

16 November 2022

Baby E

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Questions from THE JUDGE

Wednesday, 16 November 2022

(10.28 am)

(In the presence of the jury)

MR JUSTICE GOSS: Yes.

MR DRIVER: May we call [Dr C], please.

[Dr C] (sworn)

Examination-in-chief by MR DRIVER

MR DRIVER: Could you please state your full name for the record?

DR C: I'm [Dr C].

DRIVER: [Dr C], may I invite you to project your answers to the jury, although I'll be asking them in the first place at least.

Could you tell the jury of your occupational status, please?

DR C: I'm a consultant paediatrician at the Countess of Chester Hospital.

DRIVER: Could you confirm that that was your role back in 2015?

DR C: Yes, that was.

DRIVER: Thank you. I think you appreciate that you've been invited here this morning to answer questions that concern a patient within the hospital, a baby by the name of [Baby E] --

DR C: Yes.

DRIVER: -- who, as I'm sure you know, was born, together with his twin brother [Baby F], on 29 July 2015?

DR C: Yes.

DRIVER: Prior to answering questions from the police in the preparation of the making of a witness statement, were you given the opportunity to remind yourself of some of the details of the clinical records pertaining to that patient?

DR C: Yes, I was.

DRIVER: May I assure you that insofar as we go to any such records in this courtroom today, they will be displayed on the screen there, just to your right.

DR C: Okay.

DRIVER: If you wish to see any more, we have them there to be produced at request.

We understand, and could you confirm, that you were the on-call consultant for the neonatal department on the 3rd and 4 August 2015?

DR C: That's correct.

DRIVER: When on call, where would you reside?

DR C: Normally, I would stay in the hospital until about 7 or 8 pm that night, and once I was happy that all of the patients were stable and had an appropriate management plan, then the usual practice is that consultants are on call from home, but I live too far away, so I stay in the hospital accommodation, which is about 5 to 10 minutes' walk from the neonatal unit.

DRIVER: Thank you. Can you confirm that you were on site, by which I mean --

DR C: It's within the hospital site, but it's at the opposite end of the site.

DRIVER: Forgive me, I didn't make myself clear. I was inviting you to tell us whether you were actually within the unit.

DR C: I wasn't within the unit at the time after about 7 or 8 pm.

DRIVER: But prior to that --

DR C: Prior to that I had been and I would have had a handover from the junior doctors, so I would have been aware of all of the children on the neonatal unit and the paediatric unit and a summary of their clinical condition before I left the building.

DRIVER: Thank you for that.

I'm going to put something on screen now and ask the assistance of Mr Murphy, please. If you could take us to tile number 128, Mr Murphy.

This recreation, this presentation here, [Dr C], sets out a chronology of key events and entries made in the records. You can see the date here, Monday, 3 August 2015, behind which we have uploaded PDF reproductions of the actual notes.

DR C: Yes.

DRIVER: So you'll see there a description and if we go behind it, you'll see here an example of a note made by a junior colleague, Dr Thomas, in the upper part of the page, and a little further down, your colleague Dr Harkness, who I think you'll be able to confirm was the registrar on duty at that time.

DR C: Yes, he was.

DRIVER: Do you recall having communication and interaction with Dr Harkness on this date about the baby [Baby E]?

DR C: I do. It's not a particularly clear memory given the amount of time that's passed, but I do remember two phone calls and then subsequently attending the neonatal unit.

DRIVER: Thank you. Before we get to the phone calls, do you remember, and say if you don't, any discussion, exchange of information between you and Dr Harkness whilst you were on the unit prior to you going to the accommodation that you described already?

DR C: No. He would have been the night doctor, which meant he wouldn't have arrived until about 8.30, so I don't think I would have spoken to him prior to the telephone calls, and if I did I certainly don't recall that.

DRIVER: Thank you. If, Mr Murphy, we go to the bottom of the pages available on this particular screen. Forgive me, I'm

looking for -- towards the bottom of page J2555. So scroll up a little.

We have an entry from Dr Harkness, timed about 22.10 hours, which gives a description of his observations. If we scroll down to the bottom of this entry, we'll see it concludes with a note of him communicating with you.

DR C: Yes.

DRIVER: So let's just confirm that. We see, to the bottom of that entry, I think it's D/W, which is a doctor's abbreviation, isn't it?

DR C: Yes, it means "discussed with".

DRIVER: So:

"[Discussed with] [a standard abbreviation]. [Dr C] happy with plan."

I think.

DR C: Yes, his writing is not the easiest to understand, but it does say "happy with plan". He contacted me by telephone, explained the clinical situation, and his planned management plan, and I agreed that that seemed the appropriate thing to do. I always check, when I speak with one of the junior doctors on the phone, that they're happy with it just being a call for discussion and advice or whether they do want me to come in because sometimes they're not always confident enough to ask that, and he did confirm that he was happy with the situation and didn't need me to physically attend the unit at that point.

DRIVER: Thank you. Let's scroll back up and let's look at the recorded clinical situation, as you've described it, as noted by Dr Harkness. "ATSP"?

DR C: That's "asked to see patient".

DRIVER: So he was asked to see the patient. It reads?

DR C: "Re gastric", which means the stomach bleed.

DRIVER: Then thereafter, he's noted "large..."

DR C: "... very slightly bile-stained aspirate 30 minutes ago. Sudden large volume of fresh blood, approximately 14ml, as aspirate."

DRIVER: Pausing there. Between the words "blood" and the numerals "14", is that the abbreviation for approximately?

DR C: I think it is but I'm not 100% certain.

DRIVER: I'm grateful. Dr Harkness will be with us tomorrow, so he will be able to assist.

DR C: When that blood is an aspirate, it's usually not all blood, it's the stomach contents, the aspirate, and it all looks red because it's mixed with blood, but it wouldn't always be 14ml of just pure blood, if that makes sense.

DRIVER: We understand.

MR JUSTICE GOSS: 14ml of volume, not all blood, but --

DR C: Some of it will be stomach contents.

MR JUSTICE GOSS: -- and other dilutants?

DR C: Yes.

MR DRIVER: Thank you. The background, I think this is a background to the baby --

DR C: It is.

DRIVER: -- rather than the event?

DR C: Yes. It's reversed end-diastolic flow, which is the blood flow from the placenta to the baby. If a baby has reduced end-diastolic flow they haven't had as good perfusion from the placenta, a transfer of blood and nutrients, as they perhaps might have done. And then the following one is IUGR, which is intrauterine growth restriction, which means the baby hadn't grown as well in the womb as we would have liked, which is a consequence of the reduced placental blood flow.

Both of those factors mean that is the baby is more likely to have a problem with their bowel, known as necrotising enterocolitis or NEC, which is why Dr Harkness has noted them as being relevant. He's put:

"Re-screened for increased oxygen requirement yesterday."

That means screening for infection, doing blood tests, looking for infection and giving the baby antibiotics. And he notes that the CRP and inflammatory marker is less than 1, which is a sign that infection is unlikely, but we do always tend to be cautious

with small babies, and then that he's opening his bowels, which makes NEC a bit less likely.

DRIVER: So to review those four notes under the sub-heading "Background", the first two are indicators of a heightened risk for NEC?

DR C: Yes.

DRIVER: But numbers 3 and 4 are indicators inconsistent with the presence of NEC?

DR C: Yes.

DRIVER: Move on to the next entry, please.

DR C: That's mean blood pressure 48, which is a good blood pressure for a baby of his size. Capillary refill time of less than 2, which is a measure of the baby's perfusion and circulation, which is normal.

Heart rate, I think it says 140 to 100, which is again within sort of normal ranges. And sats 100% in 23% inhaled oxygen, which is a normal or very good saturation rate, but requiring a small amount of oxygen; room air is 21% oxygen.

DRIVER: Thank you. If Mr Murphy could take us further down the page or on to the next page, more accurately. The same note, effectively. Could you continue to assist?

DR C: Yes. That's O/E, which means "on examination". There's then some statements about the baby which says:

"Alert, pink, well perfused, capillary refill time less than 2."

That's a sort of standard thing we look at when first examining a baby, to get a sense of their overall clinical condition, which looks normal and healthy in that assessment.

Heart rate is normal. There's then a picture of some lungs with a line through, which means that the lung sounds and the breath sounds were normal -- actually I wonder if this first one is HS, "heart sounds normal", it's difficult to tell from Dr Harkness' writing.

Then:

"Abdo [which is short for abdomen] soft, not distended, and bowel sounds present."

Again, which is a normal examination.

DRIVER: So the plus symbol next to the letters BS, you interpret that as present?

DR C: Yes.

DRIVER: Thank you.

DR C: That's sort of standard medical documentation.

DRIVER: Thank you.

DR C: It says:

"AF normotensive."

AF is the anterior fontanelle, the soft spot on the baby's head. That's used as part of our assessment to see whether or not their circulation is okay, which it looks like from this assessment. Also if it's bulging it suggests there may be a problem like meningitis, which isn't mentioned on this assessment.

DRIVER: What does --

DR C: Normotensive is an expression that means that the blood pressure and the pressure is normal. So if a baby was clinically dehydrated or had low blood pressure, their fontanelle might be sunken.

DRIVER: Which is the opposite to normotensive in this context?

DR C: Yes.

DRIVER: Thank you. Next?

DR C: "Femorals ++."

Femorals are one of the pulses which are present in the groin and because of babies' fat distribution they're one of the central pulses that are easiest to feel. Because of babies' necks being quite thick, we don't often feel for carotid pulses in the neck in the way that you would do in adults. And the two pluses means both of the femorals were palpable, which means you could feel them.

DRIVER: Thank you. Finally for this description?

DR C: The triangle means diagnosis. So he said:

"GI [which is gastrointestinal] bleed, [query] cause."

And then he has moved on to a management plan.

DRIVER: Before we consider the plan, having kindly taken us through Dr Harkness' notes, do you recognise that as the clinical situation, to use your phrase, I think, that he conveyed to you by telephone?

DR C: Yes.

DRIVER: And thereafter, he proposed a plan in response to that clinical situation?

DR C: Yes.

DRIVER: Which was, please?

DR C: IV ranitidine, which is an anti-acid medicine.

GI bleeds in small babies can often be due to their stomach acid, so we sometimes use anti-acid medicines.

To add in metronidazole, which is an antibiotic that we use in cases of NEC, and in the brackets he's written "At risk of NEC" afterwards.

Again, the examination doesn't particularly support or doesn't support NEC at all at this point, but sometimes babies take a while to develop clear clinical signs and if we don't start treatment early then by the time they've developed clear signs things have deteriorated too far so we often tend to be cautious and start things like antibiotics early.

He's then written:

"Close observation and for a repeat full blood count in the morning."

Which is a blood test that measures, amongst other things, the haemoglobin, the red blood cells. If someone's had a bleed you can't measure their full blood count too soon because if you lose a volume of your circulating blood initially, if you check your full blood count, it will be exactly the same, you've got the same concentration of blood, it's just there's less of it. If you wait a few hours and the body's had time to adjust you'll be able to have an indication of how much blood was lost. So that's why that wasn't done immediately at the time and the plan was to do it the following morning.

DRIVER: Thank you for that. Again, does that note accord with the plan as communicated to you by Dr Harkness?

DR C: Yes, it does.

DRIVER: And did you deem it an appropriate response and a way forward having considered the clinical situation?

DR C: Yes. It was the same thing I would have done if I'd been present on the ward at the time.

DRIVER: Thank you. I think a little earlier, when first telling us about receiving this call and your dialogue with Dr Harkness, I think you told us that you believe that you volunteered to attend to assist if he so wished.

DR C: Yes. That's always my standard practice when having phone calls from juniors when I'm not present. And even when discussing patients, if I'm in the hospital but not physically at the patient's bedside, I always check whether they are happy with just a discussion and advice or whether they do want me to actually physically see the patient. Because sometimes they don't always like to ask you but when you volunteer they may say that they do want you to see the patient.

DRIVER: There's nothing in the records to suggest, nothing from your memory, to suggest that on this occasion he did so wish and you did so attend?

DR C: Yes. From what I recall of the conversation, he declined and said he was happy and if he had said he wanted me to attend, then I have never refused to attend when I've been asked, so I would have done so straightaway.

DRIVER: Thank you. We can see that Dr Harkness noted all of this, noted it at 22.10.

DR C: Yes.

DRIVER: That's not to say it all happened at 22.10 --

DR C: Yes.

DRIVER: -- but some time a little before that time?

DR C: Yes.

DRIVER: Then his note moves forward to 23.00 hours. If we go to the bottom of that note we can see that he's endorsed here:

"[Dr C], happy with plan again."

DR C: Yes.

DRIVER: So that note tends to suggest that a second conversation with Dr Harkness -- do you recall such a second conversation?

DR C: Vaguely. But I would need to rely on the medical notes.

I don't remember the detail of that conversation.

DRIVER: From the vague recollection you have, are you able to say whether the second conversation with Dr Harkness was face-to-face or --

DR C: That was through the telephone.

DRIVER: Telephone again. So a second call?

DR C: Yes.

DRIVER: He's noted these events and at 23.00 -- and can you help us with what it was that he was recording at this point in time?

DR C: Yes. He's noted a further GI blood loss and a plus, which means "and" in this situation, desaturation to 70%. That means a drop in the oxygen saturations from 100%, which it was previously, to 70%.

DRIVER: Upon that being communicated to you, how would that affect your assessment of the clinical situation?

DR C: That's a baby that needs at that point immediate medical assistance, which is what Dr Harkness is giving to them at the time. He would have updated me after he'd done that and the baby was then stable again.

DRIVER: Thank you. Let's go through the other factors of the clinical situation before looking at the nature of the assistance provided. My error. Apologies.

Next note.

DR C: He's written:

"13ml bloodstained fluid from the NG tube."

Which is the nasogastric tube, the tube that goes from the nose into the stomach, which was on free drainage, and that means that the end is left open so any fluid in the stomach can come up the tube. Again, this would be a mixture of blood and stomach aspirates.

The fact that this is written as bloodstained rather than blood as the previous one does suggest that it was maybe slightly pinker rather than redder, but I obviously wasn't there to see the aspirate at the time.

Then BP blood pressure is stable with a mean blood pressure of 43, which again is very good. And a heart rate of 140 to 160.

DRIVER: Pausing there, going back to the last line, the 13ml of bloodstained fluid from NGT on free drainage, on your interpretation of that note does that tend to suggest that that fluid was manually aspirated from the baby or did it --

DR C: No, I think it would have come up the tube spontaneously or been found in the bag that was connected to the tube by the nurse who was looking after the baby.

DRIVER: So there is the further blood loss, there is a desaturation to 70%, and that note that we've just considered twice. And then you were taking us through the other readings. Could you help us with those again?

DR C: The blood pressure is stable with a mean blood pressure of 43, which is a very good blood pressure for a baby of [Baby E]'s size. His heart was 140 to 160, which is normal. A baby who's losing a significant amount of blood would tend to develop a fast heart rate and a low blood pressure if they were losing a lot of blood and needed fluid resuscitation at that point.

DRIVER: Did that --

DR C: At that point that hasn't happened.

DRIVER: So Dr Harkness' next note, please?

DR C: "Saturations remained 60 to 70% [which should be in the 90s] in 100% inhaled oxygen. Making a good respiratory effort and crying."

So this suggests that he's applied 100% oxygen or the nursing staff have applied 100% oxygen to [Baby E], but his saturations haven't responded to that, which normally a baby who was only needing 23% oxygen earlier to have saturations of 100% to now need 100% oxygen and still not be maintaining their saturations suggested that something dramatic has changed in their clinical condition.

It says he's making a good respiratory effort and crying, so it suggests that it's not a problem with his breathing effort that's caused -- that's making his oxygen saturations be low.

DRIVER: I know this is obvious to you, but you suggested something dramatic has happened.

DR C: Yes.

DRIVER: Was that a negative or a positive trend?

DR C: A negative trend.

DRIVER: Thereafter, (inaudible: coughing) plan of action, as it were.

DR C: Yes. The first step is to replace the losses, so he's given 20ml per kilogram of 0.9% saline, which is a salt water solution that we use to replace babies who are having fluid losses. He has lost quite a lot of fluid in the aspirates and in the blood, so the plan is to replace that. Again, as I mentioned earlier, we like to try and do things proactively before it becomes a problem. So although his heart rate and blood pressure are still okay, we don't want to wait until that becomes a problem before giving him some more fluid. So that was done proactively by Dr Harkness.

The second item is "strict fluid balance". That means the nursing staff noting all the volumes of fluid that the baby gets in, which would be their IV fluids, it may be drug medicines, it may be, if they are having any milk feeds, which he wouldn't have been doing by this stage, that that's all noted. And again, any fluid losses are noted very strictly, so all the gastric aspirates, they then weigh the nappies so we can calculate the volume of urine passed, and then calculations are done every few hours to make sure that the baby's input and output are relatively closely matched and can be adjusted if things need to be.

DRIVER: To review that, in consequence of that which had been observed, a yet more strict regime of observance of fluid input and output --

DR C: Yes.

DRIVER: -- was suggested?

DR C: Yes. Normally, we would just document whether babies are weeing or not, but if they need a closer eye keeping then we weigh the nappies and document the exact volume of urine that's passed.

DRIVER: Thank you. Next, is that:

"For elective intubation with drugs"?

DR C: Yes. That means putting a tube in the baby's windpipe and taking over their breathing for them, which is something that we do if a baby's either working too hard with their breathing or their breathing is not having the required effect, which in this case, where his saturations are still low, he's not got good enough oxygenation, so we'd take over doing that for him.

Drugs means some sedative and pain-killing medicines that are just done to make that procedure more pleasant.

DRIVER: Just focusing upon the taking over his breathing for him, as you've just described it, this note indicates that he will be intubated --

DR C: Yes.

DRIVER: -- which is, we understand, could you confirm, to enable assistance with breathing?

DR C: Yes.

DRIVER: That's the method of assistance?

DR C: Intubating is the process of putting a tube into the windpipe. That would then be connected to a TP, which allows gas, oxygen and air to be delivered into the baby's lungs. Then once they're stable they'd be moved over on to a ventilator, a breathing machine, to do that for them.

DRIVER: Does this note, together with what memory you have of this conversation, inform you as to the type and degree of ventilatory support given to this baby at this time?

DR C: The plan would be to put the tube in and then get this baby stable on a ventilator for a period of time to work out what's going on and to start to see improvement.

DRIVER: So that's the means of ventilation according to Dr Harkness' notes. His next entry?

DR C: "CXR and AXR."

That's a chest X-ray and abdominal X-ray. That's to look at the lungs to try and work out why [Baby E]'s now got low oxygen saturations, despite a reasonable breathing effort. And the X-ray of the abdomen is to look for signs of NEC.

DRIVER: So these are X-ray investigations to try and assist in the identification of the cause?

DR C: Yes, and the chest X-ray will also be used to confirm that the ET tube, which is the breathing tube, is in the correct position and able to do its job properly.

DRIVER: So two results, two separate pieces of information: is the tube in where we wish it; and what's causing this problem?

DR C: Yes.

DRIVER: Thank you. And "discussions with"?

DR C: "[Discussions with] surgeons with the X-rays."

At this point, both Dr Harkness and I were thinking that [Baby E] possibly had NEC, which, if that were the case, treatment varies from bowel rest, which is not having any milk feeds along with IV fluids and antibiotics, up to needing surgical management, including removing the bowel. So the plan had been to ring the surgical team at Alder Hey, who would be able to review the X-rays electronically and discuss [Baby E]'s clinical condition and come up with a combined management plan of what we felt would be the most appropriate.

DRIVER: Thank you. Just pausing with the X-rays for a moment, we've heard from other witnesses, could you tell us whether this was the position here with this patient, that a mobile X-ray device would be taken to the incubator?

DR C: Yes, that's correct.

DRIVER: That those treating the baby would look at the images taken through that device?

DR C: The mobile X-ray machine has got a very small screen on it and we normally look at the X-ray at the time, just to check mainly the technical quality of the film, has the radiologist got every bit of the body that we want, does it look like the baby is not unduly rotated or twisted? And you can sometimes see obvious things on that small screen. It's not big enough or of a high enough resolution on the screen to give a formal report on the X-ray, so we will always review them again on our computer system on a higher quality monitor, but that takes time. The radiologist has to return the X-ray machine to the radiology department in the main hospital, they have to upload the cassette to be processed and then that has to appear on our electronic system, so that can take about 15 to 20 minutes for that to happen, which is why we have a quick look on the screen first. We also don't want them to leave the department if the film isn't of a good enough technical quality because we just ask them to repeat it immediately.

DRIVER: Thank you. So all this information was imparted to you by phone to where you were spending the night?

DR C: Yes.

DRIVER: But for these events -- and as we understand it, at some point you left the residence and went to the NNU itself; is that right?

DR C: Yes.

DRIVER: Are you able to recall with any precision when that was?

DR C: I've written in the note, the medical notes further on, that I arrived about 00.25, but I have no recollection of exactly when I arrived. I have no reason to doubt what I've written in the medical notes.

DRIVER: Thank you. Let's go to that note then and behind tile 163, Mr Murphy. Thank you.

We can see this is described as a note written by you in retrospect at 01.30.

DR C: Yes.

DRIVER: Which involves, amongst other things, the fact that CPR was commenced on this baby. Let's go to the note itself. It is dated and timed as indicated. We can see in the fifth line of the writing, the seventh or eighth line of the page itself:

"On my arrival, approx 00.25..."

Is that the note you were alluding to --

DR C: That's the one I was referring to, yes.

DRIVER: -- a moment or two ago? So written in retrospect for reasons that will be obvious to us all. And you have begun by making notes. Would these be notes about things you observed upon arrival or notes about information shared with you?

DR C: They will probably be a combination of things that I've been told and things that I've observed.

DRIVER: Thank you. So, "GI haemorrhage". Did you observe that or were you told about it?

DR C: I saw some of the syringes that contained bloodstained aspirates.

DRIVER: Thank you.

"Discoloured abdomen", did you observe that or were you told about it?

DR C: I don't think I did. When I arrived, Dr Harkness told me in quite a lot of detail about some very dark purple patches that he had seen on the abdomen and the unusual appearance of these.

DRIVER: Dr Harkness can tell us about that. You've recorded the fact that information was imparted to you?

DR C: Yes, I don't think by the time I saw [Baby E] that they were there because I've no recollection of that and I haven't documented that. I remember him telling me in quite an animated fashion because it was quite an unusual appearance, so I think if I'd seen it I would have definitely made a positive note.

DRIVER: Next line?

DR C: "I&V [which stands for intubated and ventilated] for desats and bradys."

Which is a phenomenon that premature babies do, where they drop their oxygen saturations and they drop their heart rate, which we refer to as bradycardia, because we love to say everything in Latin and Greek rather than --

MR JUSTICE GOSS: I think you have to slow down a bit. Even just to listen to it, it's difficult, but for the people who are transcribing it -- all right?

MR DRIVER: You say things very quickly in Latin and Greek.

Somebody in a different place is noting your evidence and sometimes the words come out too quickly for the fingers.

DR C: I also talk quite quickly when I'm nervous.

DRIVER: Let's go back to that line:

"I&V for desats and bradys."

DR C: So I&V stands for intubation and ventilation, which is the process of putting in a breathing tube and taking over the baby's breathing with a ventilator. Desats stands for desaturations, which is a drop in the oxygen saturations. And bradys stands for bradycardia, which is a drop in the heart rate.

DRIVER: Does all of that effectively reflect the clinical situation as reported to you by Dr Harkness in the last telephone conversation and corresponding set of notes that we've been through?

DR C: Yes.

DRIVER: The next part of your note begins with:

"On my arrival, approximately 00.25..."

So are we now moving to observations and data that was present for you?

DR C: This would have been my own assessment.

DRIVER: I'm grateful. Next line?

DR C: "SaO2" stands for oxygen saturations. I've written "80% in 100%". That means that [Baby E]'s saturations were 80% and he was having 100% oxygen. So those have improved since he's been put on the ventilator but are still not as good as we would like them to be.

DRIVER: Let's just remind ourselves of time. Dr Harkness' note was 23.40, his last note --

DR C: Yes.

DRIVER: -- 20 minutes before the other side of midnight, and this is now at or around 00.25?

DR C: Yes.

DRIVER: So not as good as you would hope, but a good and improving trend?

DR C: Yes.

DRIVER: Next?

DR C: "AE" stands for air entry and that's when you listen to the baby's chest to check that the ventilator is getting a good amount of air into the lungs, or oxygen in this case. I have written "[equals] good bilaterally", which means that the breath sounds were equal on both sides and were the volume of gas transfer that we would expect. It shows that the ventilation is working well.

DRIVER: For both lungs?

DR C: For both lungs.

DRIVER: Thank you. Next?

DR C: Heart rate. I have done a sort of wiggly equals sign, which means sort of approximately, so between 100 and 120.

DRIVER: Where does that fall in the desired range?

DR C: That's a bit lower than it was previously, but that's still an acceptable heart rate.

Then the mean blood pressure is 38, which again has dropped slightly, but is still acceptable. And the capillary refill time is between 2 and 3 seconds, which is slightly prolonged.

DRIVER: Which is indicative of?

DR C: The fact that [Baby E]'s perfusion is not as good as it was previously.

DRIVER: That's to do with circulation?

DR C: Yes.

DRIVER: The next entry takes us to X-rays, does it?

DR C: Yes. It mentions that I'd looked at the chest X-ray on the X-ray machine. It shows the endotracheal tube, which is the breathing tube in a good position, that the nasogastric tube, the tip was in the stomach, which is where we'd want it to be. Then the next line doesn't refer to the X-ray. It says that [Baby E]'s on "cef", which is an antibiotic, cefotaxime and "met", another antibiotic, metronidazole, and I'd planned to add in teicoplanin, a third antibiotic, which covers for skin bacteria because he had, I believe, a long line and an intravenous line in situ, which are at risk of getting infections from skin bacteria but that we didn't have chance to give that before further events unfolded.

DRIVER: I'm not going to put the X-ray, the film itself, on the screen, but so as we can orientate ourselves if we could, please, Mr Murphy, go to tile 160.

That's 161. Yes. It records an X-ray was taken at 00.27. If we just look at the description behind that tile, but not the X-ray itself, Mr Murphy. A radiological report made by a consultant radiologist colleague, Dr Boothroyd.

DR C: Yes. She at the time was one of the two consultant radiologists, which are doctors who specialise in X-ray and

other image interpretation. She was one of the two in the hospital at the time who specialised in looking at our paediatric and neonatal X-rays.

DRIVER: Her description, does that in other language mirror the corresponding note that we've just been looking at from your clinical notes?

DR C: Yes. So this is in more detail than my initial description because she would have reviewed the film on a high quality monitor the following day. She's put that the heart size is normal and the lungs are clear, which show that there is no indication, looking at the chest X-ray, why [Baby E]'s saturations were low. The tip of the ET tube, the breathing tube, lies just above the carina, which is where the windpipe splits into two and that's where the tube should be seen.

The tip of the nasogastric tube is projected over the region of the body of the stomach, which is just saying that it's in the stomach and in the right place.

Then it moves on to the abdominal X-ray -- both of them were taken on the same X-ray because of the size of [Baby E]:

"The bowel gas pattern is within normal limits, with no evidence of intramural or free peritoneal gas."

Which shows that all -- the bowel should normally have gas in it and it looks normal and there was no evidence of any gas in either the bowel wall or outside the bowel wall, which are signs of NEC, and no evidence of bowel perforation, which means --

MR JUSTICE GOSS: Sorry, this is all going too quick. I am trying to make a summary note because you're saying a lot of quite important things here.

DR C: Sorry.

MR DRIVER: We've dealt first with the nasogastric tube, which, in short, is appropriately placed?

DR C: Yes.

MR JUSTICE GOSS: So both tubes, the ETT and the NGT were in the right places?

DR C: Yes.

MR JUSTICE GOSS: Right.

MR DRIVER: Hence the successful respiration via both lungs?

DR C: Yes.

DRIVER: The next entries deal with the abdominal X-ray --

DR C: Yes.

DRIVER: -- and the information derived therefrom. The first being the bowel gas pattern is within normal limits?

DR C: Yes.

DRIVER: With no evidence of intramural --

DR C: That means gas within the bowel wall, which shouldn't be there, and is a sign of NEC if it is present.

DRIVER: So that's the absence of an indicator of NEC?

DR C: Yes.

DRIVER: The next and final clause in this sentence?

DR C: "Free intra-peritoneal gas", which is gas that's come outside of the bowel, and again that's an indicator of NEC and is not present in this X-ray.

DRIVER: Pausing there, giving everyone a chance to digest that part of the note, and we move on. Is this a second independent fact or a related fact?

DR C: It's a related fact that there's no evidence of bowel dilatation, which is when the bowel looks bigger and more swollen, which is also a sign of NEC, and that is also not present.

DRIVER: The final sentence?

DR C: The left-sided peripheral long line, which is the intravenous line, is no longer evident on this image.

That was seen on one of the previous X-rays to confirm its position in the leg and had been withdrawn slightly because it was in an incorrect position and it wasn't visible on this X-ray because this X-ray didn't show his leg as much as the previous X-ray. So that's not a sign of a problem, it's just a sign that the line isn't visible on that X-ray.

DRIVER: So may we break that analysis up into three parts?

DR C: Essentially, the chest X-ray is normal with both tubes in a good position. The abdominal X-ray is also normal and the long line is not visible on the X-ray because the leg's not visible.

DRIVER: Thank you. Mr Murphy, could we go back to tile 163 and the underlying note at J2558, [Dr C]'s note.

We had got as far as looking at the X-ray and your summary of that information. Is anything on your note on that line that adds to that which you've just kindly taken us through?

DR C: No.

DRIVER: Thank you. The next line, I think you began to tell us, relates to medication.

DR C: Yes. I've written that [Baby E] was on "cef", which stands for cefotaxime, and "met", which stands for metronidazole. They are both intravenous antibiotics.

DRIVER: So that was a note of an existing provision of medication, was it?

DR C: Yes.

DRIVER: Does that relate back to Dr Harkness, or perhaps even before him?

DR C: I think -- I'm not sure but I think the cefotaxime had been started prior to that, but the metronidazole had been added in by Dr Harkness earlier that evening.

DRIVER: Others will assist in that regard in due course. I'm grateful. The second part of that entry?

DR C: We'd planned to add in teicoplanin, a third antibiotic, which covers for skin bacteria because of the long line, the intravenous line being in place. Whenever you have plastic breaching the skin, you are at risk of getting infection from normal skin bacteria. Because [Baby E] had deteriorated we planned to add that in, but we had no chance to give that before further events unfolded.

DRIVER: So that element of the plan was deferred because there were more pressing issues at hand; is that right?

DR C: Yes.

DRIVER: So we go from the earlier part of your note. You estimate or approximate your arrival at 00.25?

DR C: Yes.

DRIVER: Now we're 11 minutes on --

DR C: Yes.

DRIVER: -- or thereabouts at 00.36. What did you note and record there?

DR C: I've written that the oxygen saturations have dropped to 50 to 60%, still in 100% oxygen, and that [Baby E] has no detectable heart rate and that CPR, cardiopulmonary resuscitation, has been commenced.

DRIVER: Pausing there, is it right that this note details a significant deterioration?

DR C: Yes.

DRIVER: Did that deterioration occur when you were there?

DR C: I was on the neonatal unit, but I wasn't at [Baby E]'s cot side when that occurred, as far as I can remember.

DRIVER: Do you know where you were and what you were doing at that point in time?

DR C: When I'd arrived, the 11 minutes previously, I had initially gone to [Baby E]'s cot side, I'd had a handover from Dr Harkness and presumably from the nursing staff as well. We'd looked at [Baby E]'s fluid and observation charts that were with him. I'd examined him. But often, at night, in the nurseries, the lights are kept down fairly low to try and sort of avoid overstimulating the babies. So I think that Dr Harkness and I had gone to review [Baby E]'s blood results and to review his X-rays on the computer. We would have done that either at the nurses' station, which is outside of nursery 1, or there was a computer in nursery 1, but it was behind a pillar from where [Baby E]'s cot side was. I think at the time we were looking at information on the computer.

DRIVER: So you would have been either in a different part of nursery 1 or on the corridor just outside of nursery 1?

DR C: Yes.

DRIVER: So the focus still on [Baby E], or [Baby E]'s data and his X-rays, but not cot side?

DR C: Yes.

DRIVER: Can you recall where [Baby E] was placed at this point?

DR C: He was in nursery 1. There was a cot space. When you enter the neonatal unit through the double doors there was then -- there were two doors into nursery 1, but the first door was directly in front of you when you entered the neonatal unit. He was in the cot side first on the right, which backed on to the wall of labour ward.

DRIVER: Thank you. From the point of the computer within nursery 1, as the room was configured at that point in time, are you able to say whether or not you had a line of sight from your position at the computer to [Baby E]'s cot?

DR C: No, I wouldn't have been able to see his cot directly without sort of peering round the pillar.

DRIVER: And what if, to use your other alternative, you were at the computer at the nursing station?

DR C: I wouldn't have been able to see in the nursery at all.

DRIVER: Do you recall when and how you first learnt of this deterioration?

DR C: No, I don't recall.

DRIVER: What is your first memory of these immediate events?

DR C: I can remember [Baby E] having CPR. I can remember Dr Harkness was doing the ventilation through the ET tube. Because he'd put that tube in, although the position looked good on the X-ray, I checked that myself using a laryngoscope just to look that it's in the correct position and that it hadn't become dislodged or fallen out because that would be a fixable cause for his deterioration.

Other than that, I was the team leader for the resuscitation and I try and avoid, as far as possible, doing physical tasks because you become fixated -- not fixated but you concentrate on the task that you're doing and you lose overall awareness of the situation.

So I was stood by [Baby E]'s cot with my back to the door, giving an overview and controlling the management while the resuscitation took place.

DRIVER: And the resuscitation team were led by Dr Harkness, is that right?

DR C: Dr Harkness was doing the airway and the ventilation.

I do remember Caroline Oakley doing chest compressions at least at one point, but often the nurses will rotate that to make sure that they don't get tired, and then Belinda, who was at the time Belinda Simcock, and Lucy Letby, were doing the drug medicines.

DRIVER: Thank you. We heard yesterday from a trainee, a junior doctor at the time, SHO, Dr Wood, and he took us yesterday, for your information, through his scribed contemporaneous notes.

DR C: Yes.

DRIVER: And did you subsequently rely upon those notes to assist you in the compilation of these notes of yours that we're looking at?

DR C: Yes. So he was by the work surface that was sort of against the pillar and directly opposite [Baby E]'s cot and he was taking notes throughout of the timings and what we were doing.

DRIVER: So we'll look at the detail of the next listed events and then I'll invite you to give us a summary of your appreciation of the resuscitative attempts at this point.

You've already informed us, I think, that Dr Harkness confirmed the position --

DR C: I think I confirmed that.

DRIVER: You did, forgive me. So the ET was in a satisfactory position?

DR C: Yes.

DRIVER: The air entry was good and remained bilateral?

DR C: Yes.

DRIVER: Both lungs?

DR C: And I've written "throughout". I would have checked that periodically, every few minutes throughout the resuscitation, just to check that the ET tube continues to be working well and hasn't dislodged or become blocked at any point.

DRIVER: So is it right that in doing that, you were seeking to check for, and if necessary eliminate, any mechanical obstructions, effectively?

DR C: Yes. We want to make sure that the resuscitation that we're doing is good quality resuscitation to give [Baby E] the best possible chance, so want to make sure that there aren't any mechanical difficulties with the ventilation.

DRIVER: Were there in this case?

DR C: No. I haven't documented any and I don't remember any.

DRIVER: Thank you. Next five entries. What is that list, please?

DR C: This is a summary of the drugs and medicines that were given to [Baby E]. He had five doses of adrenaline, which is a standard resuscitation drug. It's normally given every 4 minutes during a resuscitation. He had two doses of bicarb. This is sodium bicarbonate and it's a medicine that helps correct acidosis because while a baby doesn't have adequate perfusion they can't get rid of acid from the body, so their blood becomes more acidotic.

DRIVER: Could you slow down a little through this? You've taken us through the adrenaline. You didn't, I don't think, tell us the purpose of that, although it might be self --

MR JUSTICE GOSS: It's a normal resuscitative drug?

DR C: Yes.

MR JUSTICE GOSS: To stimulate the heart, is it?

DR C: It stimulates the heart and also helps preserve blood flow going to the brain and less to the peripheries where it's less needed.

MR DRIVER: Were you in a position to make a clinical judgement as to what, if any, effect that, the adrenaline, was having on [Baby E]?

DR C: I think initially it had no effect. I think later on we did see his heart rate briefly return following the adrenaline but I'm not 100% sure on that.

DRIVER: The introduction of the bicarb, is that capable of yielding any results or any signs of whether that's being effective in any way or not?

DR C: Not really. It's trying to correct any acidosis, but the only way to check that is by measuring a blood gas and it's very hard to do that when the baby has no blood circulation. So we don't routinely do that during a resuscitation.

DRIVER: Next you've noted the introduction of dextrose.

DR C: That's to correct if [Baby E] had a low blood sugar.

Again, we wouldn't measure that during the resuscitation because of the practical difficulties but it's again a standard resuscitation drug.

DRIVER: The next entry?

DR C: [Baby E]'s had 20ml per kg of O negative blood. That was aiming to correct any blood loss or any fluid loss that may have occurred.

DRIVER: Is there any means or was there any test or measure undertaken at the time to see whether that is in any way --

DR C: We did check a blood gas, which also had a haemoglobin, a blood count level, later, but we didn't check that at the time, again for the practical reason.

DRIVER: Thank you. The last entry in this list?

DR C: He's also had a 10ml per kg fluid bolus, which would have been saline, a salt solution, again in case a lack of circulating volume, blood volume or -- was contributing to his collapse.

DRIVER: So that's a list of -- you had introduced to the baby as part of the attempts to resuscitate him.

DR C: Yes.

DRIVER: In general terms, what, if any, effect were your efforts having?

DR C: So initially, no effects at all, but we then did get a detectable heart rate from 01.01.

DRIVER: Is this recorded in your next entry?

DR C: Yes.

DRIVER: Take us through that please.

DR C: We then did get a detectable, recordable heart rate.

It's high -- if a heart rate is above 60 we normally stop doing chest compressions, but it's less than 100, which is a less than ideal heart rate, he's still not breathing at that point, so IPPV is intermittent positive pressure ventilation, which is the

ventilation Dr Harkness was doing, so we continued with that and we also updated [Baby E]'s progress on -- parents on his progress at this point and throughout the resuscitation.

DRIVER: Thank you. So if we could reorientate ourselves as to time. Towards the upper part of the page, your entry at 00.36 records, amongst other things:

"No detectable heart rate and CPR commenced."

DR C: Yes.

DRIVER: Your last entry took us to 01.01, so 25 minutes have elapsed?

DR C: Yes.

DRIVER: Is that the period of the attempted resuscitation?

DR C: Yes.

DRIVER: Or thereabouts?

DR C: Yes.

DRIVER: The next entry begins with bracketed words that I'm struggling with.

DR C: It's "likely arterial". And then it says "gas", so this would have been a blood gas test. The normal values for interpreting a blood gas depend on whether it comes from an artery or a vein. It's very difficult to tell on a baby who's very poorly exactly which one it is, which is why I've written "likely arterial". It would have been an attempt at doing an arterial blood gas, which is putting the needle into an area where you know an artery is likely to be. But because of [Baby E]'s clinical condition, it wouldn't have been possible to feel exactly where the artery was prior to doing that.

DRIVER: So ideally, an arterial sample, but the pressures of the moment made that not the highest priority; is that --

DR C: Yes.

DRIVER: Thank you. A sample was taken and tested?

DR C: Yes.

DRIVER: And the results were?

DR C: That shows a pH of 6.7, which is extremely low.

A carbon dioxide concentration of 20.5, which is extremely high. I think the next one should have been a bicarb, which is HCO_3 rather than 2, which is 20.5., which is relatively normal and probably reflects the bicarb that we've given to [Baby E] during the resuscitation.

DRIVER: Yes.

DR C: A base excess of minus 18.8, which is a sign that his perfusion has been very inadequate.

DRIVER: Yes.

DR C: Glucose of 19.9, which is high, which probably reflects the dextrose given during resuscitation. I know that a high glucose level has been touched upon earlier in [Baby E]'s clinical course. The main problem that that can cause acutely is dehydration, which wouldn't happen in the short-term situation where it's given in a resuscitation, particularly because he's also had the fluids with it at the same time. So although that's higher than normal, that wouldn't be something that concerned me. It would be better in that situation to have a high glucose than a low glucose.

DRIVER: So this was a sample taken during the emergency response?

DR C: I think it's after we got the heart rate back that we took it.

DRIVER: And what was the purpose of taking and analysing a sample at that point in time?

DR C: It was to assess how severe [Baby E]'s clinical situation was now he had a returned heart rate and to see whether there was anything that we could do to improve the situation.

DRIVER: And what, if anything, did it inform you of?

DR C: So the lactate and the base excess are extremely high.

The CO_2 is extremely high and the pH is extremely acidotic. All of which indicate an extremely poor clinical condition, which isn't compatible with life.

The bottom of this note notes a haemoglobin, which is a red blood cell count, and that shows a good level.

DRIVER: This sample was taken and analysed immediately after the baby had collapsed?

DR C: Yes.

DRIVER: In your presence effectively. Do these readings or did these readings inform you as to the cause of collapse?

DR C: So this was taken, I think, after the baby's heart rate had returned rather than immediately after the collapse.

It doesn't tell me anything about what's caused the collapse. Just that the baby is -- [Baby E] is extremely poorly.

DRIVER: Yes. Could we remind ourselves as to the time. The last timed entry, the top of our page, 00.36. Could we go, please, Mr Murphy, to tile 197, and look at [Dr C]'s note that lies behind that, please.

We have some of the same note, but if we continue to scroll down, please. That's a note we've just looked at. We're moving on to the next page.

The last thing you told us about was the haemoglobin reading that (inaudible) the top of the page above; yes?

DR C: Yes. So that's obviously been measured after he's received blood during the resuscitation, but that's at a normal level.

DRIVER: Your next entry, does that pertain to heart rate?

DR C: Yes.

DRIVER: Is that independent to the haemoglobin?

DR C: Yes. So this would then be my ongoing clinical assessment at [Baby E]'s cot side, that his heart rate remained 60 to 100, so not -- so a lower heart rate than we would like and that [Baby E] needs to maintain adequate perfusion and that it was beginning to drift down again, which means if it drops below 60 we would normally recommence CPR at this point.

DRIVER: Thank you. At this point in time, armed with all that information and with your clinical assessment of [Baby E] over the last minutes, were you then at this point in a position to make an assessment about the immediate future?

DR C: Yes. So at this point it was apparent that [Baby E] was likely to have a cardiac arrest again in the very near future. His blood gas showed that it was incompatible with life and we didn't have anything that we could treat to improve that. And I felt that continuing CPR was not in [Baby E]'s best interests

and discussed discontinuing medical treatment and giving him to his mum and dad to cuddle.

DRIVER: That is all noted alongside the words "parents updated"?

DR C: Yes.

DRIVER: Does it follow, therefore, that that bleak assessment was communicated to his mum and dad at that point?

DR C: Yes. They were present in the room, they'd arrived part-way through the resuscitation, or they may have been there at the start. I know they were definitely present during the resuscitation; I'm unsure exactly when they joined us.

DRIVER: Let's go to the next sub-paragraph then, please.

DR C: His heart rate dropped again, was between 30 and 40. So we commenced CPR briefly to facilitate transferring him to mum and dad for cuddles. And then CPR was stopped at 01.23.

DRIVER: At which point in time and thereafter, he was with his parents?

DR C: Yes.

DRIVER: And was his time of death as recorded there?

DR C: So he would have still had a slow heart rate for a small amount of time while with his mum and dad. By the time I assessed him at 01.40, he had definitely died, but I couldn't tell you the exact moment between those two times.

DRIVER: Could you tell us briefly what happened in the immediate -- the minutes immediately thereafter?

DR C: So we remained in the room but stepped back to allow them some time together and then at 01.40 I assessed [Baby E] and common practice is to assess a neonate over several minutes, listening for a heart rate or breath sounds and assessing for any other signs of life. I did that for 5 minutes and there was no heart rate, no breath sounds and no movement, so death was confirmed at that point.

DRIVER: Did you and your colleagues withdraw to allow the family some privacy?

DR C: I would imagine that we would do that. That would be usual practice.

DRIVER: Thank you.

Following the death of a patient, a neonate, do certain formalities have to be observed, [Dr C]?

DR C: Yes. So anyone who dies needs to have a death certificate issued by a doctor and in order to do that you have to know the cause of death. Anyone who dies unexpectedly, which in medical terms means a death that you wouldn't have predicted 24 hours in advance -- and at the time all neonatal deaths on our unit were discussed with the coroner.

At the time I felt that [Baby E] had NEC, which had led to his collapse and deterioration. So I discussed that with the coroner and we agreed for that to be put as [Baby E]'s cause of death.

DRIVER: What was it that drove you to that conclusion?

DR C: Having the -- the fact that he was a high-risk baby, he was at risk of developing NEC, accompanied by abdominal discolouration and GI bleeding.

DRIVER: Were there any clinical factors present that militated against that conclusion?

DR C: Things that I was -- I didn't consider them fully at the time, but the fact that [Baby E]'s observations were very stable right up until the point of collapse doesn't fit with NEC. Normally we'd expect a deterioration where observations get worse over a period of hours, if not longer, prior to deterioration, and the abdominal X-ray not showing clear signs of NEC only an hour before he died -- sometimes signs on X-rays do take longer to develop, but if NEC was severe enough to cause circulatory collapse and a cardiac arrest then I would expect to see clear signs on an X-ray and I don't think I gave that enough weight at the time, that that X-ray had been normal.

DRIVER: We've seen reference in Dr Harkness' note to a GI bleed.

DR C: Yes.

DRIVER: How, if at all, was that relevant to your assessment?

DR C: I felt that that was the most likely cause of a GI bleed at the time in a baby of [Baby E]'s condition.

DRIVER: You said "that was". What's the "that" in that sentence?

DR C: NEC, sorry. That NEC was the most likely cause of a GI bleed in a baby of his gestation and clinical condition.

I don't think that now for the other factors that I've mentioned.

DRIVER: Could we go, please, to tile 237 and the underlying note, please.

So now 10.00 in the morning, still on 4 August.

You've recorded discussions -- is that a symbol for "with" -- parents?

DR C: Yes, and questions answered, so presumably I would have attempted to answer questions that they had at the time.

I remember the parents understandably being devastated and shell-shocked at the time and the following morning.

Then I've written that I've discussed with the coroner's officer about the death, who will then discuss with the coroner and get back to me.

DRIVER: And did you or can you expand upon that conversation with the coroner's officer firstly?

DR C: I would have explained the clinical situation to the coroner's officer and the fact that the death had been unexpected, but that we felt -- well, I felt at the time that I knew what the cause of death was. They would discuss that with the coroner to see whether the coroner was happy for a death certificate to be issued and they would ring me back later that same day.

DRIVER: Could you assist the jury with regards to the decision as to whether or not a neonate patient who died within the unit should be the subject of a post-mortem examination?

DR C: So a post-mortem would take place if we felt that we didn't have a cause of death and were unable to issue a death certificate because we didn't know the cause of death. A post-mortem can also be requested for anyone who dies, any baby who dies if the family want that to happen to get more information.

DRIVER: As best you recall, did your discussions with the parents as noted here at 10 am on 4 August, did that include the topic of whether or not a post-mortem examination should take place?

DR C: I did discuss with the parents. I'm unsure whether it was at this 10 o'clock discussion or whether that was at some point overnight. The parents were understandably devastated that [Baby E] had died and were not keen on a post-mortem and I didn't want

to make what was a terrible situation for them any worse, so I didn't push the issue, which is something I now regret.

MR DRIVER: Thank you. Could you remain there and answer some questions that come your way? Although I do note that it's 11.45, my Lord.

MR JUSTICE GOSS: Yes. I expect you'll be more than 10 or 15 minutes.

MR MYERS: I will, my Lord, yes.

MR JUSTICE GOSS: We'll have our mid-morning break now then.

It's virtually the middle of the morning.

[Dr C], we have a 10-minute break and you may have a break obviously, but could you be ready, please, to continue with your evidence in 10 minutes. Please don't discuss anything about this case with anyone in that interval. Thank you very much.

All right, members of the jury, you know the drill.

Thank you.

(11.46 am)

(A short break)

(11.55 am)

Cross-examination by MR MYERS

MR MYERS: [Dr C], you were a consultant paediatrician at the Countess of Chester back in 2015, weren't you?

DR C: Yes.

MYERS: And are you still a consultant paediatrician at the Countess of Chester Hospital now?

DR C: Yes.

MYERS: I just want to start by asking you a few questions about [Baby E]'s condition from birth. It's recorded that he was born at 29 weeks' gestation.

DR C: Yes.

MYERS: You're aware of that, aren't you?

DR C: Yes.

MYERS: Which makes him a very premature baby, doesn't it, or made him a very premature baby?

DR C: Yes.

MYERS: And do you accept being very premature or very preterm brings with it specific problems to do with the fact a baby is so preterm?

DR C: Yes.

MYERS: Something else that we have heard is that he was diagnosed with twin-to-twin transfusion syndrome; are you aware of that?

DR C: Yes.

MYERS: We haven't actually heard much detail about that so I'm just going to ask you: is that a relatively rare condition to start with?

DR C: It's something that only occurs in identical twins and doesn't occur in every identical twin pregnancy, so that makes it relatively uncommon, but it's something we do see routinely in our practice and are used to dealing with.

MYERS: With twin-to-twin transfusion syndrome the identical twins share one placenta, don't they?

DR C: Yes.

MYERS: So that means they're sharing the network of vessels that supply oxygen and nutrients that are essential for development in utero; is that right?

DR C: That's correct.

MYERS: It can happen that the vessel connections within the placenta aren't evenly dispensed so there can be an imbalance in the blood exchange between the twins?

DR C: Yes, that's what happens in twin-to-twin transfusion.

MYERS: Because what happens is that one twin, called the donor twin, gives away more blood than he or she receives?

DR C: Yes.

MYERS: Is that right?

DR C: Yes.

MYERS: And the recipient twin receives more blood than they would ordinarily get?

DR C: Correct.

MYERS: And the effect of that is to run the risk of difficulties for both twins. They may be different depending on whether they were the donor or the recipient, but there are difficulties associated with either, aren't there?

DR C: There are.

MYERS: That can increase the overall risk of death after birth, can't it?

DR C: It can.

MYERS: And it can certainly increase other health risks, not necessarily death, but other health risks to the baby or babies after they've been born?

DR C: Yes.

MYERS: We've heard also that they are identified to have absent or reverse end-diastolic flow?

DR C: Yes.

MYERS: Again that's another condition that is unusual, but you sometimes encounter, would that be fair to say?

DR C: Yes, it's something that we do see relatively regularly in the babies we look after.

MYERS: When you say "the babies we look after", do you mean the babies that have conditions that have some degree of complexity to them?

DR C: Babies who are born prematurely or are unwell and have some degree of complexity to them.

MYERS: And that relates to the way the blood is flowing through the umbilical artery during pregnancy, doesn't it?

DR C: Yes.

MYERS: That condition may have various risk factors associated with it for the health of a child after birth; do you agree?

DR C: I agree.

MYERS: One of those, as it happens, is NEC?

DR C: It is.

MYERS: It's not the only one but that's the foremost --

DR C: It is one of them.

MYERS: Yes, all right.

If we consider the starting point with [Baby E], he was a relatively high-risk baby, wasn't he?

DR C: He was a very high-risk baby for NEC and I think that probably contributed to us assuming his difficulty were due to NEC. But a baby who had NEC that was severe enough to lead to their collapse and death, as I've explained before, I would expect to see that gradual deterioration in their observations and blood tests and abnormalities on an X-ray taken less than an hour before their collapse.

So I completely agree that [Baby E] was a high-risk baby for NEC, but I still don't think that was the cause of death in his case.

MYERS: I'm not going to suggest it is. But he's at high risk not just from NEC, he's at high risk from a variety of different health conditions, isn't he?

DR C: He is.

MYERS: And with a baby like that, within the first few days of life, however stable he appears, there is a degree of inherent instability to them because of their condition, isn't there?

DR C: There is, otherwise they wouldn't need to be in hospital.

MYERS: And otherwise they wouldn't need to be in a neonatal unit, would they?

DR C: Correct.

MYERS: You made various statements to the police in the course of this investigation, [Dr C], haven't you?

DR C: Yes.

MYERS: When you made a statement in November 2018, you told them that you and Dr Harkness had discussed the clinical condition of [Baby E] afterwards and -- I'll give you exactly what you said -- that you both felt it was an unusual deterioration but, in a high-risk baby, not entirely or so not entirely unexpected. That's what you said.

DR C: That is what I said at the time.

MYERS: Yes. And that's by the time we get to November 2018, talking about your conversation with Dr Harkness after the event; is that correct?

DR C: Yes.

MYERS: The twins had been due to be born at Liverpool Women's Hospital, hadn't they?

DR C: That's correct, yes.

MYERS: And that was because of potential problems associated with their antenatal condition and what might follow after birth, wasn't it?

DR C: Yes.

MYERS: And a unit, a tertiary unit, like Liverpool Women's Hospital, ideally is the right place for twins like this to be born, isn't it?

DR C: It is.

MYERS: The reason they were born at the Countess of Chester Hospital is, and this may be something you have no control over, [Dr C], but there wasn't cot space available at Liverpool Women's Hospital, was there?

DR C: I believe that to be the case, yes.

MYERS: The whole point of a baby or babies that may have inherent difficulties in their condition being born in a tertiary unit is ideally that is the place to be if any of those complications create a situation that requires response or treatment, ideally?

DR C: Ideally.

MYERS: I just want to ask you something about gastrointestinal bleeds or gastrointestinal haemorrhage.

DR C: Yes.

MYERS: One cause for a gastrointestinal haemorrhage or bleed -- do you use the two words interchangeably or is there a difference, by the way?

DR C: No, we use them interchangeably.

MYERS: One potential cause of a gastrointestinal bleed or haemorrhage is ulceration in the stomach --

DR C: Yes.

MYERS: -- an ulcer; that's right, isn't it?

DR C: Yes.

MYERS: Even in a baby, a neonate, ulceration can be linked to high levels of acid in the stomach. That's how it normal -- one of the ways it can come about, do you agree?

DR C: Yes.

MYERS: And acid levels and an increase in acid levels can be triggered by stress -- I mean physical stress, not emotional -- but physical stress under which a baby is labouring? Do you agree with that?

DR C: It can, but I don't think [Baby E] was labouring under physical stress in that way.

MYERS: An increase in acid levels can cause bleeding by eroding the stomach walls or the vessel walls? That's how the bleed happens, isn't it?

DR C: Yes.

MYERS: You said you don't think he was suffering from acid, you are saying?

DR C: He would have had stomach acid. I don't think it was a baby that was under a significant amount of physical stress prior to these bleeds. He was making excellent progress.

MYERS: All right. The concern at 22.00 or thereabouts, which is when Dr Harkness first reviewed him and also spoke to you, was or included acid levels in his stomach, didn't it?

DR C: It did, which is why he received the ranitidine treatment.

MYERS: We'll see the notes shortly, but it was at slide 128 where we see a part of the plan was to prescribe ranitidine after that first bleed and vomit and aspiration?

DR C: Yes -- well, not aspiration. Aspiration implies that stomach contents have gone into the lungs. It was just that there were aspirates.

MYERS: Yes. I was just including all the different ways it came out.

So the ranitidine is prescribed because that can settle or might stop acidity in the stomach?

DR C: Yes.

MYERS: Is it also practice sometimes to stop feeds if there's concerns that acid levels in the stomach are a problem?

DR C: Not usually because often the milk feed is protective.

MYERS: Does that depend a little bit on the quantity of milk feed?

DR C: It does depend on the quantity of milk feed and on the clinical condition of the baby.

MYERS: As for [Baby E]'s condition in the period leading up to this, first of all before I look at any specifics with you, he is a baby who is capable of a change in condition?

DR C: Yes.

MYERS: Quite dramatically in fact, isn't he, in his condition?

DR C: All babies that we look after are, yes.

MYERS: And he was a high-risk baby for a variety of conditions?

DR C: Yes.

MYERS: We have spent a little time looking at the blood glucose levels. I'm not going to go back through all of that because we've looked at it. But for the time that he was in hospital, they range from about 10 to 18, those are the type of ranges of the blood glucose levels and that's high, isn't it?

DR C: It is higher than we would like, but it's what we commonly see in babies of his gestation.

MYERS: One reason or one matter that goes together with high glucose levels, one thing they may indicate, is that for some reason the baby is labouring under stress? That's correct, isn't it?

DR C: Sorry, can you repeat the question?

MYERS: Yes. One aspect you find in conjunction with high blood glucose is stress, it may indicate there is stress, physical stress, within the baby?

DR C: It's an indication that there is physical stress and that things aren't right, but it's something that's commonly seen in premature babies and is not an unexpected part of their clinical course.

MYERS: I'll break that down, but first of all you agree it can be an indicator of stress, can't it?

DR C: Yes.

MYERS: And levels like that are not normal?

DR C: They are not normal, no.

MYERS: They are not healthy?

DR C: The main problem that they cause is dehydration, which is why we treat them.

MYERS: They may cause dehydration, but they may be caused by stress, mightn't they?

DR C: Yes.

MYERS: A baby that starts in the position that [Baby E] was starting in from his antenatal and birth condition may be less physically robust in the face of what happens to them than a much fitter, stronger baby; that's true, isn't it?

DR C: Yes.

MYERS: I just want to ask you something else about blood gas and see if you can help us with this. I'm going to put slide 90 on the screen. If we go behind slide 90.

Thank you, Mr Murphy.

If we go scroll down this, I'm going to ask you to look at an entry for 3 August, 14.38, which is the third entry up from the bottom.

We can see at 14.38, the pH from the blood gas is 7.293. Can you see that?

DR C: Yes, I can.

MYERS: Can you help us with this: the normal range for pH is 7.35 to 7.45, isn't it?

DR C: That is for a term baby or for an adult. But premature babies aren't normally meant to be out and managing their own pH so we normally accept readings of above 7.25 as being what we would consider acceptable.

MYERS: Let's just break that down. So the normal for a term baby or an adult is 7.35 to 7.45?

DR C: Yes.

MYERS: When you say what you would accept for a preterm baby, of course they're all different, what it might indicate in the case of each individual child; do you agree?

DR C: Yes. And it often it's looking at that in combination with other factors.

MYERS: Yes. Of course what you may tolerate clinically is not the same as what is normal, if you see what I mean; do you agree with that?

DR C: Yes.

MYERS: And if we're getting to 7.293, I'm going to suggest that may be something that under your guidance you tolerate but it is below what is normal. Would you agree with that?

DR C: I would say that for a baby of his age and gestation that is well within what's normal and we regularly have babies of this gestation with pHs of this and even lower that don't have any physical consequences of that level of gas.

MYERS: But what may trigger a physical consequence in one baby is not going to be identical for the next, is it?

DR C: No --

MYERS: And --

DR C: -- but this is within well what we would normally see on the neonatal unit and would not cause us any clinical concern at all.

MYERS: The blood glucose is well outside the normal limits?

DR C: Yes, that is and we would treat that, but again we wouldn't expect that to lead to a clinical collapse like was seen in [Baby E] several hours later.

MYERS: Well, you say that, [Dr C]. The point, I suggest to you, is that a baby who starts with the position that [Baby E] was in is going to be so much less robust physically that he is at risk of a deterioration of condition even from this point.

DR C: There will always be that risk, but although [Baby E] was a high-risk baby we are used to looking after high-risk babies, and his deterioration was well outside of what we would expect.

MYERS: He is a baby who was meant to be at the Liverpool Women's Hospital at this time; is that correct?

DR C: That's correct.

MYERS: I just want to show you something on the fluid chart.

It's at slide 38, please. If we just look at the bottom section, we can see "aspirates" about five lines up from the bottom. Just takes your time to see that, [Dr C]. You have signatures on the bottom row.

DR C: Yes.

MYERS: If you count five or --

DR C: I can see the line that it is. I'm just struggling with reading the words.

MYERS: We're going to enlarge it for you with Mr Murphy's assistance. I am just going to enlarge that line and look at the entry under it for 20 -- between 21.00 to 22.00 in fact. I think it's under 21.00. That's right.

Thank you, Mr Murphy. Just enlarge that.

You can see it says:

"16ml mucky."

That's an entry under 21.00?

DR C: Yes.

MYERS: If that is correct, there are various matters that are in issue in this trial, which is why I identify that, so that is recognised, but if that is correct a mucky aspirate maybe of that volume might indicate some underlying problem; would you agree?

DR C: Yes.

MYERS: Take that down, please, thank you, Mr Murphy.

I want to look at what happened on the evening that you've been telling us about, [Dr C]. Can we start by putting up on the screen slide 128, please. Can we go behind that to page 1.

If we scroll down, please, to the bottom part of that. Thank you. That's what I was looking for.

Can you see that clearly, [Dr C]?

DR C: Yes.

MYERS: That's Dr Harkness' note, there's been reference to that beforehand, timed at 22.10. We have seen, just to keep it in mind, that he had discussed [Baby E]'s situation with you by the time he came to write this note?

DR C: Yes.

MYERS: We'll see that on the next page when we look at it, discussed it with you.

So by the time he'd discussed this with you, maybe at or around 10 o'clock that evening, whatever time it was, there had been, looking at that, a sudden, large vomit. Can we see about the fourth line down:

"Sudden large vomit of fresh blood, 14ml aspirate"?

Do you see that?

DR C: Yes.

MYERS: By 10 o'clock or thereabouts you had been told that [Baby E] had had a sudden large vomit of fresh blood and there had been 14ml of aspirate; do you see that?

DR C: Yes.

MYERS: First of all, there was some discussion earlier in your evidence about blood in aspirate or anything like that.

What this appears to say is that you were told a large vomit of fresh blood and 14ml of aspirate. Do you see that?

DR C: Yes.

MYERS: That is a substantial quantity of blood or blood and vomit from a baby in [Baby E]'s condition, isn't it?

DR C: Yes.

MYERS: And you recognise he was a high-risk baby, you knew that, with an unusual or with a set of particular features, wasn't he?

DR C: Yes.

MYERS: If we just continue over the page, please, the top part of this note for 22.10. At this point, you've explained to us, from the shorthand that Dr Harkness has noted, that he has diagnosed a gastrointestinal bleed; is that correct?

DR C: Yes.

MYERS: And he's put "[question mark] cause".

DR C: Yes.

MYERS: As it happens, you told us when you were given -- giving evidence that to you at this point it didn't -- the examination didn't really support NEC at this stage.

DR C: Yes.

MYERS: That's what you told us?

DR C: Yes.

MYERS: Pause there. If that is right then in your mind there must have been running through it a number of possibilities that could lie behind a gastrointestinal bleed of this volume?

DR C: Yes, ulcerations and acid was one of the things we would consider, but if a baby had died as a result of blood loss we would expect to see again deteriorations in the observations as they become more tachycardic and hypotensive over the following minutes and longer.

I wouldn't expect a baby who has blood loss that is significant enough to cause collapse and death not to have any deterioration in their observations to accompany that.

MYERS: We'll take this step by step moving forwards. At this point, looking at how you have dealt with this, [Dr C], as well as what you're saying more generally, at this point you're at home, is that correct, at your accommodation?

DR C: At the accommodation.

MYERS: About 5 or 10 minutes away from the unit?

DR C: Yes.

MYERS: You have been told this particular baby certainly has had a vomit with a substantial or a large quantity of blood? A sudden large vomit of fresh blood; yes?

DR C: Yes.

MYERS: The diagnosis is provisionally a gastrointestinal bleed?

DR C: Yes.

MYERS: There's uncertainty as to cause?

DR C: Yes.

MYERS: You've explained that on the information provided to you, NEC is not what appears to be supported by the examination.

DR C: Yes.

MYERS: And certainly, from the prescription of ranitidine we can see there, something related to acid is one of things that must have been on Dr Harkness' mind --

DR C: Yes.

MYERS: -- and yours if he told you this?

DR C: Yes.

MYERS: In fact, at this point if we look at the plan, the plan was for -- limited to anti-acid medication and antibiotics. That's the second entry down, isn't it?

DR C: Yes.

MYERS: Although you've said that you didn't regard NEC as the most likely thing. There is "close observation" written there and also "FBC in the morning".

DR C: Yes.

MYERS: Which means full blood count; is that correct?

DR C: Yes.

MYERS: At this point one thing that should have been in Dr Harkness' mind, I'm going to suggest, and yours, [Dr C], is whether it was necessary to cross-match for a potential blood transfusion; don't you agree?

DR C: Yes, and that would have been -- discussing whether or not to add in any more fluids and give blood is one of the things that we did discuss.

MYERS: Reference to discussing fluids -- please do take a look because I don't want to raise anything if it's here, but at that time, at 10.10, did that appear in Dr Harkness' note? We can just go back to the page before.

DR C: It doesn't appear in his note.

MYERS: Let's just check. Right. So we've seen what's here.

Let's go back down again to 2556. So, there is no reference to anything to do with replacing the loss of blood, for instance, with fluid, is there?

DR C: No. Can I refer back to the cross-match?

MYERS: Yes.

DR C: Normally, the babies have had a cross-match as part of their admission bloods, so that's something we would already have had done earlier in their admission, so we wouldn't need to do that.

MYERS: In any event, there's no apparent consideration here for any fluid to replace loss of blood, is there?

DR C: No.

MYERS: And certainly no reference to anything relating to a potential blood transfusion, is there?

DR C: No.

MYERS: And in fact if you've got a baby like this who's lost a volume of blood or potentially lost a volume of blood like that, whatever the reason, that is something that should have been considered, isn't it?

DR C: It's something that we did consider.

MYERS: Not at this point you didn't, did you?

DR C: It's not documented as being considered but I do remember us talking about it.

MYERS: Well, we can see what it says under "plan", I am not going to read all that out again, but you see that?

DR C: Yes.

MYERS: It says:

"Discussed with [Dr C]. Happy with plan."

Nothing here records reference to a blood transfusion or getting ready for one, does it?

DR C: No, it doesn't.

MYERS: I'm going to suggest that that's because that wasn't discussed at this point, was it?

DR C: I can only go with what's in the notes but I do think we discussed it.

MYERS: I'm going to suggest to you it's not in the notes because it wasn't. We'll have to disagree about that, [Dr C]. You say you think it was discussed.

Of course, if you're talking about a baby in the condition -- in the birth condition [Baby E] was in, who's going to need a blood transfusion, that is a potentially serious situation, isn't it?

DR C: It is.

MYERS: Don't you think that's something where perhaps, as the consultant on call for this particular baby, it's something that means you should perhaps go to hospital to oversee what was happening?

DR C: At the time I didn't because I was happy with Dr Harkness' plan and he was happy to carry that out.

Obviously, knowing how the situation ended then I would have preferred to have gone to hospital, but hindsight is a wonderful thing.

MYERS: Well, I'm going to suggest to you that this is a situation, as it was unfolding, that you could see was a serious situation, wasn't it?

DR C: It didn't look like a situation of that level of seriousness at this point or I absolutely would have attended.

MYERS: Let's move on to 23.00 when Dr Harkness had made his second phone call to you. Rolling down, if we look at it now, it says:

"13ml of bloodstained fluid from NGT on free drainage."

You weren't there, of course, were you?

DR C: No.

MYERS: So you don't know how much of that is going to be blood or any other substance, do you?

DR C: No.

MYERS: But you do know it contains, it appears, blood to some degree, don't you?

DR C: Yes.

MYERS: And you also know from looking at this that [Baby E] has desaturated to 60 to 70%?

DR C: Yes.

MYERS: Which is a serious or a significant desaturation, isn't it?

DR C: Yes, it is.

MYERS: And by this point now there has been, as recorded in these notes, a loss of 27ml of recorded fluid, some of which contains blood, by this time, hasn't there?

DR C: Yes.

MYERS: Plus there has been a large vomit of fresh blood earlier; that's right, isn't it?

DR C: Yes.

MYERS: That is potentially a significant quantity of blood for a baby who weighed probably about 3 pounds, isn't it?

DR C: Yes.

MYERS: You in your evidence said that something dramatic had changed in his clinical condition by this point.

DR C: Yes.

MYERS: And you said that it required an immediate -- he required immediate medical assistance.

DR C: Yes. Which he was receiving from Dr Harkness.

MYERS: By now, this had become a very serious situation indeed, hadn't it?

DR C: Yes.

MYERS: If we look down at the plan, there's reference to possibly -- it says:

"[Something] losses 20ml per kilogram of saline."

Do you see that?

DR C: It says "replace losses".

MYERS: So at this point it's talking about using saline just to replace bulk volume, isn't it?

DR C: Yes.

MYERS: In fact if we look at this, notwithstanding what you said to us earlier about blood transfusions, there's no reference to a blood transfusion here, is there?

DR C: No.

MYERS: I suggest if you had actually been talking about blood transfusions, that would appear in the plan, wouldn't it?

DR C: Ideally, it would. But medical documentation, particularly when done when people are busy, often doesn't contain everything.

MYERS: You agree -- you're saying you were talking about blood transfusions?

DR C: I'm certain that at one of the phone calls we discussed it, definitely.

MYERS: Well, let's be clear. There's no reference in this --

DR C: I'm aware that there is no reference to it.

MYERS: No. There is reference to saline, isn't there?

DR C: There is.

MYERS: It says there should be elective intubation with drugs.

DR C: Yes.

MYERS: That's another indication of how serious the situation was becoming; do you agree?

DR C: Yes.

MYERS: The requirement for chest and abdominal X-rays. It also says:

"Discuss with surgeons with X-rays."

Is that correct?

DR C: Yes.

MYERS: This is surgeons at Alder Hey?

DR C: Yes.

MYERS: And Alder Hey are a specialist hospital that specialises, amongst other things, in surgery for children?

DR C: Yes, a specialist children's hospital in Liverpool --

MYERS: So we're now getting to territory where you may be dealing with something that cannot be dealt with at the Countess of Chester Hospital, if it could in the first place, but you're getting there, aren't you?

DR C: Yes.

MYERS: In fact you might be there already; do you agree?

DR C: Yes.

MYERS: And this is an emergency by this point, isn't it?

DR C: Yes.

MYERS: And it says:

"[Dr C] updated. Happy with plan."

Don't you think at this point, as the consultant on call, you should have been at hospital to take decisions and to deal with this?

DR C: With hindsight I would have liked to have attended but I don't think I would have made any different decisions had I been present.

MYERS: Well, you should have been there, shouldn't you?

DR C: Yes.

MYERS: I want to move on now to when you did attend or the period that leads up to it, sorry.

First of all, let's look at the time you did arrive.

I'm going to ask to put up slide 160, please, Mr Murphy.

If we go to behind that. This is just to help with timings. It says:

"On my arrival approx 00.25."

DR C: Yes.

MYERS: You have said it might take 5 or 10 minutes to get to the unit from your accommodation.

DR C: Yes.

MYERS: And maybe it takes 5 or 10 minutes to get changed, 5 or 10 minutes to get ready to go into the unit; would that be right?

DR C: Yes.

MYERS: This would mean that you left home maybe round about midnight or a little bit afterwards, just after midnight?

DR C: Yes.

MYERS: All right, maybe a bit later than that, but that's when you left. All right. So I want to go to the page that comes before this, page 2557, which is at slide 159:

"Sudden deterioration at 23.40."

Can you see that, [Dr C]?

DR C: Yes.

MYERS: This is something that Dr Harkness will have told you about after it took place and before you went to the hospital, isn't it?

DR C: Yes, I imagine that's what prompted me to come in is when he rang me after this event.

MYERS: We'll come to that.

It describes various findings next to "sudden deterioration". The description of colour is included.

Sats at 60%. It also says:

"Intubated as an emergency at 23.45."

DR C: Yes.

MYERS: So no doubt, we've perhaps been there before, but certainly recorded as an emergency now in these notes?

DR C: Yes.

MYERS: In fact, if you recall, in the plan for 23.00, the page before this, at that time it had been discussed that there should be -- the plan was for an elective intubation, wasn't it?

DR C: Yes.

MYERS: So at 23.00, when Dr Harkness noted that there would be elective intubation, that was after talking to you, as at 23.40 that intubation still hadn't happened, had it?

DR C: No, and that's not outside normal practice. It can often take up to an hour for an elective intubation to take place by the time all the drugs are prescribed, made up and given.

MYERS: But even at 23.00, this was an emergency situation, wasn't it?

DR C: Yes.

MYERS: And we've seen that even at 23.00, [Baby E]'s saturations were down to 60%, weren't they?

DR C: They were, but I can't -- they wouldn't have been at 60 to 70 for that whole 40 minutes without someone doing something. They must have had -- he must have had periods of better sats in

between that or Dr Harkness would have done the emergency intubation sooner.

MYERS: We can see on this page:

"Sudden desaturation at 23.40."

The sats are 60% still at that time.

DR C: I think he is saying that as part of the sudden deterioration, the sats dropped to 60% rather than the sats had been at that level for a period of time.

You will need to clarify that with him. But I can absolutely not believe that he let a baby go for 40 minutes with sats of between 70 and 60% without intubating him. And I know for certain that the nurses would have rung me at home and got me to come in if that had been the case.

MYERS: Intubation having been identified as a requirement for this baby at 23.00, it should have been a priority, shouldn't it, [Dr C]?

DR C: It would have been a priority but it takes time to draw up the necessary medicines and get them made up and they need to be diluted down several times by the nurses in order to do them. It often takes up to an hour for that to happen.

MYERS: There is no further treatment from the 23.00 note between then and the deterioration at 23.40 that is recorded in these notes?

DR C: There isn't, but I wasn't there, you'll have to ask the people who were.

MYERS: The fact is no intubation actually took place until there had been a further sudden deterioration, did it?

DR C: No.

MYERS: And I'm suggesting to you, in the circumstances of this particular baby, in this particular situation, that was too slow, wasn't it?

DR C: I would argue that it wasn't because that's within our normal practice and I don't believe that the saturations would have been at that low a level for that length of time without somebody doing anything. The sats must have improved in the meantime.

MYERS: If we travel down the page to look at the plan, just scroll down to the lower part of the page, please, if you would, Mr Murphy.

Are intubation drugs in fact premade and ready to go for intubation?

DR C: We currently make them up. We have at times had some of them premade. I'm not sure what our situation was at that time.

MYERS: Are you suggesting that intubation routinely takes about an hour to -- 45 minutes to an hour?

DR C: It can do to do an elective intubation, yes.

MYERS: And in an emergency, would it take that long?

DR C: No, it wouldn't, it would take a few minutes.

MYERS: This was an emergency, wasn't it?

MR JUSTICE GOSS: At what point?

MR MYERS: We've agreed already, my Lord, that certainly by 23.00 (overspeaking) --

DR C: It was an emergency that he needed some treatment at that point that his sats were 70 --

MR MYERS: Yes.

DR C: What I presume happened, and you will have to confirm with Dr Harkness because I wasn't there, is that he received some bagging and masking, which led to his sats improving which meant he was stable to wait. There was absolutely no way that Dr Harkness or our nursing staff would have left a baby with low sats for that length of time without doing anything. All of the nurses who were present are nurses who were confident to ring me at home to ask me to come in if needed, so I categorically deny that he would have been left with low sats for this period of 45 minutes. There must have been clinical improvement with the emergency treatment he received at 23.00, although you need to confirm that with the people who were there.

MYERS: I want to carry on looking at the plan. So a further 10ml per kilogram bolus of saline. Do you see that?

DR C: Yes.

MYERS: What's the next? Question mark, what's that?

DR C: "[Query] inotropes", which are medicines that raise blood pressure. I'm unsure what the next word is. Then it says "worsen bleeding". The concern if you have a baby who is bleeding and that blood is beginning to -- the natural clot that stops the bleeding is beginning to form and you then raise their blood pressure, that you then knock that clot off, so you have to be very cautious about using anything that would raise the blood pressure if you can get away with not doing it.

MYERS: What's FFP?

DR C: That's fresh frozen plasma, which is a blood product that contains clotting factors.

MYERS: And:

"Blood sent for coagulation and cross-match now"?

DR C: Yes.

MYERS: Is that reference to possibly a transfusion now?

DR C: Yes.

MYERS: So at this point there is reference to a transfusion, isn't there?

DR C: Yes.

MYERS: It says here:

"[Dr C] updated with progress. Happy with the current plan. Will come and review patient."

DR C: Yes.

MYERS: That's from a note after a deterioration at 23.40. You left your accommodation probably a little time after midnight, didn't you?

DR C: Yes. I don't have the telephone records to know when I received that phone call, but presumably if Dr Harkness was doing the intubation at 23.45, with the nursing staff assisting him, it would have probably been close to midnight by the time that they were actually able to ring me and ask me to come in.

MYERS: Just for the clarification, your Lordship raised the issue and I just want to check this, that I asked [Dr C]:

"Even at 23.00 this was an emergency situation, wasn't it?"

[Dr C] acknowledged:

"Yes, it was."

MR JUSTICE GOSS: Yes, but it wasn't clear from your question as to which time you were actually saying because there were two -- we've got the 22.40 time and we had the 12 --

DR C: But I would like to clarify that although it was an emergency at 23.00, Dr Harkness reviewed and provided emergency treatment. There wasn't an untreated emergency left between 23.00 and 23.40.

MR MYERS: You should have got there earlier, [Dr C].

You know that, don't you?

DR C: I do and I wish that I had got there sooner.

MYERS: When you did get there, you were told about -- by Dr Harkness that there had been a discolouration?

DR C: Yes.

MYERS: Certainly by the time you were there, there was no discolouration that you could see?

DR C: Yes.

MYERS: By the time you got there, there had already been a serious deterioration in [Baby E]'s condition at 23.40, hadn't there?

DR C: Yes.

MYERS: Which had led to him being intubated as an emergency?

DR C: Yes.

MYERS: And whatever had happened beforehand, consideration was now being given -- you have said it was being given before this point -- to a blood transfusion?

DR C: Yes.

MYERS: So he was in a critical condition when you arrived, wasn't he?

DR C: When I... When I arrived, yes, he was very unwell at that point. He was in a critical condition.

MYERS: In the nursery to deliver treatment there was you and Dr Harkness; is that correct?

DR C: Yes.

MYERS: Dr Wood was present, the SHO?

DR C: Yes.

MYERS: The nursing staff, Ms Letby, was she present as far as you can remember?

DR C: At the time I arrived, I can't remember which nursing staff were in the room. They were the three nurses on duty.

MYERS: The three nurses on duty were Ms Letby, Ms Oakley, was it?

DR C: Yes.

MYERS: And Ms Simcock?

DR C: Yes. Now Ms Williamson.

MYERS: Ms Williamson now. Whatever happened in terms of you going to review a record at a computer, at no point when you were there did you see any discolouration on [Baby E] as described by Dr Harkness, did you?

DR C: No.

MYERS: Just tracking what happened in terms of the transfusion, I'm not going to go through all the figures again, but we've had the record at 22.10 of the vomit and the aspiration; that's correct?

DR C: Yes.

MYERS: Your belief is there was a discussion about transfusion at that point?

DR C: My belief is, yes.

MYERS: All right. Well, I've identified that isn't on the notes --

DR C: Yes.

MYERS: -- but we'll move from that.

There was more blood loss to some degree, whatever that was, around about 23.00 from the clinical note that we've seen?

DR C: Yes.

MYERS: And certainly by the time we get to your arrival at the hospital it was absolutely apparent that [Baby E] needed a blood transfusion, wasn't it?

DR C: Yes.

MYERS: That didn't actually happen, the transfusion. If we put up slide 164, please, Mr Murphy. If we go behind that to Dr Wood's scribing.

If we roll down we can see, at 00.50, O negative blood is given to [Baby E] at that time, isn't it?

DR C: Yes.

MYERS: So he didn't receive a transfusion until about 2.5 hours after the first time that vomit, the blood vomit, had been recorded, did he?

DR C: He didn't, but he had received other fluid.

MYERS: He'd had some saline, hadn't he?

DR C: Yes.

MYERS: But he needed a blood transfusion, didn't he?

DR C: He did, but not in that degree of urgency.

MYERS: O negative blood, is that the blood that can be given to anybody?

DR C: Yes, it is. His cross-matched blood wasn't ready by that time, so we have emergency O neg blood that we can access on labour ward if needed.

MYERS: And you had to use that because this had been left too long, hadn't it?

DR C: No, I don't feel that his collapse was due to blood loss because there wasn't the deterioration in his observations over a period of time that would have fitted with that.

MYERS: Working -- going forwards with the time, if it was recognised a little after 10 o'clock that he needed a

transfusion and if he continued to lose blood after that, 2.5 hours later is far too late, isn't it?

DR C: I would have to disagree with that.

MYERS: I suggest, [Dr C], that by -- what you're saying about how he presented, that seeks to minimise the impact of a late blood transfusion.

DR C: Yes, I don't believe that not having blood until his resuscitation led to his collapse and death.

MYERS: So you don't misunderstand my question, I'm suggesting to you that you are minimising the impact of a late blood transfusion by saying, well, he wasn't presenting as this or he wasn't presenting as that. You are seeking to --

DR C: Yes, I think I am minimising that because I don't think a late blood transfusion led to his collapse and death.

MYERS: You agree that there should have been possibly a blood transfusion as early as after the first bleed?

DR C: I think we discussed it but decided not to do it because a blood transfusion is not without its risks and he wasn't showing clinical signs of significant blood loss at that point. So I think we considered it.

I don't think he should have had, even with hindsight, a blood transfusion at that point. He could have had some slightly earlier, but I don't think a blood transfusion or lack of it is what contributed to his collapse.

MYERS: I'm going to suggest, first of all, insufficient thought was given to a blood transfusion until too late; do you agree or disagree with that?

DR C: I disagree with that.

MYERS: And the blood transfusion came far too late; do you disagree with that?

DR C: I also disagree with that.

MYERS: It came so late that in fact there was relatively little that could be done to assist [Baby E] once it had been given to him?

DR C: I also disagree with that.

MYERS: And combined with that, the intubation should never had had a delay of at least 45 minutes, should it?

DR C: I wasn't there to confirm the clinical condition but I believe that he must have responded to the emergency treatment from Dr Harkness because there is no way that Dr Harkness and the neonatal nurses would have left him in a poor condition while preparing for an elective intubation; they would have done an emergency intubation at that point. You'll have to confirm that with them.

MYERS: If you'd been there, you could have checked that everything was being done in the way you're now saying it should have been done, couldn't you?

DR C: I could have done, yes.

MYERS: You have told us in your evidence that you didn't see various clinical signs you might have expected to see for blood loss like this at the time that it came; is that correct?

DR C: Yes.

MYERS: Or for a death like this?

DR C: Yes.

MYERS: And you have told us actually a number of reasons why you thought that NEC may not have been the reason for this happening.

DR C: Yes.

MYERS: A post-mortem is conducted to establish cause of death, for example where there may be uncertainty attaching to it; is that right?

DR C: It is.

MYERS: And this is precisely the type of situation in which a post-mortem would have been very helpful, isn't it?

DR C: It is, and I regret not pushing for a post-mortem at the time.

MYERS: But even at the time, [Dr C], you were questioning whether NEC was the reason for this, weren't you?

DR C: I was.

MYERS: So at the time you had no obvious explanation, did you?

DR C: I felt that at the time NEC was the most likely explanation, but I completely agree that, with hindsight, I should have pushed, requested a post-mortem. I was keen to avoid that to avoid any further distress to [Baby E]'s parents and I apologise to them that I didn't push for that.

MYERS: But it's important to establish what the cause of death is, isn't it?

DR C: I completely agree.

MYERS: And in fact, you in effect steered them away from a post-mortem, didn't you?

DR C: I don't believe that is the case.

MYERS: You were instrumental in suggesting that a post-mortem couldn't really achieve very much here because it was so obviously NEC that did it?

DR C: I don't believe that I ever said that and I apologise if anything I said was interpreted as saying that.

MYERS: You agree that in fact when we look at this now, this is a situation where we really would benefit from a post-mortem --

DR C: Yes, I completely agree with that.

MYERS: -- to identify what had happened?

DR C: Yes.

MR MYERS: Thank you, my Lord.

Re-examination by MR DRIVER

MR DRIVER: Some areas of clarification arising from those questions.

You were taken to a sentence in a witness statement that you made in November 2018 --

DR C: Yes.

DRIVER: -- and reminded that within that statement you recorded that you'd discussed the issues with Dr Harkness.

DR C: Yes.

DRIVER: And that you and he agreed that:

"It was an unusual deterioration but in a high-risk baby."

DR C: Yes.

DRIVER: What did you mean by unusual in that context?

DR C: Um... A sudden deterioration without warning signs of deteriorating observations or blood tests prior to it happening. GI bleeds like that are unusual. I haven't seen similar bleeds in my clinical practice before or since. And although [Baby E] was a high-risk baby, he had been making very good progress up until that evening and he wasn't someone that we had expected a deterioration in.

DRIVER: The issue of GI bleeds. It was put to you that ulceration, gastric ulceration, could be linked to high levels of acid --

DR C: Yes.

DRIVER: -- and you agreed. And it was put to you that those manifestations could be associated with physical stress to a baby.

DR C: Yes.

DRIVER: To which you replied:

"I don't think that [Baby E] was labouring under significant physical stress."

DR C: Yes. All the clinical signs were that he was making good progress and the issues he'd had up to that point were all things that we'd expect with a premature baby of his age and gestation.

DRIVER: What are the causes of significant physical stress to a neonate within the unit?

DR C: That's not really a term that we use in medical practice, but --

MR JUSTICE GOSS: What's not a term?

DR C: Significant physical stress.

MR JUSTICE GOSS: Right.

DR C: But things that would make a baby unwell and more vulnerable would be things like infections, problems with their breathing, problems with their bowels.

MR DRIVER: So they're the potential underlying causes?

DR C: Yes.

DRIVER: What's the evidence of --

DR C: The evidence for a baby that is unwell would be a deterioration in their physical observation, a deterioration in their blood gases and other tests.

None of those worrying signs were really seen with [Baby E], outside of the abnormal blood glucose, which again is a well-recognised and fairly common problem in babies of his gestation.

DRIVER: As to that raised blood glucose, when asked about it by my learned friend, you said, in an echo of what you have just said, that it is commonly seen in babies of his gestation.

DR C: Yes.

DRIVER: How commonly?

DR C: I wouldn't be able to give you exact figures, but it's something that we're used to looking at in babies of that age when we look after them.

DRIVER: Different topic. You were taken to a page in the neonatal fluid balance chart. Mr Murphy, I think it's behind tile 121. That's our exhibit J2720.

If we could zoom in on the entry to the right of our page, we see the time of those entries. That batch of entries includes times. If we can magnify it.

Mr Murphy is going to align the times with those entries for us.

You were introduced to this column and invited to look at entries between 21.00 and 22.00 hours. My learned friend said in fact it's at 21.00 hours.

DR C: Yes.

DRIVER: We can see the earlier entries were made by a nurse who we happened to hear from yesterday whose initials are [Initials of Nurse B]. Then there are those entries that have been highlighted then, an entry underneath, a third set of initials. It records, and you were invited to consider this entry -- let

me get my note of what was said about it. This entry -- and there was a caveat about whether there's an issue or not, but this entry at 21.00 hours where it reads, "16ml mucky", it was put to you that this might indicate some underlying problem.

DR C: Yes.

DRIVER: If accurate, what sort of underlying problem might that be indicative of?

DR C: So this is a baby who's had fairly minimal gastric aspirates up until this point, so the fact that they suddenly have a large aspirate is a sign that things aren't flowing through the GI or digestive tract as they should be doing. So things that can make that happen is infection, which [Baby E] was already receiving treatment for, and then had the other antibiotics added in. NEC can also cause the aspirates to increase and go up like this.

Something that stopped the flow of things through the bowel, such as if the bowel became blocked or twisted, which would have other very clear clinical signs with it.

And presumably, aspirates would go up if something was put into the stomach, so if that baby had suddenly received a large volume of milk or something else then that would increase their aspirates.

DRIVER: What level of NNU staff would have noted and recorded such an event?

DR C: That would usually be the nursing staff.

DRIVER: And what would you expect to happen to that information if such an event was noted at 21.00 hours?

DR C: They would normally pass that information on to the medical staff and ask them to review the baby.

DRIVER: And how soon after the noting of that event would you expect that to happen?

DR C: It would depend on the other factors that affected the baby's clinical condition, but normally the nursing staff would tell a doctor fairly quickly, so within a few minutes, once they have had chance to assess the baby and make sure they were happy for other reasons.

DRIVER: We can see above that entry, but still under the 21.00 hours column, the word "omitted".

DR C: Yes. That would mean that the milk feed that was planned to be given wasn't given.

DRIVER: Thank you. Whilst we have this page, if we could look at the whole page again, please, Mr Murphy. When asked about the elective intubation, you gave evidence about how delays can take place and a reason for delays might be the drawing-up, et cetera, of the medication used to enable intubation. You were asked about that on or around 23.00 hours.

DR C: Yes.

DRIVER: Is there anything on this chart to inform you as to what the nursing staff were doing in relation to [Baby E] in that hour?

DR C: Well, they haven't recorded their routine observations, which I would take to mean that they were busy doing other tasks. I can't tell you what those tasks were, but presumably they were things that they considered more urgent than doing the routine reading of the drip and putting the observations in.

DRIVER: We can leave this screen, please, Mr Murphy.

It was put to you, on a different topic now, [Dr C], and you accepted, that you were minimising the impact of the timing of the blood transfusion.

DR C: Yes.

DRIVER: The word minimising can have more than one meaning.

DR C: Yes.

DRIVER: When you accepted that proposition, how were you using the word minimising?

DR C: I was taking it to mean that the defence was suggesting that a late blood transfusion is what led to [Baby E]'s collapse and demise, which I don't think is the case.

DRIVER: Were you deliberately downplaying the impact of the timing of the blood transfusion?

DR C: Yes, I think if it had been blood loss that had led to his collapse then there would have been other clinical signs with his observations that would have alerted us to that fact and would have made us use the emergency O neg sooner.

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

Does your Lordship have any questions for the witness?

Questions from THE JUDGE

MR JUSTICE GOSS: Just what signs, if it had been blood loss that was responsible for this collapse and death effectively?

DR C: So we would see tachycardia, a fast heart, poor perfusion, a worsening acidosis on -- a metabolic acidosis on the blood gases and a low blood pressure.

MR JUSTICE GOSS: Over any period in particular or just suddenly?

DR C: It can happen suddenly if there's a sudden very big blood loss or it can develop over a period of time if things are more insidious. But on the observations that Dr Harkness has documented on his assessments at each point with [Baby E] prior to the deterioration, where he's intubated, there doesn't seem to be evidence to support significant blood loss.

MR JUSTICE GOSS: Right. Thank you. I have no further questions.

MR DRIVER: I don't believe [Dr C] is scheduled to return.

MR JUSTICE GOSS: I'm just going to check.

(Pause)

MR MYERS: I just wonder if I could --

MR JUSTICE GOSS: Well, I think...

MR MYERS: There's one matter actually that I did want to ask in relation to your Lordship's question.

MR JUSTICE GOSS: Yes, certainly.

Further cross-examination by MR MYERS

MR MYERS: Thank you.

You said a number of signs that might indicate complications in connection with blood loss, [Dr C], included in those were deterioration in, did you say blood gas readings?

DR C: Yes.

MYERS: And also poor perfusion?

DR C: Yes.

MYERS: I'd just like to look with you, if you would, please, at the blood gas chart at J2715, which is slide 90. If we go down to the bottom three entries or so, we looked at the third from the bottom earlier. Obviously, the last one which we see is the one after you had arrived and you have talked about that and how serious that was, but actually if we look between 14.38 and 01.01. At 21.21, which is after or around about the time that the note was made by Dr Harkness, there is actually a deterioration in blood gas readings at that point, isn't there?

DR C: There is, but when I was answering my Lord's question I said that the deterioration would be a metabolic acidosis. This deterioration is a respiratory acidosis, where it's the carbon dioxide that's gone up rather than a significant change in the bicarbonate and base excess so this wouldn't fit with a deterioration due to blood loss.

MYERS: Yes. Although the bicarbonate has gone up a little bit, it's nothing significant.

DR C: Yes, nothing significant.

MYERS: I am not disagreeing with that.

As for perfusion, just if we look at the notes, please, for -- the note that was made by Dr Harkness at 23.40, J2557, slide 159. If we look at the top there under "sudden deterioration", we can see there actually that the bradycardia, says -- it actually does include poor perfusion, as it happens, doesn't it, amongst the findings at that point?

DR C: Yes.

MYERS: But also it separately records:

"Colour change over abdomen, purple discoloured patches"?

DR C: Yes.

MYERS: Thank you. I just wanted to --

DR C: But that poor perfusion, I think, is to do with the desat of the brady rather than the significant change in the circulation because the blood pressure recorded below still seems within the normal range.

MYERS: Yes, but as it happens in terms of poor perfusion we see it there, don't we, whatever the reason, and that is one of the items that you identified?

DR C: Yes.

MR MYERS: All right, thank you.

MR DRIVER: My Lord, as you know, [Dr C] is due to return one more time.

DR C: Yes.

MR JUSTICE GOSS: I'd spotted that. I was just going to check whether that's right. All right. That completes your evidence so far as today is concerned, but you will be coming back to give evidence again in this trial.

It's very important that you do not discuss anything about this case with anyone else at all, particularly anyone who's involved in the case. Similarly, you should not, if you were so minded to, read news feeds or news reporting feeds of the proceedings that are taking place because one can, I gather, read feeds that are coming from people who are reporting what's being said by other witnesses. So don't do that. All right?

DR C: Okay.

MR JUSTICE GOSS: It's to ensure that you are not influenced in any way by what any other witness says. Thank you very much indeed.

Will 2.05 be all right for you, members of the jury, now? And for everyone else, an hour? Thank you very much. 2.05.

(1.05 pm)

(The short adjournment)

(2.03 pm)

MR JUSTICE GOSS: Yes, Mr Astbury.

MR ASTBURY: My Lord, I call Dr Emily Thomas, please.

DR EMILY THOMAS (sworn)

Examination-in-chief by MR ASTBURY

MR ASTBURY: Could we begin with your full name, please?

THOMAS: Yes, it's Emily Elizabeth Thomas.

ASTBURY: It's very polite, aiming the answer at me, but if you could try and project it over in that direction, we'd be very

grateful, and keep your voice up, please, so everyone can hear you.

Your profession?

THOMAS: I'm a doctor, I'm a consultant paediatrician.

ASTBURY: You were asked to provide a statement about a time when you were employed at the Countess of Chester Hospital back in 2015; do you recall?

THOMAS: I do.

ASTBURY: At that time, in 2015, what was your status in your profession?

THOMAS: I was an ST1 trainee in paediatrics, so I was at the end of my first year in general paediatric training.

ASTBURY: Thank you. When did you qualify as a doctor?

THOMAS: I qualified as a doctor in July 2011.

ASTBURY: Was your time at Chester part of a rotation within the deanery?

THOMAS: It was, yes, it was part of a six-month rotation.

ASTBURY: Specifically, please, I'm going to ask you about a baby called [Baby E] and a shift that you completed, I understand a day shift, on 3 August 2015.

THOMAS: Yes.

ASTBURY: Is that right?

THOMAS: Yes.

ASTBURY: When you were asked to recall that shift, I think you took the opportunity to check the notes that were available to refresh your memory?

THOMAS: That's correct.

ASTBURY: And your statement has, to some considerable extent, relied on those notes in its preparation; is that right?

THOMAS: That's right.

ASTBURY: There's a screen to your right. We will turn to the notes from time to time to assist you. Do you remember what shift you were working on that particular day, what hours?

THOMAS: Unfortunately, I can't remember the exact shift I was working that day. I could see from the notes that I had made entries at around 2 o'clock in the afternoon and 7 o'clock in the evening. So I assume that I was working a long day shift, which would normally run from 8.30 in the morning until handover at 8 pm in the evening.

ASTBURY: Would you be covering more than one ward during the course of that shift?

THOMAS: Usually in the evening portion, I'd be covering the children's ward admissions and then the neonatal unit as well. I'm not sure where I was in the morning of that shift because that would depend on the acuity in the area. So it might be that I was on the neonatal unit or it might be that I was on the children's ward and then, once it got to 4.30, I then covered everywhere.

ASTBURY: I'm in fact going to ask you about events before 4.30, so if that assists, it took place in the neonatal unit.

Does that assist with where you were during the course of the earlier part of the day?

THOMAS: Possibly, yes.

ASTBURY: Okay, all right. Before we move on to the details, were you supported during the course of that shift by other medical staff?

THOMAS: Yes, absolutely. There would be lots of people on that shift as well. There would be at least a senior paediatric trainee, a registrar, and there would also be a consultant on call that would be available. Quite often in the Countess of Chester, there would also be a paediatric nurse practitioner that may be covering the children's ward in the evening as well, but they wouldn't usually be on the neonatal unit.

ASTBURY: Okay. Did there come a point in that shift, that day shift, when you were asked to review [Baby E]?

THOMAS: So from looking at the notes, I believe so, yes. It looks as though I was asked to review [Baby E], to examine his abdomen in the afternoon.

ASTBURY: Okay. And from checking the notes, are you able to tell us who asked you to check --

THOMAS: I believe it was Dr Ventress. I have made that as an assumption because I can see she's documented the ward round in the morning with a plan to go back and examine [Baby E] and if she was the registrar that was covering the neonatal unit, it would have been her that asked me to go and review the baby.

ASTBURY: Shall we begin then by going to the notes now. If we can go to slide number 78.

We see a presentation on the page. If we go behind that and behind that again, we should see the original notes. If we scroll down, please. We can see there a note on 3 August 2015, 11.45, it's completed by Dr Ventress, who you have told us would have completed the ward round.

When you were asked by Dr Ventress to check on [Baby E], and it was a little bit later in the day, firstly, were you told why that check was still necessary?

THOMAS: I can only make that guess by reading the notes, but my understanding is that I was asked to examine him just to check his abdomen was okay, to absolutely be certain that we could increase his feeds, because I can see from the ward round note by Dr Ventress that she said:

"Can increase feeds if examining well and no abdominal concerns."

ASTBURY: Was there a reason why his abdomen hadn't been checked during the course of that ward round?

THOMAS: It looks as though he was out having cuddles with his mum, having what we call skin-to-skin, which is bonding time that parents have with babies on the neonatal unit.

It is quite an important time --

MR JUSTICE GOSS: We have heard quite a lot about this and we are very familiar with skin-to-skin and its importance.

THOMAS: Sorry.

MR ASTBURY: He was having skin-to-skin and because of that you were led to believe because of that it wasn't appropriate to check his tummy and you were asked to complete that task a little bit later on?

THOMAS: Yeah, that's correct.

ASTBURY: All right. Would you have checked these notes before examining him, to bring yourself up to speed?

THOMAS: Yes, I'm not entirely sure that I wasn't on the ward round because I may well have been on the neonatal unit that morning on the ward round with Dr Ventress or I may not have been, I can't recall.

ASTBURY: Okay. So you may actually have been there (overspeaking) but maybe not?

THOMAS: -- and I would have been fully aware of the situation before examining him.

ASTBURY: Okay, all right. Given what you were being asked to do, did you confirm that, for example, he had opened his bowels?

THOMAS: I think I can see from the ward round he had opened his bowels.

ASTBURY: That's an important consideration given the stomach examination --

THOMAS: Absolutely.

ASTBURY: If we can come out of that tile then, please, and look at slide number 86.

It has your name on the top. Do you recognise the handwriting?

THOMAS: Yes.

ASTBURY: So that suggests that at 2.10 you conducted an examination of [Baby E]; is that right?

THOMAS: That's correct.

ASTBURY: You confirm there that he had been having skin-to-skin at the time of the ward round; is that right?

THOMAS: That's correct.

ASTBURY: And if you could talk us through, please, the rest of your entry.

THOMAS: It looks as though examining him I've reviewed his observations and I can see that his heart rate and his respiratory rate were stable. He also had good oxygen saturations in a small amount of oxygen.

ASTBURY: Pausing there, I think the record is 95% as far as saturations are concerned?

THOMAS: Yes.

ASTBURY: And then is that -- I'm not sure what that first word is, but in 25% O2?

THOMAS: I think "now in 25% O2".

ASTBURY: Right. As we have heard, of course, air being 21%, that's a little over -- only a little over what (overspeaking) receiving anyway?

THOMAS: Yes. I would class that as a small amount of oxygen.

ASTBURY: Yes, okay. Carry on, please.

THOMAS: I have documented that he had good tone and movements.

So that would be part of a neurological assessment. And I have documented that he's handling appropriately, so that means he hadn't been giving any clues or signs of being unwell or in discomfort or distress because he's been handling nicely.

ASTBURY: I think you go on to say that's throughout the day?

THOMAS: Yes. So it looks as though I will have spoken to the nursing staff to ask their opinion before examining him and I will have consulted the nursing record as well.

I've then also documented that he has no increased work of breathing -- that can be a sign of respiratory distress in a baby -- and his chest is clear, that's the drawing that's there.

ASTBURY: Thank you. That's something we're seeing on a regular basis. That's a typical way, is it, of indicating --

THOMAS: It is in the UK.

ASTBURY: HS 1 plus 2 plus -- I think that's zero...

THOMAS: So that means that his heart sounds were normal and I couldn't hear any murmurs or extra sounds when I was listening to his heart.

ASTBURY: Okay. Femorals -- is that "palpable"?

THOMAS: Yes. So as part of a cardiovascular examination we usually check babies' pulses in their groin to make sure

everything is okay and if he has nice femoral pulses or palpable femoral pulses, that's reassuring.

ASTBURY: CRT?

THOMAS: That's the capillary refill time and that's a really good marker of how well perfused a baby is. It's part of a cardiovascular examination. It's something that you would expect to be delayed or prolonged in an unwell baby. Less than 2 is normal.

ASTBURY: There's another little diagram on the left further down.

THOMAS: That's supposed to be an abdomen.

ASTBURY: Could you tell us what you have written alongside it, please?

THOMAS: I have written that it was soft and not distended. So they would be normal findings. I've put "BNO yet", which would mean bowels not opened yet, I can assume that since the ward round he hadn't opened his bowels again. I put bowel sounds were present, which is a good sign, it means his bowel is moving and active. And I have put, "No suspicious aspirates". That would refer to the nasogastric tube aspirates that the nurses check before giving babies feeds. By no suspicious aspirates that means that nothing was concerning when they were aspirating that NG tube.

ASTBURY: Thank you very much. Carry on further down, please.

THOMAS: "AF soft", that's referring to his fontanelle, which is the soft spot a baby has, and a soft fontanelle is a normal finding.

ASTBURY: Okay. P is plan we have heard?

THOMAS: Yes, P is plan, and I have said, "As overleaf", so I assume that is referring to Dr Ventress' ward round plan to increase the feeds a small amount. So I have put he's had a normal abdominal examination so I was happy for him to go up on his feeds as planned by Dr Ventress.

ASTBURY: From your examination, what, if any, conclusions had you reached?

THOMAS: My conclusion was that he was well and stable and I was happy that we could proceed with the plan to continue with increasing his feeds.

ASTBURY: "Pharmacist's note seen, thank you."

THOMAS: That's a reference to a note that the pharmacists had made earlier, where there had been advice to consider adding in teicoplanin if we were worried that [Baby E] had line sepsis. So I have noted that and I think that is something that would likely have been discussed in our medical doctors' handover as well or on the ward round.

The plan was to check another infection or inflammatory marker and, if that was raised, to think about adding in that extra antibiotic. Because he was well at examination that wouldn't be something that we would need to rush into at that time.

ASTBURY: We heard earlier that that's an antibiotic, is it, that refers to the plastic line or --

THOMAS: Yes.

ASTBURY: -- a possibility of bacteria from the skin?

THOMAS: Yes, it's very specific to that.

ASTBURY: "Due 24 hours CRP now"?

THOMAS: Yes. That's a reference to the inflammatory marker called a CRP that would have been due at that point.

ASTBURY: And that's -- subject to that -- sorry I have gone back to what you've been telling us. Subject to that would be whether you introduced that additional antibiotic or not?

THOMAS: Yes, that's correct.

ASTBURY: Thank you. We can then see that not too long after that, at 2.50, you examined [Baby E] again.

THOMAS: I think at 2.50 I reviewed his gas and I reviewed his urine output chart. I cannot see that I examined him at that time.

ASTBURY: Right, I'm sorry. So tell us what the entries mean then, please, that you have put in.

THOMAS: BM means blood sugar and that is a high level at 18.4.

PU-ing means passing urine and that's a higher than normal rate at 4.4ml per kg per hour, although it is not very high.

ASTBURY: Right. As a combination of those two it appears you have put an additional plan on the document?

THOMAS: Yes. So at that point with that sugar being high we would start insulin to try and bring that blood sugar down. It looks like I've started that at a lower than the normal rate because I could see -- and I think this may also have been discussed in the doctors' handover that [Baby E] had previously been on insulin and his blood sugar had dropped very quickly so when he had then been restarted on insulin previously he had been started on a lower rate than normal and I continued with that plan to start on a lower rate than normal so that he did not drop his blood sugar too quickly because that would be dangerous.

ASTBURY: Okay. So in summary, blood sugar is high, you note the rate of passing urine. It's a low dose and I think you articulated at the bottom of the page that, as you've just explained to us:

"Previously very sensitive to even small doses"?

THOMAS: Yes.

ASTBURY: Thank you. If we go to tile 94, please, Mr Murphy. If we can go behind that. We can see there a document which we've looked at before. Not with you, Dr Thomas, but it records the administration of insulin --

THOMAS: Yes.

ASTBURY: -- during [Baby E]'s stay in the unit. We can see there, 3 August, 3 o'clock, so shortly after you've completed your examination. Perhaps we could just zoom in a little bit, please, Mr Murphy.

We can see a time started. Sadly, the time finished. The rate, I think, which is the next row down. The dose. If we can just -- is that your signature, doctor, that's below that --

THOMAS: Yes --

ASTBURY: -- row?

THOMAS: -- yes, that is.

ASTBURY: Is it the convention that the nurses then sign having started the infusion?

THOMAS: Yes, that's correct.

ASTBURY: Just dealing with insulin briefly, is it always on prescription from a doctor before it's given to a baby?

THOMAS: Absolutely, yes.

ASTBURY: Why is that?

THOMAS: Because it's a medication, so no medication should be given to a baby unless it's prescribed by a doctor.

ASTBURY: Is it your understanding that once the insulin is prescribed and when the nurses administer the insulin -- I think we can see two signatures on that document -- that it's double-checked even at the stage it's administered?

THOMAS: Yes, absolutely. All paediatric and neonatal medications are checked by two nurses.

ASTBURY: If we can go, please, to the nursing note behind number 97.

If we can look at that -- well, in fact we probably don't need to look at it. There's a summary on this particular page, I hope, to continue the picture.

A reference to the blood sugar, mention of your name?

THOMAS: Yes.

ASTBURY: "Dr Thomas Informed, insulin recommenced at 3.30 at [the rate that's set out on the form]."

So prescribed at 3 o'clock, commenced at 3.30.

Is that consistent with what you would expect?

THOMAS: Yes.

ASTBURY: Just go back a tile, please, to 96, and look at the chart, please.

If we look along the top line, we can see the times and at 3 o'clock, you see the date in the top left of the grid?

THOMAS: Yes.

ASTBURY: 3 August, the times across the top, and if we track across to 3 o'clock, two-thirds of the way across the page --

THOMAS: Yes.

ASTBURY: -- we can see the initials [Initials of Nurse B], which the jury will recognise. If we go down that column we can see there, "Commenced at 15.30". Thank you.

If we can go back again, please, to tile 95. This is a pathology report with your name attached to it.

I think it's described as "ordering doctor". Can you tell us anything about that, please, or explain the content of that document?

THOMAS: It looks as though that was the 24-hour CRP that had been mentioned earlier in the notes. That's a blood test to look for signs of infection that we would normally perform 24 hours after starting antibiotics because it can sometimes be normal when you start antibiotics and then rise 24 hours later. If it was high at 24 hours that would suggest there was infection there. But that level is less than 1, which is completely normal and doesn't suggest that there's infection.

ASTBURY: In itself?

THOMAS: In itself.

ASTBURY: All right. Did you examine [Baby E] again at 7.30 that evening?

THOMAS: Not that I can recollect and not that I can definitively say from the notes. I definitely went back to review [Baby E], but that was likely just to look at the blood sugars and look at the blood test results and review the observation charts.

ASTBURY: Right. Could we look then, please, at tile 113?

Again, we can see your name, recognise the handwriting, and confirm it's your note. That's the result presumably at the top of your 24-hour screen; is that right?

THOMAS: That's correct.

ASTBURY: Thank you. Could you talk us through, please, the rest of the entry from that particular review?

THOMAS: It looks as though I've looked out for the blood test results and I've chased the CRP that was taken at 24 hours and I've seen that it was less than 1. I've also recorded that we'd started [Baby E] on antibiotics because he'd gone into a small amount of oxygen, having previously been in air, but the amount of oxygen that he was needing was now improving.

I have looked at his white blood cells and specifically his neutrophils and looked at the most recent results of those and looked at the trend of those, which showed that his neutrophils had improved.

ASTBURY: Let's pause there. Please explain that to us in a couple of sentences.

THOMAS: The neutrophils can be a marker of bacterial infection and less than 1 would be low. So above 1 would be more within the realms of normal. It can be a bit complicated sometimes because very small growth-restricted babies can sometimes have lower white blood cells than you would expect, so you would look at the white blood cells in context with other things like the blood culture results and the CRP results and the clinical examination of a baby.

ASTBURY: Okay. Just on that subject, taking a single reading or a single result in isolation, is that something that you would ordinarily do?

THOMAS: It would just depend on the situation because if you had a result that was extremely or high extremely low, that might be relevant, but usually we tend to look at the trend of blood test results.

ASTBURY: You told us BM is -- is that sugars?

THOMAS: That's sugars.

ASTBURY: "Now settling" does that say?

THOMAS: Yes.

ASTBURY: And then you give the result of 12.1. That's, I think, the dose that we saw earlier on the prescription?

THOMAS: That's correct.

ASTBURY: And you note that it had been a little higher 2 hours before --

THOMAS: Yes.

ASTBURY: -- hence your conclusion.

Next entry, again, concerns passing urine. Any observations on that entry?

THOMAS: So the amount of urine that he's passing has gone up a little bit, which is something that we would want to monitor and

watch carefully. It's quite often related to having high blood sugars and would go hand-in-hand with that, so we would closely check and keep an eye on that so we could increase his fluids if we needed to.

ASTBURY: If we scroll down. I think we can see a plan emerging, literally. Is that to repeat the test for sugars in 4 hours?

THOMAS: Yes.

ASTBURY: Just help us with the rest of the entry, please.

THOMAS: "Repeat BM in 4 hours. Gas with this for sodium."

That's because if we were worried that [Baby E] was becoming dehydrated. Sodium is sometimes a good marker of hydration, so it's something that we would look at.

I've also said:

"Likely to stop antibiotics at 36 hours as improving neutrophils and static CRP."

So his CRP had not gone up at all. And BC means blood cultures and I've put "negative to date". So when [Baby E] was started on antibiotics, the 24 hours previously, a sample of blood will have been taken from him and sent to the microbiology lab and we then give 36 hours for that blood to grow any bacteria. If that sample is negative at 36 hours we have given a sufficient amount of time for bacteria to have grown so we class that as not showing signs of any bacterial infection if that test is negative.

ASTBURY: The final entry in your note concerns venous bloods.

THOMAS: Yes.

ASTBURY: Could you again, in a couple of sentences, explain what that lines means?

THOMAS: I cannot recollect what that means actually at the time.

It could be that [Baby E] needed a larger volume than normal of bloods taken for his weekly bloods. Quite often when we do blood tests on babies on the neonatal unit, they have heel prick blood tests and you can usually get one sample or one blood bottle from that.

If you needed more than one bottle, we might do bloods from a vein with a needle, so that we can get a bigger sample and send that off. So I assume that is what that is associated with.

ASTBURY: So based on all of your notes at 7.30, what was your clinical assessment of [Baby E] at that stage?

THOMAS: So my impression from what I've read is that he was definitely stable and, if anything, showing some signs of improving if his oxygen requirement was coming down.

MR ASTBURY: Right, okay. Thank you, Dr Thomas. I have no more questions. If you can wait there, please.

Cross-examination by MR MYERS

MR MYERS: Dr Thomas, can I just check, you made a witness statement, was it Monday this week, for this?

THOMAS: It was Friday.

MYERS: Friday, all right. You said that:

"Given the time that has elapsed I have no personal recollection of [Baby E] and this statement is written from reading the notes"?

THOMAS: That's correct.

MR MYERS: Understandably because it's 7 years ago.

My Lord, I know the prosecution wished to call Dr Thomas to deal with those notes so they could be put into evidence but there's no questions that we have for Dr Thomas. Thank you.

MR ASTBURY: Does my Lord have any questions?

MR JUSTICE GOSS: I don't, thank you very much. Thank you, Dr Thomas. You will be coming back.

THOMAS: Okay.

MR JUSTICE GOSS: Weren't you aware of that?

THOMAS: No.

MR JUSTICE GOSS: You looked surprised. Just let me check.

MR ASTBURY: It's not on the list, my Lord. We may need to double check that. We think so, but it wouldn't be the first time I've been wrong.

MR JUSTICE GOSS: Anyway, it's possible that you will be required again, but I think that will be worked out very shortly so that you will know whether you are required.

Can I just generally say, please don't talk to anyone about this case and in particular your evidence, the questions you've been asked and what you've given evidence about, until the case is all over. But also, just in case you are coming back to give evidence, until you are told, if it be the case, that you are not required to come back, do not look at any news feeds or details of evidence, not just the general news reports but the details where there can be news feeds of what witnesses have said, sentence by sentence, basically --

THOMAS: Okay.

MR JUSTICE GOSS: -- which one can access in the digital age in which we live. All right?

THOMAS: Yes, thank you.

MR JUSTICE GOSS: Don't do that. Thank you very much indeed. You're free to go. Thank you very much for coming and giving your evidence, doctor.

(The witness withdrew)

MR ASTBURY: We're caught a little on the hop. I think the next witness is still on the way upstairs.

MR JUSTICE GOSS: Mr Driver is going to see, is he?

MR ASTBURY: Yes. It's Belinda Simcock.

(Pause).

MS BELINDA WILLIAMSON (sworn)

Examination-in-chief by MR ASTBURY

MR ASTBURY: Could we start with your full name, please?

WILLIAMSON: Belinda Williamson.

ASTBURY: Thank you. I know the temptation is to look at me when you answer, thank you very much, but if you can try and keep your voice up and make sure that everybody on the back wall there can hear you, we would be very grateful.

Thank you.

Your occupation, please?

WILLIAMSON: Band 6 nurse at the Countess.

ASTBURY: Forgive us, we will show you a number of documents in which your name appears at Belinda Simcock, as you were practising at the time we're interested in. So just by way of explanation, that's why your name appears in that way.

Were you employed as a band 6 nurse in your capacity in the Countess of Chester back in August 2015?

WILLIAMSON: Yes.

ASTBURY: And were you specifically employed in the neonatal unit given your experience and training?

WILLIAMSON: Yes, yes.

ASTBURY: I want to ask you, please, about a particular shift and a particular baby by the name of [Baby E]. Okay? And were you working a night shift between the 3rd and 4 August 2015?

WILLIAMSON: Yes.

ASTBURY: You provided a statement to the police --

WILLIAMSON: Yes.

ASTBURY: -- and I think you found it difficult to recollect the detail, would that be fair to say?

WILLIAMSON: Yes.

ASTBURY: And you've relied largely on the notes to --

WILLIAMSON: Yes.

ASTBURY: -- inform that which you told the police?

WILLIAMSON: Yes.

ASTBURY: All right. In that case then, we're going to rely on the notes that we have available to assist you. If you can look at the screen to your right, you'll see initially a coloured presentation, but rest assured we'll go behind the coloured tiles and look at the notes themselves, which are probably more helpful and more detailed.

If I can ask Mr Murphy to go to 114 to begin with, please. A tile entitled "Shift handover, 19.30 on Monday 3 August". If we

can go behind it, we see a representation of those who were on duty that particular night. We can see at the top, just to assist you, the name of the paediatrician of the week, but more importantly the on-call consultant, [Dr C].

WILLIAMSON: Yes.

ASTBURY: The registrar, Dr Harkness. The night SHO, Dr Wood.

And then as we move down, we can see the names of the nursing staff: Caroline Oakley, Lucy Letby, yourself, and two, as we have heard them described, nursery nurses, Lisa Walker and Valerie Thomas.

WILLIAMSON: Yes.

ASTBURY: If we go to the next tile, please. We have a representation of the unit itself. Can we enlarge it a little bit, please, Mr Murphy or is that not possible?

It's pretty small on that screen and it's probably a little bit too far away from you. In the centre is a green square which sets out the neonatal unit. It's a plan.

WILLIAMSON: Mm-hm.

ASTBURY: If it assists, we can see nursery 1, with the blue circle on the right, and a related arrow from it and on the left nurseries 2, 3 and 4 running up the left-hand side of the plan, just to orientate you.

In nursery 1, we can see that both [Baby E] and his twin, [Baby F], were allocated to Lucy Letby as designated nurse.

In nursery 2 we can see two babies cared for by Caroline Oakley that night. And a third by Lisa Walker.

We can see your name to the bottom left in nursery 3 --

WILLIAMSON: Yes.

ASTBURY: -- with a baby who we've described as CE.

And up to the top left we can see nursery 4, there are four babies in nursery 4, two of whom are cared for by Valerie Thomas, two by Lisa Walker.

WILLIAMSON: Yes.

ASTBURY: So that was the start of the relevant shift. You were not the designated nurse for [Baby E]?

WILLIAMSON: No.

ASTBURY: Do you remember from recollection having any contact or dealing with [Baby E] that particular night shift?

WILLIAMSON: No.

ASTBURY: Okay. All right. We, of course, have the benefit of some notes, so I'm going to take you through the relevant notes and see if they assist you with your recollection.

First of all, please, I'd like to go to tile number 125, please. It's a neonatal fluid balance chart. I'm sure you'll be very familiar with the form that lies behind it. Just acquaint yourself with that.

You can see from the top left, the date is 3 August.

That's when the form began. You'll know, forgive me, but so we can all follow it together, the times are from left to right, next to the date. Then the entries are in a column below the relevant time.

WILLIAMSON: Yes.

ASTBURY: If I can ask you, please, first of all, to track across almost to the furthest right-hand end of the form to 22.00 hours.

WILLIAMSON: Yes.

ASTBURY: If we read down, we know there's a cumulative figure of 163.7 for the fluids. I won't go through all of them, you can see the chart. If we come down at the very bottom, do you recognise the initials at the bottom?

WILLIAMSON: Yes, they're my signature.

ASTBURY: Okay. Are you able, if we just look at the figures on the top half of the form, 163.7, 184, do they appear to be your handwriting? Do you recognise them?

WILLIAMSON: Probably. It's so small.

ASTBURY: Let's see if we can make it any larger.

WILLIAMSON: Yes, it looks like mine.

ASTBURY: So you've made a series of entries there in relation to the fluid balance for [Baby E] that night at that particular time?

WILLIAMSON: Yes.

ASTBURY: If we scroll lower down in the same column, please. In particular, the manuscript entries towards the bottom.

We can see the column immediately to the left, which is the 9 o'clock column, with the words "omitted", "discarded", and "16ml mucky".

WILLIAMSON: Yes.

ASTBURY: And we can see alongside that, in the column that you've completed --

WILLIAMSON: Yes.

ASTBURY: -- "15ml of what looks like" --

WILLIAMSON: "Fresh blood."

ASTBURY: What may be fresh blood?

WILLIAMSON: Yes.

ASTBURY: Are you able to say whether that's your handwriting in that column?

WILLIAMSON: Not sure, I'll be honest.

ASTBURY: Not sure?

WILLIAMSON: No.

ASTBURY: If that's your handwriting?

WILLIAMSON: No.

ASTBURY: Okay. That's the only occasion upon which you make an entry on [Baby E]'s neonatal unit fluid balance chart.

Having seen that, does that jog your memory as to why you may have done that?

WILLIAMSON: No.

ASTBURY: No? We saw earlier that you were, I think, allocated a baby elsewhere?

WILLIAMSON: In nursery 3, yes. I could have a guess, but it would be a guess, which is they're busy and someone's asked me to do some obs for them.

ASTBURY: Is that an unusual occurrence?

WILLIAMSON: No.

ASTBURY: So around about 10 o'clock, that time, entirely accurate or is it simply a guide or a marker?

WILLIAMSON: It's an hourly marker. If we've done it later -- you can see be somebody's done 18.20, 20.15. So if we do it later than the hour, we usually write the minutes in.

ASTBURY: Okay. So you think that was probably -- are you assuming then the fact that you haven't (overspeaking)

--

WILLIAMSON: 10 o'clock, yes.

ASTBURY: I'm just being asked if you can raise your voice a little bit. I'm sorry, Nurse Williamson.

So at or near 10 o'clock, every chance you think you may have been asked to complete those observations and make those entries?

WILLIAMSON: Yes.

ASTBURY: Okay, all right. Would you have had similar responsibilities in respect of your own baby on that particular shift?

WILLIAMSON: Depends what that baby's needs were.

ASTBURY: We have a document called a neonatal review chart.

I think it might be in the white folder, which is -- please be very careful beyond the water. So if you're able to lift it out, can I ask -- I think it's the first time we may have done this -- everyone to get their neonatal review charts out, please, just to assist with your responsibilities that night in addition to this.

[Baby E]'s is the last of the charts in your folder.

I know we've got the markers.

Go to the very back page, please. You should see page 11 of 11. The very last page. Bottom right.

WILLIAMSON: I've got 6 of 6.

MR JUSTICE GOSS: I wonder if it's been put in.

MR ASTBURY: It's not been put in. Thank you. Bear with me a second. For now I think we can probably put the file away and we'll just work from the one (inaudible).

MR JUSTICE GOSS: Yes, it's not been put in.

MR ASTBURY: It will be. Apologies.

MR JUSTICE GOSS: The previous one is 6 of 6.

MR ASTBURY: (Inaudible). If everyone could turn to page 3 of 11 in that particular review chart, please.

Hopefully on that page, Nurse Williamson, you'll see some numbers down the left-hand column.

WILLIAMSON: Mm-hm.

ASTBURY: Can I ask you to follow down to line 49, please.

If we read across, we can see the date, 3 August, 21.59, so suggesting perhaps this was just before 10 o'clock.

WILLIAMSON: Mm-hm.

ASTBURY: On the relevant record, and we can go to the record in a minute if we need to, but we've got 21.59, we've got an e-prescription and medication, and you, if we read right across, it would appear administering medication with a co-signer, Caroline Oakley, your colleague.

WILLIAMSON: Yes, correct.

ASTBURY: And then, on the second line down, we can see a similar entry.

WILLIAMSON: Mm-hm.

ASTBURY: Just you on that occasion, I think that's probably updating the computer. That's why it's only your name --

WILLIAMSON: Okay.

ASTBURY: -- against that. So does that suggest that just before that entry you'd have been engaged with another child who we have represented as JE?

WILLIAMSON: Yes.

ASTBURY: I'll be corrected if I'm wrong but that wasn't, I don't think, your allocated baby, that was ME on the previous chart we looked at. But as I say I'll be corrected if I'm wrong, you don't need to look that up.

WILLIAMSON: Okay.

MR JUSTICE GOSS: You're right. Lisa Walker was the nurse.

MR ASTBURY: Yes. So perhaps an example, as you've told us, of you helping out with other babies when asked to do so or needing to do so.

WILLIAMSON: Yes.

ASTBURY: If we go down again, please, to line 59, we can see at 10 o'clock, reading across, same baby, JE. And from JE's feeding chart, the feed being given by yourself.

WILLIAMSON: Yes.

ASTBURY: Were feeds given faithfully on the hour or were they again just one of those things that would be entered --

WILLIAMSON: As near to the hour as possible, so it'd be probably either side.

ASTBURY: Okay. We can, can we, from this various information, take that you, at or around 10 o'clock, administered medication to JE, fed JE, and also, you think, probably as a result of a request, you entered those fluid readings on behalf of [Baby E]?

WILLIAMSON: Yes.

ASTBURY: All right. We've got the original records. If I can ask Mr Murphy to put those up, please, the records that were sent this morning, the prescriptions from the NNU.

We're going to see a document with the first page marked "Prescriptions". It's J28264. If we can scroll down, please, to page 9 of that document or 28269.

Hopefully in the second box up, we can see on 3 August:

"Administered: 21.59. Given: yes. One drop."

Is that the second box up? Lower down, please, Mr Murphy.

Hopefully you can see the entry, we've got the administration of medication there. This is a form you'll be familiar with, I'm sure.

WILLIAMSON: Yeah, it looks different on the computer at work.

ASTBURY: It doesn't help with --

WILLIAMSON: No.

ASTBURY: -- your memory?

If we scroll down again, please, to a feeding chart.

21.59. That's a time that shows on the review. Is that presumably created by the computer as you --

WILLIAMSON: Yes, as we press enter.

ASTBURY: Okay.

WILLIAMSON: Or -- I can't remember. Some of them -- when you enter, like open the computer, it'll put the timestamp on it and some of them do it as you hit enter on your password.

ASTBURY: Right. Allowing for a couple of minutes perhaps either way, would you have made the computer entry before or after you'd given the medication, can you remember?

WILLIAMSON: It's usually after.

ASTBURY: Okay. If I could ask Mr Murphy, please, to scroll down to 28279, which is page 19 of the document. The last entry in the top box, please, timed at 22.00, alongside the figure 150.

You confirm that entry?

WILLIAMSON: That's not my signature.

ASTBURY: That's not your signature?

WILLIAMSON: No. And it's not my handwriting.

ASTBURY: Right. You can't --

WILLIAMSON: Yes, that's definitely not mine.

ASTBURY: We will revisit that entry then, thank you.

So 10 o'clock entry, no recollection, but assuming asked to assist a colleague?

WILLIAMSON: Yes.

ASTBURY: All right. Could we go next, please, to tile 131, Mr Murphy?

Just looking before we go behind it, it suggests that you assisted with medication at 10.27 pm --

WILLIAMSON: Yes.

ASTBURY: -- with [Baby E]. Perhaps if we look behind it, I'm sure it'll be a document you're familiar with.

WILLIAMSON: Yes.

ASTBURY: Scroll down. We can see, if we pause there, please:

"Administration history detail. Administered: 22.27. Given: yes."

And then you appear to be the user, with the co-signer being Lucy Letby.

WILLIAMSON: Yes.

ASTBURY: Any significance in who appears as the user and who appears as the co-signer?

WILLIAMSON: No, it's just whoever's logged on first becomes, like, the user and then the co-signer's the second person.

ASTBURY: If we come out of that, please. We come across, please, the next tile. If we can find a similar entry here, please. This is a different form, showing a different administration. When you say that the user is created by whoever's logged on to the computer, does that person have to input who the co-signer is?

WILLIAMSON: No, they input their own details.

ASTBURY: Okay.

WILLIAMSON: So I open the computer myself, so it would be my log-on into Meditech, find the baby, open the chart, and then the second person to get them, they would -- the co-signer they put their details in so their log-in, a pop-up screen pops in and they put their log-in details and their password.

ASTBURY: So the user would have it open?

WILLIAMSON: Yes.

ASTBURY: They'd be putting the details in. A pop-up box appears, enabling the co-signer to enter their --

WILLIAMSON: Details.

ASTBURY: So when you say details, rather than just their name, they have a specific ID?

WILLIAMSON: Yes.

ASTBURY: Which is presumably a numeric code, is it?

WILLIAMSON: Yes.

ASTBURY: And then the computer generates who the co-signer is --

WILLIAMSON: Yes.

ASTBURY: -- as a consequence of that?

WILLIAMSON: Yes.

ASTBURY: If we go back to the tiles, please. Scroll across again. 133. We're not going to go behind that, but that's sodium chloride. Is that used to assist with flushing medication before and after its administration?

WILLIAMSON: Yes.

ASTBURY: Okay. Scroll again to oxygen, please, next door. And then if we go finally to the insulin tile, please, and click into that.

Again, if we scroll down we should see the same sort of entry. Yes. So immediately under "Administration history detail", we can see a similar representation in respect of the names. It was scheduled at 10 o'clock?

WILLIAMSON: Yes.

ASTBURY: If we read across, administered at 22.38?

WILLIAMSON: Yes.

ASTBURY: Okay. We've heard that [Baby E] had been receiving insulin since mid-afternoon, about 3.30.

WILLIAMSON: Yes.

ASTBURY: What would in our -- just to explain to us, what would that have required you and presumably Ms Letby to have done at 22.38?

WILLIAMSON: So it's just generally on the computer like this, it's not a prescription, the prescription chart is paper for intravenous drugs. So it's just saying: is the paper chart current and is it working and does it match what the syringe is running?

ASTBURY: Okay.

WILLIAMSON: So it's just an indication that, yes, at some point during the previous -- it might be at that time or when I've done the fluids at 10 that I've eyeballed the syringe that's running and it matches the paper chart.

ASTBURY: Please correct me if I'm wrong, but that's a confirmation from you that the insulin is still running as it should be?

WILLIAMSON: Yes.

ASTBURY: All right. So it hasn't required you to exactly do anything?

WILLIAMSON: No.

ASTBURY: Just checking?

WILLIAMSON: Just checking.

ASTBURY: Is there a reason then that it has co-signer if it's just a check?

WILLIAMSON: It's just what the computer requires as far as I am aware.

ASTBURY: All right. When insulin is administered, we've heard there has to be a prescription.

WILLIAMSON: Yes.

ASTBURY: Obviously written by the doctor?

WILLIAMSON: Yes.

ASTBURY: And then ordinarily two nurses would set up the insulin infusion; is that right?

WILLIAMSON: Yes.

ASTBURY: And that's where you do have one administering, one co-signing?

WILLIAMSON: Yes.

ASTBURY: And is caution taken when administering insulin?

WILLIAMSON: By caution, what do you mean?

ASTBURY: Tell us what steps take place before you actually administer the insulin to a baby when it's been prescribed?

WILLIAMSON: We check the prescription is correct, so you do all your maths calculations first, you check the BNF, you check your dosage, intravenous medication drug book. If you're happy with the doses you go and get everything you need to make it up and usually the two of you have checked it independently and then you go and get the equipment that you need to make it up.

ASTBURY: Okay. So you check that the prescription is right?

WILLIAMSON: Yes.

ASTBURY: Just want to go through each stage, if you don't mind, because it's the first time we've come across with a nurse in your position, the administration of insulin.

You check the prescription first?

WILLIAMSON: Yes.

ASTBURY: The dosage?

WILLIAMSON: Yes.

ASTBURY: The rate?

WILLIAMSON: Yes.

ASTBURY: The name?

WILLIAMSON: Yes.

ASTBURY: Any other details?

WILLIAMSON: Date of birth, MRN or CC number, I think you're running on.

ASTBURY: Make sure that it's going to the right baby?

WILLIAMSON: Yes.

ASTBURY: Then you mentioned I think the BNF?

WILLIAMSON: Yes. We've got I think it's called Medusa at the time, like an intravenous drug guidebook.

ASTBURY: Does the doctor put on the prescription the rate and the dose?

WILLIAMSON: Yes.

ASTBURY: But are you -- these are references, presumably a reference book or a reference resource?

WILLIAMSON: Yes.

ASTBURY: And you go and check that the doctor's got it right as well?

WILLIAMSON: Yes.

ASTBURY: So you're satisfying yourself before you even connect it up --

WILLIAMSON: Yes.

ASTBURY: -- that the prescription is accurate, it's to the right baby and the maths are correct?

WILLIAMSON: Yes.

ASTBURY: Then did you say that you go on, even when you check the maths is correct, to do the calculation again?

WILLIAMSON: Yes.

ASTBURY: So is that a way of double-checking?

WILLIAMSON: Yes. It's like triple-checking what you've done.

ASTBURY: So once you've satisfied yourself that the maths, the name, the rate, everything is correct, independently of the doctor --

WILLIAMSON: Yes.

ASTBURY: -- what's the next step?

WILLIAMSON: Check -- so usually like you see the prescription checker, the other person will do the maths as well independently so you both then make sure that your answers match the drug chart, so everybody's in agreement that there's no difference of opinions.

ASTBURY: Okay. So you both have to independently agree that it's appropriate to connect?

WILLIAMSON: Yes.

ASTBURY: Then how do you go about then administering the insulin?

WILLIAMSON: There's a protocol of making it up and how it's mixed.

It's in our drug book, for infusions, how to make the infusions up, so you get and get the equipment. If it's going through a central line it needs to be sterile, if it's going through a peripheral cannula, it's just clean.

ASTBURY: Again so I understand, you then physically make up the concentration --

WILLIAMSON: Yes.

ASTBURY: -- that you've agreed is right?

WILLIAMSON: Yes.

ASTBURY: And you do that from what?

WILLIAMSON: From the drug -- there's like a folder with all our infusions in it, so it's how you make them up step by step.

ASTBURY: Physically you have to go and get, presumably, the insulin? Where's that kept?

WILLIAMSON: Yes, it's in the fridge.

ASTBURY: And then you mix it presumably with a solute?

WILLIAMSON: Yes.

ASTBURY: And what would that be?

WILLIAMSON: Off the top of my head, no idea.

ASTBURY: All right. Then again do you both independently satisfy one another that it's done properly?

WILLIAMSON: Well, you supervise each -- one person will have the gloves on, one person will be standing there holding the equipment, holding the vials for you or whatever. If it's sterile, they'll be holding the insulin for you because you can't touch it if you are sterile. And then whatever you're diluting it down with, they'll be -- and they'll watch you prime it. So with insulin we prime it through the syringe once -- we make it up once, prime it through the syringe, because the insulin adheres to the plastic --

ASTBURY: Pause there then. It's administered through a syringe?

WILLIAMSON: Yes.

ASTBURY: Sorry to take you through it step by step --

WILLIAMSON: No, that's okay.

ASTBURY: None of us -- I don't know, I have certainly never done it, others may have. It's syringe?

WILLIAMSON: Yes.

ASTBURY: It's administered -- where's the syringe connected to?

WILLIAMSON: So the syringe has a line attached to it, an intravenous line, so a thin electrica(?) they're called. That attaches to the baby's cannula or central line, whatever the baby's got in. It doesn't generally go with anything else, it usually runs by itself. We don't usually piggyback it on anything.

ASTBURY: Okay. My fault, we're racing ahead.

You described how you prime -- you talked about the syringe, you primed the syringe --

WILLIAMSON: We've got a stock strength that we make that our -- so we have an infusion booklet and it says: you will make this infusion by adding so much insulin to so much I think we -- whatever we dilute it to. And it gives you a stock strength. You prime that through because the insulin itself, the drug, adheres to the syringe.

So if you don't prime it through the first time, the drug you're giving isn't the drug that's getting to the baby, if that makes sense.

ASTBURY: It does, thank you. So you coat the inside of the syringe with the insulin?

WILLIAMSON: Yes.

ASTBURY: So that you know that then what then goes in doesn't stick to the side of it?

WILLIAMSON: Yes.

ASTBURY: And it all goes into the baby?

WILLIAMSON: So you make it once, push it all through, and then using the same syringe, you make it all again. So you do it effectively twice.

ASTBURY: Then you attach to the syringe this line that you told us about?

WILLIAMSON: Yes, the electrica.

ASTBURY: And you connect the line to a port?

WILLIAMSON: Yes.

ASTBURY: And where would that port be?

WILLIAMSON: So on a baby's cannula or a UVC or a long line, whatever the baby's access would be.

ASTBURY: So cannula we've heard about, that's what some people may be familiar with, back of the hand in hospital, something like that?

WILLIAMSON: Yes.

ASTBURY: So it's a temporary, if I can put it that way, needle with a port on the back of it?

WILLIAMSON: Yes.

ASTBURY: A UVC, we've heard, goes into the baby's -- or where the baby's belly button would be if it had one?

WILLIAMSON: Yes.

ASTBURY: But -- is it the stump, if I can put it that way?

WILLIAMSON: Yes.

ASTBURY: And again, would the UVC have a port where you can connect that cable?

WILLIAMSON: Yes.

ASTBURY: And that port would presumably be kept shut?

WILLIAMSON: No -- well, you've got --

ASTBURY: -- until you attach something to it?

WILLIAMSON: Well, there'd be -- yeah -- so you've got something running through them because UVCs have two lumens generally and they keep both lumens running. One -- if we've got no drugs to run through it, it always has just 10% dextrose running through it, at like 0.5ml per hour, to keep it open, so it's got something through it, so it's not blocking.

ASTBURY: And do I take it then there are spare ports if there's always something (overspeaking) --

WILLIAMSON: There's always spare ports (overspeaking) --

ASTBURY: -- connect anything to (overspeaking) that you need to?

WILLIAMSON: Yes.

ASTBURY: And how is -- how is -- once you have connected it to the port, whichever port you have available, how is it actually delivered?

WILLIAMSON: Via infusion pump.

ASTBURY: Okay. We've heard that called a driver. Is that the same --

WILLIAMSON: A syringe driver, yes.

ASTBURY: Talking about the same thing. You're able to programme that with the rate --

WILLIAMSON: Yes.

ASTBURY: -- at which it is to be delivered?

WILLIAMSON: Yes.

ASTBURY: All right. I'm sorry to go through all that detail, but on your entry at 22.38, is that what you're checking?

WILLIAMSON: No.

ASTBURY: What are you doing at 22.38?

WILLIAMSON: You're just -- because quite often -- I don't -- if there's a paper chart that matches, I'm literally just matching the paper chart: is the prescription on the paper chart still running at the same rate?

ASTBURY: Okay.

WILLIAMSON: I'm not setting it up necessarily.

ASTBURY: No, no, sorry. Maybe I wasn't -- you are checking it, you're not doing anything (overspeaking) --

WILLIAMSON: No, you're just literally checking the maths.

ASTBURY: Thank you. If we can go next, please, to tile 141.

It may be we don't need to go behind this particular tile. But that suggests that yourself and Ms Letby administered a saline bolus at 23.20.

WILLIAMSON: Mm-hm.

ASTBURY: Any recollection of that event?

WILLIAMSON: No.

ASTBURY: Then if we go across to tile 143, please. Perhaps if we go into the entry. A similar form we've looked at before. Scroll down. It's the second box down underneath, "Administration history detail". Read across:

"Filed [presumably meaning administered] 23.39."

WILLIAMSON: Yes.

ASTBURY: Thank you. We can come out of that.

Not a criticism, but some treatment or some dealings with [Baby E] there at 23.39?

WILLIAMSON: Mm-hm.

ASTBURY: Scroll across again. We see there are a number of updates, and then we've seen from [Baby E]'s notes there was an episode at 23.40 or thereabouts recorded by doctors.

Finally, can we go, please, to tile 165?

Do you have any recollection of [Baby E]'s resuscitation?

WILLIAMSON: No.

ASTBURY: I simply point out that, certainly in some capacity there, it would appear that you were administering some drugs together with Caroline Oakley --

WILLIAMSON: Yes.

ASTBURY: -- but you're not able to remember that?

WILLIAMSON: No.

ASTBURY: If we keep scrolling across, please, Mr Murphy -- including adrenaline, we can see -- the shape of this is that we have Dr Wood's note and then the event?

WILLIAMSON: Okay.

ASTBURY: So it would appear, would you agree, that you were certainly assisting by administering some of the drugs or co-signing --

WILLIAMSON: Or co-signing, yes.

ASTBURY: -- for drugs being directed by the doctors at the time?

WILLIAMSON: Yes.

ASTBURY: Thank you. Although you didn't start the night looking after [Baby F], did that in fact change at some point?

WILLIAMSON: Yes.

ASTBURY: When did that change and why? Can you remember?

WILLIAMSON: I don't remember what time. I've just documented in my notes that I've taken over care of [Baby F] due to [Baby E]'s care needs increasing and then his death.

ASTBURY: So at some point you were given responsibility for [Baby F] because [Baby E] required more attention?

WILLIAMSON: Yes.

MR ASTBURY: Thank you. I have no more questions, but if you could wait there, please.

MR JUSTICE GOSS: Mr Myers, we haven't had a formal break as such, although we had a hiatus, as I described it, a gap in proceedings. I think we should just have a 10-minute break if that's all right.

MR MYERS: Certainly.

MR JUSTICE GOSS: We're just going to have a 10-minute comfort break, essentially, for people who want to make themselves comfortable.

You're free to go now, but could you be back in 10 minutes, please, ready to continue. Don't talk to anyone about your evidence or the case. Thank you very much indeed.

(3.17 pm)

(A short break)

(3.27 pm)

Cross-examination by MR MYERS

MR MYERS: What's your preferred mode of address?

WILLIAMSON: Ms Williamson is fine.

MYERS: You have worked in neonatal nursing for about 20 to 22 years, haven't you?

WILLIAMSON: Yes.

MYERS: And you've worked in the UK, you've also worked abroad; is that correct?

WILLIAMSON: Yes.

MYERS: And you've worked at tertiary centres, the sort of centres that we know Liverpool Women's Hospital were and Arrowe Park?

WILLIAMSON: Yes.

MYERS: So do you have a wide experience of caring for neonates?

WILLIAMSON: Yes.

MYERS: In your experience is it sometimes a case that neonates can deteriorate very rapidly?

WILLIAMSON: Yes.

MYERS: And can they do that sometimes even if they may have appeared sometimes to be stable beforehand?

WILLIAMSON: Yes.

MYERS: Does it sometimes follow that they can deteriorate and die in those circumstances?

WILLIAMSON: Sometimes.

MYERS: Sometimes. I'm not going to go into any particular figures, but the number of deaths in any given unit over any time can vary maybe from year to year; is that your experience?

WILLIAMSON: Yes.

MYERS: You've been working in neonatal for the period you've described. You've worked through a period where there have been advances in medicine, which mean that more premature babies and babies with complications are born; is that correct?

WILLIAMSON: Yes.

MYERS: You have seen that change?

WILLIAMSON: Yes.

MYERS: Does it follow that there's been increasing demands, in consequence, on intensive care because of the babies who are now born?

WILLIAMSON: Yes.

MYERS: And that's something you have experienced in your work?

WILLIAMSON: Yes.

MYERS: A baby like [Baby E], in your experience, does a baby like that carry a significant risk of mortality?

WILLIAMSON: They can.

MYERS: They can. All right. I'm not asking you to say more than that. They can.

I'm going to ask you some questions about the Countess of Chester Hospital if I may, please. None of the questions I ask criticise or question the dedication of the nursing staff there, can I make that plain; it's about the hospital and the way things are. None of it is critical of the nursing staff there.

Since the time of the events we're looking at in this case, a refurbished and new neonatal unit has opened, hasn't it?

WILLIAMSON: Yes.

MYERS: But the one that was operating at the time we are dealing with, at that time some aspects of the fabric of it were quite old; would you agree?

WILLIAMSON: Yes.

MYERS: Just to get a taste of this, you had noticed that things like the plumbing, drains and things like that, didn't seem to function as you'd have expected?

WILLIAMSON: Correct.

MYERS: Did you find over the period we're dealing with -- or even broader than that, please feel free to say -- that staffing levels in nursing were sometimes challenging to get the right number of nurses for the babies you were caring for?

WILLIAMSON: The skill mix sometimes would be challenging to allocate --

MYERS: Could you say a little more what you mean by that?

WILLIAMSON: Sometimes you might have more higher acuity babies and more junior staff, so it's trying to get the right balance of skill mix.

MYERS: Was it your understanding that ideally there should have been, for instance, two band 6 nurses on each shift?

WILLIAMSON: Ideally, yes.

MYERS: Ideally. But was it often the case you didn't have two band 6 nurses?

WILLIAMSON: The majority of the time there was two of us. It was rare and it would only be if there was a sick call at the last minute for us not to have a second 6 on.

MYERS: All right. Did you sometimes struggle to get the actual right number of nurses at the right level of qualification for the babies that were to be looked after?

WILLIAMSON: At times.

MYERS: At times. Were you sometimes a shift leader on the unit?

WILLIAMSON: Yes.

MYERS: And was it the case that in theory a shift leader was meant to not have a designated baby and be free to look after whatever needed looking after and deal with whatever arose?

WILLIAMSON: Yes.

MYERS: Is that what always happened or was it not like that?

WILLIAMSON: It depends. You generally were a float, but sometimes you'd have patient load depending on what the needs of the unit were.

MYERS: That's the nurses. I just want to ask you something about the doctors who worked on the unit. Was it sometimes difficult to get hold of a doctor when the doctor was needed?

WILLIAMSON: At times.

MYERS: I'm only asking for your experience and your impression.

The doctors were shared with the paediatrics ward, weren't they?

WILLIAMSON: Yes.

MYERS: And did you find sometimes that if paediatrics was particularly busy, maybe at night in particular, it was more difficult for a doctor to come across to the neonatal unit?

WILLIAMSON: Yes.

MYERS: So we have the picture, when we talk about doctors working in the paediatric unit, those same doctors would be dealing with any child that came to accident and emergency, wouldn't they?

WILLIAMSON: Yes.

MYERS: I'm going to ask you something about nursery 1., a little bit about how that was. When you made a statement to the police on 16 February 2018, you gave a rather graphic description of likening it to a bus station. Do you remember that?

WILLIAMSON: No.

MYERS: You said:

"It was constantly busy and [you'd] liken it to a bus station, it was so busy."

Do you recall saying that?

WILLIAMSON: No. I don't remember.

MYERS: Maybe I can read the passage and you can have a look at it if you want to. You were talking about the drugs cupboards. You said at page 3137:

"We have a number of drugs cupboards on the unit. There are four drugs cupboards in nursery 1 and a fridge in the sterile store opposite nursery 1."

Is that right?

WILLIAMSON: Yes.

MYERS: "All the cupboards are locked and the keys are held by the shift leader or another band 5 or 6 nurse."

WILLIAMSON: Correct.

MYERS: "As a result of the cupboard's location, nursery 1 is constantly busy [this is where you said it]. I would like it to a bus station it can be so busy."

You're not meaning it's really like a bus station --

WILLIAMSON: Yes.

MYERS: -- but did you mean when you said that, people tend to be coming in and out because they have to use the drug cupboards?

WILLIAMSON: Yes.

MYERS: And is there also a preparation trolley in there with equipment on that people come in to use?

WILLIAMSON: There was, yes.

MYERS: There was. So in addition to whoever was caring for the baby or the babies in nursery 1, staff could be coming in and out at any time to collect items that were needed?

WILLIAMSON: Yes.

MYERS: I'm just going to ask you a little bit about the evening of the 3rd into 4 August if I could. You mentioned when you gave your evidence earlier it's difficult to remember all the particulars of that; is that right?

WILLIAMSON: Yes.

MYERS: And it's many years ago now, isn't it?

WILLIAMSON: Yes.

MYERS: And you've looked after very many babies since then?

WILLIAMSON: Yes.

MYERS: All right. You won't have forgotten a tragic event that took place on that night with [Baby E]?

WILLIAMSON: I'm aware of it through reading my notes.

MYERS: When you had made your statement to the police, just to remind you again, in March of 2018, at that point it was in your mind that you had been designated to care for [Baby F] that evening. Do you remember that's what you originally had thought?

WILLIAMSON: No, I thought I'd said I looked after him halfway through the shift, I think.

MYERS: All right. In addition to that, from what you've described, you're also in nursery 1 at various points assisting in the care of [Baby E]?

WILLIAMSON: Yes.

MYERS: And as you've explained, there's absolutely nothing unusual about a nurse assisting another nurse with the care of a baby?

WILLIAMSON: No.

MYERS: I just want to ask you about the period prior to the collapse from which [Baby E] had to be resuscitated and the period we've seen on that chart that you looked at earlier. So I'm going to ask Mr Murphy, please, to put up the chart at page 2720. Slide 125, please.

I just have some questions about what we can see for the entries under 21.00 and 22.00. It's the entries we looked at a little bit earlier, Ms Williamson.

Dealing with 21.00 first, it might be difficult to read there, but what we can see at the top for the time 21.00 -- if we come down to aspirates, please, that's the bit to enlarge, Mr Murphy, if you would, the bottom section, please. Thank you.

We can see in the section that says feeds, the word "omitted" has been written at an angle. Can you see that?

WILLIAMSON: Yes.

MYERS: And then the word "discarded" is there. Then underneath that, you can see it says "16ml mucky"; can you see that?

WILLIAMSON: Yes.

MYERS: And the initials "LL" at the bottom of it, which would appear to be Ms Letby's signature; would you agree?

WILLIAMSON: Yes.

MYERS: I'd like you to help us with this: I'm going to suggest to you where it says "16ml mucky", that is something, an aspirate, that Ms Letby identified to you in the course of the evening. You may recall that, you may not, you may say that didn't happen, it's a matter for you. But can you assist us with that, please?

WILLIAMSON: She may have told me, but I don't remember.

MYERS: The next line or column that we've seen, which is timed at 22.00, you've identified at the very top of it entries that you'd made on that.

WILLIAMSON: Yes.

MYERS: And your signature is down at the bottom of it.

WILLIAMSON: Yes.

MYERS: Is it possible, where we see "15ml fresh blood", that is something Ms Letby has written in at some point after you'd put the initial entries into that?

WILLIAMSON: It can be, yes.

MYERS: Yes. And again, can you recall if that's something that was brought to your attention or not or it didn't or you can't remember?

WILLIAMSON: I can't remember.

MYERS: There's one other matter I'd just like to ask you about -- we can take that down, Mr Murphy -- thank you.

Different from that. We've heard that sometimes when a baby has to be intubated, it's necessary for drugs to be given to them to settle them and to allow the intubation to take place. Are you familiar with what I'm describing?

WILLIAMSON: Yes.

MYERS: Is it the case that drugs like that are invariably ready for immediate use so they can be used if required?

WILLIAMSON: No.

MYERS: How are they dealt with?

WILLIAMSON: They are made up by two members of staff.

MYERS: Can you assist with how long that would take?

WILLIAMSON: Depending on the experience of the staff, anywhere up to half an hour.

MR MYERS: Okay, thank you. Thank you very much, Ms Williamson.

MR ASTBURY: Nothing arising, my Lord. Does my Lord have any questions?

Questions from THE JUDGE

MR JUSTICE GOSS: You were obviously working at the Countess of Chester at this time. Can you remember what period you were working over there, because you obviously worked at a number of other hospitals and indeed institutions outside --

WILLIAMSON: I've worked at the Countess since 2012, probably February-ish.

MR JUSTICE GOSS: So early 2012 until?

WILLIAMSON: Still present.

MR JUSTICE GOSS: Now?

WILLIAMSON: Yes.

MR JUSTICE GOSS: So 10 years basically?

WILLIAMSON: Yes.

MR JUSTICE GOSS: Thank you.

Just that when you were speaking of your experience at that hospital, I just wanted to be clear about the period over which you were speaking because that hadn't been established, I don't think, by the evidence.

Thank you.

MR ASTBURY: This witness will be back.

MR JUSTICE GOSS: Right. Yes, you knew that from your response to that comment.

Please do not talk to anyone about anything to do with this case in the meantime and do not conduct any research into anything relating to this case, and in particular, read any news feeds of what other witnesses have said because that will be the same as listening to someone talking about the case. All right?

WILLIAMSON: Yes.

MR JUSTICE GOSS: So it's just to maintain your independence and integrity as a witness. All right? Thank you very much indeed.

(The witness withdrew)

MR ASTBURY: My Lord, the next witness -- clinical responsibilities -- couldn't be here before 10.30 tomorrow.

MR JUSTICE GOSS: No, I appreciate that. So that's it for this afternoon, is it?

MR ASTBURY: Yes.

MR JUSTICE GOSS: Thank you very much.

Tomorrow you'll recall we're going to finish at 2.30. Start at 10.30 to 12.30, break for an hour, and then finish at 2.30. All right? So a slightly shorter day. Remember your responsibilities, please, I'm sure they are ingrained into your heads. I'll see you at 10.30 tomorrow morning, thank you very much.

(In the absence of the jury)

MR JUSTICE GOSS: I'm just --

MR ASTBURY: Yes, the NNU entry.

MR JUSTICE GOSS: Well, two things. One, there should be whatever the final version is of this.

MR ASTBURY: Oh yes, we'll put that right.

MR JUSTICE GOSS: It'll have to go in there. That needs to be revisited, that particular area, because at the moment this does not represent the evidence.

MR ASTBURY: No, I agree. Thank you. I'm glad we checked it.

MR JUSTICE GOSS: Although we did clear up in the cross-examination an entry in which the handwriting was not recognised. Right. Thank you.

(Pause).

It's line 59, yes. It's the one, Mr Myers, where she said, "That's not my signature".

MR MYERS: Yes.

MR JUSTICE GOSS: I think I know whose it is, but it's identifiable as another person's.

MR MYERS: Yes. We'll get to that in due course, I anticipate. I misunderstood which one we were talking about.

MR JUSTICE GOSS: All right.

(3.46 pm)

(The court adjourned until 10.30 am on Thursday, 17 November 2022)