
15. They learned that Hayden was to be transferred to the Paediatric High Dependency Unit (“the PHDU”). Mr Nguyen said an oxygen mask was placed beside Hayden and the nurse “... *wafted it, in her words, around his head*”. He said that Hayden was not given oxygen and they were concerned about that, especially since they had been informed at approximately 2 am that it would be started. He said there seemed to be a general reluctance to give Hayden oxygen. Mrs Nguyen said, “...*my concern about Hayden’s breathing escalated and I repeatedly asked for him to receive some oxygen because he couldn’t breathe. Despite assurances from medical staff that he would get some oxygen, it wasn’t administered until much later, well after he was transferred to the HDU. The delay in providing oxygen was agonising. Hayden looked gravely ill throughout our time in Mercury Ward and he showed no signs of improvement. And the wait for our transfer to HDU felt endless*”.
16. Mr Nguyen said that on the PHDU Hayden was placed in a dimly lit, cold room. He said the nurses spent some time trying to make Hayden comfortable, trying to make a nest with some blankets. They were asked to leave the room while the nurse passed a nasogastric tube. Eventually, OptiFlow oxygen support was started, but this did not lead to any improvement in Hayden's breathing. He said that whereas a nurse had been present constantly on Mercury Ward, on the PHDU he and his wife were left alone with Hayden for periods of time; “...*it felt like when we went to the PHDU that suddenly the care just disappeared and we were abandoned*”.
17. Mr Nguyen said they were also very concerned about the level of monitoring. It was the same as on the ward, oxygen saturations and heart

rate only, and Hayden's blood pressure was not being monitored. He said that the monitoring equipment appeared to be unreliable and, again, it was constantly sounding its alarm. He said, "*And when the machine was not alarming, we saw his heart rate was above 180 and 180 plus. Hayden continued to gasp for every breath. It felt like an emergency and it looked to us like he was dying, but the nurses appeared unworried and were mostly absent*", although, he said, they were told that nurses could see more results on a screen in another room. On the basis of what he saw from the monitor in Hayden's room, Mr Nguyen said he emphatically disputes the accuracy of two heart rate readings of 138 and 153 bpm recorded by Nurse Underhill. He said he watched the machine intently and, when there was a trace, his heart rate was almost always at or above 180 bpm.

18. Mr and Mrs Nguyen recalled Hayden's feet and hands being very cold. Mr Nguyen said, "*They asked us, to our surprise, if we had brought socks that they could put on him to warm his feet in order to get a better reading.*" He said his wife suggested that they make some socks from bandages, as well as makeshift hot water bottles by filling some latex gloves with warm water from the tap, which they did. He said they then recalled one of the nurses, he thought it was Nurse Freemantle, calling the doctor because Hayden was not getting better.
19. Mr Nguyen said they recalled Dr Bako then telling them that Hayden's blood results were very bad. Dr Penny returned at about 5 am and told them that he would try to put a line in Hayden's femoral artery. He said that, sometime later, Dr Penny was at the head of Hayden's bed and asked, "*Is there a pulse?*" and he laid the bed flat and placed a bag and a mask over Hayden's face and there was then a flow of activity as the machines and people appeared in the room. There seemed to be some difficulty locating resuscitation equipment and, Mr Nguyen said, "*it was frightening for us to witness as it looked like they didn't know what they were doing*". They were then both taken to a quiet room. He said the resuscitation went on for a long time and, eventually, Dr Penny came to see them. They remained confused as to what was happening but, when they returned to Hayden's room, another Consultant, Dr Ross, was present and told them that the team had decided to stop the resuscitation.
20. Mr Nguyen said that subsequently they were told by Dr Penny that Hayden had deteriorated so fast that there was nothing that could have been done but, he said, he and his wife did not agree with that. They considered that there was a clear deterioration over the course of the night which was obvious but not acted upon. He said that over the

course of the time in the Hospital they had been getting increasingly frightened by the lack of attention, monitoring, testing, and urgency in communication. They did not know that there had been a diagnosis of sepsis until they subsequently received the medical notes weeks later.

Relevant National and Local Guidelines

21. I will set out briefly three pieces of relevant guidance which were in place at the time and which were considered at the inquest.

The NICE Guidance on Fever in Under 5s

22. In May 2013, the National Institute for Health and Care Excellence, or "NICE", produced "*Fever in under 5s: assessment and initial management*", the introduction of which stated,

"Feverish illness in young children usually indicates an underlying infection and is a cause of concern for parents and carers. Feverish illness is very common in young children ... [and] is the second most common reason for a child being admitted to hospital. Despite advances in healthcare, infections remain the leading cause of death in children under the age of 5 years. ... Fever in young children can be a diagnostic challenge for healthcare professionals because it is often difficult to identify the cause. ... These children with fever without apparent source are of particular concern to healthcare professionals because it is especially difficult to distinguish between simple viral illnesses and life-threatening bacterial infections in this group. As a result, there is a perceived need to improve the recognition, assessment and immediate treatment of feverish illnesses in children."

23. Against that background, the NICE guidance introduced a "*traffic light system*" for the assessment of the risk of serious illness through the presence or absence of certain signs and symptoms. I will make reference only to those signs and symptoms which are of potential relevance to Hayden. It stated that children with any of the following are in a high-risk group for serious illness:

- pale/mottled/ashen/blue skin, lips or tongue,
- appearing ill to a healthcare professional,
- grunting,
- tachypnoea (respiratory rate greater than 60 breaths per minute),
- moderate or severe chest indrawing, and
- temperature at or above 38 degrees C for those under three months,

and children with any of the following are in at least an intermediate-risk group for serious illness:

- tachycardia (heart rate of more than 160 beats per minute for those under 12 months),
- oxygen saturations at or below 95% in air,
- capillary refill time of 3 or more seconds,
- poor feeding in infants, and
- reduced urine output.

24. The NICE guidance advised measuring and recording temperature, heart rate, respiratory rate and capillary refill time as part of the routine assessment, and measuring blood pressure if the heart rate or capillary refill time is abnormal. Further, to assess for signs of dehydration by looking for prolonged capillary refill time, abnormal respiratory pattern, weak pulse, and cool extremities. The guidance also advised performing a lumbar puncture, where indicated, without delay and before the administration of antibiotics, and giving consideration to referral to paediatric intensive care if a child with fever is shocked.

The Hospital's Paediatric Sepsis Guidance

25. The Hospital had its own guidance, entitled "Paediatric Sepsis" which was in place from May 2015. Its introduction stated,

"This guideline addresses the acute management of children and young people with a suspected or confirmed sepsis or septic shock. Sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs which can lead to shock, multiple organ failure and death, especially if not recognised early and treated promptly. Sepsis remains the primary cause of death from infection despite advances in modern medicine, including vaccines, antibiotics and acute care. Severe sepsis is a clinical emergency. Signs and symptoms of sepsis in children can be subtle and deterioration to shock rapid. Early initiation of simple treatment improves outcomes."

26. The guideline stated that the "Paediatric Sepsis 6 Flowchart" should be completed for a child with a suspected or proven infection and (i) a core temperature of below 36 or above 38.5 degrees C and (ii) inappropriate tachycardia. The flowchart required the following six steps to be taken within one hour, or for an explanation for not doing so to be recorded:

- Give high flow oxygen
- Take blood tests
- Give IV or IO antibiotics

- Consider fluid resuscitation
 - Review by senior doctor (registrar/consultant)
 - Consider inotropic support early
27. The guideline also indicated that (i) baseline and subsequent measurement of vital signs must be recorded and a paediatric early warning system (“PEWS”) score calculated and recorded on each occasion and (ii) frequency of recording of vital signs should be based on clinical assessment of the child and the calculated PEWS score, and any child who is in shock and/or who has organ dysfunction should be discussed with Children’s Acute Transport Service (“CATS”). (CATS is a service based at Great Ormond Street Hospital which was described in evidence by Dr Yorke as the Hospital’s *“local retrieval and advice service for children requiring paediatric intensive care”*.)
28. The Hospital’s guidance also explained the role of the *“Senior Paediatric Nurse 0113 Bleep Holder”*. It stated,
- “In keeping with the PEWS Policy, the 0113 Bleep holder is notified of all children with a PEWS score of 3 or above. In response to this notification, they should:*
- *Ensure ward staff have performed a BP [blood pressure check],*
 - *Ensure that a Paediatric Sepsis 6 flowchart is being completed, and*
 - *Support ward team in getting medical review.*
- If the child is thought to have sepsis, they are responsible for ensuring that all 6 steps are performed within 1 hour, or the reason for any deviation documented by a senior doctor (registrar or consultant).”*

The Hospital’s Paediatric Early Warning System Policy

29. The Hospital had in place a Paediatric Early Warning Score system which required a score to be calculated every time observations were taken, with points being added for specific findings and factors. On the back of the observation record sheet was a PEWS Escalation Aid which set out the steps to be taken in response to a PEWS score. The responses required from the bedside nurse and Nurse in Charge for a score of 3 or above were as follows:

PEWS Score 3:

- Nurse in Charge to review
- Paediatric (8866) or Surgery SHO (4448) to review
- Inform Senior Nurse (0113)
- Repeat observations every 15 min until review

PEWS Score 4:

- Paeds Reg (8686) to review within 30 min
- Nurse in Charge to review
- Senior Nurse (0113) to review
- Paeds Reg/Senior Nurse to inform Consultant
- Repeat observations every 15 min until review

PEWS Score 5-6:

- Consider Crash Call 2222
- Paeds Reg (8686) to review within 15 min
- Anaesthetic Registrar (0400) to review
- Nurse in Charge to review
- Senior Nurse (0113) to review
- Paeds Consultant to review (contact via switch or 6057 overnight)
- Repeat observations every 15 min until review.

The Paediatric Emergency Department

30. **Dr Alina Grecu** told me that on the 24th August 2016 she was on duty in the Hospital's PED as a specialty trainee year three Senior House Officer, working a shift from 16.00 hours until 02.00 hours the following day. She was an emergency medicine trainee and had started her placement in the PED earlier that month. So far as records in the PED were concerned, Dr Grecu explained that the paper documentation consisted of only the triage nurse's notes and pages for observations and labels. All other notes, including those of the doctors, were placed on to the electronic system.

31. Hayden's records show that he arrived with his parents in the PED at 19.33 hours and at 19.38 was triaged by **Nurse Jessica Cottam**, whose evidence was read. Nurse Cottam recorded,

"3/7 ago baby felt hot, mum checked temp, was 39C. Called 111 asked to come to hospital. Mum cooled him down, he was very well, temperature disappeared, so did not bring him to hospital. Temperature since has fluctuated. ... Feeding very well 3-4 hourly. ..."

The witness also stated that Mrs Nguyen was visibly upset and crying and that Hayden drank some milk when given a bottle. Nurse Cottam examined Hayden and noted that he was alert, was breathing with very

mild subcostal recessions, and was warm and perfused with a capillary refill time of under two seconds. Her observations were as follows:

- Temperature - 39.4 degrees C
- Heart rate - 190 to 208 beats per minute (“bpm”)
- Respiratory rate – 88 breaths per minute (“bpm”)
- Oxygen saturations - 98%
- Glasgow Coma Score – 15/15

32. Dr Grecu explained that the temperature reading of 39.4 degrees was very elevated, that the pulse rate of 190 to 208 bpm was also very elevated, with any rate above 160 bpm representing tachycardia in a neonate, and that the respiratory rate of 88 bpm was elevated, with any rate above 60 bpm being tachypnoeic. She agreed that no blood pressure reading was recorded. Dr Grecu agreed that if a PEWS score had been calculated at this stage, which it was not, it would have resulted in a score of at least three which, under the PEWS Policy, ought to have triggered the involvement of the Senior Nurse Bleep Holder.

33. Dr Grecu said that she reviewed Hayden at about 20.00 hours. The witness said that her process was to *“take the history again, see the patient, discuss with seniors and have a repeat set of observations”*. She understood that Hayden was attending because of raised temperature and reduced feeding and said that Hayden’s parents were concerned, and Mrs Nguyen was *“tearful and worried”*, and that this was a relevant factor which needed to be taken into account in the assessment. She said her clinical examination of Hayden was unremarkable; he *“handled well”*, with jaundice but no mottled skin. She saw *“normal work of breathing”* and said he was warm peripherally and was *“rooting”* which was a good sign. She said that she thought Hayden was no longer tachycardic *“... because his heart rate would have come down somewhere closer to 160 or below”*, although she accepted that no heart rate value was recorded. Dr Grecu said that, given Hayden’s history of fever, reduced feeding, and age, it was clear that he would need to be admitted for further investigation and management. The witness was asked about the level of her concern for Hayden and she said,

“...For me, this was the sickest child that I have ever seen, but then I was just at the beginning of my paediatric emergency medicine training, so that doesn’t mean much, because I hadn’t seen many children, and certainly not many neonates”.

34. The more senior doctors on duty at that time were Dr Taylor, the Registrar, and Dr Yorke, the Consultant in charge of the PED. Dr Grecu said she discussed Hayden with Dr Taylor, who indicated that blood investigations, lumbar puncture, and intravenous antibiotics were needed. The witness then took blood from Hayden for capillary gas, full blood count, renal function, C-Reactive Protein, and blood cultures, finding him to be *"a bit too quiet"* in the process. She recalled also performing the lumbar puncture at some time before 21.00 hours. The witness said that the first blood gas results, timed at 20.38 hours, included the following findings:
- pH – 7.28
 - pCO₂ – 6.5 kPa
 - Lactate – 4.0 mmol/L
 - Base Excess - negative 3.7 mmol/L
35. Dr Grecu explained that the normal value for lactate is up to two. She said *"I thought the lactate is raised and the patient is a little bit acidotic. ... And that it takes me further on my diagnostic pathway of sepsis"*, which was her working diagnosis. She said she discussed with Dr Taylor the raised lactate level and whether a fluid bolus was needed. They decided it was not needed at that stage because Hayden was not tachycardic, was not peripherally shut down, was still taking feeds, and the blood for the gas test was from a *"squeezed sample"*, meaning that Hayden's arm had been squeezed manually, raising the possibility of trauma and stress which could affect the lactate level. The witness said they decided that, following admission, the ward team should repeat the blood gas test and reconsider giving a fluid bolus. She could not recall if anything was said by Dr Taylor as to how quickly the test needed to be repeated, but she said she had thought that Hayden would be transferring to the ward *"imminently"*.
36. **Dr Felicity Taylor** gave oral evidence and explained that in August 2016 she was a specialty trainee year 6 in paediatric emergency medicine. On the 24th August she was working in the PED until 21.00 hours. She said Dr Grecu drew Hayden to her attention. She recalled reading Hayden's triage notes and she understood that Hayden had taken some milk from a bottle whilst in the department, and that had coincided with his producing a urine sample for assessment. When questioned by Ms Bradley KC, she accepted that she had not, herself, seen Hayden feeding and that he may have taken very little milk. Dr Taylor said that as Hayden was a febrile neonate, she went to review him herself, as a priority. She said his heart rate was improving, she used the word *"normalising"*, his capillary refill time was normal, and he was handling

well. In relation to the lactate reading of 4.0, Dr Taylor accepted this was higher than the normal range of 0 to 2 and that Hayden had "*mild metabolic acidosis*", but she said she was not unduly concerned that he was very unwell; the lactate value did not correlate with the clinical picture and she thought the way in which the sample had been obtained, which she understood had been by prolonged manual squeezing, may have produced a reading which was not an accurate measure of Hayden's condition overall. She said, "*I didn't think Hayden required a fluid bolus. I didn't think he was in shock*". She said that if she had thought Hayden was in shock, she would not have directed a lumbar puncture.

37. Dr Taylor did, however, agree that a repeat of the blood gas test was important and said that, at the time, she thought it would happen within an hour. She said she thought that, first, the lumbar puncture should be performed and the antibiotics given, and that Hayden would then be transferred to the ward where the test could be repeated, and she conveyed this to Dr Grecu. Dr Taylor added that she had had in mind that the test should be repeated in the PED if there was a delay in Hayden going to the ward, but she could not now recall what, if anything, she said to Dr Grecu in this regard. Dr Taylor made no contemporaneous note of her involvement and so was not able to refresh her memory by reference to the records. As far as escalation was concerned, Dr Taylor said that she discussed Hayden with Dr Yorke at about 20.44 hours and Dr Yorke agreed with the plan, including the decision not to give a fluid bolus at that stage. Dr Taylor said that she did not ask Dr Yorke to review Hayden which, she said, she would have done if she had been concerned about him.
38. Ms Bradley KC asked Dr Taylor about the national and local guidelines. She asked whether the witness agreed that, so far as the NICE traffic light system was concerned, Hayden had two high-risk signs (temperature and respiratory rate) and one intermediate-risk sign (heart rate) for risk of serious illness. Dr Taylor said that he did when triaged but that the picture then improved; his heart rate came down to 165 bpm and, whilst she accepted that a heart rate of over 160 was said in the NICE guidelines to be tachycardia for those aged 0 to 12 months, in her view a rate of 165 bpm should not necessarily be seen as tachycardic in a neonate. Further, the witness said that the rate of tachycardia at triage was not "*inappropriate tachycardia*", as referenced in the Hospital's guidelines, because of his fever. Ms Bradley KC asked whether Dr Taylor agreed that the temperature, heart rate, and respiratory rate observations were strongly suggestive of Hayden being septic, if not in compensated shock, and the witness said that she did not agree. She said, "*Many of our*

paediatric patients come in to us with an appropriate tachycardia in response to fever”.

39. **Dr Hester Yorke** told me that she was working as a Consultant in Paediatric Emergency Medicine at the Hospital on the 24th August 2016, on a shift which finished at 21.00 hours. She first knew of Hayden at 20.40 hours when Dr Taylor came to discuss him. Dr Taylor conveyed the history and an improving picture. Dr Yorke said that she understood that Hayden was feeding well and was still feeding in the PED which, she said, was a re-assuring sign in the context of neonatal infection. She was told of the blood gas results and she said that although there was evidence of a mild metabolic acidosis, this did not fit with the rest of the clinical picture; she said she did not have concerns, at that point, that Hayden was in septic shock, as he was alert, had normal capillary refill times, and had passed urine. Further, Dr Yorke said that it had been reported that the blood gas sample was taken during a cannulation and, therefore, was probably affected by some venous stasis, which can falsely raise the lactate reading a little bit. However, she told me that, as per the NICE guidance, any baby under the age of three months who presents with a fever is automatically put into a high-risk category for serious bacterial infection. Therefore, a full septic screen and antibiotics were required, whether Hayden looked and handled well or not, and that was the plan in place. She agreed with Dr Taylor that a fluid bolus was not indicated because Hayden was not considered to be in shock. She said, *“We see an awful lot of neonates who are febrile”* and *“at that point in time, none of us were acutely worried about Hayden”*. She said, however, that if her shift had not ended she would have gone to see Hayden for herself, to make her own assessment, using her level of experience as a Consultant, in order to consider, *“Am I happy that this child is not more unwell than has been relayed to me by the staff ...? Is there any other management that I think this child needs to undertake that has not already happened?”*
40. Dr Yorke told me that she gave a handover to Dr Penny, who was the Consultant taking over responsibility for the PED at 21.00 hours. She said Hayden was the first patient she discussed and she told Dr Penny that *“...he had an abnormal gas, I explained that he was in the process of having a full septic screen done and that he would require consultant review”*. She said it was standard for all admissions, let alone all septic neonates, to get a Consultant review in the PED before being transferred to a ward. She said that there was no statutory requirement for Consultant review in the PED prior to transfer to the ward, but her own view was that *“I’m there, I’m responsible for that child and, therefore, I review them in the setting that they are in”*.

41. Dr Yorke said that she considered Hayden's management up to this point to have been in accordance with the NICE and Hospital guidelines. She did not consider that the Sepsis 6 protocol ought to have been activated because Hayden's tachycardia at triage was not "*inappropriate*" and his observations subsequently improved.
42. Blood results timed at 20.57 hours became available electronically, and Dr Grecu told me that they came to her attention at some point, although she could not recall precisely when. The findings included:
- Bilirubin – 237 umol/L
 - C-Reactive Protein – 30.4 mg/L
 - Blood platelets – 57

Dr Grecu said that the bilirubin reading reflected Hayden's jaundice, that the C-Reactive Protein reading was raised and indicated an inflammatory process, and that the platelets reading was low and showed that he was thrombocytopenic; the latter two results were consistent with the suspected sepsis diagnosis.

43. Dr Grecu told me that, after completing the lumbar puncture, she had called the Registrar on Mercury Ward, to which Hayden was to be admitted, to provide his details. She said she mentioned that the lactate was raised and that the blood gas needed to be repeated and fluid bolus reconsidered; she said she also told the Registrar that the platelets result was low and that the full blood count should also be repeated. The witness said she also spoke to Dr Penny as she wanted to make sure he was aware of Hayden; she could not recall whether the conversation was in person or by telephone. She said she told Dr Penny of the history and the management so far, and of the lactate reading, and she asked whether a fluid bolus should be given. She said that Dr Penny said he would review Hayden on the ward and make a decision then. The witness was challenged by Mr Brassington, as Dr Penny could not recall this conversation, but Dr Grecu stated that it did take place.
44. Dr Grecu said that she then went on to review other patients and did not recall seeing Hayden again. She had thought that he had transferred to Mercury Ward at sometime between 21.00 and 21.30 hours and she had not been aware that he was not, in fact, taken there until 23.00 hours. She told me that she received a call from the microbiology department with the result of the microscopy on the cerebrospinal fluid, which showed a raised white cells result of 12/cmm, and she telephoned the Registrar on the ward again to alert her to this.

45. On the basis of the records, Dr Grecu stated that the two antibiotics she had prescribed, cefotaxime and amoxicillin, had been administered intravenously at 21.50 and 22.00 hours respectively. So far as further observations were concerned, she could not recall whether she, or any other doctor, gave directions to the nursing staff as to what observations should be taken and how frequently. Again, on the basis of the records, she confirmed that two sets of observations were taken by a nurse whilst Hayden was still in the PED, although she could not recall seeing them at the time. They included the following findings:

21.50 hours	22.45 hours
<ul style="list-style-type: none"> • Respiratory rate: 65 bpm • Oxygen saturations: 99 % on room air • Blood pressure: Not recorded • Heart rate: 165 bpm • Alert • Temperature: 37.1 degrees • PEWS score: Not recorded 	<ul style="list-style-type: none"> • Respiratory rate: 55 bpm • Oxygen saturations: 97 % on room air • Blood pressure: 69/18 • Heart rate: 170 bpm • Alert • Temperature: 37.2 degrees • PEWS score: 1* <p>*But ought to have been calculated as 3</p>

46. **Dr Jonathan Penny** gave evidence and told me that he is a Consultant Paediatrician and that on the 24th August 2016 he was on duty at the Hospital as the Consultant in charge of the PED overnight from 21.00 hours. He explained that, as such, he was also the Hospital's "resident" Paediatric Consultant overnight, and this role gave him additional responsibility for urgent response, if needed, to the patients on the paediatric wards and the PHDU. The in-patients on those wards were admitted under a different Consultant who was not present in the Hospital overnight and who was, therefore, referred to as the "non-resident" Consultant. The non-resident Consultant was on-call throughout the night. At the material time, the non-resident on-call Consultant was Dr James Ross. Dr Penny explained that there was in place guidance entitled "Paediatric Resident and On-Call Consultants Overnight Roles and Responsibilities" despite which, he said, the precise thresholds for involving the resident and/or the non-resident Consultants were "nebulous" and were affected to some extent by the personalities of the clinicians involved. Dr Penny said, "If a patient is very unwell and requires a consultant review, the resident consultant can be contacted and asked to do that, pending the arrival of

the non-resident consultant, who is responsible for the patient". Otherwise, he said, the Registrar on the wards ought to be contacting the non-resident Consultant. He accepted that it was part of his own role, as the resident Consultant, to re-direct inappropriate requests for help by junior doctors to the non-resident Consultant, even if that appeared unhelpful.

47. Dr Penny told me that when he arrived in the PED at the start of his shift he received Dr Yorke's handover concerning Hayden. He said he was told that Hayden *"had been admitted with a history of fever, had had a partial septic screening, was due to have a lumbar puncture, was going to have intravenous antibiotics, and that the blood gas ... showed a raised lactate. However, the feeling was that he looked well, so the plan was to repeat that lactate when he was transferred to the ward"*. He assumed this meant that the test would be repeated in one to two hours. He said it was not at all uncommon to see lactate levels that were raised because the sample had been squeezed, which then, when they were repeated, were normal; however, when questioned by Ms Bradley KC he did accept that this was not a reason to ignore or discount the objective lactate finding. Further, he accepted that the blood gas test ought have been repeated in the PED as it was important to clarify whether Hayden did or did not have a raised lactate and whether he did or did not need fluids. Dr Penny said he knew that Hayden had not been seen by Dr Yorke but, on the basis of what he had been told, he did not consider that he needed to examine or to assess Hayden before his transfer to the ward as he had been seen by Dr Taylor and a plan was in place. Dr Penny said he was not informed of the triage observations and, if he had been, they would have presented a more concerning picture. He said he was asked to oversee the lumbar puncture, but Dr Taylor stepped in to do that. He had no recollection of seeing or speaking to Hayden's parents at that stage.

48. Dr Penny was asked about the Sepsis 6 protocol in the Hospital's guidelines and said that, at the time, he did not consider whether Hayden met the criteria. He stated that, in practice, despite those guidelines, it was rare for a neonate with suspected sepsis to be given oxygen, unless it was clinically indicated. However, he said that if he had known that Hayden's respiratory rate had been 88 bpm at triage, he would have wanted to see him. He said he did not consider whether there was a need for a fluid bolus as, at the time, he did not think there was any evidence of shock, but again, if he had seen the triage observations, he would have had that concern. He agreed that Hayden was his patient from 21.00 hours until he was transferred to the ward at 23.00 hours, and he accepted that, at the time, he did not know what Hayden's condition was in that period. He said, *"with hindsight, I would like to have known"*. He accepted that Hayden was the

sickest patient in the PED and that he ought to have checked on whether or not the plan had been carried out in the period he remained in the department.

49. Dr Penny was asked whether he recalled Dr Grecu speaking to him about Hayden, and asking for reconsideration of a fluid bolus, and he said that he was *“positively asserting that that did not happen”*.

The Mercury Ward

50. I then heard evidence from those concerned with Hayden’s care following his transfer to Mercury Ward. **Nurse Amrita Gill** told me that she was a paediatric nurse who had qualified in 2015. She was working a night shift on Mercury Ward which was one of the Hospital’s paediatric wards. Hayden was admitted to the ward at 23.00 hours and was the fourth patient allocated to her. The handover document which accompanied him, recorded that he had sepsis and the observations, timed at 22.45 hours, indicated that he was alert, with a temperature of 37.2 degrees C, a heart rate of 170 bpm, a respiratory rate of 55 bpm, and an oxygen level of 97% in air. On the basis of these observations a PEWS score of 1 was recorded, although Nurse Gill accepted that the score ought to have been 3. She could not remember whether there was discussion about the need for Hayden’s blood gas to be re-tested but, she said, there was no discussion about reconsideration of giving a fluid bolus.
51. Nurse Gill said that Hayden was placed in an individual room next to the nurses’ station. She was immediately very busy with him and consequently her other patients were re-allocated to other nurses. She recalled Hayden’s parents trying to feed him but that he took very little from the bottle. She said that Hayden was attached to a monitor to check his heart rate and oxygen saturations and, although the machine was sounding its alarm intermittently, when it did give readings, they were reliable. Observations were being taken *“PRN”* meaning *“as required”*. The witness took a full set of observations at 23.50 hours and recorded:
- Nurse/Family concern: Yes
 - Respiratory rate: 75 bpm
 - Respiratory distress: Mild
 - Oxygen saturations: 100% on room air
 - Blood pressure: 100/58
 - Heart rate: 172 bpm
 - Capillary refill time: Less than 2 seconds

- Alertness: Decreased – alert to voice
- Temperature: 37.2 degrees
- PEWS score: 4

At the time, Nurse Gill was not, she said, familiar with the PEWS scoring system; she knew that the actions mandated by the score were listed on the rear of the observation sheet, but she could not recall following them. In fact, the PEWS score of 4 required review by the Nurse in Charge and the Senior Nurse Bleep Holder, review by the Paediatric Registrar within 30 minutes, the Consultant to be informed, and repeat observations every 15 minutes until review.

52. **Dr Chloe Norman** gave oral evidence and explained that she was a paediatric specialty trainee year 2, on duty as an SHO. She and Dr Bako, the Registrar, were the doctors present in the Hospital who were responsible for the paediatric wards and the PHDU overnight. She said that Dr Bako informed her that Hayden was coming up to the ward from the PED and was being managed for sepsis. She conducted a “clerking” assessment, after which she made an entry in his notes which was timed at 23.55 hours. She noted Hayden’s history and recorded her findings which included jaundice and mottling, systolic heart murmur, heart rate of 60 bpm, subcostal recessions, intermittent tachypnoea, and capillary refill times of less than 3 seconds centrally and 3 to 4 seconds peripherally. Dr Norman said she felt that Hayden was dehydrated and septic, and she was worried about him. She felt he was more unwell than she had been expecting. He was alert and, at the time, she did not think he was in septic shock although, she said, looking back, she could now see that he was. Her plan was to seek review by Dr Bako and consider a 10ml/kg fluid bolus, as well as continuing the antibiotics.
53. **Dr Oluwakemi Bako** told me she was a specialty trainee year 7 doctor on duty as the Paediatric Registrar for the paediatric wards and HDU overnight. Dr Bako recalled Dr Grecu telephoning her about Hayden’s admission, giving his history and stating that he had been discussed with the Consultant. She said Dr Grecu did mention the blood gas results and the lactate reading of 4.0, saying it was from a squeezed sample, and it should be repeated within an hour of when it was previously done. She did not recall Dr Grecu telephoning her for a second time to inform her of the white cell count reading in the cerebrospinal fluid.
54. Dr Bako said Dr Norman assessed Hayden on the ward and came to her and said that “*he looks sick*” and that he needed a fluid bolus. Dr Bako said she went to assess him for herself, making a note which was timed at

00.30 hours. Her findings included that Hayden handled well, and had jaundice++, intermittent tachypnoea, capillary refill times of 2 to 3 seconds centrally and 3 to 4 seconds peripherally, a heart rate of 170 bpm, intermittent systolic murmur, and mottled legs. Dr Bako also recorded that Hayden's parents reported that he had not fed properly since 18.00 hours. Her impression was of "*sepsis, clinically fairly stable at present.*" Dr Bako made a plan for fluid maintenance and bolus, continuation of antibiotics, continuous monitoring, and repeat of blood gas and full blood count. She expected Dr Norman to perform the repeat blood gas within an hour of the assessment.

55. Dr Bako told me that, unlike Dr Norman, she did not consider that Hayden looked sick. Ms Bradley KC questioned the witness about that and asked why, in view of his presentation and observations, she had not escalated Hayden to a Consultant and given him oxygen. Dr Bako said she agreed that the combination of dehydration and sepsis could lead to septic shock but, at that time, she was not thinking about septic shock but about the dehydration and how to address it. Her plan had been to give fluids, see how he responded, and then escalate and perform a blood gas test. However, Dr Bako accepted that she ought to have repeated the blood gas immediately and she accepted that, given what we now know, it would have shown a worsening acidosis and oxygen would have been indicated. The witness also agreed that, given Hayden's platelet count, it would have been useful to repeat the blood tests, but that did not cross her mind at that time. Further, on reflection, she accepted that, given the picture overall, Hayden ought to have been transferred to the PHDU at this time.

56. **Nurse Anne-Marie Deas** told me that she is a Paediatric Nurse and was working as the Senior Nurse Bleep Holder (0113) overnight from the 24th to the 25th August 2016, covering the PED, the paediatric wards, and the PHDU. Nurse Deas confirmed that part of her role was to review paediatric patients with a PEWS score of 3 or above and she was well aware of the PEWS policy. However, when Nurse Deas was asked about the Senior Nurse Bleep Holder's responsibilities under the Hospital's Paediatric Sepsis guidelines, she told me that she was not aware of the guidelines at that time as they were not "*rolled-out*" to nurses until November 2016, and she said she had had no training on the Sepsis 6 protocol. She had received training on paediatric life support, but none specifically on the management of sepsis and the early administration of fluid and, if indicated, inotropic support.

57. Nurse Deas said that she recalled Nurse Gill drawing her attention to Hayden at about midnight. She was aware of his observations but not the earlier blood gas results. She went to see Hayden and found he was not on a saturation monitor and she asked for that to be done. She undressed Hayden to examine him properly and said,

“When I touched his extremities, he was very cold, and so I did a central capillary refill on him ... it was less than two, but he looked ... it’s quite hard to explain. He looked quite dry. And I had a conversation with both mum and dad, about how much he’d had to feed, and they had said he hadn’t really had much feed since early on in the evening”.

She said Hayden was quite mottled, although the parents said he was usually a little bit mottled. Nurse Deas said his presentation fitted with the PEWS score of 4. She said he was unwell and *“I thought it was important that, actually, the doctors came and reviewed him, so as we could get some fluid on board”*. However, when she left Hayden’s room, she saw Drs Norman and Bako together and learned that a decision to give fluids had already been taken and she assisted Nurse Gill with the administration. Nurse Gill told me she gave the first fluid bolus of 10 ml/kg at 00.25 hours. Hayden’s parents recollected a significant deterioration in his condition following the first bolus, but Nurse Gill could not recall any significant change in Hayden’s respiratory effort or the appearance of obvious mottling in response to the fluid bolus.

58. Nurse Deas made an entry in the notes timed at 00.30 hours and stated, *“Reviewed patient after first bolus, decision made to transfer patient to PHDU”* which she accepted, on the face of it, suggests that there may have been a deterioration at this time. However, Nurse Deas said that she thought the time of the entry must be wrong because, she thought, the decision to transfer Hayden to the PHDU had been made later, after Dr Penny had attended, and her note made at 08.53 hours on the 25th August suggests this. Nurse Deas was asked about the evidence of Nurse Freemantle, whose evidence I review below, who was the Nurse in Charge of the PHDU and who recalled Nurse Deas telephoning at about 01.00 hours to inform her of Hayden’s possible transfer; indeed, she said his cubicle was prepared and ready for use at approximately 01.30 to 01.45 hours. Nurse Deas could not recall that call, but accepted that it may have happened. Nurse Deas agreed that she had the authority to transfer a patient to the PHDU herself and, at the very least, it seems that at some time before 01.00 hours she had in mind that Hayden may need to go to there, and that she conveyed that to the PHDU, although she thought the decision was taken subsequently following medical review. This scenario seems to

me to be likely and I find that Nurse Deas' note at 00.30 hours was accurately timed and that this reflected Hayden's need for increased support and monitoring at this stage.

59. Nurse Gill said she took further sets of observations at 00.30 hours and 01.00 hours. She did not take Hayden's blood pressure on either occasion which, she accepted, she ought to have done. She recorded the following:

00.30 hours	01.00 hours
<ul style="list-style-type: none"> • Nurse/Family concern: Yes • Respiratory rate: 70 bpm • Respiratory distress: Mild • Oxygen saturations: 100% on room air • Blood pressure: Not recorded • Heart rate: 170 bpm • Capillary refill time: Less than 2 seconds • Alertness: Decreased – alert to voice (Asleep) • Temperature: Not recorded • PEWS score: 3 	<ul style="list-style-type: none"> • Nurse/Family concern: Yes • Respiratory rate: 76 bpm • Respiratory distress: Mild • Oxygen saturations: 100% on room air • Blood pressure: Not recorded • Heart rate: 185 bpm • Capillary refill time: Less than 2 seconds • Alertness: Decreased – alert to voice (Asleep) • Temperature: 37.6 degrees • PEWS score: 4

60. Dr Norman told me that after the second set of observations, she was asked to review Hayden due to nursing concerns and she did so, making a note of her findings at 01.40 hours. She found him to be still tachycardic despite the fluid bolus and with persistent tachypnoea. He was alert, with capillary refill time of 4 seconds peripherally, heart rate of 184 bpm, raised respiratory rate with subcostal recessions, a temperature of 37.4 degrees, and a mildly distended abdomen. She recorded “ ? shock despite bolus” and planned for a senior review. Dr Norman also performed two blood gas tests at 01.32 and 01.34 hours and the results included the following:

01.32 hours	01.34hours
<ul style="list-style-type: none"> • pH – 7.06 • pCO2 – 10.7 kPa • Lactate – 7.5 mmol/L 	<ul style="list-style-type: none"> • pH – 7.17 • pCO2 – 7.2 kPa • Lactate – 7.1 mmol/L

<ul style="list-style-type: none"> • Base Excess - negative 7.6 mmol/L 	<ul style="list-style-type: none"> • Base Excess - negative 8.8 mmol/L
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61. Dr Norman said that the results, which showed mixed metabolic and respiratory acidosis, evidenced a worsening picture and, she considered, meant that the blood gas results from the PED at 20.38 hours had probably not been anomalous. She felt that the heart rate of 184 bpm, despite the fluid bolus having been given and the temperature being only 37.4 degrees, was significant. She informed Dr Bako and she said they were both very concerned. They planned to give another fluid bolus and then perform another blood gas test, and to add an anti-viral medication. She said they also recognised that Hayden needed respiratory support. Dr Norman explained the different levels of oxygen support, short of intubation; low flow oxygen, either by nasal cannula or a face mask, which could be provided on the ward, higher flow oxygen ("OptiFlow") which could be delivered only the PHDU, and a continuous positive airway pressure delivered through a sealed mask ("CPAP"). Dr Norman said that although it was apparent to her that intubation may become necessary, the feeling of Dr Bako and Dr Penny was that something less invasive should be tried first.
62. Dr Bako recalled seeing the further blood gas results and thinking that they "*looked awful*". She reviewed Hayden and, in a subsequent note timed at 02.00 hours, recorded that he had received the maintenance fluid and bolus, and had drunk 20mls, but "*90 mins later*" he was still tachycardic, with a temperature of 37.6 degrees, oxygen saturations of 98% in air, a respiratory rate of 60 to 70 bpm with subcostal recessions, and he remained centrally and peripherally shut down. Dr Bako noted the recent blood gas outcome and that microbiology had reported a white cell count of 12 in the cerebrospinal fluid. The witness recorded that another fluid bolus had been given and her plan was for further fluids, antiviral medication, chest and abdominal x-ray, repeat of full blood count, repeat of blood gas in one hour, and transfer to the PHDU. So far as diagnosis was concerned, Dr Bako recorded that Hayden's condition was "*likely sepsis related*" in view of the raised lactate but she wondered whether there may be "*inborn errors of metabolism*". The witness was asked by Ms Bradley KC why she had not, herself, involved the anaesthetic team and CATS, given the level of acidosis that was shown by the blood gas results, and the witness said that she had escalated to the Consultant in the first instance.

63. In fact, Dr Bako informed Dr Penny of these developments rather than Dr Ross, who she did not contact at all at this stage. She was asked for her understanding of when she was expected to contact the resident and non-resident Consultants overnight. She said that if she wanted a child to be reviewed immediately, she could contact the resident Consultant; she would also contact the resident Consultant concerning a child who had been admitted overnight through the PED, as he would already be aware of the patient. She said she was not aware of any guidance as to when it would become appropriate to make the non-resident Consultant aware of the patient; this was usually, but not always, done if there was a transfer to the PHDU. She said she contacted Dr Penny in relation to Hayden because, *"I wanted someone to see the child. So, like I explained, the gas I was looking at didn't reflect the child that I was seeing. So, it's hard to try and explain that to somebody over the phone. So, I spoke to Dr Penny and I asked, could he kindly come and review the child that was discussed in handover, and the reasons why"*. She said it did not cross her mind to contact Dr Ross as well at that stage and she denied that she told Dr Penny that she would do so.
64. Dr Bako made a note of Dr Penny's attendance in which she stated, *"Clinical findings as previous"*, although she said Hayden's observations had improved somewhat, following the second fluid bolus at 01.45 hours. She was challenged in this regard by Ms Bradley KC and she accepted that the recorded observations before and after Dr Penny's attendance showed that Hayden remained significantly tachycardic, without an improvement in his respiratory rate, and that his respiratory distress had increased. Dr Bako said Dr Penny examined Hayden and agreed with her plan for transfer to the PHDU, and he directed that Hayden should be placed on OptiFlow oxygen support there. Dr Bako said they did not discuss transfer to a Paediatric Intensive Care Unit ("PICU") which, she accepted, they ought to have done. Dr Bako also said there was no discussion about informing Dr Ross about Hayden at this stage. In relation to contacting Dr Ross, I will note too that Nurse Deas said, *"If you follow the guidance, it says that the consultant should be called at home, but our practice then was that there was a consultant there that would review the child on the ward. If the consultant is there, I wouldn't have called another consultant to come in unless I didn't agree with the decision"*.
65. Dr Penny told me that Dr Bako had contacted him at about 01.45 hours saying she was concerned about the blood gas test which had been done, which she did not feel correlated with Hayden's clinical picture. He said, *"she was concerned about whether there was potential for an inborn error of metabolism. She was asking for advice as to what to do. She told me that she was*

going to contact Dr Ross, but once she told me the blood gas result, I felt the need to go and see myself ... because of the mixed acidosis". Dr Penny said he went to Mercury Ward where he spoke to Dr Bako and Dr Norman. He did not read the notes, but he examined Hayden who, he said, was not particularly tachycardic; he was handling well and had reasonable colour; and clinically, his presentation was not in keeping with the blood gas results and observations. Dr Penny said the picture was confusing because it was not the clinical presentation of a baby with bacterial sepsis which was, at that stage, the main differential diagnosis. It raised the possibilities of a different disease process or an unusual presentation of sepsis.

66. Dr Penny said that there was now evidence that Hayden was in shock. He said he agreed with the plan for transfer to the PHDU because "*the sickest paediatric patients in the hospital should be on the high-dependency unit*". He directed that Hayden should receive respiratory support, OptiFlow, and a further fluid bolus. Dr Penny said he then left Mercury Ward and did not thereafter think about Hayden because he thought Dr Bako was contacting Dr Ross. Dr Penny said his expectation was that Hayden would be given oxygen quickly on the ward pending transfer, would be transferred to the ward quickly, that OptiFlow would be commenced quickly on arrival in the PHDU, that the blood gas test would be repeated about 30 minutes after the OptiFlow was commenced, that there would be full monitoring on the PHDU, including of blood pressure and by ECG, and that Dr Ross would be contacted as the responsible Consultant. However, Dr Penny accepted that he did not give directions in relation to any of these matters and he accepted that, in fact, they did not happen. He said, "*in hindsight, I should have definitely been more clear with my instructions ... and I very much regret not calling Dr Ross myself*".

67. Nurse Gill told me that she performed a further set of observations at 02.30 hours, when she recorded:

- Nurse/Family concern: Yes
- Respiratory rate: 74 bpm
- Respiratory distress: Moderate
- Oxygen saturations: 100% on room air
- Blood pressure: None recorded
- Heart rate: 184 bpm
- Capillary refill time: Less than 2 seconds
- Alertness: Decreased – alert to voice (Asleep)
- Temperature: None recorded
- PEWS score: 5

Nurse Gill said that she did not take any specific action in response to the PEWS score of 5 because the SHO, the Registrar and the Senior Nurse Bleep Holder were already on the ward and involved. She could not remember, however, whether she informed any of them about the PEWS score of 5. She did not inform Dr Penny or Dr Ross. Nurse Gill did not know that the score of 5 required consideration of the need for a 2222 crash call for resuscitation assistance and the involvement of the Anaesthetic Registrar and she was not aware of anyone discussing taking those steps at this time. Nurse Deas told me that she was not made aware of the PEWS score of 5 at 02.30 hours. She confirmed that the score meant that the anaesthetic team ought to have been involved then as there might have been a need for intubation.

68. Hayden was not taken to the PHDU until 03.00 hours and the witnesses concerned were asked why that was the case. Nurse Gill explained that she was busy actioning the plan that had been made and Nurse Deas emphasised that Nurse Gill was busy throughout. Further fluid boluses were given (at 01.45 and 02.45 hours) and intravenous acyclovir (antiviral) was commenced at 02.10 hours. Nurse Gill said they were waiting for the mobile x-ray machine to arrive and the x-ray, which had been directed by Dr Bako, was not performed until 02.50 hours, although Dr Norman agreed that the mobile machine could have been directed to the PHDU instead. Indeed, I was told that all the actions under the plan could have been performed in the PHDU. Nurse Gill agreed that the concern for Hayden was growing through this time, not only because of his increasing respiratory effort and distress, but also because he had not passed any urine during his time on Mercury Ward, despite having had three fluid boluses by the time of transfer to the PHDU.

69. Dr Bako recalled having gone to the PHDU expecting Hayden to have arrived and, when he was not there, she returned to Mercury Ward. She was told he needed to be cannulated and she performed that task. In the notes she recorded,

“Whilst cannulating the baby – mottled++, centrally and peripherally capillary refill time 3 seconds – this is despite 20 mls/kg fluid bolus. Patient given another 10 mls/kg bolus, started grunting intermittently.”

70. The witness said that Hayden’s mottled legs, seen previously, had resolved and this was a reference to new mottling which she saw spreading across his chest during cannulation. She said the grunting, which started after the third bolus was given, was a new development

and she was worried that his respiratory distress was getting worse. She recorded that the blood gas test should be repeated, “*an hour after been on Optiflow*” but accepted that it ought to have been repeated immediately. Dr Bako said she was concerned about the delay in the transfer taking place and the OptiFlow being started, but she did not recall directing that low-flow oxygenation be given pending transfer. (Nurse Deas said she thought they started Hayden on some oxygen support, through a nasal cannula or mask, prior to the transfer.) Dr Bako also recorded that a nasogastric tube should be placed but could not now recall her reasoning for that.

71. Nurse Gill said she went with Hayden to the PHDU at 03.00 hours and she handed over to Nurse Lucy Underhill. She said she went through the observations, including the PEWS score of 5, with Nurse Underhill. Dr Bako told me that she also went with Hayden to the PHDU, as did Dr Norman and Nurse Deas. Dr Bako said she did not give directions for either one-to-one monitoring of Hayden or an immediate blood gas test, both of which, she accepted, he needed.

The Paediatric High Dependency Unit

72. The evidence of **Nurse Gemma Freemantle** was read. She was the Nurse in Charge of PHDU who said that she was alerted to Hayden’s transfer by the Senior Nurse Bleep Holder, Nurse Deas (as set out above).
73. **Nurse Lucy Underhill** gave evidence and told me that she is a Registered Nurse and was working on the Hospital’s Apollo ward, which was the PHDU, overnight from the 24th August 2016. She said that Hayden was allocated to her and when he arrived, he was placed in his own room where the main lights were dimmed, because it was night-time. The room had a standard monitor which could measure heart rate, saturations, and blood pressure, and it could give an ECG trace if set to do so. She said she tested the machine before Hayden’s arrival to ensure it was working properly and she probably set it to reflect normal parameters for Hayden’s age at that time. Its readings showed up on the machine itself and on a central monitor at the nurses’ station.
74. Nurse Underhill said that on admission she received handovers from Dr Bako and Nurse Gill. She was told that Hayden had suspected sepsis, but the possibility of shock was not mentioned. She received a history and was told that Hayden had been tachycardic, throughout his time on

Mercury Ward, and he had been tachypnoeic, but she said she was not told details of the 02.30 observations or the PEWS score of 5, although she accepted that his records had accompanied him and she could and should have looked at those observations herself, but she did not do so. She said she was not told, either, of the lactate reading of 7, but again she could and should have seen that in his notes. She said that Dr Bako said the plan was to insert a nasogastric tube, to put Hayden on OptiFlow, and then to repeat the blood gas test an hour later. Dr Bako did not give any directions as to observations, she said.

75. The witness said that Hayden arrived with a probe on his foot and she attached that to the monitoring machine in the room. It was monitoring heart rate and oxygen saturations, giving both a trace and numerical readings. She did not set up any further monitoring such as for blood pressure or ECG because, she said, that was done only “if it was indicated” and nothing had been requested by the medical team. She said that if she had known of the lactate reading of 7, she would have considered that they were indicated. Nurse Underhill said that at times the readings were difficult to obtain from the machine because Hayden was moving his feet a lot and he was cool peripherally, but the readings which were obtained were, she said, reliable. She recalled Hayden's parents raising a concern that the monitoring equipment in the room was sounding its alarm frequently and she tried to reassure them.

76. Nurse Underhill said that on her initial assessment Hayden was pale and mottled, his capillary refill time was 3 seconds centrally, and 3 to 4 seconds peripherally, and he had moderate work of breathing, with subcostal recession, and occasional grunting. She performed a set of observations at 03.15 hours and then proceeded to place a nasogastric tube at 03.45 hours and the OptiFlow at 03.50 hours; on the basis of the plan, this meant that the repeat blood gas test was needed at about 04.50 hours. The witness performed a second set of observations at 04.00 hours and then went to deal with her other patient. She recorded the following observation results:

03.15 hours	04.00 hours
<ul style="list-style-type: none"> • Nurse/Family concern: Yes • Respiratory rate: 68 bpm • Respiratory distress: Moderate • Oxygen saturations: 97% on room air 	<ul style="list-style-type: none"> • Nurse/Family concern: Yes • Respiratory rate: 56 bpm • Respiratory distress: Moderate • Oxygen saturations: “Pink” on Optiflow at 30%

<ul style="list-style-type: none"> • Blood pressure: 96/35 • Heart rate: 138 bpm • Capillary refill time: 3 seconds • Alertness: Decreased – alert to voice • Temperature: 36.6 degrees • PEWS score: 4 	<ul style="list-style-type: none"> • Blood pressure: Not recorded • Heart rate: 153 bpm • Capillary refill time: 2 seconds • Alertness: Alert • Temperature: Not recorded • PEWS score: 3
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77. Nurse Underhill was questioned about the accuracy of the respiratory and heart rate readings on the basis that Mr and Mrs Nguyen saw Hayden’s respiratory effort increasing and heart rate readings of over 170 and 180 bpm. The witness maintained that the recorded readings reflected what she saw and that she would not otherwise have recorded them.

78. Dr Bako told me that she went back to the PHDU at about 04.00 hours to review Hayden and to repeat the blood gas test, but she did not do so. She said she saw the observations, which appeared to be improved, and she said Hayden was settled. *“I remember the nurse telling me that he had just not long been on the Optiflow, that it took a while to settle him on the Optiflow. ... But he’d settled down now. I checked his capillary refill time. It was less than two seconds. That’s the central capillary refill time. I listened to his chest, because that was my concern. It sounded fine. His heart rate, I remember, had come down when I looked at the monitor. And I thought since he had just been put on the Optiflow, to give it more time, then I’ll repeat the blood gas”*.

79. Nurse Freemantle stated that she saw Hayden in his room and noted that there was a poor trace on the monitor for his oxygen saturations and heart rate, which she thought was because he was cold. The witness reapplied the saturation probe to his foot, securing it with a bandage for warmth and also a glove filled with warm water in an attempt to warm his feet. She said this achieved a better trace on the monitor. However, she said that, throughout, she noted that Hayden’s breathing appeared to be fast and more laboured, with subcostal recession and, at approximately 04.40 hours, she bleeped Dr Bako to escalate her concerns that Hayden’s breathing was laboured despite OptiFlow being commenced. Dr Bako recalled being told that Hayden’s respiratory rate had increased. She attended and thought *“things have changed”* and that the blood gas test had to be repeated immediately.

80. Nurse Underhill said she conducted the blood gas testing on the PHDU machines. In the records there are two further sets of blood gas results, timed at 04.10 hours and 05.00 hours. However, Nurse Underhill said both the tests were conducted at the same time and that the time of 04.10 represents an error by the machine, and the time should have been 05.10 hours. Both she and Dr Ross confirmed that, at the time, there was a known error on one of the two blood gas testing machines in the PHDU in that it was incorrectly recording the time with a one hour discrepancy. I accept this evidence and therefore find that the two results were obtained at 05.00 hours and 05.10 hours respectively. The results were:

05.00 hours	05.10 hours
<ul style="list-style-type: none"> • pH – 6.69 • pCO₂ – 15.53 kPa • Lactate – 15.92 mmol/L • Base Excess - negative 22 mmol/L 	<ul style="list-style-type: none"> • pH – 6.72 • pCO₂ – 13.38 kPa • Lactate – No reading* • Base Excess - negative 23 mmol/L <p>*No lactate reading was obtained because of the type of cartridge used for testing</p>

81. Dr Bako said she was shocked by the results. She said the lactate level was obviously life-threatening. She told Nurse Underhill to call Dr Penny, which she did. Dr Bako called the anaesthetist as it was clear, she said, that intubation would be needed. She told someone to get sodium bicarbonate ready to help with the acidosis. She said that when Dr Penny arrived, he told her to alert Dr Ross and she did so but her call was interrupted by an arrest call.

82. Dr Norman told me that she was present when the blood gas results were received and she said it was then obvious that Hayden urgently needed to be intubated and transferred to a PICU. She was asked by Dr Bako to perform a repeat blood test. She said she saw Hayden and was distressed to find he was so peripherally shut down, with a heart rate of over 200 bpm, and she refused to try to take blood; rather she informed Dr Penny how extremely unwell Hayden was. She said the real priority was for Hayden to be intubated. Dr Penny asked her to contact CATS, which she did. Whilst making the call, she heard the emergency buzzer; she went to assist and found Dr Penny performing chest compressions.

83. Nurse Underhill said she performed a further set of observations at 05.15 hours. She recorded the following results:

- Nurse/Family concern: Yes
- Respiratory rate: 50 bpm
- Respiratory distress: Moderate
- Oxygen saturations: 96% on Optiflow 30 %
- Blood pressure: Not recorded
- Heart rate: 177 bpm
- Capillary refill time: 2 seconds
- Alertness: Not recorded
- Temperature: Not recorded
- PEWS score: Not recorded

84. Nurse Underhill said she was asked to place Hayden on CPAP oxygenation and was preparing to do so when he had an apnoeic episode. Nurse Freemantle stated, *“I re-entered the cubicle at approximately 05:40 hours to assist Nurse Underhill and Dr Penny ... I was instructed to give fluid bolus, while doing this I noticed that Hayden was apnoeic. I stimulated him and he gasped, he then became apnoeic again. I called the emergency crash alarm to muster further support, and Dr Penny commenced bag-valve-mask breathing”*.

85. Dr Penny told me that he returned to the PHDU immediately following the alert from Nurse Underhill. Dr Ross was not there and he took charge of the situation. He said Hayden required intubation and Dr Ramsden, the Anaesthetic Registrar, had been called and was preparing for that. Dr Penny said he was trying to get hold of a central line when he heard a crash call. He went to Hayden and started resuscitation efforts. Dr Hare, the Paediatric Anaesthetic Consultant, also attended and took part in the resuscitation efforts. Those efforts, which were described fully in the evidence of **Dr Fiona Ramsden** and **Dr Alison Hare**, which was read, were extensive and continued for some time.

86. **Dr James Ross** also gave oral evidence to the inquest. He told me that he is a Consultant Paediatrician and was the non-resident on-call Consultant for the paediatric wards of the Hospital on the 24th August 2016 overnight. He said that the first he knew of Hayden was when he received a telephone call from Dr Bako at 05.54 hours on the 25th August 2016. He came in to the Hospital, arriving at 06.25 hours and finding the resuscitation process ongoing. He told me that the resuscitation continued until 07.15 hours when all three Consultants present agreed that further efforts would be futile and Hayden’s death was confirmed.

87. Dr Ross said that he considered that he should have been made aware of Hayden's presence in the Hospital and his condition at an earlier point, certainly following Dr Penny's involvement at about 01.45 hours. It would, he said, also have been reasonable for him to be informed at an earlier stage, when there was first a PEWS score of 4, as the policy requires a Consultant to be informed in those circumstances.
88. The witness was asked about CATS which, he said, was a service physically based at Great Ormond Street Hospital. They have two ambulances. He said that, if contacted, they can advise about the management and resuscitation of a deteriorating child and, if a child needs admission to the PICU at Great Ormond Street or elsewhere, they can assist with securing a bed and transporting the child. There is a response and consultation period, which can take hours and, to Great Ormond Street, a transportation time of 30 minutes. Dr Ross said that "*a couple of hours*" would be the amount of time it would normally take to move a child to the PICU at Great Ormond Street Hospital.

Post Mortem Evidence

89. A post mortem examination was performed by Dr. Al-Adnani, Consultant Pathologist, and it was his opinion that the medical cause of Hayden's death was:

Ia Lymphocytic Myocarditis
Ib Disseminated Enterovirus Infection

90. So far as his findings were concerned, I note that the virology testing showed enterovirus in the blood, lung, nose and cerebrospinal fluid, as well as the heart. Further, the pathologist noted that, "*the myocardium, both ventricles and the septum showed extensive infiltration by lymphocytes and macrophages associated with areas of necrosis.*"

The Expert Evidence

91. I heard oral evidence from four independent experts. Dr Steven Conway assisted me in relation to the question of whether the treatment and care provided to Hayden by the Hospital on the 24th and 25th August 2016 was appropriate and/or in accordance with any relevant local or national policies, protocols or guidelines, good practice or other relevant standard. Prof. Stephen Playfor, Dr Robin Martin, and Prof. Michael

Burch assisted me with the question of whether the treatment and care provided probably caused or more than minimally contributed to Hayden's death and/or whether any different treatment and care could or probably would have prevented his death.

The Standard of Treatment and Care

92. **Dr Steven Conway** told me he is a Consultant Paediatrician with a special interest in paediatric infectious disease, immunology and respiratory medicine. He was in clinical practice when he wrote his report in 2017 in which he gave his opinions in relation to the standard of treatment and care provided to Hayden by the Hospital.
93. In summary, Dr Conway told me that, in his opinion, Hayden did not receive a reasonable standard of care at the Hospital.
94. Dr Conway said that, on arrival, Hayden's triage observations showed that he was a significantly unwell child at high risk of serious illness. He had a high temperature, tachycardia, and tachypnoea and he drew the Court's attention to a paper by M. Thompson and others, entitled "*How well do vital signs identify children with serious infections in paediatric emergency care*", which concluded that having one or more of (i) a temperature of more than 39 degrees, (ii) oxygen saturations of less than 94%, (iii) tachycardia, and (iv) tachypnoea, was 80% sensitive and 39% specific for serious or intermediate infection. He also considered the traffic light system in the NICE guidelines provided the same result.
95. Dr Conway said that, in his view, Hayden's condition was so serious that there was an obvious need for early Consultant-led management, by which he meant that a Consultant should have seen Hayden urgently in the PED and should have been in charge, throughout, of managing his treatment plan. He said it was "*absolutely necessary*" for the Consultant to see Hayden themselves. Hayden's care required a Consultant to be present in the Hospital and intimately involved at all stages in order to continue to see him and to update the management plan as matters progressed. Hayden's care should not have been left to junior doctors.

96. Dr Conway said that if there was a lack of clarity as to who the responsible Consultant was, either in the PED or following admission to the ward, it was vital for that issue to have been addressed at an early stage. He said that Hayden should have been seen straight away by the Consultant in the PED who should have discussed Hayden *“then and there with the ward consultant, in order to decide exactly where Hayden should be transferred to and who was going to be the consultant in charge”*. Dr Conway said this was important because *“Hayden was a very vulnerable child with a very high probability that he had sepsis”*. Dr Conway said that every paediatrician knows how quickly very young babies can decompensate and become irretrievable, *“so you don’t leave them”*.
97. Dr Conway stated that, in his view, Hayden remained in need of this level of care as matters developed. His condition did not improve in any significant way. He noted the blood gas results at 20.38 hours which, he said, showed mild metabolic acidosis, but the lactate reading of 4.0 was worrying. He was asked whether the fact that the results had come from a squeezed sample could have affected the lactate reading. He said, *“... if you have an abnormal value like that in a significantly ill baby and you’re concerned that it might be an aberrant reading because of the way the sample was obtained, in my view the only reasonable course of action is to repeat it and get a proper sample, not to ignore it”*. He considered that the plan to repeat the blood gas test following transfer to the ward was insufficient because there was an urgent need to clarify the reading.
98. Dr Conway was critical too of the decision not to give Hayden a fluid bolus in the PED which, he said, he ought to have received by 21.00 hours. In his view, probable compensated shock should have been diagnosed and a fluid bolus in the amount advised in the Hospital’s guidelines, namely a 20 ml/kg bolus given over five minutes, should have been administered. Giving half that amount (as occurred later) would have run the risk of not obtaining a positive response and thereby delaying the ability to reach a clinical evaluation. It would have been reasonable to give the fluid bolus first and then repeat the blood gas test after about 10 minutes, he said. Dr Conway said he had considered the suggestion that a fluid bolus may have worsened Hayden’s condition, given what the autopsy showed his diagnosis to be. He said that an initial fluid bolus may have improved the circulating volume resulting, temporarily, in a slight improvement, but overall, there would have been a deterioration; persistent administration of fluids in the PED could have caused a problem, and worsening blood gas results would have been likely. However, proper monitoring would have picked up any worsening results at any stage, resulting in an earlier appreciation of the need for intubation, ventilation, and a move to a PICU,

where his fluid balance could have been properly managed by an intensivist. The risk of fluid having a detrimental effect at some point was not therefore, he said, a reason for not giving it.

99. Dr Conway noted that the decision not to give a fluid bolus in the PED was in part because the junior doctors considered that Hayden's condition had improved since the triage observations but, he said, the Registrar should not have been re-assured by the improved readings. He said Hayden had persisting tachycardia and tachypnoea and he was acidotic, and the fall in heart and respiratory rates was not reassuring; it should have been well known to a Paediatric Registrar that children with sepsis can appear deceptively well when they are not. Indeed, Dr Conway's view was that Hayden's history, clinical signs and assessment were consistent with the blood gas results showing a mild metabolic acidosis and he saw no disparity between the blood gas results and the vital signs measurements. I asked Dr Conway how, in any event, a paediatrician should approach an apparent discrepancy between how a child appears and the readings, and the witness said, "*You go on the objective, not the subjective*".

100. In relation to the blood test results requested at 20.57 hours, Dr Conway said they were supportive of an infective process. He said the low platelet count in the context of all the other findings and a suspicion of sepsis would raise the possibility of disseminated intravascular coagulation which cannot be ignored and ought to have been considered.

101. Dr Conway was critical of the fact that there was no medical review of Hayden or his observations between about 21.00 hours and his transfer to Mercury Ward at 23.00 hours. He considered this to be a serious omission. He said that the observations taken at 22.45 hours showed a blood pressure reading of 69/18 which was significantly concerning and ought to have been drawn to a doctor's attention. It indicated hypotension which, in suspected sepsis, is a poor prognostic sign, and a sign of severe illness and of progression of the infection. It suggested Hayden had stopped compensating and indicated a need for escalation of care and proactive thinking that he was going to get worse and that he was going to need intensivist input and, if need be, a transfer to a PICU. Dr Conway said that it is recognised that hypotension is often a late sign in paediatric sepsis. So, the low blood pressure here would indicate that the infection was well advanced and there needed to be a vigorous response to it.

102. Dr Conway's final concern in relation to Hayden's management in the PED was that consideration should have been given to transferring him

directly to the PHDU rather than to Mercury Ward, given his obvious need for continuous monitoring, including of his blood pressure.

103. The expert considered that the treatment and care provided on Mercury Ward was inadequate. The level and frequency of observations was insufficient and there was further delay in performing the repeat blood gas test. Fluid boluses were given from 00.25 hours but only in half the quantity advised in the guidelines. The medical reviews revealed a persistent failure to appreciate how ill Hayden was. Dr Conway said that the further blood gas results at just after 01.30 hours were very concerning, showing very significant acidosis, now coupled with respiratory failure. They revealed a significant increase in the severity of the infection, a significant decrease in Hayden's clinical status, progression to respiratory failure, overwhelming sepsis, and that Hayden was in shock. Dr Conway said the plan for further fluid, transfer to the PHDU, and Optiflow was wholly insufficient. Dr Conway said that Hayden was, "*...past Optiflow treatment at that stage, he's in respiratory failure, he's very acidotic, he's deteriorated considerably*".

104. Dr Conway said that, in his view, Hayden obviously needed immediate resuscitation, intubation and ventilation, and transfer to a PICU. He said there should have been immediate involvement of CATS and the anaesthetic team to intubate and ventilate so that the doctor is in control of the situation, proactive rather than reactive. "*Because you have a very, very sick infant here.*" Efforts should also have been made to try to improve the pH by administering some sodium bicarbonate. Dr Conway said that anything short of these steps represented seriously deficient care. He commented that Dr Penny, having attended at this stage, did not remain to see how effective the plan proved to be; on the basis of what was known at the time, he did not consider that to be sufficient care. He said that Hayden, "*...must have been one of the most vulnerable patients in that hospital ever*" and that he continued to need ongoing Consultant management. In view of his opinion, that Hayden should have been intubated and transferred to a PICU, Dr Conway did not express further specific views concerning the care provided in the PHDU.

105. Dr Conway summarised his conclusions by saying that –

- Hayden did not receive a reasonable standard of care at the Hospital,
- From the start, there was a persistent failure to recognise the severity of his condition, including the severity of shock and the progression of Hayden's shocked state,

- There were failures to respond sufficiently in terms of diagnosis of sepsis, frequency of investigations, including blood gas and full blood counts, the standard of observations, and escalation of care,
 - There was a persistent failure to intervene in a timely fashion, to monitor appropriately, and to refer to the intensive care in a timely fashion,
 - There was a failure of the consultant to take a lead role, and
 - There were failures to follow hospital guidelines in relation to recording of observations, and the PEWS escalation protocol was not followed.
106. Finally, in response to questions from Ms Bradley KC, Dr Conway confirmed Hayden's blood results, blood gas results, and observations all suggested that his kidney function remained normal throughout.

Whether Hayden's Death was Preventable

107. **Dr Robin Martin** told me that he is a Consultant Paediatric and Adult Congenital Cardiologist.
108. Dr Martin was asked about the cause of death proposed by the pathologist which indicted that Hayden had suffered disseminated enterovirus infection and consequential lymphocytic myocarditis, conditions which can result in septic and/or cardiogenic shock. Dr Martin explained that enterovirus is a common group of viruses which can result in the inflammation, and possibly infection, of the heart muscle cells. Dr Martin said that the histology performed as part of the post mortem investigation showed extensive infiltration by lymphocytes and macrophages associated with areas of necrosis in Hayden's myocardium; this indicates a more severe form of myocarditis had developed by the time of Hayden's death. Dr Martin said that treatment is supportive, buying time to allow the body to recover. There can be recovery, even if there is a degree of organ failure. Dr Martin said, *"You will have organ failure, but you hope it's not irreversible organ failure. So, you're hoping to intervene at a stage where there's a chance of recovery for those organs. And principally, you're talking about kidneys, and obviously, brain function"*.
109. Dr Martin told me that Hayden would have had myocarditis when he arrived at the Hospital, because the changes seen at post mortem do not occur in a small number of hours. There was a rapid decline and progression of circulatory failure. He said that from the time when the first blood gas was taken to Hayden's cardiac arrest, *"things moved*

inexorably onwards, ... at a relatively quick pace", with increasing cardiac failure and rapidly progressing shock. Hayden was very much at the worst end of the spectrum of severity of his condition, he said.

110. Dr Martin was asked for his opinions about Hayden's prospects of recovery and survival. He said he based his views on his own clinical experience, which was inevitably very narrow given the rarity of the condition, and the literature. He had noted that the prognosis reported in the medical literature for neonates with enterovirus myocarditis is very poor, with those needing Extracorporeal Membrane Oxygenation ("ECMO") having a roughly one in three chance of survival. If ECMO is not needed, statistically, the chances of survival were higher at about 60 %. The witness said that, in his view, Hayden would inevitably have needed ECMO support because of the severity of the post mortem findings and the speed of his deterioration. He said he would have needed to get to Great Ormond Street Hospital, where "*fast track*" ECMO was then available, to have any chance of surviving. Given that ECMO would probably have been needed, Dr Martin said that he considered it unlikely that Hayden would have survived. He said, "*I'm not saying he might not have, but it is a less than 50% chance*".
111. When questioned by Ms Bradley KC, he agreed that if Hayden had not needed ECMO, he would have fallen in the cohort of patients who would probably have survived. Ms Bradley KC also took Dr Martin to a medical paper which suggests that non-survivor patients had a higher prevalence of renal dysfunction, with 50% of the patients who did not survive having renal dysfunction, in contrast to none of the survivors. She suggested that if Hayden had not suffered renal dysfunction then that would put him in the more favourable group of patients, even if it were the case that he required ECMO, and Dr Martin replied, "*Potentially, it might do, yes*".
112. Dr Martin also accepted, as a general proposition, that if treatment and support is given in a timely manner, the progression of an illness, such as myocarditis, will be less severe and less rapid than it would be if it is not. He agreed that supportive treatment in the form of fluids, oxygen and, when required, intubation and ventilation and inotropes, would make a material difference to prospects of survival, as it would buy extra time for the body to overcome the inflammatory process. The witness agreed and accepted that if treatment had been offered at 21.00 hours, it could

have made a material difference to Hayden's prospects of survival. He said, *"I guess it is for the coroner to decide whether those treatments would have bought sufficient time to put Hayden into the more favourable group that would survive"*. However, he maintained his view that Hayden was unlikely to survive. He stated, *"In my opinion, I think that's unlikely. I still feel that, on the balance of probability, he would not have survived. But I accept he would have had a better chance of surviving if that had been done"*.

113. **Prof. Stephen Playfor** told me that he is a Consultant Paediatrician and Consultant Paediatric Intensivist.
114. Prof. Playfor explained that the mortality rate for enterovirus myocarditis in neonates is usually quoted as being 25 to 50%. He said it is a rare disease which occurs sporadically, and the literature is mostly comprised of small series, and case reports. Further, a population based mortality rate has little applicability to an individual and their progress.
115. The witness said that Hayden's lactate reading of 4.0 was of considerable clinical significance. A large body of literature has emerged demonstrating a consistent relationship between blood lactate levels and mortality in critically ill patients across neonatal, paediatric and adult critical care populations, and support was therefore needed. He said that, in his view, if Hayden had received appropriate treatment with aggressive intravenous fluid resuscitation, and then intubation and ventilation, and the administration of inotropic agents, at any time prior to 01.32 hours, then his blood lactate level at that time would not have been as high as 7.5.
116. Prof. Playfor said that Hayden was extremely sick when he arrived at the Hospital and the blood gas result was a clear indicator that there was significantly deranged physiology and he was very likely to need a significant resuscitation. Hayden had features of shock from the time of his admission and they gradually became more clear through the evening until, he considered, around 23.00 hours by when it was obvious that he was in shock. His blood pressure on admission to the ward was way below the minimum acceptable, and was a feature of decompensated shock, or end stage shock, where the patient is more rapidly approaching cardiac arrest.

117. He said that the standard treatment would have been to give intravenous fluid and, depending on the clinical response, further fluid; then at a certain point, which is typically after between 40 and 60 mls/kg, if there is no improvement, then intubation and ventilation, and the administration of inotropic agents. If the response is inadequate, then it is almost certain that the patient is going to need critical care intervention, he said. He explained that, once in a PICU, patients benefit from being looked after by qualified critical care nursing staff and would have access to a Paediatric Cardiologist.
118. He said that, in his opinion, had Hayden received appropriate treatment at around midnight, then he would have received multiple intravenous fluid boluses, to which he would, on the balance of probabilities, have demonstrated partial but not sustained improvement. He said, *“It’s my opinion that he would have required intubation, mechanical ventilation and the administration of inotropic agents. With these interventions, it is my opinion on the balance of probabilities that Hayden would have been stabilised to the degree that he could have been transferred to a paediatric intensive care unit and would have survived”*. On the question of timings, Prof. Playfor went further, saying that, at the outside, appropriate intervention that met the standard before 04.00 hours would, in his view, have led to Hayden's survival.
119. The witness went on to explain the basis for his view. He said he had not seen any evidence of a significantly increased risk of mortality, such as prematurity. He accepted that Hayden was only six days old, that his myocarditis, certainly by the time of his death, was severe and extensive, and that the progression of the disease had been rapid. However, he said, *“The key factor in my mind is that we know that the degree of cellular necrosis and heart damage increases with delayed resuscitation. And we’ve highlighted the profound hypotension that was present from 11 o’clock the night before, and during all of that time, in my opinion, Hayden was under-resuscitated, and a failure to instigate appropriate supportive care and to treat those factors of impaired oxygenation and hypotension contributed to the damage. So all of those avoidable factors led to his overall clinical position at the point when he died and the degree of heart compromise that was present then. And I don’t know how you separate those in an analysis ... as a general point, it’s correct that if you progress within eight hours to needing those interventions, then your outcome is likely to be worse, but that’s not taking account of the fact that your position would have been better if you’d been treated more aggressively at the outset. ...*

If intervention had been given, then the outcome would have been different. There would have been less cellular necrosis, and the heart would have been less damaged by seven o'clock in the morning".

120. On the question of whether Hayden would probably have required ECMO, Prof. Playfor stated that, if pushed, it would be his opinion that had Hayden received appropriate treatment prior to 00.30 hours, then on the balance of probabilities, he would not have required ECMO. If intervention was as late as 04.00 then probably would have needed ECMO but for the reasons given, it was his view that Hayden would still probably have survived. In this regard, he agreed with Ms Bradley KC, that if it is the case that Hayden had not suffered multi organ dysfunction or renal impairment, the prognosis for his survival was significantly better.
121. **Prof. Michael Burch** also gave oral evidence and told me that he is a Professor of Paediatric Cardiology. He said that he was based at Great Ormond Street Hospital at the time of writing his report and he confirmed that the hospital had a paediatric cardiac intensive care unit where ECMO was available.
122. Prof. Burch was asked what the timescale for the necrosis seen at autopsy might have been. He explained that necrosis is a very acute inflammatory process where the cells are destroyed by the virus after the virus has entered the cells. He said he could not give a precise time scale, but it is a fairly short process, hours or days, certainly not weeks or months.
123. As far as prospects of survival were concerned, the witness said, *"We know that this is a very severe disease in newborn children and many children don't survive. However, some children do. The majority of children will survive until they get into a stage of multi organ failure, but still, many children are going to die. The suggestions from Dr Playfor about intubation, ventilation, and inotropes, they are likely to have benefited Hayden and to have stabilised him, but of course it's still difficult to know with any certainty that he would have survived because this is such a serious illness."* He said that ECMO would have been needed if, despite intubation and inotropic therapy, Hayden was deteriorating with multiple organ failure, for example, kidney failure, or becoming more and more acidotic on the blood tests.

124. The witness said that his own paper on survivability concluded that there was a mortality rate of 31% to 44%, which increased to 67% if ECMO was needed. He said that, in his view, if Hayden had been admitted to cardiac intensive care and supported, then it is likely he would have survived, unless he was put on ECMO, in which case he probably would not have survived.

125. Ms Bradley KC then put to the witness, as she had to the other experts, that the literature suggested that there was a better prognosis based on the statistics alone for those who did not develop multi organ failure, and in particular renal failure, and Prof. Burch agreed. He said that if Hayden had not had renal dysfunction, then even if he received ECMO, that would place him in the more favourable group of patients in terms of prognosis. He also agreed that it is necessary to take account of the impact that timely support would have had in mitigating the disease process. He said, "*...these are pretty fine margins and many children with this disease are going to die. Some will survive. The majority do survive. Those that are very, very ill don't survive. I think when I'd gone through this and I'd looked at Dr Playfor's opinion and the intensive care opinion of Dr Conway, that there were things that could have mitigated the progression of the disease. ... While it's definitely true this is a very, very serious disease, it was progressing and there was destruction of heart muscle cells at post mortem, I don't think that having really looked at this, one could say he would not have survived on balance. I think on balance, if we accept the intensive care specialist's opinion about the things that could have been done to mitigate his condition, then I think on the balance of probabilities he would have survived*". In relation to the impact of ECMO, if needed, he said, "*The majority of children who go on ECMO don't survive. But then, as we just discussed, there were things in his favour. For example, the fact that he didn't have renal dysfunction. And I agreed with counsel that those were positive factors*".

C. CONCLUSIONS

The Factual and Expert Witnesses

126. So far as the witnesses of fact are concerned, as stated above, I found the witnesses from whom I heard oral evidence to be truthful and doing their best to assist me. There were relatively few disputes of fact in the evidence I heard, and none of them are material to my findings and

conclusions below. I will, however, note that four witnesses gave accounts of conversations with Dr Penny which he did not accept as accurate; both Mr and Mrs Nguyen stated that when they were in the PED, Mrs Nguyen had spoken to Dr Penny at length concerning Hayden's history, but Dr Penny said he could not recollect that; Dr Grecu told me that she spoke to Dr Penny concerning Hayden's history and management and sought his advice on giving a fluid bolus but Dr Penny positively asserted that this did not happen; and lastly, Dr Bako stated that there was no discussion about contacting Dr Ross, whereas Dr Penny stated that Dr Bako had twice indicated that she would do so. I have considered the matter carefully and concluded that whilst Dr Penny may now believe his accounts to be true, his evidence is not reliable in this regard, and I prefer the accounts of the other four witnesses.

127. Having considered the evidence of Dr Conway carefully, I have no hesitation in accepting all his opinions, the conclusions of which I adopt. In my view, there were obvious shortcomings in the care provided to Hayden which Dr Conway has particularised carefully and supported with clear reasoning. In reaching this view, I have been anxious to take account of the reality of clinical practice in a busy hospital, and I have reminded myself of the importance of considering matters on the basis of what was known, or ought to have been known, at the time; it is important to be unaffected by the benefit of hindsight. Further, it is not part of my role to second guess clinical judgments. However, I am entirely satisfied that Dr Conway's criticisms are fair and correct. My factual findings reveal that Hayden had obvious needs which were simply not met, despite there being in place national and local sepsis guidelines, and a PEWS policy which, if followed, would itself have led to the care Hayden required. I have noted that many of Dr Conway's criticisms were, in fact, accepted by the clinicians concerned when they were put to them by Ms Hewitt or Ms Bradley KC. Dr Penny also accepted that "*with hindsight*" he should have acted differently in a number of ways although, in my view, the need for greater action on his part should have been obvious prospectively given what was known or ought to have been known at the time.

128. I have also considered carefully the evidence of the three experts who addressed the issue of Hayden's prospects of survival. Although Dr Martin came to a different conclusion to those of Prof.s Playfor and Burch as to whether Hayden would probably have survived if he had received timely support, there was little disagreement between them all as to the underlying principles. I have decided that I prefer the views of Prof. Playfor and Prof. Burch and I find that, had Hayden received the timely

interventions which he obviously needed, as set out in Dr Conway's evidence, he probably would have survived. Whilst I accept that Hayden was very unwell, and faced a risk of death, when he arrived at the Hospital, especially in view of his age, there was a clear period of time in which the relevant interventions could and should have been provided. If they had been, Hayden would probably have been intubated at the Hospital and supported with inotropic medication, and transferred to Great Ormond Street Hospital. This additional support would probably have interfered with the rapid progress of the disease and the damage it was causing to Hayden's heart. Given that Hayden had not developed renal or multi-organ failure, which I find to be the case, I consider that it is unlikely he would have required ECMO and, if he had, that it is likely that he would have been in the cohort of paediatric patients who survive it.

My Conclusions as to How Hayden came by his Death

129. On the basis of the evidence and all my findings above, I have reached the following conclusions:

- (i) On the 24th August 2016, Hayden Nguyen, who was then only five days old, was found to have a raised temperature and a reduced appetite and was taken by his parents to the PED of the Hospital, arriving there at 19.30 hours,
- (ii) Hayden was seen quickly and was found to have a very elevated temperature, significant tachycardia and tachypnoea, and a raised lactate level. There was clinical doubt as to the reliability of the lactate reading and, consequently, the blood gas test needed to be repeated. I find that it needed to be repeated urgently in view of its importance to Hayden's assessment and management, for which time was of the essence, but it was not, in fact, repeated until 01.32 hours,
- (iii) Hayden's observations indicated that he was significantly unwell and at high risk of serious illness. Consequently, he required Consultant-led management from the start,
- (iv) It is likely that he was in compensated shock, but this was not recognised and he was not given a fluid bolus and managed in accordance with the NICE and Hospital guidelines in this regard,

- (v) He was suspected to have sepsis and a plan was made for admission, further investigation, and intravenous antibiotics. The Consultants on the PED, Dr Yorke and Dr Penny, were aware of Hayden and approved the plan which had been agreed by Dr Grecu and Dr Taylor, but Hayden was neither examined nor assessed by either of the Consultants. In pursuance of the plan, blood tests and a lumbar puncture were performed, and antibiotics were commenced at 21.50 hours. There was no medical review between 21.00 hours and 23.00 hours and, in that period, the observations suggest that he had become more unwell,
- (vi) Hayden was admitted to Mercury Ward at 23.00 hours without Dr Ross, who was the on-call Consultant who was responsible for the ward, being informed. Hayden's management thereafter was not Consultant-led,
- (vii) Hayden was reviewed on the ward and was found to be very unwell, but his blood gas test was not immediately repeated. A fluid bolus, of half the quantity advised by the Hospital's guidelines, was given at 00.25 hours, despite which his condition deteriorated. When the blood gas test was repeated at 01.32 hours the results showed very significant acidosis, now coupled with respiratory failure. They revealed a significant increase in the severity of the infection, a significant decrease in Hayden's clinical status, progression to respiratory failure, overwhelming sepsis, and that Hayden was in shock,
- (viii) Consequently, Hayden now obviously needed immediate resuscitation, intubation and ventilation, and transfer to a PICU, but this was not recognised and no steps were taken to provide or to procure this support. Neither the anaesthetic team nor CATS were contacted. Dr Penny attended the ward at about 01.45 hours and assessed Hayden. He approved a plan, which had been made by Dr Bako, for Hayden to be given further fluids and transferred to the Hospital's PHDU, and he directed that Hayden be given OptiFlow oxygen support in the PHDU, but he gave no further directions. He then left the ward and did not provide any further oversight of Hayden's management. Neither Dr Penny nor Dr Bako contacted Dr Ross and so he remained unaware of Hayden,
- (ix) Observations taken at 02.30 hours resulted in a PEWS score of 5 in response to which the Hospital's policy mandated consideration of the need for a 2222 crash call for resuscitation assistance, the

involvement of the Anaesthetic Registrar, review by the Paediatric Consultant, and 15-minute observations until review, but none of these steps were taken,

- (x) Hayden was transferred to the PHDU at 03.00 hours and OptiFlow was commenced at 03.50 hours. He required comprehensive and continuous monitoring, but this was not provided; he was not effectively monitored, and his observations were insufficient. At 04.40 hours he was found by Nurse Freemantle to have deteriorated further, and Dr Bako was called. A further blood gas test which was performed at 05.00 hours showed a catastrophic and life-threatening rise in Hayden's lactate level,
- (xi) Although steps were taken immediately to respond, and to resuscitate and to prepare to intubate Hayden, he suffered a cardiac arrest at about 06.00 hours. Advanced life support resuscitation was performed for over an hour and until continuation was judged to be futile. It was ceased and Hayden's death was declared at 07.15 hours on the 25th August 2016,
- (xii) Throughout, there was an absence of proper Consultant-led management of Hayden's care, with insufficient recognition of the seriousness of his condition and treatment of it, an over-reliance on his physical appearance and alertness as opposed to the objective findings, an insufficient level of observations and monitoring, and a lack of compliance with the Hospital's PEWS policy, and
- (xiii) If the care and support which Hayden obviously needed had been provided in a timely manner, as it could and should have been, it is likely that Hayden would have survived.

Legal Submissions re Conclusion as to the Death

130. I received written and oral legal submissions from the IPs, all of which I have considered.

131. All the IPs have submitted that I may record a short-form conclusion of Natural Causes and/or a narrative conclusion. It is submitted on behalf of Mr and Mrs Nguyen that I may also record that Hayden's death was contributed to by Neglect and they invite me to make that finding. The submissions made on behalf of the Hospital appear to accept that it is open to me to consider

Neglect. On behalf of Dr Penny, it is submitted that it is not open to me to record Neglect; that proposition is supported by submissions that there is no evidence of any gross failure on the part of Dr Penny and that, on the evidence, it would be speculation to find that Hayden would probably have survived if there had not been a gross failure to provide the basic medical attention.

132. So far as the legal test for Neglect is concerned, this is apparent from two authorities in particular:

- (i) *R (Jamieson) v HM Coroner for North Humberside* [1995] QB 1 in which the Court of Appeal indicated that Neglect means a gross failure to provide adequate nourishment or liquid or to provide or procure basic medical attention or shelter or warmth for someone in a dependent position (because of youth, age, illness or incarceration) who cannot provide it for himself. Failure to provide medical attention for a dependent person whose physical condition is such as to show that he obviously needs it may amount to Neglect. The crucial consideration will be what the dependent person's condition appeared to be, and
- (ii) *R (Jamieson) v HM Coroner for North Humberside* [1995] QB 1 and *R (Khan) v HM Coroner for West Hertfordshire* [2002] EWHC 302 (Admin) which found that there must be a clear and direct causal connection between the conduct described as Neglect and the cause of death; the causal connection is satisfied if the failure represented a missed opportunity to render care which would have prevented the death, on the balance of probabilities. It is not enough to show that there was a missed opportunity to render care which might have made a difference; it must be shown that the care which should have been rendered would have saved or prolonged life.

My Conclusion as to Hayden's Death

133. It is uncontentious that Hayden died of natural causes in that his death resulted directly from the effects of a natural disease process.

134. What is contentious as between the IPs is whether Hayden's death was contributed to by Neglect. I have considered this carefully and I have concluded and I find that it was. When Hayden arrived at the Hospital he was a severely unwell neonate who was clearly in an entirely dependent

position so far as his need for medical attention was concerned. The case-law requires me to consider what Hayden's condition appeared to be. I find that, on the basis of all the information which was available at the time and ought to have been considered, including Hayden's presentation, observations, and investigation results, the seriousness of his condition was entirely apparent. I have found, as set out above, that there were persistent failures, from about 21.00 hours onwards, to provide or procure the medical attention and interventions he obviously needed. Initially, there was a failure from 21.00 hours onwards to provide a fluid bolus in a timely manner and, thereafter, a failure to provide or procure respiratory support, intubation and ventilation, and critical care support and monitoring in a timely manner. I find that these interventions constituted basic medical attention in all the circumstances, as evidenced by the contents of the national and local guidelines on the management of paediatric sepsis. I also find that the failures, which persisted over a number of hours during which Hayden was increasingly unwell, were serious and "gross". Dr Conway considered that the care provided fell very seriously below acceptable standards and I agree.

135. Further, for the reasons I have already set out above, I find that Hayden would have survived if the care and support which he obviously needed had been provided in a timely manner, as it could and should have been. As such, I am satisfied that there is a clear and direct causal connection between the gross failures and the cause of death.

D. RECORD OF INQUEST

I shall, therefore, record the following on the Record of Inquest :

Box 1 :

Hayden Blake Nguyen

Box 2 :

Ia Lymphocytic Myocarditis

Ib Disseminated Enterovirus Infection

Box 3 :

See Box 4

Box 4 :

On the 24th August 2016 at 19.30 hours, Hayden Nguyen, who was then five days old, was taken to the paediatric emergency department of the Chelsea and Westminster Hospital, London, by his parents. He displayed signs of sepsis including significant pyrexia, tachycardia, tachypnoea, and poor appetite, and was found, at 20.38 hours, to have abnormal blood gas results. A septic screen was performed and antibiotics were given, but there was urgent need for the blood gas test to be repeated; this was not done until 01.32 hours the following day. Hayden's observations indicated that he was significantly unwell and at high risk of serious illness and it is likely that he was in compensated shock. This was not recognised and he was not managed with fluid boluses in accordance with the relevant national and local guidelines for the management of paediatric sepsis and shock. His condition required Consultant-led management. He was reviewed, but not examined or assessed, by a Consultant in the emergency department and there was no medical review at all between 21.00 hours and 23.00 hours, during which period he became more unwell.

Hayden was admitted to the paediatric ward at 23.00 hours without the on-call Consultant, who was responsible for that ward, being informed. He was reviewed and found to be very unwell. A fluid bolus, of half the quantity advised by the hospital's guidelines, was given at 00.25 hours, despite which his condition further deteriorated. A second blood gas test at 01.32 hours showed very significant acidosis, now coupled with respiratory failure, overwhelming sepsis, and shock. Consequently, Hayden obviously needed immediate resuscitation, intubation and ventilation, and transfer to a paediatric intensive care unit elsewhere, but this was not recognised and no steps were taken to provide or to procure this support. A Paediatric Consultant present in the hospital, who was based in the emergency department, assessed Hayden at about 01.45 hours and approved a plan for him to be given further fluids, transferred to the hospital's paediatric high dependency unit, and started on Optiflow oxygen support. Observations taken at 02.30 hours resulted in a paediatric early warning system score of 5 in response to which the hospital's policy mandated consideration of the need for a crash call for resuscitation assistance, the involvement of the Anaesthetic Registrar, review by the Paediatric Consultant, and 15-minute observations until review, but these steps were not taken.

Hayden was transferred to the paediatric high dependency unit at 03.00 hours and the oxygen support was commenced at 03.50 hours. He required comprehensive and continuous monitoring, but the monitoring that was provided fell significantly short of that. A further blood gas test at 05.00 hours showed a catastrophic and life-threatening rise in Hayden's lactate level. Although steps were taken immediately to

respond, and to resuscitate and to prepare for intubation, Hayden suffered a cardiac arrest at about 06.00 hours. Advanced life support resuscitation was performed for over an hour until continuation was judged to be futile. Hayden's death was declared at 07.15 hours on the 25th August 2016.

Throughout, there was an absence of proper Consultant-led management of Hayden's care, with insufficient recognition of the seriousness of his condition and treatment of it, an insufficient level of observations and monitoring, and a lack of compliance with the hospital's paediatric early warning system policy. There was an over-reliance on his physical appearance and alertness as opposed to the objective findings.

Post mortem examination revealed that Hayden had been suffering disseminated enterovirus infection and consequential lymphocytic myocarditis and this caused his death. If the care and support which Hayden obviously needed for his suspected sepsis and shock had been provided in a timely manner, as it could and should have been, it is likely that Hayden would have survived.

Hayden's death resulted from Natural Causes contributed to by Neglect.

Box 5 :

(a) 19th August 2016 in London

(b) Hayden Blake Nguyen

(c) Male

(d) -

(e) 25th August 2016 at the Chelsea and Westminster Hospital, London

(f) -

I would like to record my thanks to counsel for their work and assistance, which I have appreciated, and to pass my very sincere condolences to Mr and Mrs Nguyen and to Hayden's wider family.

Richard Travers
HM Senior Coroner for Surrey

6th December 2024