

6 March 2023

Baby N

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Monday, 6 March 2023

(10.30 am)

(In the presence of the jury)

MR DRIVER: As the court is aware, Dr Mayberry has joined us via a link in Australia. Might he take the affirmation, please?

DR HUW MAYBERRY (affirmed) (via video link)

Examination-in-chief by MR DRIVER

MR DRIVER: Good morning. Could you state your full name, please?

MAYBERRY: Yes. So my name is Huw Francis Mayberry.

DRIVER: Could you tell us your current occupation, please?

MAYBERRY: So I'm employed as a paediatric intensive care registrar at the Royal Children's Hospital in Melbourne, Australia.

DRIVER: If I could take you back to June 2016, what was your role back then?

MAYBERRY: Then I was a paediatric ST3 trainee, which is the first level on the middle grade rota for paediatric doctors.

DRIVER: Thank you. And in June 2016, were you employed at the Countess of Chester Hospital?

MAYBERRY: Yes.

DRIVER: We're going to ask you questions about your involvement with a patient, a baby, by the name of [Baby N], and in particular events on 15 June 2016.

MAYBERRY: Okay.

DRIVER: We have access to the clinical notes that were prepared on that day and we're able to show them to you on screen, but when doing so you'll see the notes but you won't be able to see the court simultaneously.

MAYBERRY: Okay. No problem.

DRIVER: Have you had opportunity to refresh your memory from a statement you made on 10 March 2020?

MAYBERRY: Yes. So I've re-read the statement. Unfortunately, I haven't had access to the notes because of a problem with the EGRESS system, but I've re-read the statement.

DRIVER: Thank you. I can show you the note. Your note is actually quite a brief note on the clinical note, so if I could ask my colleague here, Mr Murphy, to put up tile 245 and then show the witness the original document that lies behind it.

If we go to the bottom of that page, please, Mr Murphy.

Dr Mayberry, can you see your own note there at the bottom of the page?

MAYBERRY: Yes.

DRIVER: If you'd like to take a minute or two just to refresh your memory from that note.?

MAYBERRY: Sure.

(Pause)

Yes, I have read it.

DRIVER: I'm grateful. It's a brief note and your statement goes into quite a bit more detail.

MAYBERRY: Yes.

DRIVER: Could you confirm that you were crash bleeped to attend at the neonatal unit just before 15.00 hours on 15 June 2016?

MAYBERRY: Yes.

DRIVER: Did you subsequently create this note of these events about 2 hours later?

MAYBERRY: Yes.

DRIVER: Thank you. Upon arrival at the unit and attending upon the baby [Baby N], what were you informed as to the reason why you'd been called?

MAYBERRY: So I was told that he had had a sudden deterioration after 3ml of blood had been aspirated from his nasogastric tube.

DRIVER: What was the nature of the deterioration as communicated to you?

MAYBERRY: So from the notes and the best of my recollection, it appears that he'd had a profound drop in his oxygen levels, which you'd normally expect to be above 92%, down to 44% on my arrival.

DRIVER: Thank you. Are you able, from this distance of time, to recall who it was who informed you about the 3ml of blood that had been aspirated from his nasogastric tube?

MAYBERRY: No, I can't recall that, sorry.

DRIVER: I understand. So when presented with this baby, who was, as you've described, profoundly desaturating, what intervention did you perform?

MAYBERRY: So I undertook a jaw thrust, which is a procedure to open the airway if it's -- if there's some degree of obstruction for whatever reason, and then proceeded to, in medical slang, bag the patient, which means -- where you ventilate the child's lungs for them and continue to ventilate them until their oxygen saturations were 100%.

DRIVER: Thank you. Did you feel comfortable conducting this exercise alone or did you seek some support elsewhere?

MAYBERRY: Given that there'd been concern about bleeding from the NG tube, and I think earlier on in the day there'd also been concern about bleeding in the upper airway or oropharynx, I bleeped the consultant to attend. I was happy in the procedure of ventilating the patient as I had a lot of experience in that, but I was worried about further complications, hence bleeping Dr Saladi.

DRIVER: Thank you. Were you cognisant of the fact that the patient was deemed to have a history of haemophilia?

MAYBERRY: Yes.

DRIVER: Whilst awaiting the consultant, Dr Saladi, did you explore the airway at all?

MAYBERRY: Yes. So I had one attempt at intubating [Baby N].

I could see the vocal cords, which is the landmark that you normally look for to put a breathing tube through, but I was unable to get a very clear view because there was quite a -- there was a substantial swelling within the airway, so I didn't attempt further and I handed over to Dr Saladi.

DRIVER: I appreciate that several years have passed, but do you have any actual recollection of what you've described as "substantial swelling" within the airway?

MAYBERRY: So the swelling was unlike anything that I'd encountered previously. The epiglottitis, which is essentially a flap of tissue that is behind the tongue and that often hangs over the area of the upper airway and the vocal cords, was quite swollen, it looked quite large and sort of red-pink in colour. It was more red than the surrounding mucosal tissue. It looked somewhat more rounded than I expected it to and it reminded me of what you sometimes see in textbooks described as epiglottitis, though this -- I had not seen this in my practice before, only in textbooks.

DRIVER: Thank you. So just to recover that ground for certainty, your evidence is to the effect this was the first time you'd actually observed this sort of presentation in a neonate or in any patient?

MAYBERRY: Because my predominant experience in intubating patients up to this point was in neonates, it would be in neonates.

DRIVER: Thank you. You described the colour as being more red than the neighbouring tissue; is that correct?

MAYBERRY: Yes.

DRIVER: And you said it was round. Can you expand upon the shape any further?

MAYBERRY: Yes. So with a -- I think I provided a picture potentially, which may have been submitted to you of an epiglottitis. It is normally relatively -- it is almost... It is predominantly flat, but it's curved slightly at either end, and normally quite thin. But it appeared to be more, slightly more rounded. I don't know if that related to what I perceived as the inflammation of the epiglottitis, the swelling of it, if that had caused it to be more rounded or not.

DRIVER: Thank you, Dr Mayberry. You have provided some images and we'll look at them in a moment.

MAYBERRY: Sure.

DRIVER: In your evidence a minute or two ago you said that the swelling provoked you to think of epiglottitis.

MAYBERRY: Yes.

DRIVER: Is that correct?

MAYBERRY: Yes.

DRIVER: Was it your opinion that this was epiglottitis or it reminded you of epiglottitis?

MAYBERRY: I probably, certainly up to that point as well, don't have the expertise to say whether it was or wasn't. It was reminiscent of what I'd seen described as epiglottitis in textbooks. I had not -- it's not something that I'd seen children of this age have, epiglottitis, it wasn't something I was aware of neonatal -- the neonatal population having as an illness. Most of the experience with epiglottitis relates to an infection called haemophilus influenzae B, which is something which has largely moved out of modern practice thanks to vaccination, but it's described as a sort of much-feared problem in older children when they are being intubated.

DRIVER: Thank you. You helpfully provided two images to the investigative team, one, is this right, of a standard, if I may say so, a normal epiglottis, and also, by comparison, an image

of an epiglottitis where epiglottitis is present, to compare and contrast; is that right?

MAYBERRY: Yes.

DRIVER: We're going to put them on screen now. These are the images that you helpfully retrieved from, I think, the internet; is that correct?

MAYBERRY: Yes, that is correct, yes.

DRIVER: Could you assist us laymen, please, as to which is which and what it is that we should be looking at here?

MAYBERRY: Okay. So I presume you can see the same images that I can see.

DRIVER: We can.

MAYBERRY: The image on the left-hand side is rotated through 90 degrees to the left, so it's on its side at the moment. The thing that I have highlighted with a black line is the epiglottitis. Between that you can see a sort of dark opening and two bits of tissue either side, which is the tracheal opening and the vocal cords beneath it.

The image on the right-hand side, I can't remember the exact source, but I did provide it to the police.

It is an image taken of a child with epiglottitis. So if you look at the two images, the rounded structure appears to be more reddened and swollen on the right-hand side than on the left-hand side.

DRIVER: The image is now being rotated. Do they now match each other in terms of orientation?

MAYBERRY: Yes.

DRIVER: Thank you. You selected this image, did you, to convey, to communicate, the swelling, the swollen feature; is that right?

MAYBERRY: Yes. The image on the right was the closest to my recollection at that period of time of what the epiglottitis looked like.

DRIVER: I'm grateful. So we all understand, you made witness statements in March 2020 and in September 2021; that's correct, isn't it?

MAYBERRY: Yes.

DRIVER: So you were casting your mind back a few years in any event?

MAYBERRY: Yes.

DRIVER: Thank you. Could we now --

MR JUSTICE GOSS: Mr Driver, before we leave the images it might be worth just clarifying in the right-hand image what it is that is surrounded by the epiglottis there.

The large, apparent tube-like structure that the epiglottis is around.

MAYBERRY: My apologies. The epiglottis is around an inserted endotracheal tube, so a tube going from the outside down into the trachea or the windpipe.

MR DRIVER: Thank you. I'm grateful, my Lord.

So that explains the image and also gives us some greater understanding of the procedure that you were at least contemplating with [Baby N].

MAYBERRY: Yes?

DRIVER: Thank you, Dr Mayberry. Can I return to the events of 15 June 2016 now. Did you stay with [Baby N] until Dr Saladi attended?

MAYBERRY: From the best of my recollection, yes, I did.

I wouldn't have left the child without a healthcare professional with him, especially in this case. But to the best of my recollection, I believe I did stay there until Dr Saladi was there. I wasn't there continually as things went on. I did pop back intermittently. The predominant reason for that is I believe I had to cover other parts of the department, so at that point there were other people in place to cover that. But obviously out of concern for [Baby N], when I could, I popped back -- and also to see how other people had got on.

MR JUSTICE GOSS: I'm sorry to interrupt again. Could we have the image of Dr Mayberry back on our screen, please?

(Pause)

Thank you.

MR DRIVER: I'm grateful.

So you had other responsibilities, I'm sure we all understand, but you did return, in your words, intermittently to see how things were progressing with [Baby N]?

MAYBERRY: Yes.

DRIVER: Was that the only reason why you returned or was there another reason?

MAYBERRY: My main concern was about [Baby N]. I also -- it was predominantly about [Baby N], to be honest. I obviously had a professional curiosity as to how other people had got on in terms of intubating him and if they'd experienced similar difficulty, but my main concern was about [Baby N].

DRIVER: I'm grateful. Did you see any blood at all with this baby?

MAYBERRY: Not that I recall, although it obviously is a long time ago now. But I don't recall it, no.

DRIVER: Thank you. Were you in a position to assess what had or may have caused the swelling at all?

MAYBERRY: No, it's not something I have had much experience of, especially in the neonatal population.

DRIVER: Thank you, Dr Mayberry.

My Lord, the only other contribution from Dr Mayberry as recorded on our sequence of events is the prescription of dexamethasone, which I don't think merits taking the doctor to the tile. It was a prescription at 17.35 behind our tile 288 for completeness, but it's not a particularly noteworthy event.

MR JUSTICE GOSS: It's on the record and so if anyone wants to ask anything about it, they can, or if anyone wants to look at the record they can.

MR DRIVER: Thank you.

Just finally, Dr Mayberry, do you recall communicating with colleagues at Alder Hey, and in particular the haematology department, and you making an urgent request for factor VIII to be brought to Chester for [Baby N]? Do you recall that?

MAYBERRY: Yes, I believe so, yes.

MR DRIVER: I'm grateful. I think there may be some more questions for you, but that's the extent of the questions I have for you this morning, Dr Mayberry.

Cross-examination by MR MYERS

MR MYERS: Dr Mayberry, when you attended [Baby N] after you'd been asked to see him, do you recall whether the blood that had been aspirated was in a pot attached to the tube on free drainage?

MAYBERRY: I don't recall, I'm sorry.

MYERS: All right. As to the blood that had been aspirated, did you consider what possible explanations there might be for that?

MAYBERRY: So I'd been asked previously by the police as to possible reasons, essentially, for why this might be there. The concerns could be related to his factor VIII deficiency, there might be concerns about a gastric erosion or some irritation within the stomach from an indwelling nasogastric tube or concern about necrotising enterocolitis, which is an illness that newborns, particularly premature newborns, can have.

MYERS: Thank you. The link is good given that you're on the other side of the world, but it's occasionally a little bit fuzzy, so I'm just going to go back over what you said so we can follow it clearly here. First of all, did you make reference to gastric irritation?

MAYBERRY: Yes.

MYERS: Could you explain what you meant by that as a possible cause for blood?

MAYBERRY: Sure. So sometimes when the lining of the stomach becomes irritated, then the sort of surface tissue can become a bit more friable and sometimes you can have blood coming from that.

MYERS: You also made reference, did you, to necrotising enterocolitis?

MAYBERRY: Yes.

MYERS: We know that's called NEC for short.

MAYBERRY: Yes.

MYERS: That's something which, with neonates, when there is a potential problem with their stomachs or intestines, that's often a factor that is borne in mind, isn't it?

MAYBERRY: Yes.

MYERS: Did you also consider whether there was something called haemorrhagic disease of the newborn related to a potential clotting disorder?

MAYBERRY: That would also factor in related to sort of -- whether there was a problem with bleeding related to sort of the factor VIII deficiency. I must say at the time the predominant concern was his airway and so that was where most of the focus was at that point in time.

MYERS: We understand that. Just with the question about clotting, you were aware that [Baby N] had been identified as someone with haemophilia, weren't you?

MAYBERRY: Yes.

MYERS: And that there was what's called a factor VIII deficiency, wasn't there?

MAYBERRY: Yes.

MYERS: We'll come to your examination in a moment, but can I just confirm with you, Dr Mayberry, that there was a call to the consultant haematologist at Alder Hey, was it that morning, about getting factor VIII?

MAYBERRY: I believe so. I would have to just look over my statement, but I believe it was that morning.

MYERS: All right. Is that because at that point there was no factor VIII on the unit at the Countess of Chester?

MAYBERRY: I don't recall, to be honest with you. That could be a potential explanation.

MYERS: Turning to your examination, Dr Mayberry, in the note that you made at the time, you did identify that there was swelling in the epiglottis, didn't you?

MAYBERRY: Yes.

MYERS: As best as you can remember, you didn't identify or see any blood in that area, did you?

MAYBERRY: Not to my recollection, no.

MYERS: Is it standard practice that when you are about to perform an intubation, you do examine the area of the trachea and the epiglottis as carefully as you're able to see what's there? That's right, isn't it?

MAYBERRY: Yes. I mean, you'd identify the structures to make sure that you intubated properly, yes.

MYERS: Was this the first time that you had examined [Baby N] so far as his trachea, his windpipe, his epiglottis was concerned?

MAYBERRY: To the best of my recollection, yes.

MYERS: And were you aware that [Dr A] had been involved in an attempted intubation with [Baby N] round about 8 o'clock the same morning --

MAYBERRY: Yes.

MYERS: -- although we know as a matter of record that was unsuccessful?

After you'd called Dr Saladi to the unit, did he attempt to intubate [Baby N] as well?

MAYBERRY: I don't recall.

MR MYERS: All right. We'll hear more about that from someone else then, Dr Mayberry. Thank you. Those are my questions.

Re-examination by MR DRIVER

MR DRIVER: Just one area of re-examination. You assisted us with possible, dare I say, hypothetical explanations for the blood. Do you know where the blood originated from?

MAYBERRY: As in -- when you say do I know, as in... I was told it came from the nasogastric tube, but that is as much as I have been told.

DRIVER: Thank you. Do you know the explanation for the bleed?

MAYBERRY: No.

MR DRIVER: Thank you, Dr Mayberry. They are all the questions I have for you.

Does your Lordship have any questions for the witness?

MR JUSTICE GOSS: No.

MR DRIVER: Thank you, Dr Mayberry.

Dr Mayberry will be returning to court via the link later this week.

MR JUSTICE GOSS: Right. Dr Mayberry, thank you very much for making yourself available this evening to you, because it's quite late at night, I believe, in Australia --

MAYBERRY: Yes.

MR JUSTICE GOSS: -- although you were greeted with a "this morning" when we started from Mr Driver because it's morning here of course. That completes your evidence tonight from your point of view, but you will be required, I'm told, on Thursday. I assume a similar arrangement is going -- it'll be the same time on Thursday if you could make yourself available then, please.

MAYBERRY: Okay.

MR JUSTICE GOSS: In the meantime, although I doubt whether there will be anyone out in Australia who may be interested in this, but please don't talk to anyone about anything to do with this case.

MAYBERRY: Sure.

MR JUSTICE GOSS: That's worldwide, obviously. All right?

MAYBERRY: Yes.

MR JUSTICE GOSS: Thank you very much indeed. Thank you for being available tonight.

MR DRIVER: My Lord, the next witness has special measures.

MR JUSTICE GOSS: Yes. Three or 4 minutes, as quickly as we can anyway. Thank you very much.

(Pause)

(In the absence of the jury)

MR DRIVER: The photographs that Dr Mayberry provided are exhibits HFM/1 and 2. We'll have to formally exhibit them. Mr Murphy will have them on the additional file for the iPads for [Baby N].

MR JUSTICE GOSS: Thank you very much.

(Pause)

(In the presence of the jury)

[DR A] (recalled)

Examination-in-chief by MR DRIVER

MR DRIVER: Could I invite you to state your full name for the recording, please?

DR A: It's [Dr A].

DRIVER: We know from your previous evidence that you worked for a while as a registrar in the paediatric department of the Countess of Chester Hospital.

DR A: Yes.

DRIVER: Today you're going to be asked questions specifically about your involvement in the treatment of a baby by the name of [Baby N] and, in particular, the night shift of the 14th into 15 June 2016.

I anticipate you've had the opportunity to refresh your memory from witness statements that you have made --

DR A: Yes, I have.

DRIVER: -- and original clinical notes; is that correct?

DR A: No, not the clinical notes.

DRIVER: Not the clinical notes. As per your last visit to the witness box, we have the notes available for you to look at on screen, but before doing so, do you have any direct memory of [Baby N] and your involvement with him?

DR A: Yes, I do.

DRIVER: Is there anything in particular that made [Baby N] memorable?

DR A: [Baby N] had an unusual clotting disorder or -- not an unusual disorder, it's one of the first times I've seen that clotting disorder in a neonatal unit baby, and I remember as that night went on, he became more unwell and at the end of my night shift, the very beginning of the daytime shift's work, I had been unable to intubate him, which for me is not a frequent occurrence.

DRIVER: Thank you for that summary. Let's focus in on the detail if we may. Mr Murphy, if you could put up tile 80, please. Leave it at that for the moment.

This timeline records that at 01.45 on Wednesday, 15 June, you made notes, or the notes suggest, I should say, that you had cause to attend upon [Baby N].

If we click on to the original note, please. Would you like the opportunity to refresh your memory from this note before I ask you any questions?

DR A: Yes, thank you.

DRIVER: Were you asked to see the patient?

DR A: Yes.

DRIVER: The reason why?

DR A: From the top of my note there, it says:

"Asked to see patient regarding mottling and appearance."

DRIVER: Thank you. At which point he was 14 days old and had a notional gestational age of 36 weeks, 3 days?

DR A: Yes.

DRIVER: It was presumed that he had haemophilia A on the basis of his mother's known medical history. Was he at this point in time self-ventilating in air?

DR A: Yes.

DRIVER: He was being fed by bottle upon demand?

DR A: Yes, that's right.

DRIVER: The rate -- sorry?

DR A: The next line is:

"Increased feeds today to 60ml."

DRIVER: Thank you.

MR JUSTICE GOSS: Sorry, we're getting intermittent disruptions to the display. Maybe Mr Astbury is responsible for it. All right. It's back on again now anyway, thank you.

Sorry, [Dr A].

MR DRIVER: So his feeding regime was progressing?

DR A: I believe so, yes.

DRIVER: His medication was limited, was it?

DR A: Yes, to vitamins and minerals.

DRIVER: Thank you. Does the following entry record that which you directly observed?

DR A: Yes. On examination he was settled, then there was mottling to the torso and limbs.

DRIVER: Pausing there, why would you have recorded the fact that he was "settled"?

DR A: Because a baby may be in distress, they may be crying, they may be writhing, they may have signs of discomfort following a feed, but [Baby N], at 1.45 in the morning, was settled.

DRIVER: Thank you. You observed, as you had been told, that there was mottling to the torso and -- is that all limbs or any particular limbs?

DR A: I just said limbs. I don't recall whether that's all or just the upper limbs, lower limbs.

DRIVER: Pausing there, what is the potential significance of mottling in a neonate?

DR A: Mottling, it's seen sometimes. It can be to do with illness, it could be a sign of sepsis, meaning that blood flow is being diverted away from the skin.

Usually you would... It's an appearance that makes you want to find the cause for it.

DRIVER: So that was an appearance, part of his presentation that you noted, and in fact it was the reason why you'd been asked to review him?

DR A: Yes.

DRIVER: But as to the rest of his presentation upon examination, how was he?

DR A: All of the -- the remainder of the examination was normal. His heart rate was normal, his heart sounds were normal, his femoral pulses were normal, his respiratory rate was normal. There was no discrepancy in the sounds of air entering his lungs. His abdomen was soft and there was no enlargement of his liver, either kidneys or spleen, he had active bowel sounds, which suggests good health generally.

DRIVER: Thank you. In those circumstances, what significance or explanation would you apply to the mottling?

DR A: Well, mottling can sometimes be seen with reflux and he'd been -- I noted there that he'd been fed approximately 45 minutes earlier. But I believe this may have been the first time that I'd met [Baby N] and I wasn't sure what his normal appearance was like.

That is information that you get from the staff looking after him.

DRIVER: Thank you. Enable the doctor to look further down this note, please.

Did you cause investigations to be undertaken?

DR A: Yes. So because of the appearance and because of the concern that had requested me to go there at that time of night, I'd asked for a capillary gas to be performed, a little sample from the foot, with numbers I'm sure you're familiar with.

DRIVER: Is that a test that generates the results at the cot side?

DR A: Within 1 to 2 minutes, yes.

DRIVER: Thank you. Could you summarise those results for us?

DR A: Certainly. His pH is normal at 7.416. His carbon dioxide is normal at 5.43. His bicarbonate is normal or acceptable for a baby of his age at 25.6. His base excess, which is a measure of compensation, is normal. The two numbers on the right-hand side -- his lactate is very slightly elevated and his glucose again is very slightly elevated.

DRIVER: Those elevations of lactate and glucose, what are they indicative of?

DR A: The lactate can indicate a metabolic disturbance. It is often increased when there's infection. It can be increased if there's poor circulation and it can also be increased if the sample was squeezed as it was taken out. So if it was difficult

to get the blood for the sample in the tube, then that extra squeeze can sometimes elevate it.

DRIVER: So the very act that enables the test can skew that test result?

DR A: It can occasionally, yes.

DRIVER: As to glucose?

DR A: It is slightly higher than usual. Normal is about 5.4, but again this is 45 minutes after his last food and today was the day that his feeds had been increased to 60ml, so there was probably more glucose content in the feed that he'd had. It's not a worrying number.

DRIVER: Are either of those worrying numbers, lactate or glucose?

DR A: The lactate more so.

DRIVER: The degree to which that would cause you worry?

DR A: I beg your pardon?

DRIVER: How great a worry is a lactate of 3.2?

DR A: So normally I don't expect to see a lactate above 2 unless there's something causing it, but again he examined very well: his observations were normal and the only worrying sign at the time or sign for concern was the mottling. And again, if his skin was mottled, sampling blood from the skin may be the reason that that lactate is slightly elevated.

DRIVER: Thank you. And your plan at this stage of the morning?

DR A: Observe for now and I will review him within the next 1 to 2 hours.

DRIVER: Thank you. And indeed, you did -- and in fairness to you, could [Dr A] be shown the remainder of the note.

I think some of it is down the bottom of this page.

If we keep scrolling down, please, Mr Murphy.

So at 03.45, just refresh your memory.

DR A: So I've returned to review. Desaturations are noted on the monitor. Five episodes -- I'm sorry, I can't read that word because the annotation is stamped above it.

DRIVER: Might it be "whilst on monitor"?

DR A: Probably. Then on examination, his mottling has resolved. Heart rate remains at 130 beats a minute and is regular.

DRIVER: We'll get to the remainder of your note in a moment.

But focusing on your note that indicates desaturations, 5x episodes, does that inform us that you directly observed desaturations or were they reported to you or don't you know?

DR A: I would presume at that time not to have observed five episodes myself. It's most likely that that's been reported to me by the member of staff looking after him for the previous 2 hours.

DRIVER: So if I was to ask you about the time period within which there were five episodes, would you be able to help or not?

DR A: I can't tell you from this notation but I would look at that on the record chart that was at the end of the baby's cot.

DRIVER: Right. Thank you. Could we go to tile 84, please, where I hope there will be a more complete note.

There we have the note at the bottom of the first page, which continues through to the next page. Would you like the opportunity to read your own note to refresh your memory?

DR A: I've done so, thank you.

DRIVER: Thank you. So might I ask about his cardiovascular presentation at 03.45?

DR A: Certainly. His heart rate, we've already said, is 130 beats per minute and regular. His heart sounds are normal. His abdomen is soft, non-tender. He's not showing any signs of discomfort. He has active movements and -- I have written "no chest distress".

I would normally meant to have written "no respiratory distress", but it conveys what I've observed. He has vesicular sounds in all zones, so there's no additional unexpected sounds in his breathing, it is a normal chest. And his tone and movement are normal.

I have then said my impression, and I'm wondering whether [Baby N] has an infection.

DRIVER: So at 01.45 you had set yourself the plan to review him within an hour or two. You returned 2 hours later and, in summary, how was he?

DR A: He's changed slightly. So the original concern of mottling has resolved, but I'm now being informed that he's dropped his oxygen saturations within these 2 hours on a number of occasions. That, accompanied by the knowledge that he was mottled earlier, I have then had to consider what that cause is and I'm considering that it might be infection.

DRIVER: So you have just explained to us that the indicators that cause you to consider infection, were there any counter-indicators?

DR A: No. His tone and movement are normal. He examines normally. But infection can evolve as it establishes itself and I'm believing at this time that I've seen the very beginnings of that process.

DRIVER: If we look at your plan, if we could scroll down, Mr Murphy, we'll see what you did to further investigate.

Could you take us through the plan?

DR A: Yes. My first item is screening. This is a septic screen, to take blood for markers of infection and also a blood culture so that if any bacteria are causing this, we may be able to grow them and that would later inform us about changes in antibiotic therapy if required.

My next plan is IV cefotaxime; it's a first-line antibiotic. He is to remain on the monitor rather than being intermittently monitored. He can continue his oral feeds for the moment. We await the results of the blood tests and, right now, a repeat gas.

DRIVER: Do we see immediately below the results of the repeat gas?

DR A: That's right, yes.

DRIVER: Could you take us through those, please?

DR A: Yes. So this is a reassuring gas. He has a normal pH, his carbon dioxide level is normal, his bicarbonate level is normal. There is a slight increase in his base excess, it was 1 previously, it's now 2.5. His glucose is normal. His lactate has also normalised in the last 2 hours.

DRIVER: Could you explain to us the significance or otherwise of the increase in the base excess?

DR A: Base excess is a marker of how much compensation the body is doing to maintain that normal pH. Acceptable limits for base excess are minus 2 to plus 2, so he's just over, and again, I would normally expect to see a discrepancy in the base excess if there were abnormal pH, PCO2 or bicarbonate. Again, this is a slightly out of range result, but it's not massive, and the rest of the gas is normalised and reassures me, but I'm still concerned as to what's caused the physical symptoms that he's experienced over the last few hours.

DRIVER: And you would look to the blood results to inform you?

DR A: That's what I'm waiting for.

DRIVER: I wonder whether Mr Murphy could put up J19341, please.

If you could magnify it.

We know, [Dr A], that you made a second review of [Baby N] at about 03.45. This document tends to suggest that there was a sample collected from [Baby N] at 03.53 on 15 June under your instruction. Does it flow that this is the bloods that you were awaiting?

DR A: Yes.

DRIVER: "Presumed sepsis", that was a sort of presumptive diagnosis on your part?

DR A: That's right.

DRIVER: What do these blood results tell you?

DR A: This is a reassuring set of blood test results. CRP is a marker of inflammation, which is a secondary marker of infection, it is low. In fact, it's an unrecordable result, there is no elevation in CRP. The remainder of the tests below that are the full blood count component and his total white cell count is normal, platelets are normal, which are often elevated in an inflammatory process. His haemoglobin is normal. The remaining blood cell counts, the MCV and MCH, are largely to do with red cell performance, they are not really pertinent to what I'm looking at here, but they're a normal component of a full blood count. And the ones down at the bottom, his neutrophil count is normal, which is the white blood cells that usually deal with bacterial infection. His lymphocytes are normal, that's a component that normally deals with a viral infection.

DRIVER: Looking at it globally, do those results tend towards or against the earlier presumed diagnosis?

DR A: At 03.53 when this sample was taken, there was no elevation. Unfortunately, CRP doesn't tend to rise for about 18 hours. There's a lag phase to it of approximately 18 hours. The full blood count component, you're correct to suggest that there is not an inflammatory process going on at this time, but it doesn't always follow that the results are there, and so this might be very early in that process and [Baby N] hasn't yet mounted a response.

DRIVER: I understand. You caused the tests to be taken for a purpose; what purpose did they serve?

DR A: They reassured me that he wasn't mounting a big inflammatory response, there wasn't a big immune response going on, and that reassures me that this is unlikely to be an infective cause, but I still don't know that for sure. The result that will help me there is the blood culture result, which would take 36 to 48 hours to become available.

DRIVER: Thank you. Let's move, please, to tile 98. Timed at 05.15. Tile 98 is your third review of [Baby N] this morning. If we can click on the underlying note, please, at 05.15. Would you care to refresh your memory from that note?

DR A: (Pause). Yes.

DRIVER: So at this point in time, had you had the opportunity to consider the results that we've just looked at a minute or two ago?

DR A: So I've certainly seen them at this time because I've written them in two different places as part of that note.

DRIVER: The capillary refill time as of 05.15 was centrally 3 seconds.

DR A: Yes. So that's a prolonged capillary refill time.

Normally, I would expect to press on the skin, it will go pale and then refill with blood. Its normal colour appearance should return usually in under 2 seconds.

DRIVER: So this is a little slow, sluggish?

DR A: A little.

DRIVER: What is that indicative of?

DR A: It suggests that blood flow to the skin is being diverted elsewhere for some other purpose. Usually, peripheral capillary refill time prolongs before central capillary refill time. So the fact that I've got prolonged cap refill centrally suggests to me that this is slightly more serious and needs taking account of.

DRIVER: Is it a sign of infection, dehydration or what?

DR A: It's a non-specific sign. It can represent both of those things. It just suggests that the volume of blood is not being delivered to the skin in the way that is normal.

DRIVER: Thank you. So the list of digits on the left, are they some of the data that you'd extracted from the results that we considered previously?

DR A: It's what I considered pertinent. I've obviously looked at the whole record, but I've written in the pertinent results here.

DRIVER: Where it says HB, I think it's 139. Let's go to the right of the page. Could you decode that note for us?

DR A: That's turgor and I have put an N with a circle. This is skin turgor. It's the sign where you gently pinch the skin and lift it. And as you let go, you watch for how that skin behaves. If you're dehydrated and underfilled, you get some tenting of that skin and it takes a long time to settle back down to the normal skin surface appearance.

DRIVER: So is this a measure of the elasticity of the skin?

DR A: It's a measure more of volume of fluid that's there. If you are underfilled, if there is not enough blood volume, dehydration essentially, then that skin turgor is prolonged, and in [Baby N] I've said that his skin turgor is normal.

DRIVER: And the note beneath that?

DR A: "Femorals ++."

So I've undone his nappy and felt both the pulses in his femorals. I recorded them as "++" which just means that they're normal. There's nothing abnormal about them. It's not that they're unusual in any way.

DRIVER: Thank you. And the plan as of 05.15?

DR A: Based on that capillary refill time being slightly prolonged and he now has mottling, I've said a bolus of 10ml per

kilogram of body weight with normal sodium chloride, I'm going to stop his oral feeds and give him his volume of fluid per day as IV glucose, and I'm presuming at the time I looked at these results the CRP wasn't available, but we saw it all in one document on the previous screen and then obviously the CRP has become available and I've written the result at the end of my note.

DRIVER: Is the bolus of saline intended to improve his circulation?

DR A: That's right.

DRIVER: Did you ever have the opportunity to see whether it had achieved that objective?

DR A: I recall seeing him later on into that night.

DRIVER: Let's go to tile 143, please, Mr Murphy. It takes us to a note written at 08.00 hours. If you could refresh your memory from it first, please.

(Pause)

Firstly, as to the timing of the review of [Baby N], if I could tell you, [Dr A], it's not controversial, at tile 142 of our chronology here there is swipe data of you entering the maternity neonatal entrance doors at 07.16 hours.

DR A: I may have been asked to see other children on the unit.

I may have looked at [Baby N] first, I don't recall.

Obviously, I'd been busy that night, back and to. If I've entered the unit at 7.16, it may be for some other reason than this patient.

DRIVER: Understood. But in any event, the timing of the writing of the note --

DR A: Is at 8 am, yes.

DRIVER: The reason why you reviewed [Baby N] prior to the note?

DR A: My note says that I've been:

"Asked to review due to a profound desaturation down to 48% and a drop in heart rate."

DRIVER: You use the adjective "profound". How significant a desaturation is that?

DR A: That's a concerning desaturation.

DRIVER: How significant is a drop of heart rate to about 80 beats per minute?

DR A: A brief desaturation or a desaturation that doesn't go very low in percentage terms usually doesn't affect heart rate. The fact that the oxygen supply to the child's tissues is down to 48% means that there's been enough to affect heart rate and reduce it.

DRIVER: We know from your notes and from your evidence that you, amongst other times, reviewed [Baby N] at 03.45 --

DR A: Yes.

DRIVER: -- at which point your note alludes to five episodes of desaturations at that point in time. In terms of degree, how do the two compare, 03.45 to this as noted at 08.00 hours?

DR A: I haven't recorded those in my note and it would be likely that I would have used the child's record chart at the end of the cot to look at those.

DRIVER: I think you have a paper version. Not that file, [Dr A]. The one nearest me, I think that's the one, behind divider 18.

DR A: Both 16 and 18 are empty.

DRIVER: Right.

(Pause)

Can I pass up, through Mr Worthington, a bundle of documents?

(Handed)

Apologies for that, [Dr A].

DR A: Thank you.

DRIVER: There are half a dozen or so documents there.

Observation chart...

(Pause).

Do those documents assist at all?

DR A: They show his progress over the night and certainly starting at 9 pm... Sorry, starting at 1 am, they show me that his oxygen levels at 1 am were recorded as normal and this looks as though it's a scheduled check, as do the results at 5 am.

I'm struggling to make out the time of the next entry; I assume that's 7 am. His oxygen saturations have been recorded at 100% for those times.

DRIVER: So oxygen at 100% at 7 am, if your reading of the handwriting is correct?

DR A: Yes.

DRIVER: But by the time you examined him at some point prior to 8 in the morning --

DR A: Yes.

DRIVER: -- his sats had dropped to 48%?

DR A: Yes. I'm just looking at the 7 am entry again.

It would appear that he is on -- it looks as though he is receiving 25% oxygen at that time and that's maintaining his oxygen saturations at 100%. I suspect that this follows the five episodes of desaturation that were recorded earlier in the night.

DRIVER: Are you aware the method through which that 25% oxygen was being supplied to [Baby N]?

DR A: It will have been either through nasal cannulae or a mask.

DRIVER: Because we know that he wasn't intubated and therefore wasn't being ventilated?

DR A: At the start of the night he was self-ventilating in air and I would have been called if he'd needed any other way of administering the oxygen.

DRIVER: So that non-invasive form of assistance was sufficient to have him 100% saturated?

DR A: It would appear so. At 9 am the record is that he is 100% in air. So clearly, this changes sometimes more frequently than the lines on the chart allow the recording.

DRIVER: Understood. So let's go back to your review of [Baby N] as written up at 08.00 hours. So he desaturated to 48%, the heart rate correspondingly low?

DR A: Yes.

DRIVER: And so what remedial action did you take?

DR A: The next line says that he was being bagged using a Neopuff circuit. This is the equipment at the cot side that has a mask to be placed over the infant's mouth and nose.

DRIVER: Yes.

DR A: And a bag method of squeezing a certain percentage of oxygen into the infant to restore their oxygen saturations.

DRIVER: And his skin at this point?

DR A: It says, "Mottled appearance and reduced tone". So since my last review of [Baby N], his mottling, I think at 5 am, I'd said, had returned, but at the time he had normal tone and now he's not as responsive as he was, he doesn't handle in the same way.

DRIVER: So your use of "reduced" in this note is comparative --

DR A: Yes.

DRIVER: -- as compared to your --

DR A: To my previous examination.

DRIVER: Having considered all these features, what did you determine was necessary in the circumstances?

DR A: [Baby N] needed more assistance than could be provided in one of the lower numbered nurseries. So he's moved through to nursery 1, which allowed me to have more equipment available and more opportunities for interventions to be performed.

DRIVER: You've had the benefit of reminding yourself of this note at this point, but might I invite you to step back from the note for a moment. Do you remember this event, the event that caused you to have [Baby N] moved from one of the lower nurseries to nursery 1?

DR A: I don't remember the move. I remember entering nursery 1 because I think I may have helped push the cot or the bassinet that the baby was in. My recollection is more of what happened in the next hour or so.

DRIVER: Which we'll come to shortly. But at this point in the sequence were you acting alone or with others and, if so, can

you remember who else was looking after [Baby N] with you at that point?

DR A: At this time, so between me starting to see [Baby N] and moving through to nursery 1, I... This time of sort of 7 to 8 am is when the nursing shift changes, so there will have been more people on the unit having handover and taking over care of different babies.

DRIVER: Thank you. Does it flow from that that you can't remember who was involved or not?

DR A: I don't recall who was involved, but I obviously know because I can see on the remainder of the observation chart what's initialled.

DRIVER: Yes. Thank you. Let's go down the note, please. So he was being bagged or Neopuffed at this point. Was that sufficient, at least in the short term, to maintain his stability?

DR A: I've said that as we move, he's continued to maintain saturations with facial oxygen. Now, I presume that he doesn't require bagging at this point because he's been bagged up using the Neopuff circuit and I have just said facial oxygen, so I presume this is oxygen that's the cylinder on the cot or incubator and that's being delivered to him via a face mask.

DRIVER: Were you content for that to continue or did you wish to alter things at this point?

DR A: No, [Baby N] is now concerning me, more so than earlier in the night. And because of his earlier run of five desaturations and now this profound desaturation with reduction in heart rate, I'm not prepared to leave [Baby N] to maintain his own airway and oxygenation. And the next section of the note shows that we've given drugs in preparation for intubation and then that would lead to mechanical ventilation.

DRIVER: Pausing there, when we began your evidence, you said that you recalled [Baby N] and recalled these events in part because there was a difficult intubation --

DR A: That's right.

DRIVER: -- which stands out in your memory because you were an experienced intubator at the time and were unaccustomed to having difficulties?

DR A: That's right.

DRIVER: How clear a recollection do you have of the intubation attempts?

DR A: I remember the position of the incubator within nursery 1. I remember standing to the side of the incubator in preparation for doing the intubation and the appearance of the oropharynx of [Baby N] as I was trying to intubate him.

DRIVER: So you have a memory of that?

DR A: I do.

DRIVER: Thank you. Looking at the note, it says:

"Attempted intubation x3."

It tells us of the size of the tube and the technique, the neck roll. Could you explain what that is for us before we go any further?

DR A: Yes. The natural position of a baby's head when laid on their back makes it difficult to intubate without supporting their neck and using -- it's often a nappy that's rolled, a disposable nappy, because they're quite small. It can be anything, but a roll that just sits in the nape of the neck before the protuberance at the back of the head, and that prevents the baby's neck from flattening, which then reduces the height of the trachea, the air inlet. So by putting the roll there, I can guarantee that I'm not going to be prevented from seeing where the tube needs to go because the baby's position is wrong.

DRIVER: Thank you for that explanation. What did you see?

DR A: So I... I was stood slightly to the left of [Baby N] but certainly behind him. He at that time had been rotated within the incubator and there is a little shelf that pulls out so that his feet remain in the incubator but his head, neck and part of his chest protrudes from it.

It means that the laryngoscope, which I held in my left hand, wouldn't then knock on the lid of the incubator and it means that I can manipulate the laryngoscope and insert the tube. It also means that he's outside of the incubator ready for all of the things that need to happen to secure that tube in place once it's been positioned.

DRIVER: Could you remind us what a laryngoscope is, please, and what is its function?

DR A: The laryngoscope is a device that provides light and a mechanical way of lifting the baby's tongue up so that you can see past that bit of their mouth and throat to where the entry to the trachea is. Typically, it contains two small batteries and it's very similar to the device that you look in ears and eyes, it's just that it has a different attachment to it.

DRIVER: So was it through the laryngoscope that you viewed [Baby N]'s oropharynx?

DR A: Yes, because on his back, laying down, his tongue would droop with gravity and without him sort of being able to hold it in the correct position -- so for all intubations a laryngoscope is used of to provide light and mechanical support to the tongue to lift it up so you can see where the tube is required to go.

DRIVER: And what did you see down the laryngoscope on this occasion?

DR A: I saw blood at the back of the throat. I saw blood that prevented me from seeing where the entry to his airway was.

DRIVER: Did that, in effect, impede your attempted intubation?

DR A: I couldn't see where I was aiming to position the tube.

DRIVER: In addition to blood, did anything else catch your attention?

DR A: I recall that the back of [Baby N]'s throat did not look -- it looked unusual. There was a degree of swelling, I recall. I can't picture that -- that would have been at the sort of upper aspect of my view and I was concentrating on the lower aspect where the blood was and where I was aiming to position the tube.

DRIVER: Taking them in turn, separately, which did you notice first, the blood or the swelling? Are you able to say?

DR A: I think it will been the blood because that's such an unusual thing to see at the time of intubating.

DRIVER: Were you able to discern where the blood was coming from?

DR A: No, I wasn't.

DRIVER: Moving to the swelling, were you able to discern what caused the swelling?

DR A: No. I noted that the swelling was there and the anatomy of babies has a degree of variation anyway and having never had the opportunity to look at or having to perform this procedure on [Baby N] before, I wasn't sure whether this was long-standing or whether this was new.

It must have been unusual for me to have remembered it.

DRIVER: This was the first time that you'd looked at [Baby N] through a laryngoscope?

DR A: It was, yes.

DRIVER: Did you succeed in intubating [Baby N]?

DR A: No, I didn't.

DRIVER: Did you abandon attempts?

DR A: I did.

DRIVER: Why?

DR A: I abandoned because I've had three attempts at that time and I was concerned because of his haemophilia that if I persisted, the metal blade on the laryngoscope, it's not sharp, it has smoothed edges, but the metal blade, as it's used to lift the tongue up out of the way, a little bit like a spatula, to lift the tongue up, I didn't want to cause any mechanical damage with the laryngoscope. And at this time, 8 to 9 am, there will have been more staff arriving and I was able -- I think we'll find a little bit lower down, I've given my reasoning for abandoning.

I have said that I was unable to visualise the tracheal inlet and that suction did not clear the view.

It's common for there to be mucous secretions, maybe some milk, clear fluids usually, the sort of physiological fluids that are removed by suction.

Normally, that degree of suction allows you to have a clear view without any mucous reflecting light or causing bubbles. But unfortunately the suction that was being done did not clear my view of the blood enough to allow me to intubate. So I've abandoned due to the blood present in the oropharynx and I have stopped because I don't want to carry on failing to intubate and cause more -- well, any mechanical trauma.

DRIVER: Would you have taken that course absent haemophilia? So if [Baby N] was not suspected to be a haemophiliac, would you

have continued to attempt to intubate even with the presence of blood or not?

DR A: The haemophilia was certainly a big element in this.

I would usually not persist after three attempts unless it was a life-and-death situation.

DRIVER: Thank you. Let's continue considering your note.

DR A: The next line says that we've commenced [Baby N] on BiPAP, so non-invasive ventilation. The machine was set with a back-up rate of 30 breaths per minute.

DRIVER: Thank you. And is that a measure of his blood pressure and his refill time?

DR A: That's right. So his blood pressure is acceptable at 81/55 and his capillary refill time has remained at 3 to 4 seconds.

DRIVER: And the standard return is at 2 seconds; is that correct?

DR A: That's right, that's normal.

DRIVER: So the plan of action?

DR A: Because of the prolonged capillary refill time, and also because that blood pressure is okay, but I'm presuming because of the capillary refill time that his circulating volume is not as good as I would like it to be, he's having another bolus of 10ml per kilogram of sodium chloride to help boost that circulating volume of his blood.

DRIVER: Thank you. Was this the extent of your involvement with [Baby N] on this shift?

DR A: I will have -- I've requested a chest X-ray, and then I will have handed over to the oncoming day shift.

I don't recall whether that was back on the children's ward where handover normally takes place or whether somebody came through to the neonatal unit because they will have heard that I was busy.

DRIVER: Thank you. Even though your shift ended, were you sufficiently concerned about [Baby N] to make enquiries as to his well-being after your shift whilst you were off duty?

DR A: Yes, I was.

DRIVER: Did they include communicating with your colleagues in the Countess of Chester?

DR A: Yes.

DRIVER: Did you make any enquiries of anybody else, any other colleagues outwith the Countess, do you recall?

DR A: I don't think so.

DRIVER: Could we go to tile 461, please. This is at 22.22 on 15 June, so you left [Baby N] in the morning at the Countess, and now we're late into that night. This message seems to be you informing Nurse Letby of:

"Last gas was good, still doing art..."

Is that arterial?

DR A: That's right.

DRIVER: "... line."

Do you know where that information came from?

DR A: Sorry, is this information that I've sent?

DRIVER: Yes.

DR A: So I will presume that I've been asked how he's doing.

DRIVER: Yes.

DR A: And my response is that the last gas was better and that the team that are now looking after him are trying to site an arterial line.

DRIVER: Thank you. If we go to tile 498, please, Mr Murphy.

No, the next tile, sorry.

Again, this is a communication from you to Nurse Letby, now we're at 01.03 on Friday, 17 June 2016, so we've moved on a few days.

DR A: Yes.

DRIVER: Could you explain it to us:

"Just spoke to PICU"?

DR A: And [Baby N] is making good progress, he's been taken off the medication to support his blood pressure, he's had an ultrasound of his brain, which is normal, but he remains ventilated. His factor VIII medication for his haemophilia has been increased and they are unsure why he became unwell. The microbiology results from the blood culture are all negative. I'm happy to say that they're optimistic he will be okay.

DRIVER: Can we infer from that that you communicated with Alder Hey, some colleagues in Alder Hey?

DR A: It would suggest that I've spoken to the intensive care team.

DRIVER: And the information you received from them, does that tend towards or against your presumed diagnosis of sepsis as per your much earlier note?

DR A: No, it suggests that the microbiology didn't suggest infection and that the team looking after him on the intensive care unit are unsure why he became unwell.

MR DRIVER: Thank you, [Dr A]. Could you remain there and answer any questions that are asked of you?

MR MYERS: I wonder whether this would be the time for the break, my Lord. I can continue.

MR JUSTICE GOSS: You're likely to be more than 5 minutes?

MR MYERS: Oh yes. I will be.

MR JUSTICE GOSS: We're going to break off at 12.45 in any event. Would you be able to complete if we had a ten-minute break now? Would you be able to do it in half an hour?

MR MYERS: I might be.

MR JUSTICE GOSS: I'm going to pose an alternative. Do you want a break or do you want to do another 40 minutes?

Does anyone need a break? No?

If anyone does need a break just raise a hand. I'm thinking of a comfort break. All right. Are you happy to continue, [Dr A]?

DR A: Yes, thank you.

MR JUSTICE GOSS: I think we'll do that just to be on the safe side, otherwise [Dr A] will be here this afternoon.

Cross-examination by MR MYERS

MR MYERS: [Dr A], you've had the opportunity to see how [Baby N] was from the early hours of the morning right through until the attempts to intubate him leading up to 9 o'clock that morning, haven't you?

DR A: Yes.

MYERS: And your overall view was that there was a deterioration in his condition from when this began at about 1.45 in the morning through to the intubation?

DR A: Yes.

MYERS: Is that right?

DR A: That's right.

MYERS: Obviously, the way we have done this, which is to look at your notes as we go through, takes a series of snapshots, doesn't it, of what was happening?

DR A: It does.

MYERS: But if one looks at the overall picture it is a picture of a deterioration over a number of hours, isn't it?

DR A: Yes.

MYERS: Do you recall that the nurse who was looking after [Baby N] during that night until the handover, we know this, I'm not asking you to try to recall independently, was Jennifer Jones-Key?

DR A: I think I do. But I'm unable to remember which nurseries he was in, either number 2 or 3. I do recall he was on the right-hand side as you went in through the door. I remember his position within the nursery but not which one.

MYERS: It's nursery 3. Could we put up tile 80, please? We'll have a quick look at the notes with you, but not everything all over again.

If we go into that to take a look at the note, please, Mr Murphy.

At 01.45 you made a point of identifying mottling to torso and limbs. It's about eight or nine lines down where we have got the "on examination". Do you see that?

DR A: I do.

MYERS: And also if we look a little further down, Mr Murphy, we can see the lactate was raised as well, wasn't it?

DR A: Yes.

MYERS: Your view, [Dr A], was that raised lactate is worrying; that's right, isn't it?

DR A: That's right.

MYERS: And the mottling is also a cause for concern?

DR A: Yes.

MYERS: So those are both features that would put you on notice that there may be an issue here?

DR A: It may be the beginning of an evolving process, yes.

MYERS: You've been asked naturally a lot of questions about how infection was one of the matters that you had in mind.

And for medical practitioners dealing with a baby in this situation, infection is one of the things that would be bound to come to mind as a possibility, wouldn't it?

DR A: Yes.

MYERS: But whether it was infection or not infection, what matters is there is potentially an issue of some sort, isn't there?

DR A: That's right.

MYERS: If we move on please to tile 84, which is when you next come to see [Baby N] at 03.45, and we'll go into that.

If we scroll down to the 03.45 entry. Thank you. And over the page. There we go.

When we look at 03.45, the mottling, starting with that first, about three lines down, had resolved or appeared to have resolved?

DR A: That's right.

MYERS: By which you mean quite simply there was no sign of mottling on his skin that you could see?

DR A: That's right.

MYERS: But of concern now were what appeared to be a series or episodes of desaturation?

DR A: Yes.

MYERS: And that's something that would have been reported to you by the nurse who was looking after him in all probability?

DR A: Most likely.

MYERS: Most likely. You were taken, if you recall, to look at the observation charts with the records for -- they're right in front of you now, I can see -- with the records for oxygen saturation. You were asked to take a look at them.

For those of you who have got it there, but you may recall them, they were these ones (indicating), the first page behind divider 18.

You'd noted, in fact, that round about the 5 to 7 o'clock entry, maybe just on the edge of the 7 am entry, it appeared to refer to 25% oxygen.

DR A: That's what it looks like, yes.

MYERS: That could be introduced into the incubator in fact, couldn't it, if the baby was in an incubator? Is that correct?

DR A: Yes.

MYERS: That would be consistent with a requirement for more oxygen for [Baby N]?

DR A: To address the desaturations.

MYERS: Precisely. So that's consistent with the picture that you've been telling us about, isn't it?

DR A: Yes.

MYERS: Again, looking at your entry for 03.45, whatever the cause for this, the series of desaturations again indicate, don't they, a potential medical issue of some sort underlying this?

DR A: That's right.

MYERS: Then we can move forwards now a little bit further down this tile to your entry for 05.15. Let's take a look there. Thank you.

[Dr A], you've explained to us the capillary refill time of 3 seconds, and you make the point of putting "centrally". That indicates potentially something more serious, do you agree, suggests something more serious?

DR A: It suggests that [Baby N] is becoming more unwell.

Whether this is the same issue that I've been thinking of earlier in the evening or whether this is a new issue, it's a symptom.

MYERS: And that's the point. Whatever lies behind this, there appears to be an escalation in the difficulty?

DR A: Yes.

MYERS: And just to remind us what you said, you had indicated that the capillary refill time of 3 seconds is non-specific, so it doesn't tell us precisely what is wrong, but it does suggest a volume of blood isn't being delivered to the skin in the way it normally should?

DR A: That's right.

MYERS: That's what we can tell from that. Looking down from there, we note also that the mottling has now returned --

DR A: Yes.

MYERS: -- the mottling appearance.

DR A: Yes.

MYERS: In fact, you explained that mottling may occur where blood is directed away from the skin?

DR A: Yes.

MYERS: So that could be -- that would be consistent potentially with the delayed capillary refill time, wouldn't it, in terms of an issue with blood?

DR A: It may well be, yes.

MYERS: You were sufficiently concerned at this point that you took the decision that [Baby N] should be nil by mouth from this point, is that correct --

DR A: That's right.

MYERS: -- if we look down to the plan?

DR A: Yes.

MYERS: That meant that a nasogastric tube would have to be sited now for him to receive the fluids that he required; is that correct?

DR A: No, if he's nil by mouth that means no enteral feeding.

MYERS: Right.

DR A: And item 3 on that plan is that he gets 150ml per kilogram per day of 10% glucose, which would be administered through an IV cannula.

MYERS: Right.

MR JUSTICE GOSS: That's where he'd get his nutrition from?

DR A: That's where his energy will come from for the duration of the time the fluids are administered, yes.

MR MYERS: So made nil by mouth. His fluids would be received enterally as you have just described -- sorry, by IV fluids? Sorry.

DR A: That's right.

MYERS: I just want to ask you something else about the nasogastric tube, a different issue. To do that, to help us, I just want to remind us what Jennifer Jones-Key put in her note and then you can see where I get this from. So if we just move away from your note and put up tile 143, please, Mr Murphy, which is the note by Nurse Jones-Key.

Sorry, my fault, it should be 141.

I'm going to look at the large entries on the left-hand side, and scroll down to the lower one, which says "Addendum, 15/06/16 at 08.19". Hopefully this will pick up what you have been telling us, [Dr A]:

"At 07.15, baby crying and dropped his sats. Seen by NNU nurse Lucy. Neopuff given with 100% oxygen by paediatric registrar [Dr A]. Noted to be mottled all over body and blue in colour and cold to touch. Decision made to transfer to nursery 1. NG re-sited in right nostril with acid reaction. At handover, baby

dropped saturations again and required Neopuff. Care handed over to NNU nurse Lucy."

Where it says NG, that's the nasogastric tube, do you remember that happening, the nasogastric tube being re-sited?

DR A: No, I don't, I'm afraid.

MYERS: I'm going to return to that in a bit, but I just wanted to put that in the details that we have as we go along.

Now could we return, please, to page 143, which is your note as we go into 8 o'clock and beyond, [Dr A].

We will pick things up from here. The desaturation that [Baby N] had, the more profound one now to 48%, that's something that was brought to your attention, was it, [Dr A]?

DR A: Yes.

MYERS: In your recollection, you can't remember whether you'd gone specifically for [Baby N] or whether you were on the unit anyway; is that correct?

DR A: That is correct. I know the entry there is timed at 08.00 but I suspect that's when I timed the episode for the interventions that were being made. I may have been there for the preceding half an hour.

MYERS: Yes. In fact, just dealing with the timing, to help us with this, if we look at the page we've got here, we can actually see, just getting ahead of where I am at the moment, but it's got some times for when the intubation drugs were given, hasn't it?

DR A: Yes.

MYERS: And we can work out, plainly 8.06, which is something called suxamethonium chloride?

DR A: That's correct, yes.

MYERS: SUX it says here. Plainly that is later than 8 o'clock, which is what the note is timed at.

DR A: Yes. So I presume here that I put 8 o'clock as that's the time that I'm recording the major intervention.

Obviously, the section above that has happened in the time prior and these notes will, obviously, have been written after the

intubation attempts and it's very difficult to recall exact times.

MYERS: You told of the desaturation to 48%. Do you recall being told of a series of less profound desaturations in the period immediately leading up to that? Don't guess if you don't recall, but I just ask if you were told of any other desaturations in the period immediately leading up to that?

DR A: I don't recall, I'm afraid.

MYERS: Once you were with [Baby N], having been asked to deal with him, we know that he was transferred to nursery 1 and then we move into the process, it seems, of a nasogastric tube being fitted at some point?

DR A: Yes.

MYERS: And also the attempts at intubation. You don't recall the nasogastric tube?

DR A: No.

MYERS: But so far as him going to nursery 1 and the intubation and what took place, is that all a series where one thing led to another, in other words from the point you first joined [Baby N]?

DR A: Yes. Restoring his oxygen saturations and then making the decision to proceed to mechanical ventilation because he wasn't coping, that will have -- it will have become just a series of events one after another.

MYERS: And from the point that you go to deal with [Baby N], having been told of the desaturation, up to the point that you have to abandon the intubation, you were with [Baby N] throughout that period so far as you can recall?

DR A: Yes.

MYERS: We know that at some point at least Jennifer Jones-Key was there up to a certain point, but do you have any recollection of when she was there and when she wasn't there?

DR A: No, I don't.

MYERS: And do you recall Nurse Letby being present at any point during all of this?

DR A: I don't recall the people, the staff, that were around me when we moved from nursery 3 to nursery 1. My recollection is more starting at the time of beginning the intubation.

MYERS: And when you began the intubation, that's something you'd be assisted with, isn't it?

DR A: That's right.

MYERS: You wouldn't do an intubation on your own?

DR A: Oh no.

MYERS: And do you recall who was assisting you at that time?

DR A: I believe it was Nurse Letby.

MYERS: One other nurse I'm going to ask you about in terms of identity is Nurse Butterworth. You knew who Bernadette Butterworth was?

DR A: Yes.

MYERS: Do you recall her being present or do you have no recollection of that?

DR A: Because I will have been facing into the incubator, I will be aware of the sounds of people behind and around me, but I don't recall Bernadette being there, I'm sorry.

MYERS: So that specifically with the issue of the intubation drugs being given, but you have no recollection of her?

DR A: No, I don't, I'm afraid.

MYERS: It's important if you can't remember, it's better to say I don't remember than to hazard a guess.

From the time that you began to deal with [Baby N] up to the point of intubation, can I ask, was he continuing to desaturate or was he stabilised because of the oxygen that he was given?

DR A: That may have been very fluid. He may have had further desaturations that required more attention from me. He may have just required the face mask with the oxygen flowing without any assistance from the Neopuff circuit.

That's not the sort of thing that I would normally record because we've already made the decision that he is going to be intubated.

MYERS: Thank you. Well, following this through with the note and also your recollection, [Dr A], the decision having been taken to intubate, the first step was to provide intubation drugs, wasn't it?

DR A: That's right.

MYERS: And that's why we see the drugs that are given at 8, 8.05 and 8.06?

DR A: Yes.

MYERS: For the sake of completeness and because it follows in the sequence, I'm going to ask if Mr Murphy could help us with the entries we have for those drugs being given. I don't expect you to recall this detail, [Dr A], but the first is at tile 155, please.

We can just look at the front page here. Morphine at 8 o'clock, as it says in the notes, [Dr A]. And the nurses involved in that administration, Bernadette Butterworth and Lucy Letby.

Next for the atropine, tile 158, please, Mr Murphy.

Thank you. So as we've got in the notes, 08.05, atropine, Bernadette Butterworth and Lucy Letby.

Do you see that, [Dr A]?

DR A: I can't see the detail. I can see the tile there.

MYERS: Can you see the names on the top of it?

DR A: The coloured names, yes.

MYERS: The computer-based prescription lies behind the tile but at this point perhaps it's sufficient to check the personalities and the time. That's what I'm doing.

Finally, the suxamethonium at tile 160. Looking at the front of that, we can see 08.06, as is in the note, and again Nurses Butterworth and Letby.

DR A: Yes.

MYERS: Right. I'm going to ask if we can go back to tile 143, Mr Murphy, which is your notes, [Dr A].

The purpose of giving the intubation drugs principally is to -- is it to relax and sedate the baby to assist with the process?

DR A: Yes.

MYERS: Then we know there were three attempts to intubate before you decided you'd stop?

DR A: Yes.

MYERS: I'm just going to go through a little bit to do with the layout of the airways --

DR A: Yes.

MYERS: -- and how this is dealt with. So I'm going to ask if we can put up, please, D18, which is simply a diagram of respiratory anatomy in fact from the NHS website, [Dr A]. There we are.

To help all of us, those of us who aren't doctors or medically qualified, which is probably a lot of us, if not most of us, with what is where, the epiglottis that we've been focusing on is a flap of tissue which actually sits just beneath the tongue at the back of the throat, doesn't it?

DR A: Yes, it does.

MYERS: And we can see, it's the first one on the right as we're going down. Thank you.

Now on this image we can see where the model's nose is. Obviously there's an airway from the nose going to the back of the throat, isn't there, and the mouth as well is marked in below that and we can all work out where that is. And they both join at the back of throat?

DR A: Correct.

MYERS: So whatever is going down through the nose or through the mouth, they'll meet eventually at the back of the throat, won't they?

DR A: That's right.

MYERS: And that's where the passageway comes to the epiglottis, doesn't it?

DR A: Yes.

MYERS: Then we can see on the image, actually below the epiglottis, this is the way it's drawn here, and to the right in

grey is the trachea, which is the pipe that goes down to the lungs; is that right?

DR A: That's right.

MYERS: I know this may seem very simple to you, but just so we've got it. The oesophagus, running parallel and it's red, that's the pipe that goes down to the stomach; is that correct?

DR A: That's right.

MYERS: So being close together, that's where the epiglottis and the structures there close or open to make sure what's meant to go down the trachea goes down the trachea and what goes down the oesophagus goes down the oesophagus?

DR A: Yes.

MYERS: Is one of the main functions of the epiglottis to close over the trachea when you're eating to make sure food doesn't go down there?

DR A: That's correct.

MYERS: I'd asked about NGTs. I want to put up next a diagram that shows where the nasogastric tube goes. I'm going to ask to put up D19, please.

It's a simple picture, but if you take a look at this. The nasogastric tube actually goes through the nose, that being the naso. We can see it's the pale coloured tube which is marked "NG tube". Then it goes down past the area where the epiglottis is and down through the oesophagus down to the stomach; is that correct?

DR A: That's right.

MYERS: That's the NG tube. One of those, according to the nursing note, was re-sited that morning --

DR A: Yes.

MYERS: -- before Nurse Jones-Key handed over to Nurse Letby.

I'm going to ask you next, now we've got those clear, [Dr A], just a little bit more about the laryngoscope and the endotracheal tube. So I'm going to ask to put up, please, D20A. We're just going to look at some images and then I have some questions. If anyone's interested, the images come from the intubation guidelines from the NHS East of England guidelines 2018, if anyone wanted to check.

You told us about this earlier, [Dr A]. The item that the hand has got, is that a laryngoscope?

DR A: Yes, it is.

MYERS: So the handle and then there's what you described as the soft-edged spatula part of it?

DR A: It's a metal implement and it's got smoothed edges so as not to cause any damage, but it's referred to as a blade.

MYERS: But we understand that doesn't mean a blade with a sharp edge?

DR A: Absolutely not, no.

MYERS: What's happening there is that it's used to push back and up the tongue so that the practitioner can look down into the airway, isn't it?

DR A: Yes.

MYERS: We can see it goes down and then we can see where the epiglottis is marked, we see "epiglottis" written at the bottom of those and the arrow going right up, is that up towards roughly where the end of the blade of the laryngoscope will come to?

DR A: Usually. There are different size blades and they can be used for different age and weight babies.

MYERS: The way the laryngoscope is designed means light can be shone down there to help the doctor, in this case you, look into the throat?

DR A: The laryngoscope has a light source and then there are fibre optic threads which take that light and then deliver it to the end of the plastic part of the blade, which isn't shown there. Then there is a -- the design of the blade is such that the light can get to the end of the area you are looking at and the endotracheal tube can be run alongside the blade into where you're aiming for, the tracheal inlet.

MYERS: So for those of us that aren't familiar with this, the light actually is inside the throat, down where the epiglottis is so that you can see?

DR A: That's where it emerges, yes.

MYERS: It's not like shining a light in from outside and having a look around?

DR A: Yes.

MYERS: Thank you for that explanation, because we can look at D20B now, which shows where the endotracheal would go.

Take your time to have a look here.

The laryngoscope, you've explained to us, [Dr A].

The ETT certainly on this diagram is the tube to the left of it, as we're looking?

DR A: That's right.

MYERS: And that goes down the throat, down to -- is it just above the area of what's called the carina in the trachea?

DR A: Yes, it is.

MYERS: The carina is where the lungs, as we would think of it, it separate into the left and the right; is that right?

DR A: Yes.

MYERS: So once you can see what's happening, you can see the passageway and in it goes --

DR A: Yes.

MYERS: -- up to a certain point?

DR A: A calculated length.

MYERS: A calculated length, yes. Just so that you know, we've had the benefit of seeing an image of an epiglottis this morning, so we have an idea of what it looks like once you're inside there.

Now, as to the steps for intubation and the use of a laryngoscope, you've explained about giving the drugs that are handed -- sorry, given to the baby. The head and neck, as you said, they have to be positioned in the optimal position for intubation, don't they?

DR A: They do.

MYERS: If you are using the laryngoscope to look inside the throat, in theory if there's blood there you should be able to see that when you first look inside; do you agree?

DR A: Yes.

MYERS: It's important, isn't it, to be able to visualise, see, the trachea and the cords correctly when you come to intubate; is that right?

DR A: That's right.

MYERS: In some cases, and this is a new term, certainly new for us anyway, is something called cricoid pressure applied to the trachea when intubation takes place?

DR A: It can be. It's often used in adult intubation.

I believe it's often used in children's intubation.

It's not common in neonatal intubation because the size and shape of a neonatal patient's head and neck often don't require it.

MYERS: Just so we -- should it become relevant, cricoid pressure, can you explain to us what that is so we can follow?

DR A: It's pressure on the front of the throat around about where the Adam's apple would be in an adult. That little bit of pressure there brings the tracheal inlet down so that with the tongue scooped up out of the way, the entrance to the trachea is visible.

MYERS: So pressing a little about there (indicating), and it makes it more visible?

DR A: You will get a much better description from an anaesthetist than from.

MYERS: All right, but that's the principle?

DR A: That's right.

MYERS: I take it that's not something you did during the course of this procedure?

DR A: I don't believe so. It can be done by the intubator because with the laryngoscope in the left hand your little finger would be free if necessary to do a little bit of pressure or you could ask somebody who's assisting to do it.

MYERS: Given you say that, if we look at the image here, we can certainly see what looks like the little finger of the left hand going down. Is that the sort of thing -- so a practitioner would reach down and just apply a little pressure?

DR A: That's right.

MYERS: And that's what's meant by cricoid pressure?

DR A: Yes.

MYERS: Thank you. Then once all of that is done, and there is a view into the orifice there, then the endotracheal tube can be inserted; is that correct?

DR A: That's right.

MYERS: We can take those down. I'm going to return now to what you've been telling us about. We'll put the notes up, [Dr A], in case it assists you or anyone to refer to them as we're dealing with this. It was tile 143. This is the section that we're looking at now.

As for the swelling to the throat that you saw, were you able to form any view as to what the cause of that was or not?

DR A: No, I wasn't.

MYERS: Was it something that just observed or did it actually mean that you couldn't visualise the back of the throat at all because of the swelling?

DR A: That's very difficult to determine.

MYERS: As in it's hard to say, to determine or to remember, just so we can follow what you mean when you say difficult to determine?

DR A: A little bit of both. The memory of my intubation attempts for [Baby N] was more about the blood being present and the fact that the suction wasn't able to clear that as an obstruction to my view. The swelling was at the upper aspect of my view and I was concentrating mainly on the mid to lower aspect of the view because that's where I was expecting to see the tracheal inlet. I think what I'm wanting to say is that the areas of swelling, if you're looking at a clock face, were sort of 10 to 11 o'clock and 2 to 3 o'clock, and I'm aiming for the sort of 6 o'clock position and just above for where the tube should be inserted.

MYERS: If we imagine a circle there, it's more towards the top edge?

DR A: That's correct.

MYERS: The top edge is where you could see the swelling and the blood below that?

DR A: Yes.

MYERS: Right. Now, as for the question of the blood, what I'm interested in, so you know exactly why I'm asking the questions I'm going to be asking, is when exactly you saw it. That's what I'm going to ask you about, when you processed the fact that there was blood there.

DR A: Yes.

MYERS: Because if we start at the end of this, the reason you ceased to intubate, apart from the fact there were three attempts, was that the blood, in particular, obscured the view, didn't it?

DR A: That's right.

MYERS: Now, it's crucial to intubate that you do have a view of the cords and the epiglottis and down into the trachea, isn't it?

DR A: Yes.

MYERS: So what I'm interested to know by way of a question is surely if you embarked upon intubation, there must have been a view of that when you started because you wouldn't just have a go at it if you couldn't see.

DR A: No.

MYERS: So does that mean it is possible -- I'll come to the note in a moment actually -- that blood became visible to you only once you'd embarked upon the insertion of the endotracheal tube, either the first, second or third time? Is that possible?

DR A: I believe the blood was there as I was attempting insertion attempt number 1 and obviously remained for numbers 2 and 3.

MYERS: If you can't see what's there, you wouldn't ordinarily attempt to insert the endotracheal tube, would you?

DR A: You can do. If you're quite certain of the position and you are confident that that's where it should be -- certainly I

know a very experienced neonatal consultant who had told me that they are able to intubate a pulmonary haemorrhage without issue.

MYERS: A pulmonary haemorrhage is blood coming up from the lungs into the windpipe?

DR A: That's right. But no, in this instance, I wasn't going to push on and I wasn't going to have a blind attempt, mostly because of the haemophilia.

MYERS: If we look at the note, [Dr A], it says:

"Attempted intubation x3."

Is that a 3 gauge tube that you were using, 3.0?

DR A: No, attempted intubation times 3, three times.

MYERS: Right:

"Using neck roll..."

And is that --

DR A: A number zero blade.

MYERS: "Blood [is that] present in oropharynx"?

DR A: Yes.

MYERS: "Unable to visualise trachea inlet. Suction did not clear the view. Intubation abandoned due to blood present at oropharynx..."

DR A: That's right.

MYERS: "... and likelihood of trauma due to..."

DR A: Repeated attempts.

MYERS: The notes don't say, as a matter of fact, that blood -- they don't say the point at which blood was identified, do they?

DR A: No, they don't.

MYERS: If we actually go through the order in which it's put, starting with attempted intubation times 3, as it happens that's the first thing you put and you put in the neck roll and then you put in "blood present at oropharynx", don't you?

DR A: I do.

MYERS: I'm just going to ask you to have a look at what you put in your statement, which is based on your interviews with the police and it's something you'll be able to see, his Lordship and the barristers, page 3270, please.

I'm going to ask you to read to yourself what it says there and ask you something about that.

(Pause)

This is a statement, just for our record, [Dr A], that was made on 12 December 2018, so closer to the time, obviously, than we are now. I'm going to ask if we can go to page 3 of 3 and scroll down a little bit.

I'll ask you to read to yourself the paragraph that begins "I have to add".

DR A: (Pause). Yes.

MYERS: All right. Do you think it's possible that blood may have been there before you actually commenced the procedure?

DR A: Blood may have been there before I commenced the procedure, yes.

MYERS: Your recollection back in 2018 was that you weren't sure if it was -- id the blood was your fault when you used the blade inadvertently or if it had been present before attempting to intubate.

DR A: Yes.

MYERS: All right. Actually, do you accept that "probably" is where we get to on that issue?

DR A: I think all I can say there is that I've used my recollection of the event and I've determined what I thought at the time. The laryngoscope blade will have gone in and there is a degree of positioning of the intubator in order to look down through the airway to the tracheal inlet. As my statement says there, I have some doubt, but I've not been able to determine the location of the bleed. And if it had been caused by my blade, I would have expected to see the bleeding along the route of where the blade is. But again, this is many years ago now and I don't recall, I'm afraid.

MYERS: All right. So there is no mystery, I'll just say what it was. Your recollection at the time, doing the best you could at the time you did the statement was as follows:

"There was blood present in the oropharynx. It did look unusual, but I'm not sure whether if this was my fault when I used the blade and inadvertently caused the swelling, or if it had already been present before attempting to intubate him."

DR A: Yes.

MYERS: All right. Whenever it was that it was there, [Dr A], was your thought that it appeared to be something that might have come up from lower down, from the chest or somewhere certainly below where it was that you could see it?

DR A: I couldn't see a bleeding source.

MYERS: So in other words, there's nothing you could see that was producing fresh blood when you looked inside?

DR A: No.

MYERS: Did it cross your mind it could be linked to whatever it was that had been causing mottling earlier, some potential link?

DR A: You'll have seen at the end of my written notes, I'd say that I'd ordered a chest X-ray. That was to look to see whether there was any signs of pulmonary haemorrhage, which would be evident on a chest X-ray. And then that would suggest where the source of the bleeding was.

MYERS: So we can be clear about that and what you said, [Dr A], I'm going to ask Mr Murphy, please, to put up again tile 143 so you have the benefit of seeing what we're referring to. Just scroll down to the bottom of that page. It's almost the last thing you put under "plan". We have seen the bolus and out have put:

"Chest x-ray [query] pulmonary haemorrhage."

So that's what you were referring to, so you were wondering is it from somewhere below. As it happens, that could be consistent with the sort of mottling that had been seen?

DR A: Potentially, yes.

MYERS: I'm not asking you or anyone to say it definitely is but the reason for that is the mottling is linked to a poor supply of blood which could be linked to a bleed elsewhere in the body somewhere?

DR A: That's right.

MYERS: Right. Can I ask you about one message, we looked at some messages, at tile 489, Mr Murphy.

This is the only message I'm going to, [Dr A].

Just before we go there, so we can all follow, a doctor will consider what all the potential explanations could be; that's correct, isn't it?

DR A: It is.

MYERS: So I'm not trying to suggest to you this is definitely one thing or another, it's just the process you were going through?

DR A: That's right.

MYERS: But in a message to Ms Letby later that day, that night, you said this:

"I think there will be a haemangioma or collection. If it was epiglottitis his CRP should have been higher because he was starting to become unwell. Glad to hear that his cranial [ultrasound] didn't show any bleeds. I'd be surprised if you didn't sleep well after so many long days."

And then a ZZZ emoji.

Haemangioma, is that a collection of small blood vessels?

DR A: Yes, it is.

MYERS: Were you just going through one possibility, which would be there's a small collection and there's been a bleed from them somewhere inside his body?

DR A: That was what I considered, yes. There will be many others but that was one that I wondered about. Personal opinion.

MYERS: And throughout with [Baby N], one of the issues was this, I'm going to suggest, that because he had a variety of haemophilia there was a concern that he would bleed more readily than a baby who didn't have that?

DR A: That's right.

MR MYERS: Thank you, [Dr A].

Re-examination by MR DRIVER

MR DRIVER: Brief re-examination if I may, my Lord.

[Dr A], the blood that you saw -- a different direction. The oropharynx, is that what we non-medics just refer to as the back of the throat?

DR A: Yes, it is.

DRIVER: When you saw blood, was that in the oropharynx?

DR A: Yes, it was.

DRIVER: Was it from the oropharynx?

DR A: I don't know where the source of the bleeding was, I'm afraid.

DRIVER: When did you first visualise blood?

DR A: I believe it was on my first attempt when I had the laryngoscope blade in my left hand lifting the tongue up out of the way. I believe I saw blood there the first time but I... I don't have... I can't remember the three individual attempts at intubation. I can remember collectively starting and then I remember the discussion at the end about moving on to BiPAP.

MR DRIVER: Thank you. I have no further re-examination.

Does your Lordship have any questions for [Dr A]?

MR JUSTICE GOSS: I don't, thank you very much. Thank you, [Dr A], for coming back and giving evidence again.

Yes or no?

MR DRIVER: Yes.

MR JUSTICE GOSS: You will be coming back again, but that's it, so what I have said to you before still applies: please don't talk to anyone about anything to do with this case. Please remain seated where you are.

Thank you, members of the jury. Could you be ready, please, to continue -- I don't know whether it would cause inconvenience if we started at just before 2 o'clock for anyone.

MR DRIVER: Not from the prosecution's perspective.

MR MYERS: I don't mind, my Lord. It's kind of you to ask.

We'll fit in with whatever time suits the court.

MR JUSTICE GOSS: We'll say 1.55. You may think it's pernickety, 5 minutes, but they all add up.

1.55, please.

(12.47 pm)

(The short adjournment)

(1.55 pm)

(In the presence of the jury)

MR DRIVER: May I call Dr John Gibbs, please.

DR JOHN GIBBS (recalled)

Examination-in-chief by MR DRIVER

MR DRIVER: Good afternoon, Dr Gibbs. Could you state your full name again for the record?

GIBBS: I'm John Gibbs.

DRIVER: You've been invited this afternoon to give evidence in relation to your involvement with the baby [Baby N]. Were you the on-call consultant in the evening and overnight into 15 June 2016?

GIBBS: Yes, I was.

DRIVER: And did you first become involved with [Baby N] shortly before 18.00 hours on 15 June 2016?

GIBBS: Yes.

DRIVER: Did you effectively receive a handover of responsibility from your consultant colleague, Dr Saladi, at about that time?

GIBBS: Yes.

DRIVER: In so doing, were you appraised by Dr Saladi of the events and presentation of [Baby N] in the preceding hours?

GIBBS: Yes, I was.

DRIVER: Did you appraise yourself of his clinical history?

GIBBS: Yes.

DRIVER: He was born on 2 June 2016, so by the time we reach the events of 15 June 2016, he'd been within the unit for the best part of 2 weeks; is that correct?

GIBBS: Yes, it is.

DRIVER: And in summary, how would you describe his course over that period?

GIBBS: Well, up until the 15 June, it had been progressing very well. He had some initial respiratory difficulties in the first day of life, not unexpected for his gestation, and then he had been nicely settled and established on feeds and, I understood, was ready to go home at the time he started to deteriorate on the 15th.

DRIVER: Thank you. Could I invite Mr Murphy, please, to take us to tile 247, which is a set of clinical notes made by Dr Saladi, who briefed you. If we could go to those.

We can see what it is that Dr Saladi -- if we could scroll down, please -- recorded at 16.30. So what was the picture as portrayed to you upon you assuming responsibility this early evening?

GIBBS: Well, [Baby N] was in an unusual situation in that he'd been deteriorating since the night-time before the day of the 15th, so in the early hours of the 15th he started to deteriorate in various ways, which presumably you've heard from [Dr A] this morning, so I won't say anymore about that. But I knew he'd been deteriorating during the night.

An attempt -- I was aware an attempt had been made to place an endotracheal tube into him at about 8 o'clock in the morning and it wasn't possible to do that, but he'd been put on BiPAP respiratory support and he'd been stable on that for some hours until, as Dr Saladi reports here, at 2.50 pm or 14.50, he was on BiPAP support when he started to desaturate repeatedly and it was felt at that time he needed ventilation support. That's full ventilation support.

So various attempts were made by several people to place an endotracheal tube, but none of those attempts were successful.

DRIVER: Thank you. Because of the lack of success, did you discover that your colleagues had communicated with both the ear, nose and throat team and also anaesthetists from Alder Hey Hospital?

GIBBS: Yes, I understood a team was on its way or was setting off from Alder Hey Hospital in the early evening to come and support us in Chester with managing [Baby N]'s airway.

DRIVER: Thank you. In the meantime, did you learn that your colleague Dr Brearey had inserted a laryngeal mask airway into [Baby N]?

GIBBS: Yes, and that's what I saw was inserted at the time I first saw [Baby N] that evening.

DRIVER: The jury have heard lots of descriptions of endotracheal tubes and their connection to mechanical ventilation, but I'm not sure we've had an explanation about the laryngeal mask route. Can you help us understand that better?

GIBBS: Right. If I could briefly recap on the endotracheal tube. Just to remind the jury, that's a thin tube that goes through the vocal cords, through the larynx and rests inside the windpipe, and then passes out through the mouth and is connected to ventilator tubing through which a child can be ventilated.

A laryngeal mask air, which is a long tube, fatter than an endotracheal tube, because it doesn't need to fit inside the airway, it just fits in the back of the throat. It goes over the tongue, down the first part of the back of the throat. At the end of the laryngeal mask airway is an oval-shaped soft flexible mask which -- the usual mask you might have seen rests over the nose and mouth when you're putting a mask over a patient, this is a much smaller version that fits inside the back of the throat, attached to a fat tube, and that little oval mask sits just above the larynx, just above the windpipe at the back of the throat. It's not inserted through the vocal cords into the windpipe, it sits above it.

But it is possible to ventilate through a laryngeal mask airway because the top end of the airway, the rather thick tube, is connected again to ventilator tubing connected to a ventilator, through which ventilation can be given.

DRIVER: Is essentially the difference between the two a question of security?

GIBBS: Yes, and where they rest inside the airway. The endotracheal tube, fitting right down inside the airway, so it's more secure and less liable to be dislodged.

The laryngeal mask airway sits just above the voice box, down inside the back of the throat, just above the voice box, and can be dislodged a little more easily.

DRIVER: Thank you.

GIBBS: Could I also add, though, that when ventilating a patient, if you need anything higher than low pressures it's much more effective to ventilate down through an endotracheal tube that's inside the windpipe because all the oxygen and air is being directed down the tube into the airway. With a laryngeal mask airway it sits above the voice box so a fair amount of the oxygen and gas air is being directed down into the windpipe, but not all of it, like an endotracheal tube, and it's sometimes difficult to generate high pressures if you need a lot of pressure to inflate the lungs because the mask is sitting just above the windpipe, the tube isn't down inside the windpipe.

DRIVER: So was [Baby N] being ventilated via a laryngeal mask airway at the point that you first saw him on this day?

GIBBS: Yes, at around 6 o'clock in the evening when I first saw him he was being ventilated satisfactorily through the laryngeal mask airway.

DRIVER: If we could go to your corresponding note, please, tile 291. Click on to the original note, please, Mr Murphy.

We see your handwriting at the top of the page --

GIBBS: Yes.

DRIVER: -- timed at 17.50. Could you tell us what this informs us of, please?

GIBBS: One of the first actions I took when I'd been told about -- I had the handover about [Baby N] was to contact our local ear, nose and throat registrar as an initial point of contact with our local ear, nose and throat team. I knew a team, including a consultant ear, nose and throat specialist, was on its way from Alder Hey Hospital in Liverpool but my worry was, just in case [Baby N]'s airway needed help before that team arrived, I wanted our local ENT specialists to know about his problems in case their help was needed.

So I phoned the -- well, I bleeped and then phoned the registrar in ear, nose and throat surgery at the Countess of Chester Hospital -- I'll call him Dr Umesh because that's what he called himself, he had a much longer surname that is written in the surname that I can't read properly, but...

So Dr Umesh. I informed him about [Baby N] and his difficult airway, requiring LMA, laryngeal mask airway, and the type of laryngeal mask airway he had was called an I-Gel airway, that's

why I have put that in brackets, and he is needing that for ventilation.

Then I have just recorded that:

"He [meaning Dr Umesh] or a colleague will come to assess, but knows that the Alder Hey ENT team are also involved."

My concern about [Baby N] particularly is that I had been told, and I could see in the notes, that several of the people, which included two anaesthetists from the Countess of Chester Hospital, two registrars and two of my consultant colleagues, several of them had written that they'd noticed a swollen epiglottis, that's the flap of tissue just above the windpipe, and one registrar had written that there was swelling just below the epiglottis. So it is a worry knowing that someone has an airway with a swelling above it because that might block off the airway, which is why I wanted our local ENT colleagues to be aware of the problem in case we needed their help urgently before the ENT team and their specialists had arrived from Alder Hey.

DRIVER: If I can ask you to consider the corresponding note from the anaesthetist you referred to as Dr Umesh -- the ENT registrar, forgive me, not the anaesthetist. I think it's behind tile 304, Mr Murphy, but certainly J19179.

There we have an untimed but dated note to the effect that you, Dr Gibbs, consultant in neonatology, informed, et cetera.

GIBBS: Yes.

DRIVER: So does that just -- is that his side of that conversation --

GIBBS: Yes.

DRIVER: -- that you described to us?

GIBBS: Yes.

DRIVER: Is there anything additional in this note that adds to that which you've already explained to us?

GIBBS: No. As you point out, it's not timed and this must be some time after about 8.15 or later because he does refer to the collapse at around 7 o'clock in that. Yes, in this second paragraph after the discussed with Mr Temple, who's a consultant ENT surgeon at the Countess of Chester hospital, he is referring to the collapse that subsequently [Baby N] suffered from. So he wrote this some time after 8.15 or later.

He also mentioned, which I haven't mentioned but I'm sure the jury is already aware of from [Baby N]'s history, and I was informed of this to make clear, I realised this could be a problem, that [Baby N] suffers or was known to suffer from haemophilia.

DRIVER: Yes, thank you. So just going back then to your note that we've just looked at behind our tile T291, at that point in time what was the plan of action for the management of [Baby N]?

GIBBS: The plan of action was to continue the ventilations through the laryngeal mask airway as long as that continued satisfactorily, to await the team, the specialist team arriving from Alder Hey, and the plan is they would then try -- or one of that team would try to intubate [Baby N]. They may -- if they weren't successful in intubating and [Baby N]'s airway seemed to be blocked off, they would perform a tracheostomy. That's a surgical hole created in the front of the windpipe in the neck to assist with breathing.

DRIVER: Thank you. Let's move to tile 292, which records the arrival of the Alder Hey team. Click behind there, please.

This is a note of yours, the note written at 22.05?

GIBBS: Yes.

DRIVER: Does it set out your involvement and the sequence of events from about 18.00 hours?

GIBBS: Yes.

DRIVER: Could you assist us understand this? What's the recorded time for the arrival of the Alder Hey team?

GIBBS: I think it was 17.20. I can't see it in my note here, but it was 17.20. Now, before my note we're looking at now, one of our registrars, [Dr D], had written a detailed account of what had happened in the previous 2 hours and it's in her account she records the ENT as arriving at about 17.20 -- well, sorry, the Alder Hey team, which included a ENT consultant and two other specialists.

DRIVER: When you say 17.20 --

GIBBS: Sorry.

DRIVER: -- I think you might mean 19.20.

GIBBS: Sorry, yes, 7.20 pm.

DRIVER: Thank you. The team consisted of Dr Potter?

GIBBS: Yes.

DRIVER: Is he or she an experienced consultant anaesthetist?

GIBBS: Yes, he's a very experienced consultant anaesthetist at Alder Hey and also an intensive care consultant.

DRIVER: Dr Lakin?

GIBBS: Who is another intensive care consultant from Alder Hey Hospital in Liverpool.

DRIVER: And a Ms Day?

GIBBS: Yes. She's a consultant ENT surgeon from Alder Hey Hospital.

DRIVER: Thank you. So you told us of what might happen with regards to this team and [Baby N]. Was that intended to take place in Chester or post-transfer to Alder Hey?

GIBBS: It was intended to take place in Chester and once the team arrived at 19.20, the plan was to take [Baby N] through to the obstetric operating theatre, that's just down the corridor, a short distance from the neonatal unit in Chester. It is used for caesarean section operations on the labour ward, but it's also used for emergency paediatric surgery.

It wasn't planned definitely to perform any surgery on [Baby N]. The plan was to take him to the obstetric operating theatre where the anaesthetists and intensive care consultants could anaesthetise him so he will be quiet and totally compliant. They would then try to intubate him. If they couldn't intubate him and his airway blocked off, then Ms Day, the consultant ENT surgeon, would perform emergency surgery to create a hole in the front of his neck into his windpipe through which a breathing tube could be inserted; that's a tracheostomy. But that's only if the airway blocked off, which, when you have a difficult airway and you know that several colleagues have noticed the top of the airway is swollen, is a possibility and the airway may block off completely when you try to intubate.

DRIVER: So that was the plan. But did events intervene at about 19.40?

GIBBS: Yes. As part of that plan, I forgot to mention one other technique they were going to use to try and facilitate intubation was called a flexible bronchoscopy. That's using a

flexible camera with a light that you place into the airway so you can see the airway and then you pass an endotracheal tube over that flexible bronchoscope.

So that was -- I was taken up with trying to arrange with other colleagues at the Countess of Chester Hospital to obtain a flexible bronchoscope with the light source that they needed in the operating theatre and that had just arrived some time around 19.30/19.40, and we were planning to take [Baby N] through to the operating theatre when he suddenly deteriorated.

DRIVER: Were you with [Baby N] when he suffered this sudden deterioration?

GIBBS: I was in or next to nursery room 1 discussing with various colleagues the equipment they needed to take to the operating theatre when, I can't remember exactly who, but someone called out for help with [Baby N] within nursery room 1. I went over to him at that stage.

DRIVER: Thank you for that. Could you illustrate for us the nature and the extent of this sudden deterioration?

GIBBS: [Baby N] had dropped his oxygen saturation levels down to about 80% and his heart rate had dropped to around 60, and then whilst I was trying to assess him with other colleagues from the Alder Hey team who'd arrived and who came with me to assess [Baby N], his oxygen saturations dropped further to about 40%. And it was clear he was not being ventilated properly at that time with his laryngeal mask airway still in site.

DRIVER: So the laryngeal mask airway was still, as you've phrased it, in site?

GIBBS: In situ I should have said, really.

DRIVER: But it wasn't achieving the desired objective?

GIBBS: No. [Baby N] wasn't being oxygenated and his heart rate was slowing down because of that.

DRIVER: How would you describe the degree or seriousness of that desaturation?

GIBBS: It was a serious, worrying desaturation, but the initial response is to provide breathing support for [Baby N] and it was a colleague, Dr Lakin, one of the intensive care specialists who'd come from Alder Hey, who took over managing [Baby N]'s airway. He initially tried to ventilate him with a bag and mask through his laryngeal mask but couldn't get any chest movement so his ventilation wasn't working at all. So he removed the

laryngeal mask airway and applied a face mask straight to [Baby N]'s mouth and nose and started to bag him with oxygen through that face mask.

DRIVER: Going back in time a minute or two, you told us that you were in discussions with colleagues about [Baby N] when your attention was drawn to him and his deterioration.

Can you recall which colleagues you were in discussion with?

GIBBS: Um... As far as I remember, it was the three consultants from Alder Hey Hospital plus operating department professionals. They are technical staff who help with operating department equipment, particularly anaesthetic equipment, and they had arranged for the flexible bronchoscope and light source to be brought to the neonatal unit. So I was talking to them about the bronchoscopy that needed to be undertaken in [Baby N].

DRIVER: Can you recall whether or not [Dr D] was part of that discussion?

GIBBS: I can't remember where [Dr D] was at that time. She was involved in the resuscitation of [Baby N] but just at the time [Baby N] collapsed I can't remember where she was, no.

DRIVER: Thank you. Let's return then to the events. You told us that Dr Lakin was able to provide ventilation through a bag and mask device; is that correct?

GIBBS: Yes. But [Baby N] didn't respond well. I can't remember his saturations but his heart rate remained low, which is a worry when the heart rate has not improved.

Therefore chest compressions were started and I helped to give those chest compressions.

DRIVER: So that was you together with Dr Lakin?

GIBBS: Yes.

DRIVER: Thank you. Was that intervention successful?

GIBBS: No, in that [Baby N]'s heart rate still did not improve.

At this stage we started to give him some intravenous adrenaline.

DRIVER: Can you recall how many doses of adrenaline were given?

GIBBS: In all, six doses were given during the roughly half hour resuscitation. But a key intervention after the second or third

dose of adrenaline was that Dr Potter, the consultant anaesthetist and intensivist from Alder Hey, attempted to intubate [Baby N] with an endotracheal tube and successfully managed to do so the first time. And that significantly improved ventilation with good chest movements after the endotracheal tube had been passed.

DRIVER: So a successful intubation, which enabled [Baby N] to be connected to a ventilating machine?

GIBBS: Yes. Well, he could have been -- sorry, he could have been connected to a ventilation machine but Dr Potter continued to ventilate by hand.

DRIVER: My mistake. Thank you.

GIBBS: But he was provided with ventilation through the endotracheal tube.

DRIVER: And you told us --

MR JUSTICE GOSS: I'm sorry, could I just interrupt you?

Would you mind just pushing the microphone away a little bit, please? Thank you. We are getting a slight -- and it's probably because of the sensitivity of the microphone. We'll see if that's any better. Thank you.

Sorry to interrupt you, Mr Driver.

MR DRIVER: Not at all, my Lord.

So six doses of adrenaline, you said, over approximately 30 minutes. I think the records suggest it was between 19.47 and 20.09, which is about 30 minutes, but just so as we are certain as to the time.

So this resuscitation, how significant a response was this and how significant a deterioration had [Baby N] suffered?

GIBBS: Well, it was a very serious, life-threatening deterioration, and the worry was that at first [Baby N] was not responding to the resuscitation efforts by Dr Lakin supporting his ventilation, me supporting his breathing by -- his heart by pressing on his chest, and still his heart rate wasn't improving. So he took time to improve. But he did start to steadily improve after he'd been intubated. It wasn't a complete improvement because he still needed several doses of -- further doses of adrenaline, even after he'd been intubated by Dr Potter.

DRIVER: Thank you. By 20.10 hours had you, the team, managed to raise his heart rate to a point where it was regularly above 100 beats per minute?

GIBBS: Yes, it was above 100 beats per minute and he no longer needed chest compression to support his circulation.

DRIVER: Was he then attached to a ventilating machine?

GIBBS: No, I think Dr Potter -- I believe he's going to give evidence later so he can confirm this, I think he carried on hand ventilation after that. But he was being ventilated, provided with artificial ventilation.

Anaesthetists are very used to performing hand ventilation of patients, they sometimes do it throughout a patient's operation, for example. They don't always use a ventilation machine, so I think it was Dr Potter doing the ventilating but [Baby N] needed to be ventilated.

DRIVER: Thank you. How was he following the resuscitation?

GIBBS: Well, he was much improved as far as his various parameters, observation parameters were concerned. His oxygen levels, his heart rate, had returned to normal.

And he was no longer needing chest compression support.

But he still needed to be artificially ventilated so he still needed intensive care support and, in fact, I think Dr Lakin probably did this more because he'd anticipated, after a half hour resuscitation, that [Baby N] would need continuous support. He started an adrenaline infusion. So that's not adrenaline doses, the large doses we give during resuscitation, that's a very small continuous dose of adrenaline to support the heart and blood pressure. So he needed an adrenaline infusion after that.

DRIVER: Thank you. Was it the plan to summons a paediatric transport team?

GIBBS: Yes. [Baby N] needed then to go to an intensive care unit to be supported, but the transport team to take him to intensive care had already been requested around about the time that the specialist team arrived from Alder Hey. The transport team were getting together to come to collect [Baby N], so in fact the team arrived shortly after the resuscitation had finished. They weren't that fast at getting from Liverpool, they were already on their way. It was sort of part of the plan with the specialist team that had come over from Alder Hey that [Baby N] would be taken off to an intensive care unit elsewhere.

DRIVER: I think the records show that they arrived at about 20.40 hours, which fits in with your chronology.

GIBBS: Yes. Half an hour/25 minutes after resuscitation had finished, but they were on their way probably during the resuscitation.

DRIVER: Indeed. We know that [Baby N] was moved from Chester to Alder Hey --

GIBBS: Yes.

DRIVER: -- that night.

So taking a step back, and considering all that you learned and witnessed, what were your conclusions as to the events of 15 June?

GIBBS: I was unsure what had caused [Baby N]'s deterioration.

I knew he'd been deteriorating during the night, during the early hours of the morning, and I also knew his chest X-ray taken at around 9 o'clock in the morning had shown some shadowing on the right of his chest that could be infection. Knowing he had haemophilia it perhaps could have been a bleed into his lung because, as you probably would have heard from [Dr A], I was aware that when various colleagues had tried to intubate [Baby N], they had noticed blood in and around his airway.

So possibly it might have been a bleed into his lungs.

What I couldn't understand is why two consultant paediatric colleagues, two registrar paediatricians and two consultant anaesthetist paediatricians had not been able to intubate him and three of those at least had recorded in the notes there was swelling around the airway, and yet Dr Potter managed to intubate first time.

But a couple of things had happened in between those different attempts. After the unsuccessful attempts during the afternoon, [Baby N] had been given a dose of intravenous high dose steroid called dexamethasone.

That was at the request of the Countess of Chester anaesthetists who had tried to intubate him.

Dexamethasone is very potent at reducing swelling. It's a medication that's given if there's brain swelling after a head injury to reduce the pressure inside the skull. Now, for [Baby

N], it was given to try and reduce the swelling around his airway.

Also, shortly after Dr Potter had intubated [Baby N] successfully, he'd been given at least two, I think, looking at the records, maybe three doses of intravenous adrenaline as part of his resuscitation. And adrenaline is a powerful drug at stimulating the heart, which is why we use it in resuscitation. It also reduces swelling around the airway, which is why people, for example, who have severe allergic reactions and if they come into contact with the thing that causes their allergy, like a peanut if they have a peanut allergy, their airway and voice box can swell up and they can stop breathing and it can be lethal and they carry an adrenaline pen, which is -- they should inject themselves or stander-by (sic) should inject them with.

And because [Baby N] had had two doses at least of adrenaline -- this was a few hours after the potent intravenous steroid -- perhaps the reason all the colleagues had failed to intubate him early, but the reason Dr Potter managed to intubate him straightaway -- but Dr Potter is going to come to talk to the court about this -- perhaps it was because these medications had reduced whatever swelling was there.

Why [Baby N] had that swelling in his airway, which had been documented by several colleagues, I really don't know.

DRIVER: You mentioned X-rays, so for the sake of completeness could we go to tile 176, please, Mr Murphy, which includes Dr Wright's consideration of a radiograph taken at 09.08. I think that's the one you referred to a few moments ago.

GIBBS: Yes.

DRIVER: Approximately 9.10, you told us. If we can click behind, please. Was this something that you appraised yourself of during your care of [Baby N]?

GIBBS: Not this report because I think -- if we can see a little higher up on the report, please -- it says underneath -- on the right-hand side -- hospital number, account number, responsible doctor. And underneath that, "Date typed", and it was typed on the 16th.

DRIVER: Yes.

GIBBS: So it's been reported and typed the day after the events we're talking about. So I did see the X-ray, and this is a report of the X-ray, so indirectly I knew -- didn't know this report, I saw the X-ray this report is about.

DRIVER: What did you glean from the X-ray itself when you considered it?

GIBBS: There was some shadowing on the right-hand side. As I mentioned, that could have been infection and [Baby N] was being covered for infection, as we often do with an ill neonate, cover for infection and check for infection before doing anything else because the infection takes several days to show whether they're positive or not.

But because blood had been seen in his airway because he had haemophilia, the shadowing on his X-ray on the right-hand side might also have been a bleed into his lung.

Dr Wright here in her report is saying that she thinks a pulmonary haemorrhage is less likely but I still, on the night of 15 June, thought it possible there was a haemorrhage particularly because colleagues had seen blood in the airway.

DRIVER: Thank you. There was another X-ray taken at 21.07, which we have behind tile 421. So about 12 hours later, almost exactly 12 hours later. Did you consider this X-ray, the radiograph on the time?

GIBBS: Yes. The report is typed up again the day after, but this is the X-ray that was taken after resuscitation had been completed, after Dr Potter had successfully intubated [Baby N], and also Dr Potter inserted an intravenous line -- I'm trying to get control... This is the tube (indicating). This is the endotracheal tube running down [Baby N]'s airway (indicating). This white line down the right side of his neck (indicating) is an intravenous line inserted into a vein into [Baby N]'s neck.

And we can see the heart in the middle and the lungs either side, but this whiteness, hazy whiteness (indicating) throughout the lungs is more shadowing than you normally see in the lungs. This could be infection that's got worse from the X-ray in the morning.

This may be bleeds in the lungs, but if it is, it's very extensive bleeds on both sides. Or it could be, and this is what Dr Wright in her report as an X-ray specialist said, fluid in the lungs from a bit of heart failure, that's called pulmonary oedema. And of course, after the heart has been severely compromised, which is what was happening to [Baby N] at the time we had to resuscitate him and take over his breathing and press on his chest to stimulate his heart, it's possible after that there may be a degree of heart failure causing fluid in the lungs.

All of those are possibilities: pulmonary oedema due to heart failure or blood in the lungs or infection in the lungs.

DRIVER: The heart failure you refer to was the collapse at 19.40?

GIBBS: Yes.

DRIVER: So in conclusion, were you able to determine a cause of that collapse?

GIBBS: No. But my best guess at that time in the evening was bleeding into [Baby N]'s lungs. It might have been swelling of the top of his airway, but you'd have to ask Dr Potter whether he saw any swelling when he intubated.

There was definitely swelling recorded by various colleagues earlier in the afternoon. Dr Potter didn't seem to have a problem but he's very experienced at intubating, at getting the tube in.

So the collapse might have been due to swelling of the airway blocking off if Dr Potter feels the airway was still swollen and blocked when he put the tube in.

As I said, we have to cover for infection without knowing the result of the tests we do to look for infection. In the end, over the next few days on the intensive care unit at Alder Hey Hospital, all the tests for infection proved negative. The blood tests that had been taken from [Baby N] on the morning of 15th by [Dr A], that proved negative. The white cell count and the CRP protein never rose in [Baby N]. So it looks unlikely that his deterioration on 15 June was due to infection. But at the time we were dealing with him, we did not know that and we were covering him for possible infection. But in the end, I don't think infection was the cause of his deterioration.

MR DRIVER: Thank you. Could you remain there and answer any further questions?

Cross-examination by MR MYERS

MR MYERS: Dr Gibbs, at the time you came on duty who was managing the situation with [Baby N]?

GIBBS: Do you mean which consultant was managing it?

MYERS: Yes, who would be responsible for that?

GIBBS: Dr Saladi was responsible at the time I came on and then I took over from him.

MYERS: So you came on at about 18.00 hours, didn't you?

GIBBS: About then, yes, or slightly before.

MYERS: Dr Saladi was managing it at that point?

GIBBS: Yes.

MYERS: And then it was your responsibility to manage the situation after he had finished; is that correct?

GIBBS: Yes.

MYERS: So you were managing or had responsibility for managing the situation when we get into the period around about 7.20 pm?

GIBBS: Yes.

MYERS: Just so that we can be quite clear what your involvement was just leading up to that, we've looked at the records with you contacting the ENT team at the Countess of Chester?

GIBBS: Yes.

MYERS: So we can follow this through, was that because you were making preparation in the event that it was necessary to perform an emergency tracheostomy on [Baby N]?

GIBBS: Yes. But before that might have become necessary, that would have meant [Baby N]'s airway had failed, the laryngeal mask airway, and it would be my intention for myself to have attempted intubation, but I was aware that various colleagues had failed earlier in the day.

And if that intubation had failed and his airway was blocked off, he might need a tracheostomy, but we might be able to support him with another laryngeal mask or by bag-mask ventilation.

MYERS: The tracheostomy would be, in the circumstances, the last thing you would want to do?

GIBBS: Yes, but you have to do it if the airway is blocked off and you can't secure the airway.

MYERS: Would that be a unusual step to take for a neonate at the Countess of Chester?

GIBBS: Yes.

MYERS: So is that why you were taking steps to prepare a theatre should it become necessary to do so that?

GIBBS: Yes. And the intention was the specialist team from Alder Hey would perform the tracheostomy. But the reason I'd alerted our local ENT team is just in case that became necessary before the team from Alder Hey arrived, but they did arrive shortly afterwards, fortunately.

MYERS: When [Baby N] deteriorated around about 19.40, 7.40 pm, you were close by but not with him; is that correct?

GIBBS: Yes.

MYERS: And I think you have described to us you were in the area outside nursery 1 making arrangements for whatever course might come next?

GIBBS: Yes. I was standing near the entrance way to nursery 1 and I'd been moving in and out of nursery 1, talking to the various colleagues that I have described already, and trying to make sure we had the equipment that they needed. So I might have been just inside nursery 1 or just outside it. But there's an open doorway into nursery 1.

MYERS: You've been asked various questions about what was the cause of the collapse at 19.40. You've heard those questions being asked by the prosecution.

GIBBS: Yes.

MYERS: I want to go back to something that you said early on when you were going through the steps with [Baby N]. You said this about 19.40:

"His oxygen dropped to 80% and his heart rate was down to 60% then down to 40% on the oxygen."

In fact, if it helps I'll put the note up so we're not trying to remember it. Could we put up tile 292, please, Mr Murphy?

This is just so you can keep track of what you said and we can as well, Dr Gibbs. Thank you.

You have told us the oxygen dropped to 80%. That's in your evidence to us. Then the heart rate goes down to 60. Is that where we can see, about five lines down, it says:

"... leading to bradycardia of 60 per min"?

GIBBS: Yes.

MYERS: Then oxygen levels dropped down to 40% next, didn't they?

GIBBS: That's right. In my third line down, I say:

"Sudden deterioration, 19.40, as described overleaf by [Dr D]."

Because [Dr D] was the registrar, she had about an hour before me, 21.05, recorded a more detailed account of the resuscitation. Rather than repeat everything she'd put down -- and she was assisting during the resuscitation -- I'm referring back to her notes as well. So if it's helpful, if there's any particular point, we might have to look back at her notes as well.

MYERS: We've got them, just to reassure you, and we've seen them and we can go back to them if we need to. It's this. You then said this about the desaturation and the heart rate dropping:

"It's clear he wasn't being ventilated properly at that time with the LMA in situ."

Which is the laryngeal mask?

GIBBS: Yes.

MYERS: You touched on it earlier. Can you explain to us, so we can follow, what's the link between potential problems with his saturation and the LMA, if there is one?

GIBBS: Well, the laryngeal mask airway is the conduit, the apparatus, through which oxygen and air is being delivered from the ventilator down into [Baby N]'s airway.

Now, if the laryngeal mask has slipped, moved or even folded over on itself, the little oval mask at the bottom of the tube that's sitting above the voice box, if that folds over on itself or the tube is moved, then that can block air and oxygen getting down into the airway.

But also, if there was a swelling of the airway just underneath, below the laryngeal mask, if that swelling has worsened -- and several colleagues saw swelling of the airway when they looked down in the afternoon -- that swelling could stop any ventilation of his lungs because that swelling of his own tissues at the top of his airway could block his airway off and the laryngeal mask would be useless above a completely blocked airway.

MYERS: If he had been dexamethasone and it had had the effect you said, we know he was given at 17.35, in fact that swelling

shouldn't have been a problem in that way if it was no longer preventing intubation?

GIBBS: It's uncertain how much the dexamethasone will reduce swelling of the airway. It's intended to reduce it. So without looking down -- and Dr Potter is the only one who looked down while I was on the unit -- without looking down, I wouldn't know if the swelling had reduced or gone away completely. But, yes, the swelling should have been less of a problem after the dexamethasone.

MYERS: But as it happens, as we get to 19.40, there were problems in getting oxygen into [Baby N] in the way that would have been desirable?

GIBBS: Yes.

MYERS: So one factor that may play a part in the desaturation that took place was that the oxygen he was receiving through the LMA may not have been as effective as would have been desirable?

GIBBS: Yes.

MYERS: And is that why that is one of the issues you have issued which plays a part, whatever part that is --

GIBBS: Yes.

MYERS: -- in what took place?

GIBBS: Yes.

MYERS: You also identify the question of the extent to which any swelling that was present myself interfered, for instance, with the fit of the mask?

GIBBS: Yes, or even without the fit of the mask, if -- the swelling would be below the mask, therefore it doesn't -- the laryngeal mask airway would be inadequate, in fact could be completely unhelpful at ventilating [Baby N] if the swelling had blocked his airway off.

An endotracheal tube passing past the swelling, down into the windpipe, wouldn't have got blocked off by the swelling.

MYERS: So as to why at that point there is a desaturation, a significant feature potentially is the fact that he was being ventilated by an LMA and we might have just reached the point at which it was failing to do all that was required?

GIBBS: Yes. But in order to have failed, there either had to be swelling blocking off below the laryngeal mask airway or it had moved in some way. The other possibility was that he could have bled. Blood in his oropharynx had been noticed by several people that looked down earlier in the day. If he'd bled again then the blood could have filled his windpipe and might have stopped him being ventilated.

There wasn't any blood that I could see around at the time, but again Dr Potter is the only person who looked down at his windpipe.

MYERS: We'll hear from Dr Potter shortly and, this isn't meant to sound rude, but we'll stick to exactly what he could say he saw rather than possibilities with blood.

As to the mask, the LMA, looking at the note you have made four lines down, you've got:

"Very difficult to ventilate via LMA (Dr Lakin)."

GIBBS: Yes.

MYERS: Had Dr Lakin been using the LMA around the point of the desaturation or do you simply not know?

GIBBS: No, initially Dr Lakin tried to ventilate [Baby N] through the laryngeal mask airway and couldn't do so. So he took the laryngeal mask airway out and continued to ventilate him with a bag and mask, so a mask directly over [Baby N]'s mouth and nose.

MYERS: And that the Alder Hey team had arrived, hadn't they, some time shortly before the deterioration [Baby N] suffered?

GIBBS: Yes, and Dr Lakin was one of the team members who had taken over his ventilation when he deteriorated, when he collapsed.

MR MYERS: All right. Thank you, Dr Gibbs.

MR DRIVER: My Lord, I have no re-examination. Does the court have any questions for Dr Gibbs?

MR JUSTICE GOSS: I don't, thank you very much.

Thank you, Dr Gibbs, for coming back and giving evidence again. Will he be required again?

MR DRIVER: Yes.

MR JUSTICE GOSS: So what I've said to you before applies: don't talk to anyone about the case.

(The witness withdrew)

MR DRIVER: My Lord, I hand over to Mr Astbury to call the next witness.

MR ASTBURY: I recall, please, Dr Stephen Brearey.

DR STEPHEN BREAREY (recalled)

Examination-in-chief by MR ASTBURY

MR ASTBURY: If you could state your full name for the record, please.

BREAREY: Dr Stephen Paul Brearey.

ASTBURY: Thank you. You given evidence before. If you can make sure you keep your voice up, please. Even though I'm the one asking the questions, we'd be very grateful.

You have come along this afternoon to assist with your treatment of a baby by the name of [Baby N].

BREAREY: That's correct.

ASTBURY: Which took place on the afternoon of 15 June 2016?

BREAREY: Yes.

ASTBURY: In preparing a statement in that regard, you have summarised [Baby N]'s history up until that date, day 13 of his life. As it happens, we have heard only this morning about collapses or certainly -- let me rephrase that -- incidents at 1.45, 3.45, 5.15 and 7.15 through the course of that morning.

BREAREY: That's correct.

ASTBURY: And you have reminded yourself of those in preparing the statement; is that right?

BREAREY: Yes.

ASTBURY: Thank you. You commented that intubation had proved unsuccessful with [Dr A] during the course of that morning.

BREAREY: Yes.

ASTBURY: And that BiPAP had been used to assist and to support [Baby N] in its stead; is that right?

BREAREY: That's correct.

ASTBURY: You were aware, I think, that blood was noted in the oropharynx during the course of the morning; is that correct?

BREAREY: That's correct.

ASTBURY: Thank you. And you, I think, were on duty that afternoon in the Countess of Chester.

BREAREY: I was at work, but I was called by my colleague, Dr Saladi, who was the on-call consultant.

ASTBURY: Do you recall what time you were called?

BREAREY: Some time in the afternoon.

ASTBURY: Okay. Do you remember why you were called?

BREAREY: Because Dr Saladi and his team were having difficulty intubating [Baby N].

ASTBURY: Were you made aware that [Baby N] had suffered a further desaturation that afternoon?

BREAREY: Yes.

ASTBURY: And as a result of the call, what did you do?

BREAREY: Well, I went to the neonatal unit and Dr Saladi gave me a summary of the events up until that point and then I attempted to intubate [Baby N] as well.

ASTBURY: Thank you. It's not your note, but so it assists you, could we have, please, tile 246, Mr Murphy?

We can see a note there. Again, not your handwriting, Dr Brearey?

BREAREY: No.

ASTBURY: But we can see that you are certainly mentioned, I think. About halfway down it says:

"Laryngeal airway placed by Dr Brearey."

Is that right?

BREAREY: That's correct, yes.

ASTBURY: I don't know whether you just want to have a look at the note and remind yourself of perhaps what you were told and what the situation was that you came upon.

BREAREY: I can't quite see who wrote the note. It looks like Dr Saladi's handwriting.

ASTBURY: And I think the signature at the bottom looks like it is a double S (overspeaking) --

BREAREY: So I would have checked his record afterwards. But Dr Saladi mentioned that [Baby N] had desaturated that afternoon at 2.50 pm and had bled in the oropharynx and...

ASTBURY: Is that something in the NG tube?

BREAREY: And blood in the NG tube, yes:

"Improved with bagging [which is Neopuffing [Baby N]]. Electively intubated following [sorry] pre-medication. Unsuccessful attempts with two registrars and two consultants."

So I believe that would have been [Dr D], Dr Mayberry as the two registrars, and Dr Saladi and myself recorded on that:

"Cords difficult to visualise."

I'd concur with that from memory. And:

"Laryngeal airway placed by Dr Brearey and myself."

ASTBURY: Right.

BREAREY: I'm not sure whether a laryngeal airway has been explained to the jury yet.

ASTBURY: Before we do that, could we rewind a little bit?

Thank you for helping with the note. You've included yourself as one of the two consultants who unsuccessfully attempted to intubate. We're familiar with intubation. Could you just tell us your recollection, please, of your attempts to intubate?

BREAREY: I don't have too much recollection of the reason for not being able to intubate that afternoon. But certainly from a number of records that I've reviewed of the notes since then, it would appear that there was blood in the oropharynx and there was swelling around and above the vocal cords that was making the view difficult.

ASTBURY: All right. So we've heard quite a bit this morning about what has to be visualised, what can and can't.

We're told that the vocal cords ideally have to be visualised because that is where the tube will pass; is that right?

BREAREY: Yes.

ASTBURY: That indicates where the trachea is?

BREAREY: Mm-hm.

ASTBURY: Could you recall what difficulties you were having in visualising that particular part of [Baby N]'s anatomy?

BREAREY: From memory it seemed to be that there was a combination of the larynx being anterior -- feeling more anterior than perhaps we would expect to see.

ASTBURY: What does that mean, please?

BREAREY: That means when you're having a look with the laryngoscope blade, you can't see the whole of the cords, you can only see the lower section of the vocal cords. The other reason for not getting a good view was a feeling that the tissue around the vocal cords appeared swollen and was occluding the view.

ASTBURY: Are you able to recall, please say if you can't, whereabouts the swelling was precisely?

BREAREY: I can't precisely recall that myself.

ASTBURY: When you talk about the larynx being anterior, is there a cause for that or is that just an anatomical feature?

BREAREY: I think it's just a variation in different babies.

I don't think there's any certainty about that at the time, no.

ASTBURY: There's mention in the note of blood. Do you recall seeing any blood?

BREAREY: I don't, no.

ASTBURY: So certainly you would agree that you struggled to intubate in the way that would ordinarily be the case?

BREAREY: Mm-hm.

ASTBURY: Do you happen to remember in what order you came out of those four medical professionals?

BREAREY: I was fourth.

ASTBURY: Okay. You were going to tell us what the alternative was that you eventually chose.

BREAREY: So we have a difficult airway trolley because we sometimes have to deal with a difficult airway, particularly with much smaller babies. One of the options there, which I thought was most appropriate, was to use a laryngeal mask. The brand is called an I-Gel.

It represents -- if you like, rather than the ET tube on its own, at the end of the tube it's a small mask that fits over the vocal cords area of the airway to provide as much of a seal as possible without actually passing a tube through the cords.

ASTBURY: So is it a tube in itself?

BREAREY: It's a tube in itself, yes.

ASTBURY: It fits inside, presumably, the oral cavity?

BREAREY: Yes.

ASTBURY: How far does it extend into the baby?

BREAREY: It extends all the way to the point of the epiglottis and the vocal cords and then it's designed in a way -- it looks like a small mask, if you like, that actually fits over the vocal cords themselves.

ASTBURY: So rather than making a seal at the front of the mouth is it making the seal --

BREAREY: The seal with an ET tube would be at the point of the vocal cords because those vocal cords would sit on the ET tube. But you're not passing the tube through the vocal cords, you're just sitting something on the top of it, making, you know, a loose fit over the top of the vocal cords.

ASTBURY: So the seal in fact is further forward than it would be in the event of successful intubation?

BREAREY: It's closer to the mouth, yes.

ASTBURY: Okay. Presumably, the other end of the tube is then connected to whatever --

BREAREY: The ventilator, yes, or whatever gas supply you're using.

ASTBURY: Is that a permanent piece of equipment or is that just a temporary fix?

BREAREY: It's something that was quite new to neonates at the time but something that's been used in older children and adults for quite some time, maybe 20 years or so.

And the companies that make this sort of thing had started making them down to a size that can be used in neonates, the laryngeal masks --

ASTBURY: Sorry, I interrupted you.

BREAREY: In adults and children, they can be used for elective surgery, for example, so that adults and older children don't need to be intubated for procedures. They can be fitted blindly, so you don't need a laryngoscope blade to look at the cords to fit them in, you just put them into mouth until they don't go any further and they sit in the correct position.

ASTBURY: We've heard how the efficiency or otherwise of an ET tube is checked once it's in place. Same process or similar process with the airway?

BREAREY: If it's connected to a ventilator you'll get the same readouts from the monitor on the ventilator as you would do for an ET tube. So you would expect a little bit of a leak, for example, with a laryngeal mask. But actually, for [Baby N] when he was connected to the ventilator, the ventilator settings weren't particularly great, the pressures and the rate and the amount of oxygen we were giving weren't excessive for a ventilated baby.

ASTBURY: Were you able to satisfy yourself in the way you would with an ET tube that it was working efficiently, that air was going in and out of the lungs?

BREAREY: Absolutely.

ASTBURY: Did you use a capnograph to check there was carbon dioxide?

BREAREY: Yes --

(2.57 pm)

(No audio or video feed from court)

(2.58 pm)

MR JUSTICE GOSS: It might be a convenient point to have a break. It's about that time. We'll see if we can get this sorted out during the course of the break.

Sorry, Dr Brearey.

(2.59 pm)

(A short break)

(3.11 pm)

MR ASTBURY: Dr Brearey, apologies. We're going to rewind a little bit. You'd confirmed for me that as one of the measures to check that the airway was working properly, a capnograph would have been used?

BREAREY: Mm-hm.

ASTBURY: And you confirmed that you were able or would have been able to check that air was entering the lungs and I think you said that it was certainly enough until something more permanent could be arranged. Is that effectively what you were saying?

BREAREY: Yes.

ASTBURY: So having fitted the laryngeal airway, what efforts were made then to further the prospects of intubation?

BREAREY: Well, I suppose you have to consider that a decision would have to be made that intubation was definitely needed.

ASTBURY: Yes.

BREAREY: And with discussion with Dr Saladi, who was the consultant that afternoon, his concern was a cause for the blood that was seen in the oropharynx, and one of the possibilities for that was a pulmonary haemorrhage, which is unusual in this gestation of baby. Actually, we see it more commonly in very preterm babies and occasionally with more mature babies that have had severe hypoxic insults for a long time and are on a ventilator.

So that's quite serious and quite often with babies with pulmonary haemorrhage, they need greater ventilation pressures and more ventilatory support.

It's quite serious and can be quite catastrophic. So the worry was that if the laryngeal mask stayed as it was and it was a

pulmonary haemorrhage that we were dealing with, then a laryngeal mask on its own wouldn't be enough, and with an ET tube in place you're able to ventilate at higher pressures with a more secure airway.

ASTBURY: So it was still required?

BREAREY: It was still required. That was the decision that was made at the time, yes.

ASTBURY: Can I ask you to pause there? A pulmonary haemorrhage, why was that the suspicion at the time?

BREAREY: It was a suspicion at the time because blood was seen in the -- at the time when the first intubation was noted and subsequently by a number of doctors. In retrospect, now, I don't think [Baby N] had a pulmonary haemorrhage, but we thought that it was a possibility and the fact he had haemophilia was obviously of great concern, which is why Dr Saladi opted for [Baby N] to have an endotracheal tube in place.

ASTBURY: Would the amount of blood seen have any bearing on the suspicion that it was a pulmonary haemorrhage?

BREAREY: Not necessarily, but there are some indicators now in retrospect that would sort of indicate that it wasn't really.

The first of the blood was seen outside of the -- or above the vocal cords in the oropharynx rather than actually coming from between the cords and from the airway, which you'd see -- pulmonary haemorrhage is blood that's coming from deep down in the lungs, if you like, and it needs to come up the bronchi and into the trachea and out through the vocal cords.

ASTBURY: That was one of the things that was being considered at the time?

BREAREY: That was, yes.

ASTBURY: All right. Was anyone else asked for assistance with regard to intubation?

BREAREY: Yes. The anaesthetic team were called and requested to come along.

ASTBURY: Is that the anaesthetic team at Chester or somewhere else?

BREAREY: At Chester, yes. I think at the time when Dr Saladi was writing this note, the anaesthetic team had already arrived. By anaesthetic team I mean two fairly senior anaesthetists from

Chester. And one of them, Dr Jameson -- Dr Jameson and Dr Campbell. Dr Jameson was the senior paediatric anaesthetist in hospital.

ASTBURY: Okay. So with a paediatric specialty?

BREAREY: Yes.

ASTBURY: Were either of those two doctors able to assist with the intubation?

BREAREY: Neither of them were able to intubate.

ASTBURY: So having exhausted the resources at Chester, what, if anything, next?

BREAREY: Then Dr Saladi had spoken to Dr Yoxall, who's a consultant neonatologist at Liverpool Women's Hospital, and also discussed with the transport service.

He's mentioned NWTs here, which is the North-west Transport Service.

ASTBURY: Yes.

BREAREY: Normally they would transfer all children under 16, other than neonates and there's a separate neonatal transfer team. But they are linked with intensive care at Alder Hey and also work with the anaesthetists at Alder Hey as well as the ENT specialists at Alder Hey.

So incidents like this, in terms of difficult airways in neonates, have occurred previously and there was a process in place for what would happen in this sort of case, really.

We're in what would be called a "can't intubate but can ventilate" situation, so there wasn't any immediate time of urgency but we wanted to get on and get a secure airway as soon as practicable and as safely as possible.

ASTBURY: Okay.

BREAREY: So there would have been a number of conversations between ourselves, the transport service, NWTs, and the specialists in Liverpool and ENT specialists and the intensive care doctors at Alder Hey in intensive care.

ASTBURY: Okay. Did those conversations eventually result in a member of their team or members of their team attending?

BREAREY: It did, yes. Two doctors came directly to Chester: Dr Potter, who's a senior intensive care doctor and anaesthetist at Alder Hey and the most skilled at Alder Hey in airway management, I would say really; and Ms Day, who was a consultant ENT surgeon at Alder Hey.

The plan for both of them coming was that if Dr Potter couldn't intubate [Baby N] himself then Ms Day, the ENT surgeon, would undertake what's called a surgical airway where a surgical cut is made in the neck so that the tube can be placed directly through the neck into the trachea.

MR JUSTICE GOSS: A tracheostomy?

BREAREY: Yes.

MR JUSTICE GOSS: We have heard this from two witnesses already today.

MR ASTBURY: So that bypasses the vocal cords?

BREAREY: Yes.

ASTBURY: Thank you. Were you involved with [Baby N]'s care beyond that point?

BREAREY: No.

MR ASTBURY: Thank you. If you could wait there, please.

Cross-examination by MR MYERS

MR MYERS: Dr Brearey, you've had the opportunity to review the case, haven't you.

BREAREY: Yes.

MYERS: So you're familiar with the clinical notes in general in this case?

BREAREY: Yes.

MYERS: I'm not going to expect you to remember them without showing. I'm going to show you a note from Dr Ukoh to help us. I'm going to ask Mr Murphy to put up tile 178.

Just so you know, it's some questions about factor VIII and the use of factor VIII on this day.

BREAREY: Okay.

MYERS: We know, so you're aware, Dr Brearey, that [Baby N] had a variety of haemophilia which we know also can increase the risk of bleeding and potentially increase the extent of bleeding, potentially.

BREAREY: I wouldn't...

MYERS: Comment on it as you see fit.

BREAREY: Haemophilia, I don't know what's been explained before, but it's obviously an inherited clotting disorder which prolongs bleeding time. The initial blood tests, the APTT, was 60-something; the normal is about 30. So the time it takes to clot blood was twice as long as would normally be expected. But the skin, the mucosa, the capillaries of [Baby N] are exactly the same as any other baby. So it still takes some sort of incident, if you like, to breach that barrier before a bleed happens. So when you said it makes babies bleed, it doesn't make babies bleed: it takes them longer before the bleed clots and stops bleeding.

MYERS: I'm certainly not suggesting just spontaneously bleeding for no reason. If that's what it sounded like, it's not that. We're going to hear some more detailed information on haemophilia in due course as well, so we'll all know more about it by the time we get to the end of this part of the evidence.

But factor VIII is something that can be given to someone with this variety of haemophilia. Does it improve the clotting properties of the blood?

BREAREY: Yes. It increases levels of factor VIII, that's important in the clotting cascade, and so the clotting time would reduce, yes.

MYERS: As to that, if we look at this, we've got a note here, we know because his name is at the end of it, I think it's Dr Ukoh. It starts at 9.45 on 15 June. So just to keep us all up to speed at this point, by this stage [Baby N] had been moved to nursery 1 and the first attempt to intubate him had been conducted by [Dr A], which hadn't been successful. That's where we've got to at this point.

I have just started on that page so we can see the time and date the note is made but it's the next page I would like to go to please, Mr Murphy and Dr Brearey.

If we scroll down, it says:

"Plan. Discuss urgently with [is that] haem team at AH"?

BREAREY: I would say haematology team.

MYERS: And AH, is that Alder Hey?

BREAREY: Yes.

MYERS: "Needs factor VIII."

It also says, "And ventilate". And then:

"May need intubation after above factor VIII if still ongoing apnoeas. Repeat gas. Repeat blood."

Do you see that?

BREAREY: Yes.

MR JUSTICE GOSS: I think it's "repeat head scan".

MR MYERS: Sorry, is that what it is? Sorry:

"Repeat head scan..."

And something else in fact.

BREAREY: "Locum paed.".

MYERS: It's the factor VIII side I'm most interested in at this stage, Dr Brearey. If we continue to scroll down, 15 June 2016, 10.00 hours:

"I contacted Dr Caswell..."

And Dr Caswell, he or she is a paediatric haematologist consultant?

BREAREY: Yes, he's a senior paediatric haematologist at Alder Hey.

MYERS: "... re above."

Is that:

"Advises needs urgent factor VIII"?

BREAREY: Yes.

MYERS: Is that the name of it when it says?

BREAREY: Advate is the trade name.

MYERS: That's the trade name and it has a dosage underneath that and it says "over next few days intravenous"; is that correct?

BREAREY: It says:

"... and then 12-hourly over the next few days after the 50 units per kilo stat."

Which means it's been prescribed then, and then 12-hourly over the next few days.

MYERS: Then:

"(2) To obtain repeat factor VIII."

And there's another word after that?

BREAREY: "Levels".

MYERS: (3), I'm not sure what that is.

BREAREY: FFP, that stands for fresh frozen plasma.

MYERS: "But we could administer after factor VIII given if we want"?

BREAREY: Yes.

MYERS: Then it says:

"Spoke to..."

I'm not going to guess what it says.

MR JUSTICE GOSS: "Blood bank", I should think.

BREAREY: Yes.

MR MYERS: And then:

"Urgent call to blood..."

Is that "blood exchange"?

BREAREY: "Blood transfusion."

MYERS: "... 5385 extension."

BREAREY: Yes.

MYERS: And:

"Need consultant approval."

The reason I went there was just to ask this. Did you actually have factor VIII on the unit already or did you have to get it in that morning from what you can tell?

BREAREY: Obviously I was only called in the afternoon, but I understand they didn't have it immediately available, no.

MYERS: [Baby N] had been identified as a baby who had low factor VIII, hadn't he, from the point of birth?

BREAREY: Yes.

MYERS: And this is nearly 2 weeks into his time at the Countess of Chester, isn't it?

BREAREY: Yes.

MYERS: All right. We can move on actually to tile 201, please, carrying on with Dr Ukoh's notes.

We've got a note of 15 June, it's a little bit difficult, it looks like it's "11.00/15". It says:

"Repeat factor VIII levels/coag?"

I'm not sure what the next bit is and I wouldn't ask you to guess if it is not clear to you.

BREAREY: It says:

"Group and save taken."

If you are giving blood products, you need to take a blood sample to get the blood group and save a cross-match of the blood you'll be giving to the baby, or in that case FFP, which they might have been considering, which is the fresh frozen plasma we were talking about earlier.

MYERS: Does that indicate [Baby N] receiving factor VIII at that point or is that not yet receiving it?

BREAREY: No, he said he's taken the level.

MYERS: He's taken the level? Right, so he hasn't yet received factor VIII at this point?

BREAREY: When I was reviewing the notes prior to coming to court today I could see in the transfusion charts that the factor VIII was given at 11 o'clock.

MYERS: Right. So that's the time we can take it from?

BREAREY: Yes.

MYERS: And then if we carry on down, 15 June 2016, 11.44:

"I contacted haemophilia liaison nurse. She called..."

And there's a name:

"She will kindly bring in more supply of factor VIII/Advate on to NICU here later today."

So is it that case that a small amount had been obtained but more had to be brought?

BREAREY: Again, from reviewing the notes of this case prior to coming here, I understand that they might have used mum's Advate to give [Baby N] the first dose because of difficulties in obtaining it from the pharmacy.

MYERS: Right. But the first dose in any event from your review of the records is 11 o'clock?

BREAREY: Yes.

MYERS: In fact, perhaps just to assist all of us, if you take the file that's in front of you and have a look inside behind divider 18 and on the screens for those who don't have the files immediately to hand --

MR JUSTICE GOSS: No, no, not that one. It should say number 2 on the spine. That's it.

MR MYERS: Thank you.

If you go behind divider 18. On the screens actually --

BREAREY: 18?

MYERS: Yes. It's tile 174 if you want to put it on the screens.

BREAREY: An observation chart?

MYERS: If you move forwards now, please, until you see in red letters 19317 in the bottom right-hand corner. Then you'll find yourself on the intensive care chart. It's on the screen as

well. This is just to confirm, so we can follow on our records, what you've described to us.

BREAREY: Mm-hm.

MYERS: It's a chart for 15 June. We can see 11 o'clock across the top. Can you see that?

BREAREY: Yes.

MYERS: We need to go down to the bottom just to see what you have referred to, right down. It's a little difficult to see there. It looks like:

"11.00, factor VIII."

BREAREY: That's correct.

MYERS: So that's the first point at which [Baby N] received factor VIII; is that correct?

BREAREY: It looks like it, yes.

MYERS: Did he actually receive factor VIII again whilst he was on the unit from what we see here?

BREAREY: I believe so later that evening, yes.

MYERS: Later that evening?

BREAREY: Yes.

MYERS: Can you help us with a time?

BREAREY: I think it was around about 8 pm.

MYERS: 8 pm or thereabouts. Thank you.

I'm going to ask next if we can turn to the question of the intubations that took place. We've got a note from [Dr D], which actually sets out the history of the intubations. I'm going to ask if we can put that up. It's on tile 421.

Let me correct the reference. It's not that one.

420, thanks, Mr Murphy.

These are notes that you're familiar with, aren't they, Dr Brearey because you have had the opportunity to look at these --

BREAREY: Yes.

MYERS: -- in reviewing the case?

We can see the list of doctors who had attempted to intubate [Baby N], although we also know that that morning [Dr A] had had three attempts as part of his effort to intubate [Baby N].

BREAREY: Mm-hm.

MYERS: Where we can see "myself", which is [Dr D] -- can you see that?

BREAREY: Yes.

MYERS: It says:

"Cords seen by [it seems] very anterior and obstructed by red swelling inferior to epiglottis."

Can you see that?

BREAREY: Yes.

MYERS: You made the observation that:

"So far as cords being anterior are concerned, that could just be an anatomical feature of [Baby N]'s throat in that area."

BREAREY: Yes.

MYERS: The red swelling is something else that we are considering.

BREAREY: I think in retrospect, although an anterior larynx was suspected, I do know that [Baby N] had an ENT review and endoscopy at Alder Hey subsequent to his care, immediate care there, which didn't show any abnormalities with his airway.

MYERS: You attempted to intubate, didn't you? We see that.

BREAREY: Yes.

MYERS: Then the anaesthetic team, which is Doctors Campbell and Johnson, did you say?

BREAREY: Jameson.

MYERS: They attempted to and were unsuccessful?

BREAREY: That's correct.

MYERS: An intubation like this, it's one that any one of these practitioners should have been able to do; do you agree?

BREAREY: Yes, under normal circumstances. But if there was swelling there and a tube couldn't be passed or couldn't be seen or the cords couldn't be seen because of the swelling, then clearly that made it not possible for quite a large number of very experienced and very highly skilled professionals that don't usually have any problems intubating a baby of this size and gestation.

MYERS: It's something that should be possible to do, isn't it?

BREAREY: In normal circumstances.

MYERS: You can perhaps only speak for yourself at this point, but when you say unable to intubate, is that unable to intubate because you can't see the route through to intubate or because there's an attempt to introduce the endotracheal tube, but for some reason you just can't get it through the epiglottis -- past the epiglottis?

BREAREY: I think it's more likely to be the view.

MYERS: The view?

BREAREY: Because with a baby with haemophilia -- all these professionals were very aware of that and wouldn't want to traumatise that area by trying to put a tube in something that they couldn't see. So they'd be wanting to see the gap between the vocal cords so they could place a tube and if they couldn't see that they wouldn't attempt it blindly.

MYERS: That's right. If there's something obscuring that view, you wouldn't just have a go and hope for the best?

BREAREY: No, absolutely.

MR MYERS: Thank you, Dr Brearey.

Re-examination by MR ASTBURY

MR ASTBURY: You were asked about doses of factor VIII, Dr Brearey. Could I just ask Mr Murphy to go to tile 394, please. It's a note from [Dr D]. We can see, next to the hole punch on the right, factor VIII, second dose of -- is that 85 units?

BREAREY: Correct, yes, given at 20.25.

ASTBURY: Thank you.

BREAREY: It's worth saying that the timings of the factor VIII don't explain why [Baby N] deteriorated repeatedly that night.

ASTBURY: Why do you say that?

BREAREY: Well, you know, I've talked about my uncertainty about the diagnosis of pulmonary haemorrhage. There wasn't evidence of pulmonary haemorrhage on the chest X-ray.

The ventilator settings were very minimal, he was in very minimal support, which would be exceptionally unusual for that. Pulmonary haemorrhage isn't associated particularly with babies that are born with haemophilia. Babies born with haemophilia are at high risk of brain bleeds, intracranial haemorrhage, and they're at risk of oozing of the umbilical cord because that's been cut. The main problem is because the brain is being squashed through the birth canal, it's a traumatic process, the birth. But you wouldn't expect a baby who had been in air, feeding normally, on no respiratory support, to suddenly have a pulmonary haemorrhage because there's no stress on the lungs to cause a bleed.

ASTBURY: Right.

BREAREY: At the beginning of the evening, I don't believe there was even an NG tube that was in this baby causing any trauma either, because the baby is ready for home, the baby was cleared and ready for home the day before. So I can't see a reason why this baby collapsed and deteriorated on the multiple occasions he did -- [Baby N] did in the course of that evening. I can't see it.

I think it's highly unlikely that -- I can't think of a natural cause for why this would have occurred.

I've told you the respiratory status of the baby was relatively stable and the baby improved, [Baby N] improved dramatically 3 days after being in intensive care at Alder Hey. There were no anatomical abnormalities identified by the ENT team or the cardiac team, who looked at the heart and the blood vessels.

We know there was no evidence of an infection and although blood was seen in the oropharynx, it must have been a small amount of blood because the haemoglobin levels were normal in this baby. So I can think of no natural, normal cause for why [Baby N] deteriorated multiple times as he did and then improved so dramatically afterwards.

ASTBURY: By afterwards, you mean once he'd been transferred?

BREAREY: Exactly, yes.

MR ASTBURY: Does my Lord have any questions?

Questions from THE JUDGE

MR JUSTICE GOSS: At the very beginning you said there wasn't any evidence of pulmonary haemorrhage on the X-ray.

BREAREY: Mm-hm.

MR JUSTICE GOSS: Could pulmonary haemorrhage be excluded then completely?

BREAREY: Not entirely excluded on X-ray. But it was reported by a paediatric haematologist who is used to reporting on newborn babies' X-rays and there was no evidence in the report -- on either report of the two X-rays [Baby N] had of any evidence. I mean, I did a literature search prior to coming to court, looking for reports of pulmonary haemorrhage in preterm babies or newborn babies with haemophilia and I could only find one report in 2021 claiming to be the first report of a baby with haemophilia who had pulmonary haemorrhage, but that baby was 29 weeks, it was born 10 weeks -- sorry, 5 weeks earlier in gestation, much smaller than [Baby N] was, and much smaller and had been on a ventilator for a week prior to that pulmonary haemorrhage.

So you know, this is exceedingly rare and for [Baby N] to be in air, not needing any respiratory support --

MR JUSTICE GOSS: No need to repeat yourself.

BREAREY: It just doesn't -- it's so, so very rare.

MR JUSTICE GOSS: It was just at the very beginning of that answer you said that and I just wanted to be clear as to the extent it could be excluded or not. Thank you very much.

MR ASTBURY: Thank you.

MR JUSTICE GOSS: Again?

MR ASTBURY: Yes, we think we'll see Dr Brearey again.

MR JUSTICE GOSS: Thank you very much for coming and giving evidence. You will be coming back, so please don't talk to anyone about this case in the meantime.

(The witness withdrew)

MR ASTBURY: My Lord, Dr Francis Potter.

DR FRANCIS POTTER (sworn)

Examination-in-chief by MR ASTBURY

MR ASTBURY: Could we begin with your full name, please?

POTTER: I am Francis Anthony Potter.

ASTBURY: Thank you. And your occupation, please?

POTTER: I'm a consultant paediatric anaesthetist.

ASTBURY: Thank you. Did you become a consultant paediatric anaesthetist back in 1996?

POTTER: I did, yes, 1 April.

ASTBURY: Thank you. We'll put that date aside for a moment! Was that at Alder Hey?

POTTER: Yes.

ASTBURY: And have you worked there ever since?

POTTER: I have.

ASTBURY: Do you have a particular interest in your practice?

POTTER: My particular thing is paediatric intensive care --

ASTBURY: Thank you. Do you have particular experience with airway difficulties?

POTTER: Yes, I do. Of the group of consultants on the intensive care unit, I have the most experience of airway problems.

ASTBURY: Are you talking about Alder Hey amongst that group?

POTTER: Yes.

ASTBURY: How many paediatricians are we talking about?

POTTER: I think it's 10 or 11 full-time equivalent.

ASTBURY: You've been asked along today to assist us with your treatment of a baby by the name of [Baby N] --

POTTER: Yes.

ASTBURY: -- as long ago as 15 June 2016.

POTTER: Yes.

ASTBURY: Now, do you have any independent recollection of [Baby N]?

POTTER: I remembered the case quite -- well, bits of the case very well because it was quite unusual. Normally, children from other hospitals who need intensive care at Alder Hey, the usual process is for the hospital who have got the problem patient to contact what's called NWTs, that's the North-west Paediatric Transfer Service.

ASTBURY: Yes.

POTTER: And they ring us to check that we've got a bed, but NWTs actually send out an ambulance and a team of either a registrar or consultant from NWTs to the hospital and bring --

ASTBURY: We've heard a little bit about that system. Are you leading up to say this was a little bit different?

POTTER: This was a bit unusual. I can't remember now whether we got the call directly from NWTs or whether it was from Chester. But they said that the problem was that they had this child who was ill and needed to come to Alder Hey for intensive care, but they couldn't intubate him.

ASTBURY: Right. I'm going to ask you to pause there. Have you checked the notes during the course of the preparation of your statement?

POTTER: Yes.

ASTBURY: Would it assist to see some notes as we go along?

POTTER: Yes.

ASTBURY: I'm going to ask Mr Murphy, who's behind me, to put up tile 291, please, just with regard to who contacted you.

If we go behind it, please, and scroll down.

So certainly by 6 o'clock, I think that's a phone call from you; is that right?

POTTER: From what that said, yes.

ASTBURY: I think if we go down a little bit, I'm not sure whether it's this page, you'd certainly been contacted by 6 o'clock?

POTTER: Yes.

ASTBURY: We can see some of the arrangements that were being made if that assists you.

POTTER: Yes. Basically, this call had come through to the ICU at Alder Hey and they'd explained the situation, that they had been -- they'd attempted to intubate this baby and hadn't been able to do so. And I knew some of the people involved in that.

ASTBURY: At Chester?

POTTER: At Chester. That was [Dr C], who was one of the consultant paediatricians there, and Dr Brearey. They'd both worked at Alder Hey for about 6 months on the intensive care unit, so I knew them reasonably well.

When I heard that they had had trouble intubating this child, I realised that -- I surmised that this would be a genuinely difficult case.

ASTBURY: Right.

POTTER: So I thought then that the best way of dealing with this would be for me to go out to Chester to intubate the child.

ASTBURY: Is that what you did?

POTTER: Yes. Again, I was anticipating that this would be very difficult, so I have taken some -- I drove out to Chester, taking some specialist equipment with me. That was a very small, flexible telescope that you can use for intubating someone who is difficult to intubate. So rather than using a conventional laryngoscope, I was taking out a special bit of kit to do so.

ASTBURY: Right.

MR JUSTICE GOSS: Was that a flexible bronchoscope?

POTTER: Yes. You can call it different things, but a flexible --

MR JUSTICE GOSS: I'm just looking at the note, that's all.

POTTER: Yes, that would be a flexible bronchoscope.

MR JUSTICE GOSS: Right.

MR ASTBURY: Thank you. So you made the decision to set off from Chester, you selected some kit to take with you.

POTTER: Yes.

ASTBURY: You were given, were you, before you left, a summary of the issues that were the problem? I think you were told that [Baby N] was suffering with apnoeas; is that right?

POTTER: Yes.

ASTBURY: Did that strike you in itself as problematic?

POTTER: No.

ASTBURY: That the team at Chester had been unable to intubate his windpipe. There was a concern of a pulmonary haemorrhage. Were you told that?

POTTER: Yes, I remember that, yes.

ASTBURY: And that he was having his airway supported but was breathing for himself?

POTTER: Yes.

ASTBURY: So we've just looked at the note a moment or two ago.

A [Dr D] noted that you arrived at Chester at 19.15 hours. Does that accord with your recollection?

POTTER: Um... I can't recall at this distance exactly what time it was.

ASTBURY: Do you recall having anyone with you when you went to Chester?

POTTER: Again, I can't quite recall. Another of my consultant colleagues on the paediatric intensive care unit, Dr Ben Lakin -- and I can't quite recall if he came in the car with me -- and possibly an ENT surgeon from Alder Hey came with us as well. But I really -- I know that Dr Lakin was at Chester during the actual time we were there. I can't quite recall how he got there.

ASTBURY: Okay. That may not be important. Don't worry about that.

If we can go next, please, to tile 316. These tile numbers are just to assist with our presentation, Dr Potter, if you'll bear with me when I'm shouting these numbers out.

I think this is a nursing note which suggests that you arrived between 7.00 and 7.15. Do you recall what you did when you first arrived?

POTTER: Yes. I got the special intubating bronchoscope out of my car and went into the paediatric block at Chester and I started -- I may have briefly -- I can't recall absolutely. I may have briefly seen the patient but I do remember that we started to get the stuff ready for doing a fibre-optic intubation, so I was assembling the kit.

ASTBURY: I think you told us about the -- I'm not going to attempt to say it -- the flexible tube that you can use?

POTTER: Yes.

ASTBURY: Which is a little more sophisticated than the laryngoscope that we've heard about?

POTTER: Yes. Normally, you use a laryngoscope, which is a sort of C-shaped bit of metal that you insert into the mouth to light up the view of the voice box, the larynx.

ASTBURY: We've heard a little bit about that. What was the advantage of your bit of kit?

POTTER: Well, with the kit that I have, a fibre-optic scope, it's very flexible and you put the scope down the tube that you want to pass into the windpipe through the voice box and then you can look through the scope and either pass that, usually through the nose, through the nose, through the back of the mouth, view the larynx, view the voice box, pass the scope into the windpipe and then you pass the tube -- the tube is mounted on the scope -- and you then just wriggle the tube in over the scope into the windpipe.

ASTBURY: So it's guided through?

POTTER: Yes.

ASTBURY: Did you get that far? Did you get to look at the voice box using that equipment?

POTTER: No. As I was -- I was still assembling the fibre-optic scope, because that needs its own light source and that all needs to be assembled. As I was doing that, the sort of -- the arrest bleep went off for this baby.

ASTBURY: Can you recall where you were at that point?

POTTER: I was in a room immediately near the baby.

ASTBURY: So within the vicinity (overspeaking).

POTTER: I think I must have been within the unit, yes.

ASTBURY: But not in the same room?

POTTER: Not when the arrest bleep went off.

ASTBURY: Okay.

POTTER: When I say the arrest bleep, I mean someone -- I don't know whether -- exactly if there was a bleep or whether someone physically came into the room and said the child's arrested.

ASTBURY: Was anyone with you while you were doing that?

POTTER: There would have been -- I think Dr Lakin was probably with me by then. Anyway, when I heard that, I left the scope and went in to where the child was.

ASTBURY: What did you find? What did you initially find?

POTTER: The baby had a -- was mottled and greyish.

ASTBURY: Did you make a note of this at the time?

POTTER: Not directly at the time, but shortly afterwards I've noted what I'd seen.

ASTBURY: Perhaps, rather than ask you to remember every detail, would it help to see your note?

POTTER: Yes.

ASTBURY: Could we have page J19382, please, Mr Murphy. We'll enlarge it. Do you recognise the handwriting?

POTTER: Afraid so.

ASTBURY: Okay. Is that:

"Called to see infant while preparing theatre for intubation"?

POTTER: Yes, I was preparing theatre for intubation.

ASTBURY: Just take us through your note, please.

POTTER: Right. So:

"Infant very pale and mottled. Bradycardic."

That means a slow heart rate, of 60 beats a minute.

That probably sounds normal to a layperson, but in a newborn baby that heart rate really isn't sufficient to have a circulation working properly.

ASTBURY: Okay. We've heard that's a point at which intervention follows?

POTTER: Absolutely. And in particular, because this baby also has an arterial oxygen saturation measured by that SPO2, it's less than 40, so it's no longer accurate down at those sort of levels, a pulse oximeter, but it suggests the child was very, very short of oxygen. And by the time your heart has slowed from being short of oxygen, you are at the point of arrest, so something needs to be done immediately in that circumstance.

ASTBURY: Okay. So what follows?

POTTER: I think from that, it says the child was still making some respiratory effort and it had an LMA, which means a laryngeal mask airway. That was in the child's mouth, acting as an airway. So that laryngeal mask sort of points towards the voice box, but doesn't pass through the voice box.

ASTBURY: We've heard a little bit about that. So what (overspeaking) --

POTTER: I took that out and held a face mask over the child and then artificially -- tried to artificially ventilate the child using what's called a bag and mask circuit.

ASTBURY: Okay. Do you remember anyone who was with you at that point?

POTTER: No.

ASTBURY: All right. So bag and mask. Did that have a positive effect?

POTTER: It didn't really. I think I noted there, the SPO2 was not really improving.

ASTBURY: That's the oxygen saturation which is below 40?

POTTER: Yes. So at that point we started doing ECCM, that means we did external closed chest cardiac massage, so we then started --

ASTBURY: CPR --

POTTER: CPR.

ASTBURY: -- as we call it?

POTTER: On this baby, yes.

ASTBURY: Carry on with your note, if you don't mind.

POTTER: So the child is given some adrenaline. I presume the child -- from that, the child must have had some IV access.

ASTBURY: Yes.

POTTER: But through a peripheral line because normally you'd use 1:10,000 adrenaline in an arrest situation but we're using a slightly more dilute form of adrenaline, 1:20,000, which is giving a bigger volume.

ASTBURY: We can see, "Right foot peripheral line"?

POTTER: Yes. The pulse then speeded up but the SpO2 remained low. So the pulse increasing in speed is what you'd expect having given the child adrenaline, but really, the child is still very hypoxic because we haven't got a good airway at this stage.

ASTBURY: Then is that "direct" --

POTTER: I then used an ordinary laryngoscope to look into this child's mouth and I could see the back half of the voice box.

ASTBURY: Okay. Describe to us what you saw. Was there anything unusual about what you saw?

POTTER: Um... No. There was no... What I feared was seeing a lot of blood and sort of a distorted picture because I knew that this child had had multiple attempts at getting this tube in, in the way that I was doing it.

ASTBURY: Yes.

POTTER: And I think by that time, I also knew that there'd been talk of the pulmonary haemorrhage and I'm pretty sure that even by this time I knew that the child's mum was a haemophilia carrier so there was a 50% chance that this child would have haemophilia.

ASTBURY: Right.

POTTER: So if there had been any trauma to the voice box or any of the structures inside the mouth, there was a reasonable chance of blood being there. I can recall that -- I couldn't recall, if -- that's like a double negative... I recall at the time thinking, well, there's no blood here. I could see the arytenoid cartilages which mark the furthest back part of the voice box and so I was able to pass a bougie, which is a sort of very, very thin plastic stick, flexible stick, between the arytenoid cartilages, through the hole, as it were, in the voice box.

ASTBURY: And that's the --

POTTER: Having got that bougie in, I was then able to pass a tube over the bougie into the windpipe.

ASTBURY: Is that a similar principle to -- you were telling us about?

POTTER: Yes.

ASTBURY: The tube goes over the guide --

POTTER: Yes.

ASTBURY: -- and you're able to slide it over the top?

POTTER: Yes.

ASTBURY: Okay. So you were able to visualise the relevant point, if I put it that way --

POTTER: Yes.

ASTBURY: -- in the voice box behind the two structures that you told us?

POTTER: Yes. So the voice box has these -- the voice box (inaudible) hole like that (indicating). And what I was looking at were these two structures here, the arytenoid cartilages. So I knew the -- you know that you've put a tube into the -- through the voice box and into the trachea, into the windpipe if you can see the tube passing in front of those cartilages and not behind those cartilages. Behind those cartilages you're passing a tube into the gullet, into the food pipe, and you can't ventilate the lungs if the tube is in the food pipe.

But I could see that first the bougie and then the tube over it had passed anterior to those cartilages and were lying then in the windpipe. And that was confirmed then because you

get -- carbon dioxide only comes out of the windpipe, not out of the food pipe, and they had a little device that changes colour when it's exposed to carbon dioxide.

ASTBURY: Is that a capnograph?

POTTER: We were able to put that on the tube and with this carbon dioxide that came out of the lungs, that changed colour, so we knew that the tube was in the windpipe.

ASTBURY: So I think the rest of your note talks about the bougie inserted and three --

POTTER: A size 3-millimetre tube.

ASTBURY: Is that "railroaded"?

POTTER: Was railroaded, yes, over, over the bougie.

ASTBURY: All right. And then is that "hand ventilation"?

POTTER: "Hand ventilation in 100% oxygen, good chest movement, positive CO2 colour change, but only slow improvement of the saturation beyond the 60s."

So you'd expect, if the child was entirely well and we've intubated it and you're ventilating the child in 100% oxygen, you'd expect the saturation on the oximeter to be 90-plus. This one was still in the 60s, so it was going up, but it was still pretty low.

ASTBURY: Do it take it from that you'd have expected it to go up quicker?

POTTER: Yes.

ASTBURY: If we can scroll down to the rest of your note.

Is that, "Given sodium bicarbonate"?

POTTER: He was given sodium bicarbonate, a bolus of that, because the child -- the assumption is that the child would be very acidotic having been without oxygen or with a very low oxygen for so long, and it's just immediately sort of post an arrest situation. And we've then given -- an adrenaline infusion was then started via the peripheral line. So having given boluses of adrenaline, we're now giving a continuous infusion of adrenaline.

ASTBURY: Right.

POTTER: By this time the NWTs team had arrived.

ASTBURY: Yes. This is the transport team?

POTTER: That's the transport team. So the transport team will have come from Warrington, their base, and I come from Alder Hey, so by this time everyone who was needed was there.

ASTBURY: Just before that, we've got tube fixed; is that right?

POTTER: Yes.

ASTBURY: Then just take us through the next part, please.

Is that, "IJ line"?

POTTER: Yes. So we've got the adrenaline running through a peripheral line. Adrenaline causes the blood vessels to constrict a lot and you really -- a drug like adrenaline should be given via a central line, that's a big venous -- a big vein, essentially, that runs pretty directly into the heart so that you can be absolutely sure that the child is getting the dose of adrenaline that you think you are giving it. So I think I inserted that right internal jugular line (indicating).

ASTBURY: So that's into -- you're pointing to your neck. That's into the neck?

POTTER: Yes. It's into the jugular vein in the neck. As I say, the NWTs team has arrived and the doctor with the NWTs team, Chris Goodwin, then looked to pass an arterial line into the femoral artery in this child. This is standard intensive care monitoring and a standard way of giving an intensive care infusion of a drug like adrenaline. He actually struggled a little bit to get that arterial line in so I ended up taking over from him in doing that. And then we had the arterial line in so we could measure the child's blood pressure and do arterial gases and make any further alterations into the dose of adrenaline that we had to give to maintain a good circulation and giving the child fluid. And then basically, they were sort of preparing to move the child then from Chester to the intensive care unit at Alder Hey.

ASTBURY: So at that point, presumably the transport team take over?

POTTER: Yes.

ASTBURY: Would you then have really concluded with your treatment of --

POTTER: Yes, I think I -- yes. Having established that the transport team were quite happy to transport the child to Alder Hey, I then left and went home.

ASTBURY: Okay. In preparing your statement, you've told us that you're a consultant at Alder Hey. You've also summarised [Baby N]'s progress after he'd arrived at Arrowe Park; is that right?

POTTER: After Alder Hey.

ASTBURY: Yes.

POTTER: Yes. It was fairly uneventful, basically. By the time he got to Alder Hey it was just after midnight, so it's then down as the 16th.

ASTBURY: Yes.

POTTER: He had remained on the adrenaline infusion following this episode of effective cardiac arrest that he'd had at Chester. But my colleagues were able to fairly quickly decrease the amount of adrenaline that the baby was requiring to maintain his circulation overnight. He needed ventilation but in not very much oxygen and not very high pressures over the course of that night and the following day, I think into the following day. But he was able to be fairly rapidly taken off the ventilator. So he's only on the intensive care unit for, I think, about 48 hours, something like that and was able to go from the intensive care unit to the high dependency care unit by the Saturday. So this -- I've been involved with this child on the Wednesday evening and then by the Saturday he's able to leave ITU.

ASTBURY: Right. Okay. Your note and your statement is he's breathing for himself by the afternoon of the 18th?

POTTER: Yes.

ASTBURY: All right. Did he continue to suffer with episodes of apnoea?

POTTER: Yes, he did. They were less frequent and altogether less troublesome, but they did require some further investigation.

ASTBURY: Right.

POTTER: Apnoea in a child of this age is one of those things that can be simply a sign that the child is unwell for many reasons, really, or you can have specific reason, some specific reason why the child might have apnoea.

I think that the child ends up being given, I think, some -- on the ward is given a medication to guard against apnoeas and to decrease their frequency. That's caffeine.

ASTBURY: Yes.

POTTER: That was kept on for a good few days and then stopped and then they just observed the child. But then I think subsequently, the child ended up being readmitted to Alder Hey, but not to the intensive care unit.

ASTBURY: No.

POTTER: But was readmitted for some further investigation of these apnoeas, which he had by means of -- he has, I think, an MR scan of his head, looking at the brain, to see if there was anything specific within the brain that might give rise to apnoeas, and there wasn't. He also had an ENT examination of his voice box and trachea to see if there was anything there that might give rise to problems with apnoea, and again that drew a blank.

ASTBURY: Any abnormalities detected on that particular examination?

POTTER: I don't think there were, no.

ASTBURY: From what you saw on the evening of the 15th when you successfully intubated [Baby N], are you able to say what may have caused the problems or did you not see anything?

POTTER: It wasn't an entirely straightforward view of the voice box. You would normally, in a baby of this size, expect to be able to see pretty well all of the voice box quite clearly and I was only able to see the back half of the voice box. It's possible to have completely normal anatomy and still be not entirely -- still have a not entirely normal view of the larynx, the voice box.

Getting a good view of the voice box with an ordinary laryngoscope depends on being able to push the tongue forwards and out of the way.

Now, your tongue in fact isn't just the top bit you see in your mouth, it's sort of got -- it's sort of an inverted L shape, your tongue. You need to be able to move the vertical bit of the tongue forwards and it's attached to your lower jaw. So if your lower jaw is a bit receding, a bit backwards, then there isn't room to push the tongue forwards. And if you can't push the tongue forwards, you can only see the back half of the voice box.

Now, this can be occasionally just the way things are, particularly in a newborn, and then as the child grows in size, the jaw itself may even fractionally just move a little bit further forwards and you can then see the voice box more clearly when you look in with a conventional laryngoscope.

In fact, I noted that this child, [Baby N], came back for an operation when he was 9 kilos, having been 1.7 kilos at the time I saw him. He was intubated by one of my colleagues and she said that, again, it was straightforward but there needed to be some external pressure on his neck to push his voice box back that little bit more so that she could get an entirely clear view of his voice box.

So I took it that he was just one of these infants in whom the view is more difficult than usual but they sort of easily grow out of it rather than having any specific anatomical problem with the voice box.

ASTBURY: Do you recall when you came to intubate him that evening whether there was any swelling of the epiglottis?

POTTER: I can't recall that. Basically, in this sort of situation, what you're looking for is the hole and you want to get the tube in the hole. What's surrounding it, you're less interested in.

MR ASTBURY: I have no more questions. If you could wait there, please.

Cross-examination by MR MYERS

MR MYERS: Just to reassure everybody, I'll be about 15 minutes, my Lord, Dr Potter. This is the slot I have.

It was apparent to you, wasn't it, when you got to the unit that a number of practitioners had attempted to intubate [Baby N] and they just hadn't been able to do so?

POTTER: Yes.

MYERS: You'd been informed that there'd been an issue with that before you went, hadn't you?

POTTER: Yes, I knew that they'd had trouble intubating this child before I set off from Alder Hey; that's why I took the specialist equipment.

MYERS: The bronchoscope and things like that?

POTTER: Yes.

MYERS: All right. Just getting right down to the question of the intubation, when it came to you dealing with it, you really didn't encounter great difficulty, did you?

POTTER: It wasn't the most straightforward I've ever done, it was more difficult than usual, but, no, I didn't have great difficulty in doing it.

MYERS: You didn't need to use a bronchoscope as it happens, did you?

POTTER: No.

MYERS: So you were able to do this using a laryngoscope, which is the piece of equipment the doctors at the unit had used?

POTTER: Yes.

MYERS: You were able to use, was it a 3-millimetre -- a 3.0 tube?

POTTER: Yes. A 3-millimetre internal diameter tube to intubate the child's voice box.

MYERS: Which in your view, I'm looking at your statement here, is pretty unremarkable for an infant of his size?

POTTER: Yes, for a 1.7-kilogram infant you'd expect to get a 3.

MYERS: Nothing from your experience that got in the way of you being able to intubate as it happens?

POTTER: No.

MYERS: And as we've seen your note, certainly no reference to any swelling at the time that you dealt with it?

POTTER: No.

MYERS: And no reference to any blood?

POTTER: No.

MYERS: So let me put it this way: for you, it was something you managed to do with relative ease. I'm not suggesting it was easy, but with relative ease?

POTTER: Yes.

MYERS: And nothing like as complicated as you'd expected from what you'd been told beforehand?

POTTER: That's correct.

MYERS: That's for you. On the other hand, was it your assessment when you look at all of this that for doctors who don't have the experience that you have, it may have presented some challenges?

POTTER: Yes.

MYERS: All right. And a doctor without your experience, or with less experience, might find this difficult if not impossible to do; was that your view?

POTTER: Yes.

MYERS: You have just explained to us a feature of [Baby N]'s anatomy as best as you can recall that.

POTTER: Yes.

MYERS: Which was that it was more difficult, was it, to get a view at a certain part of his voice box looking down into the trachea?

POTTER: Yes, to see the voice -- to get a tube into his windpipe, you have to see -- the opening is the voice box. The opening to the windpipe is within the voice box. So you have to get a good view of the voice box to get a tube in the windpipe. To get a good view of the voice box, it's necessary to move both the tongue and the epiglottis out of your line of sight. And I think in [Baby N]'s case, it was more difficult to do that than usual in a baby.

MYERS: And that's something that can follow simply from the way that his tongue and the soft tissues around that part of the body were structured at that time in his life?

POTTER: Yes.

MYERS: Notwithstanding that, would you expect that, for instance, consultants in a neonatal unit would be able to deal with this?

POTTER: Um... Yes. Most of the time, yes.

MYERS: All right. One of the matters you described, which informs your view of [Baby N], was that there was an operation he had when he was 11 months old, wasn't there?

POTTER: Yes.

MYERS: You made reference to that. Was it Dr Rodrigues, your colleague, who said it wasn't entirely straightforward dealing with the intubation?

POTTER: Yes, she'd just made a little note on the anaesthetic sheet that she wrote at that time, saying he needed cricoid pressure, that is external pressure on the neck, to press the voice box back a little bit to make it easier to get the tube in.

MYERS: So that's called cricoid pressure?

POTTER: Yes.

MYERS: And that's just down on the lower part of the trachea, is it --

POTTER: The upper part (overspeaking) --

MYERS: -- near to the Adam's apple?

She needed to do that to make it work with [Baby N] when she did the intubation?

POTTER: Yes. But that's... That might be the case in 5%, 10% of cases that we do.

MYERS: Did you need to use cricoid pressure at all yourself when you dealt with [Baby N] initially or can you not recall?

POTTER: I can't recall. I probably did, but I can't quite recall.

MYERS: It's something you would understand might be necessary in dealing with a child in that situation if it's a little difficult to visualise?

POTTER: Yes.

MYERS: And that comes from your experience, the level at which you work?

POTTER: Yes.

MYERS: Just something slightly different, Dr Potter. If a baby, a neonate, undergoes a series of intubations or attempted intubations, can that series of intubations in itself add to the physical stress upon the baby?

POTTER: Sorry? I don't quite... I don't understand what you mean by physical stress.

MYERS: The easiest thing is can I ask you to look at page 3311 of your statement. I'm going to ask Mr Murphy to put up page 3311 so you have it in front of you. It's a statement you made on 9 April 2019.

POTTER: Yes.

MYERS: It's the fourth page and it's just the paragraph that starts:

"It is important to consider the circumstances..."

POTTER: Yes.

MYERS: I'm just going to ask you to read that paragraph to yourself and then I'll just go over with it you, please.

POTTER: Yes.

MYERS: That was quick. Have you read it?

POTTER: Well, I'm very familiar with it.

MYERS: Okay. You make the observation that:

"An initial failure [this is to do with intubation] is likely to have produced a fall in the baby's saturation..."

POTTER: Yes.

MYERS: "... (which may have been lower than normal here to begin with), which almost invariably adds stress to the next attempt. And even putting stress apart, it's now well recognised that views at difficult laryngoscopy tend to deteriorate with repeated attempts."

POTTER: Yes. So what I meant by that was, it's stress on the part of the person trying to intubate.

MYERS: Sorry, I misunderstood that.

POTTER: If you're trying to get this tube in to maintain the life of an infant and you go to a -- and you expect to be able to do this straightforwardly, and you look in and it's not straightforward, and you do what you think should produce the desired results, the tube passing into the windpipe, and it fails, so you then sort of re-group and try and do it again and in the meantime you can hear the saturation falling from the

note on the oximeter and you're looking again and you may not be able to see any of the structures that you want to see in order to get this tube in and you're aware that the baby's oxygen levels are falling and you're trying to stay calm and simply intubate the windpipe again.

If you're failing to do that then everything becomes more difficult and you're aware that the oxygen saturations are falling and that the child's in front of you and the child's going a little bit blue and its heart rate is falling and you're aware that if things go on like this for much longer, the child is going to have a cardiac arrest. So you have to stay calm in that situation or try to.

It is known now that -- it's been demonstrated in a number of studies that your best chance of intubating an infant is your first attempt, as it were, and failure makes the second attempt more difficult and the third more difficult and it just becomes a law of diminishing returns. There has been in general throughout the whole of anaesthesia an idea that rather than making repeated attempts at intubation, attempts at intubation are limited and you then rapidly move to getting someone with more experience to do the job rather than repeatedly trying.

MYERS: Thank you for explaining that. In this case, of course, we know that, because you explained how for an individual practitioner it may become difficult with repeated attempts.

POTTER: Yes.

MYERS: Of course one feature of this case is there was a whole series of practitioners who all had attempts to intubate [Baby N], weren't there?

POTTER: Yes. That's why I was anticipating that this would be very difficult because I knew at least some of the people involved and I thought they were pretty competent.

MYERS: What was the word, sorry?

POTTER: Pretty competent and would be able to, you know...

MYERS: You would expect it?

POTTER: Yes.

MYERS: Finally this, Dr Potter: you were asked some questions just about [Baby N] after the key date that we've just been looking at.

POTTER: Yes.

MYERS: [Baby N] was judged safe to go home on 26 June 2016.

POTTER: Yes, that was a typo --

MYERS: Right.

POTTER: -- on my part, I think.

MYERS: He was readmitted to Alder Hey, having been at home on 3 July 2016, wasn't he?

POTTER: Yes.

MYERS: There had been further episodes of apnoeas and abnormal movements when he was readmitted, hadn't there?

POTTER: Yes.

MYERS: And he was given breathing support with CPAP and then a number of investigations were undertaken to look for causes for those apnoeas, weren't they?

POTTER: Yes.

MYERS: But there was nothing conclusive by way of a definite cause that could explain those; is that right?

POTTER: Yes, that's how I would interpret the note.

MYERS: And in any event, in due course, that settled and there was no continuing problem so far as you're aware?

POTTER: That's the case.

MR MYERS: Thank you, Dr Potter.

MR ASTBURY: I have nothing arising. Does my Lord have any questions?

Questions from THE JUDGE

MR JUSTICE GOSS: Just one question, and you may or may not be able to answer this: would the administration of adrenaline and/or steroids have any effect on swelling?

POTTER: Um... Possibly. Do you mean the fact that the child had been on adrenaline, which would reduce swelling to an appreciable degree between... Certainly not between the previous efforts at intubation and mine.

MR JUSTICE GOSS: Right.

POTTER: There would not have been time for that --

MR JUSTICE GOSS: To have had any effect?

POTTER: Any effect, I don't think.

MR JUSTICE GOSS: Steroids?

POTTER: Again, this had been done. The effects would be fairly marginal in that sort of time course between the last effort on the part of the anaesthetists at Chester and my attempt. I don't think that steroids would have had time to have made a substantial difference to any swelling.

MR ASTBURY: My Lord, there is another medication that was administered, dexamethasone.

POTTER: That's a steroid. But I would be very surprised if that had sufficient time to --

MR JUSTICE GOSS: Do you know when it was administered and how many times?

POTTER: No.

MR JUSTICE GOSS: Right.

MR ASTBURY: 17.35.

POTTER: Right. I'm not sure what time I intubated.

MR ASTBURY: You arrived at 19.15. I'm not sure what time you actually...

POTTER: Right. So you wouldn't really expect -- no it, wouldn't make... It certainly wouldn't make a difference such that you'd say, that was very badly swollen and now it isn't. I don't think there would be that --

MR JUSTICE GOSS: No, I left it as an open, neutral question: any effect on swelling?

POTTER: Steroids such as dexamethasone do reduce swelling, but usually the time course for that effect is hours into a day or two rather than minutes.

MR JUSTICE GOSS: Well, it's not minutes. Here it's 2 hours.

POTTER: Even after a couple of hours, I would be very, very surprised if that had that sort of effect.

MR JUSTICE GOSS: Right. Thank you. Thank you very much.

That completes your evidence, Dr Potter, thank you very much. You won't be required again, so thank you for coming and helping us this afternoon.

(The witness withdrew)

MR JUSTICE GOSS: Right. That's it for today then.

Thank you, members of the jury. 10.30 tomorrow morning.

Thank you very much.

Please remember your obligations: no research, no communication.

(In the absence of the jury)

MR JUSTICE GOSS: Do you want to go down, Mr Myers?

MR MYERS: If we could briefly do so, we'd be grateful, if it's possible.

(4.33 pm)

(The court adjourned until 10.30 am on Tuesday, 7 March 2023)